

The Source Magazine

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Green Scene

Bear 212

By Dan LeGrandeur, Bear Scare Ltd.

It was 1997 on a warm summer evening and I was watching a young, male, cinnamon-phase black bear feeding on clover on Whistler Mountain. I was the conservation officer for the area and, reasonably familiar with the various bears that frequented the Sea to Sky corridor. This bear I did not recognize. Most of the bears I saw on a regular basis were habituated to people to one extent or another. Most of them, too, were the subjects of on-going monitoring and various research projects and, as a result, were generally ear-tagged and/or radio-collared.

The newcomer I watched that July evening bore no signs of human manipulation or scrutiny; he was an 'unadulterated' and hitherto unknown bear, a relatively rare phenomenon amongst the populations of bears (particularly black bears) frequenting the roadsides of national parks in North America. This particular bear was striking in his appearance, being golden-brown and having a long, shaggy coat that gave him the look of a Toklat grizzly; even an expert could be forgiven for mistaking him for a grizzly bear at a distance. In addition, above the Roman nose and the more convex face that helped distinguish him as a black bear, he had a dark ring around each eye.

As it was late in the day, there were relatively few people on the road, and so, with my patrol vehicle stopped at a discreet distance, I had a private viewing of this unique-looking bear: He was about 120 meters from the road and seemingly quite oblivious to it. Ambling along parallel to me, he would stop occasionally, and sometimes even sit, all the while busily feeding on dandelions and meadow-grasses. Periodically, he would look up and, with a bunch of dandelions hanging



Photos: Dan LeGrandeur

out of either side of his mouth, cast a glance in my direction. As I was at a sufficient distance not to vex him, he continued with his primary preoccupation, which was feeding.

It struck me there was innocence in the wild scene I observed that warm summer evening: A wild and un-habituated bear moving through an area to which he completely belonged, and where, with our best assurance, he should have been safe. And yet, there was uneasiness, too. Could he remain inconspicuous in this place that, despite the best of our intentions, was beset with hazards for unwitting bears? With these two thoughts in mind, I watched him until he was out of sight. That was the first and last time anyone saw this particular bear as the completely wild animal I have described. His life was about to change forever.

The next morning, a report spread like wildfire that a bear had ripped open a tent and had also obtained some human food from a picnic table in the same campground.

No one had been hurt, and the whole incident spoke clearly of an opportunistic investigation of something unfamiliar. But humans need sensationalism, and there are times when objectivity seems to be an undesirable restraint. Within a few hours word of the 'incident' (and even the 'attack') had traveled far. There was another 'problem bear' in Whistler. Within a day, the news of what had transpired reached Eastern Canada. There, he swiftly became the subject of some basic debate and reporting that highlighted the most elementary and primeval of human reactions to the behavior of wildlife: A Toronto newspaper announced 'Bear on the rampage in Whistler'. This, of course, is what most of us believe, because we want to. During the next couple of days when the bear was under close observation, I had an indelible image in my mind of him sitting in his sunny meadow, mouth full of dandelions, content and unaware, a world away from the vicious predator he had since become. I could make no reconciliation

between reality and the perception of this animal.

The rot had set in though, as sure as if it had been a virus borne through the air. The contact the bear had experienced with something he could not understand as wrong had been learned and absorbed. And the high level of intelligence bears possess served to lure him back to look further for a source of food that had taken no struggle or effort to find. What to him was simply the pursuit of food, for us became danger. The process of habituation had begun and the danger it represented, no matter how it came about, was intolerable. The campground was closed and a culvert trap was set. The young bear walked willingly into it. After being caught he was anaesthetized, weighed, fitted with a radio-collar and a radio ear-tag, to ensure he could still be monitored in the event of failure of one or the other. In addition, a blood- sample and a tooth were taken, both standard procedures of wildlife immobilization. I looked at the bear, now named '212', as he lay trussed and anchored at my feet. He seemed so small and inoffensive, so violated, this menace renowned even thousands of miles away. Here he was in reality; a three-year- old black bear who weighed less than me! The grim procedure finished, '212' was hefted back into the culvert trap where he was observed until he regained consciousness and where he was then left for the night.

It had been decided that on-site aversive-conditioning would be applied upon releasing the bear in the morning. This is a methodology that has shown considerable success (particularly amongst black bears), in a growing number of areas in North America. It appears as one solution in a climate of thought that suggests there are few places left to move 'problem' bears to. Prior to releasing the bear, the culvert trap was hit with sticks to create a frightening din, a brutal-sounding procedure that, in fact, does the bear no harm and has the result of a bad association with a particular area. This part of the manipulation had gone according to rule, but then a mistake was made that could have cost the bear very dearly. An entire can of capsicum (pepper spray) was emptied into the culvert trap... just prior to the release of the bear! When the door was sprung, the bear stumbled out to a salvo of firecracker rounds and rubber bullets, the final cherry on the cake of the



degradation he had already suffered. As might be expected, he collapsed about 70 meters from the trap.

Pepper spray is intended to function as a debilitator, significantly yet temporarily irritating the olfactory and visual senses and creating a distraction that can allow a person to escape an attacking bear. In a situation such as I have described, the whole procedure is based on the bear being able to recognize its surroundings through sight, sound, and smell. Through this, the bear can learn to avoid the area it remembers as having been the location of the bad experience. How ridiculous does it seem, then, to render ineffective the senses that would achieve this by incapacitating them with pepper spray? The great danger in this, for Bear 212, was that he may never have had the opportunity to learn that the area he was in was somewhere to be avoided in the future, and that his likely and imminent return could have resulted in his death!

During the ensuing weeks, Bear 212 was continually monitored for a possible return to the area of his first infraction. While at times there was doubt he would not return, and despite the problems associated with his 'reconditioning' procedure, 212 did not return. As the summer extended, so too did our belief that he would stay in his own wild world away from the hazards of ours.

At the height of the berry season in 1997, there were a number of potential conflict situations with bears, which were averted, partly due to management practice, partly due to good fortune. During that same

season, 11 black bears were lost, almost exclusively to motor vehicles in the Sea to Sky corridor. Bear 212 was not one of these, nor was he involved in any other incidents, though he was initially suspected of being so on several occasions. Ironically, at such times it was his constant monitoring, through devices so intrusively fitted that kept him free. In September 1997, 212 was seen once in the employee housing area but, other than that he kept away, although known to be in the general vicinity.

He was not seen again until August 10, 1998, when he was observed near the Whistler golf course. The following day, he fed on garbage he obtained in the grounds of the town administration building. He was driven away from the area by a method referred to as 'hazing' which, as a first stage of aversive conditioning, generally involves a combination of pepper spray, rubber bullets and noisemakers. He was observed later, near the Function Junction, to the south of Whistler town site. During the night of August 11, after being seen at the Transfer Station, I captured him in a culvert trap. After much debate as to what to do with him, and much pressure from media and environmental groups, he was relocated to the Pemberton Meadows.

During the ensuing days he was seen in the vicinity of the town of Pemberton, but he did not stay there long. He was back in Whistler, again near the town's administrative buildings, around August 25. The following day he was seen at the golf course, where he was 'hazed' for a

second time. By now, Bear 212 had become part of what is an all-too-familiar cycle of habituation. He had swiftly reached the limits of human tolerance; he was now a 'nuisance' bear and a public liability. I shot him after he had entered into a local residence on August 28, 1998. He was four years old. He should have lived to be 30.

The brief, sad story of the part of Bear 212's life we know is not much different from the story of many other bears, grizzly and black, nor to the story of many other wild animals who, in innocence, breach the walls of tolerance we build around ourselves and our society. He, like thousands of other bears each year become a statistic, is simply an epitome of a huge and unsustainable problem.

This article is not particularly an indictment of the Conservation Officer Service. It is an indictment of ourselves, of where we are going, and of what we do not know that we are responsible for. How many visitors to our wilderness areas really know or accept what they (we) are responsible for in the most basic of the activities they (we) pursue there? The answer is: Not many. And yet, I think if

we made it important that people learn and understand such things in schools, in daily life and work, and in places like national parks, those people would be appalled at what happens as a result of their actions and they would want it to stop; would want, perhaps, to be part of stopping it.

The great irony is that Bear 212 (and the thousand like him that were killed in British Columbia that year) is so much a symbol of Western wilderness, the subject of a million post cards and business logos, the name on the gate of countless homes. We think we can be part of them in our high-tech urban lives, but we cannot, because there is more to sharing the land with bears than a four-wheel-drive and a particular brand of jacket and boots. Bear 212 was a victim of our modern society, a bureaucratic and economic problem in the dominion we see ourselves as having over the natural world. While we want to marvel at him in every way, we do not know when to stop getting any closer. We seem numb to the idea that it might be our responsibility to educate and moderate ourselves in such a way that accommodates other forms of life.

Bear 212's brief life and untimely death

serve to illustrate how easy it is for a bear to go from wild and independent to habituated and dependent on human beings. An intelligent, resourceful omnivore easily becomes a scavenger, sustaining itself on the detritus of our activities, if we allow it to. That is adaptability - The reason for the success of a species, while at the same time part of its undoing. One action, as he browsed through the woods on a warm summer evening, one source of food instead of another, scraps overlooked by a family hurrying to get the children organized to go to town for the evening, was the forbidden fruit for 212. And, as with a stone thrown up by the wheels of a speeding car that shatters the windshield of the car behind, causing an accident they may never know they are responsible for, too many of us are not aware of the consequences of our actions. Until we become aware, and until we take complete responsibility for what we do in wild land and are willing to moderate or even compromise our actions, Bear 212's story will be repeated until bears are gone forever. **S**

Species at Risk

Loggerhead Shrike

(*Charadrius melodus circumcinctus*)

Eastern Population
(*Lanius ludovicianus migrans*)
ENDANGERED

Prairie Population
(*Lanius ludovicianus excubitorides*)
THREATENED



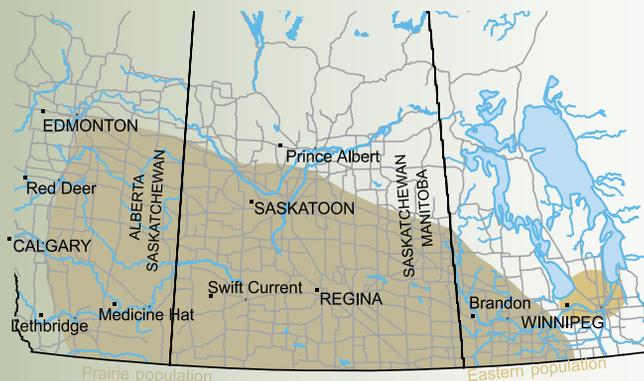
Length: 23 cm (9 inches)

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Loggerhead Shrikes are slightly smaller than a robin with a distinctive black mask across their eyes and forehead. They occupy open grassland areas, but require scattered trees or shrubs nearby for nesting and as perches. Loggerhead Shrikes migrate south in winter, and are replaced on the Canadian Prairies by the similar but slightly larger Northern Shrike.

Did you know?

- These masked hunters use their sharply hooked beak to kill insects or mice and will often impale their prey on thorns or other sharp objects for future use.
- Shrikes often use roadside power lines and fences as hunting perches.
- The prairie and eastern populations are so similar in appearance that identification is usually based on geographic location.



SAR Courtesy of Environment Canada

the GREENSCENE

Hinterland Who's Who

by Dan LeGrandeur,
Bear Scare Ltd.

The Canada lynx is a medium-sized cat (about 10 kilograms for males and 8 kilograms for females) with silver-gray to grayish-brown upperparts and a white belly and throat. Lynx have long legs and a relatively short, compact body. The total length averages approximately 92.5 centimeters for males and 89.5 centimeters for females). A facial ruff surrounds the face except directly beneath the snout. The facial ruff is longest on either side of the snout and has black markings on these longest hairs. The ears are 70 to 80 millimeters long and have a long, 30 millimeter black tuft at the end. The backs of the ears are darker than the rest of the body and have a central white spot. The feet are large and round (10 x 10 centimeters) and heavily furred. The tail is short and the tip is entirely black.

Canada lynx are most similar to bobcats, but differ in many respects. At a distance, lynx appear leggier and are grayer in color, with less distinctive spotting. Lynx have much larger feet and longer ear tufts. In addition, the entire tail tip is black in the Canada lynx whereas in bobcats the underside of the tail tip is white and the back of the hind legs is black on bobcats and a light beige color on lynx. Immature cougars may be superficially similar to lynx but have a much longer tail and body.

The lynx generally inhabits forested wilderness areas. It favours old growth boreal forests with a dense undercover of thickets and windfalls. However, this carnivore will populate other types of habitat as long as they contain minimal forest cover and adequate numbers of prey, in particular snowshoe hares. Because hare populations increase in forests that are growing back after disruption by wildfires or logging operations, these regenerating forest ecosystems are often able to support denser populations of lynxes as well.



Photos: Dan LeGrandeur



Home range sizes in North America are large, varying from 10 to 243 square kilometers; typical home ranges are 16 to 20 square kilometers. Home range sizes vary with sex, age, population density, prey density, and method of survey and calculation. Some researchers have reported lynx maintain single sex territories (especially males) with male territories overlapping female territories. However, others found substantial overlap between territories of both the same and opposite sexed animals. Where lynx and bobcat are sympatric, home ranges overlap; however bobcats are at lower elevation in winter.

The primary winter food for lynx throughout their range is the snowshoe hare, comprising 35 to 97% of their diet. Squirrels are also an important prey item, particularly when snowshoe hare populations are reduced. Summer diets are not as well known but are probably more varied. Lynx in Alberta probably prey on a wider variety of species throughout the year because of generally lower snowshoe hare densities and available alternate prey. Other known prey items include grouse, flying squirrels, ground squirrels, porcupines, beavers, mice, voles, shrews and occasionally ungulates as prey or carrion.

Canada lynx populations are tied to snowshoe hare populations and cycle with them. Snowshoe hare populations were not thought to cycle in southern Alberta, but recent research suggests that southern hare populations do cycle, but not at the amplitude of northern populations. Southern hare populations also exist at lower densities than northern populations. Southern Alberta lynx ecology is subsequently different than those populations further north with average home ranges nearly twice the size of those found in the north. Home ranges are quite variable

with increasing home range sizes during periods of low hare populations. Home ranges of males are larger than that of females. Long distance dispersal movements of up to several hundred kilometers have been recorded and dispersal is common and thought to be essential for population regulation. Population density usually is less than 10 (locally up to 20) per 100 square kilometers, depending on prey availability. Mean densities range between 2 and 9 per 100 square kilometers.

Lynxes hunt at night. They watch and listen for prey, but they do not seem to track it by smell. Like all members of the cat family, they move silently. Although excellent climbers, they are seldom found in trees. Because they cannot run fast except over short distances, they stalk or ambush their prey at close range. A common strategy is to lie in wait beside the well-used trails, or runways, of the snowshoe hare. Success usually depends on whether the lynx manages to capture the hare at one bound—about 6.5 m or four hops for the hare.

Male lynxes hunt alone, except briefly during the mating season. By autumn, females travel with their kittens, the young learning to hunt, and the family group may stay together until the breeding season, in late February or March. Family groups cooperate to increase their hunting success. The mother and young often travel in single file through habitat where hares are scarce, but will travel abreast when hunting in habitat where hares are plentiful. A hare flushed, or forced out of its hiding place, by one lynx may be caught by another.

Canada lynx breed through March and April. Gestation lasts 62 to 74 days with litter sizes averaging 3 or 4. Males do not help rear the young. Adult females produce one litter every 1 to 2 years and the young stay with their mother until next mating season or longer. Some females give birth as yearlings, particularly during years with high snowshoe hare populations, but their pregnancy rate is lower than that of older females. Prey scarcity suppresses breeding and may result in mortality of nearly all young. In Alberta, reproduction fell 38% (ovulation rates, pregnancy rates and litter size) and mortality of kittens reached 95% during cyclic hare population lows.

In Canada, trapping seems to be the only important cause of death besides the decline of populations of the lynx's main prey, the snowshoe hare. Although the wolf is alleged to be the chief natural enemy of the lynx in northern Europe, nothing is known of lynx-wolf interactions in North America. The incidence of diseases, such as rabies and

distemper, among lynxes and their impact on populations are also unknown.

Trapping is also the most important influence of people on the lynx. The lynx is easily trapped, and when fur prices rise, trappers take a larger proportion of the lynx population. Intense trapping can remove most lynxes from a given area. Historically, trapping has caused long-term changes in the size of the lynx population in Canada. Lynx populations began to decline after 1900, and the decline continued to the mid-1950s. At that time, garments made of long-haired furs went out of fashion, there was a major depression in fur prices and a decline in trapping, and the lynx population was able to recover. Since the early 1970s, the demand for lynx pelts has risen steadily. The average price paid per pelt went from about \$30 in 1970 to peak in the mid-1980s at over \$500 per pelt. By 1990, it had fallen to \$117.

Today, the lynx is trapped in all provinces and territories except Prince Edward Island, Nova Scotia, and New Brunswick. Trapping is confined to regulated seasons, and wildlife managers can vary the regulations as needed from year to year and among districts within a province. Many jurisdictions have also placed restrictions on the number of lynxes that may be killed. Some biologists have recommended closing trapping seasons entirely during lows in the population cycle. Several provinces are carefully studying the influence of trapping on their lynx populations and adjusting regulations to protect this renewable resource. High fur prices have also stimulated interest in raising lynxes on ranches. It is possible that ranching may one day provide a considerable number of the pelts that enter trade, as are now the case with mink and fox.

In general, human activities do not seem to be threatening lynx populations. Although the lynx is usually considered to be a wilderness animal, human settlement does not seem to have reduced its range. Logging in the boreal forest that produce a good mix of mature conifer stands (for cover and travel) and regenerating stands (in which snowshoe hares abound) may even enhance habitat for lynx. Forestry operations, however, provide roads and ease of access to the trapper. If the regulations governing logging are not conservative and flexible enough, extensive clear cutting that results in the virtually complete removal of conifer forests from large tracts of land is probably harmful to resident lynx populations. ●



Green Scene

Canaries in the Coal Mine

By Dan LeGrandeur, Bear Scare Ltd.



Photo: iStockphoto

B iologists have long suspected that amphibians, whose moist permeable skins make them susceptible to slight changes in the environment, might be good bellwethers for impending alterations in biodiversity during rapid climate change.

Now two University of California biologists have verified the predictive power of this sensitive group of animals in a global study of species turnover among amphibians and birds. Their study supports the role of amphibians as ‘canaries in the coal mine’ theorizing that amphibians are likely to be the first to respond to environmental changes and their responses can forecast how other species will respond. Amphibians are much more tuned in to the changes in their specific environments as they are much more sensitive to differences in environmental conditions as you move geographically from one location to another.

The two scientists used maps of the environment and amphibian and bird

distributions to answer the question of how the environment—as well as the distribution of birds and amphibians—changes as one moves from one place to another around the globe.

The researchers found that if the environment changes rapidly as one travels from one location to another, the amphibian and bird communities also change rapidly. However, the species of amphibians would change more quickly than species of birds. This confirms that amphibians are particularly sensitive to changes in the environment, the researchers conclude, and that this sensitivity is particularly acute given their narrow distributions.

Not immune to this crisis, the Northern Leopard Frog which was once a common species across Canada is also now in danger. The Northern Leopard Frog is perhaps most recognizable as the formaldehyde-soaked specimen in the high school lab tray. Once the most abundant and widespread frog species in North America, leopard frogs were widely collected not only for

dissection but for the food industry (frog legs) as well. However, massive declines beginning in the early 1970s, particularly in Canada and the western United States, have significantly reduced their numbers. The reason for this population decline is not fully understood, but possible causes include climate change, disease, habitat loss, habitat fragmentation, water quality degradation, and poor water management practices.

Northern Leopard Frogs are not likely to be mistaken for any other species in western Canada. The Northern Leopard Frog is a medium-sized green or brown frog with distinctive dark spots ringed with paler “halos.” The number and colour of spots is variable. The frogs have large hind legs with dark bars, pale under parts, and prominent dorsolateral ridges that are paler than the back. A white stripe runs along the upper jaw and back to the shoulder.

Adult Northern Leopard Frogs range from 5.5 to 10 centimeters from nose to rump with the females being somewhat larger than males. The adult’s pattern of haloed spots and pale dorsolateral ridges is quite distinctive. The call is usually described as a “chuckling” or “gabbling” sound. It has also been described as sounding like a hand rubbing a wet balloon. Northern Leopard Frogs also give alarm cries that sound like shrill squeaks if they are handled.

Adult Northern Leopard Frogs are semi-terrestrial and maintain home ranges of up to 600 square metres during the summer. The size of the range is related to the size of the frog. Within the home range, Northern Leopard Frogs spend much of their time in small clearings of damp soil, called forms, or in crevices if the habitat is forested. They favor open, grassy sites,

which has given them one of their common names, the Meadow Frog.

Breeding ponds in other parts of their range are usually less than 60 m in diameter, and approximately 2 m deep at their deepest point and the eggs are laid in 15 to 65 cm of water. Breeding ponds are warmer and shallower than the streams and ponds used for hibernation, and usually have rich vegetation.

Adult Northern Leopard Frogs gather at breeding ponds very early in the spring sometime before the last frost when the water temperature approaches 10°C. Males migrate to the breeding ponds from their hibernacula and begin calling with the females following some five to seven days later. Calling males typically float at the water's surface in the warmest part of the pond, and are far more visible than the females clustered along the pond's shoreline.

Mating takes place between late April and early June, over a period of two to seven days. Each female mate once, lays a single egg mass, and leaves the pond. The males tend to mate more than once.

The Egg masses are concentrated in warm, shallow water where they may float at the water's surface or be attached to submerged vegetation. Each egg mass contains between 1000 and 5000 eggs. Hatchlings emerge in about nine days and spend a couple of days clinging to vegetation and the remnants of the egg mass before becoming free-swimming tadpoles. The tadpoles are dark brown or grey, with light blotches on the underside and the tail is pale tan.

Tadpoles transform in summer (late July), emerging as miniature frogs (metamorphs) about 3.5 cm long. Mortality among these juveniles is very high and for a short time

they make up a huge proportion of the population (up to 98 percent), but they are very quickly decimated by predation. Those metamorphs that survive to reach sexual maturity do so in about two years, though maturity is dependent more on size (and hence food availability) than age. Northern Leopard Frogs become mature at 5 to 6 cm in length. The frogs have a lifespan of about four years in the wild, and have been known to live nine years in captivity.

Northern Leopard Frogs hibernate from October through to March, in deep ponds or streams, in small indentations in the mud. These water bodies must have adequate oxygen, and not freeze solid in winter.

Northern Leopard Frogs are indiscriminate predators as adults; they will eat virtually anything that moves. They use a sit-and-wait strategy, waiting for the prospective meal to come fairly close before they orient toward it, stalk, then leap 15-40 cm to seize the prey. The diet consists primarily of insects — beetles, ants, flies, and leafhoppers. Other invertebrate prey includes pillbugs, worms, snails and slugs. Adults often eat smaller frogs, including juveniles of their own species. Northern Leopard Frogs may occasionally consume other vertebrates; voles, birds, and even garter snakes have been found in the stomachs of large frogs. Both nocturnal (active by night) and diurnal (active by day) prey species have been found in the stomach contents, indicating that Northern Leopard Frogs hunt during both periods. The tadpoles are mostly herbivorous and graze on algae.

Northern Leopard Frogs are themselves on the menu for a variety of predators, which include herons, grebes, mergansers, snakes, turtles, fish and larger frogs.

Aquatic insect larvae, water birds, garter snakes, fish and leeches, consume the tadpoles.

In B.C., the Northern Leopard Frog was once found fairly widely in the eastern Kootenays, the Creston Valley and the South Okanagan, and they are presently known from only one location in B.C., in the Creston Valley.

At one time in Alberta, Northern Leopard Frogs were widely distributed in the eastern half of the province, but in the late 1970s their populations declined dramatically. Presently there are a few records of small populations from the northeast corner of the province and they appear to be absent from most of central Alberta. The remaining reduced populations are found in the mixed grassland in the south. The species has been designated as 'threatened' in Alberta since 1997. It is estimated that Northern Leopard Frog populations in Alberta have fallen by 60-80% over the last 30 years.

The Northern Leopard Frog is also one of the species most at risk in B.C. The B.C. population is listed as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and is on the provincial Red List.

In the Northwest Territories, Alberta, Saskatchewan and Manitoba these populations are now considered to be of Special Concern by COSEWIC. The reason for this designation is that the species remains widespread but has experienced a considerable contraction of range and the loss of populations in the past. This has been accompanied by increased isolation of remaining populations, which fluctuate widely in size but have some shown signs of recovery. Leopard Frogs in eastern Canada are considered Not at Risk. **S**



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Green Scene

Insects and Snakes

By Dan LeGrandeur, Bear Scare Ltd.

The two greatest risks from most bee, wasp and yellow jacket stings are an allergic reaction (anaphylaxis; which occasionally can be fatal) and infection (more common and less serious).

Bees, wasps, yellow jackets, and hornets belong to the same class of insects. Typically, most stings cause only minor discomfort and can occur anywhere on the body. Yellow jackets cause the most allergic reactions and stings from these insects cause three to four times more deaths than poisonous snake bites, due to severe allergic reaction.

Stings are immediately obvious where there is a sharp pain followed by a burning sensation that soon resolves into a major itch. A red ring or bump may appear at the site of the sting. A bee's stinger is barbed and usually remains in the skin as the bee tears the stinger and the attached poison sac out of its abdomen, killing itself in the process. Wasps, yellow jackets and hornets lack barbs on their stingers and can attack repeatedly.

Anaphylaxis is a severe allergic reaction that affects the entire body. It can occur within a few seconds or minutes after a person is exposed to an allergen such as a sting.

Symptoms and signs of a severe allergic reaction may include:

- Itching
- Raised, red bumps on the skin (hives)
- Wheezing or difficulty breathing
- Swelling, either in one area or over the entire body. Swelling is most serious when it involves the lips, tongue, mouth, or throat and interferes with breathing
- Abdominal cramps



- Low blood pressure, shock, and unconsciousness

The sooner symptoms occur after exposure to the allergen, the more severe the anaphylactic reaction is likely to be. An anaphylactic reaction may occur with the first exposure to an allergen, with every exposure, or after several exposures. An anaphylactic reaction can be life-threatening and is a medical emergency.

A severe anaphylactic reaction requires immediate treatment that involves the patient receiving an injection of epinephrine. The Epi-pen is a brand name of the most common type of auto injector of epinephrine (i.e. adrenaline). The Epi-pen can be self-administered and is very fast-acting.

In Canada; Epi-pens are regulated medical devices that require a prescription. If a worker knows that he has a severe allergy that can cause an anaphylaxis reaction, an Epi-pen should be carried at all times. If an Epi-pen is not available, an oral

antihistamine can often be used to slow the symptoms of anaphylaxis.

If a bee stings you and the stinger is still in the skin, remove the stinger. It is important to remove the stinger within 30 seconds of a sting. Delay in removing the stinger may increase the amount of venom that is received. The stinger can be removed by the following methods:

- Flicking the stinger out with a finger
- Scraping it out with a knife or credit card
- Place tape over the stinger and surrounding skin then pull the tape off the skin to remove the stinger

Avoid pinching the stinger out with your fingers or tweezers, which can release more venom into your skin. However, it is better to use this method than to leave the stinger stuck in the skin.

- Wash the area well with soap and water
- Apply a cold or ice pack wrapped in a

cloth to help reduce swelling and pain (10 minutes on and 10 minutes off for 30 to 60 minutes)

- If the sting occurs on an arm or leg, elevate the limb to help reduce swelling
- To help reduce the itching use a paste of baking soda and water, a wet tea bag, or a commercial product made to use on stings
- An oral antihistamine or calamine lotion may help relieve itching, redness, and swelling

Rattlesnakes

The rattlesnake is the only poisonous snake found in Canada. The chance of being bitten is very remote but caution should be exercised when working in areas inhabited by rattlesnakes.

Ranging from southern British Columbia to southern Saskatchewan, the western rattlesnake can be divided into two distinctive races: the Prairie Rattlesnake, the lighter of the pair, is found in Alberta and Saskatchewan, and the somewhat darker Northern Pacific Rattlesnake which is found in the arid valleys in British Columbia. Anyone working in areas where these snakes are found should always take precautions. Rattlesnakes tend to shy away from people, but disturbing them is not recommended; their bite is extremely hemotoxic, meaning it destroys blood cells.

Pit vipers are poisonous snakes of the Crotalidae family. Rattlesnakes, copperheads, and water moccasins (or cottonmouths) are common pit vipers found in North America. Rattlesnakes are the only pit vipers commonly found in Canada. The name comes from the pit-like depressions behind the nostrils that function as heat sensors, making it possible for the snakes to locate warm-blooded prey, even in darkness.

Characteristics of pit vipers include:

- A keen sense of smell
- Triangular heads and slit-shaped pupils
- Fangs. When these snakes strike, they often leave distinctive double fang marks on the skin (rarely, they leave one or three puncture marks)
- A single row of plates or scales on the undersurface of the snake (in contrast to the double row of plates or scales on non-venomous snakes)
- A diet of small animals, reptiles, birds, and insects



Symptoms of pit viper snakebites often appear from five minutes to two hours after a bite. Severe burning pain at the site usually begins within minutes and then swelling starts spreading out from the bite.

Several factors affect the severity of a poisonous snake:

- The type and size of the snake
- The amount of venom injected (if any)
- The potency of the venom injected
- The location and depth of the bite
- The number of bites and where they occurred on the body
- The age, size, and health of the person who was bitten

If no symptoms appear within eight hours, it is possible that no venom was injected; this is called a dry bite. About 25% of bites are dry. Of the 75% to 80% of bites where poison is injected, about 35% of bites are mild envenomations, 25% are moderate, and 10% to 15% are severe.

It is important to remember that a snake only injects part of its venom with each bite, so it is still a dangerous threat after the first strike. A young (immature) snake is more likely than an older snake to inject all its venom with its first strike. For this reason, a bite from a young snake can be serious. A dead snake can have a bite reflex up to an hour after death, so it must be considered dangerous as well. Even if no symptoms appear within eight hours, continue to watch for symptoms for up to 24 hours.

Non-Poisonous Snake

Most snakes and lizards in North America are non-poisonous and harmless. Bites may be frightening, but most do not cause serious health problems. A bite from a small, non-poisonous snake might leave teeth marks (not fang marks), a

minor scrape, or a puncture wound without other symptoms. The force of the bite can cause injury to the skin, muscles, joints, or bones. Other problems can occur with a non-poisonous snakebite even if the reptile is small: a snake's tooth may be left in a wound or a skin infection may develop at the site of the bite. Treatment should be sought as it will often relieve symptoms and help prevent infection.

Immediate Treatment

- Remain calm. Lie down and stay as quiet and still as possible after the bite. Any physical activity may increase the flow of venom to the bloodstream.
- If you are not sure what type of snake bit you, **call a poison control centre immediately** to help identify the snake and determine the next steps to take.
- If an extraction device is used, it should be applied within 3 minutes of the bite. Leave it on for 30 minutes. **Do not** cut the skin over the bite before applying the suction.
- Remove any jewelry on the bitten limb. The limb might swell; making it more difficult to remove the jewelry after swelling begins.
- With a pen, mark the edge of the swelling around the bite every 15 minutes so the progression of swelling can be evaluated.
- Apply a splint on an arm or leg that was bitten. This is intended to limit motion and thus limit the flow of venom into the bloodstream. If possible, keep the bitten area at, or slightly lower than, the level of the heart.
- Drink fluids (not alcohol) in frequent, small amounts unless vomiting is a problem. This will help maintain blood volume and reduce the risk of going into shock.

- Immediate treatment should not delay transport for emergency evaluation.
- If medical care is more than 60 minutes away, a constriction band on the affected limb may reduce the spread of the poison. Apply a 2.5 cm to 5 cm wide band or cloth about 5 cm to 10 cm above the bite. You can use a watchband or a belt. You should be able to place two fingers beneath the band, which means the band is only tight enough to slow blood flow in veins near the surface of the skin without cutting off circulation. Fingers and toes should maintain normal colour and feeling. Signs that the band is too tight include numbness, tingling, increased pain, or coolness in the toes, fingers, or limb below the band. The tightness of the band needs to be closely watched. If swelling increases, the band may become tighter and act like a tourniquet. The band should be loosened if this occurs.
- If the worker is many hours or days away from medical care, these measures can be used until further help can be obtained.

Prevention

Some bites, such as those inflicted when snakes are accidentally stepped on or encountered in wilderness settings, are nearly impossible to prevent. When working in “Rattlesnake Country” take the following precautions to lower the risk of being bitten:

- Leave snakes alone. Many people are bitten because they try to kill a snake or get a closer look at it
- Stay out of tall grass unless you wear thick leather boots, and remain on cleared paths as much as possible.
- Keep hands and feet out of areas you can’t see. Don’t pick up rocks or firewood unless you are out of a snake’s striking distance. (A snake can strike half its length)
- Be cautious and alert when climbing rocks.
- Don’t sleep next to brush, tall grass, large boulders, or trees. They provide hiding places for snakes. Place your sleeping bag in a clearing. Use mosquito netting tucked well under the bag. This netting should provide a good

barrier.

- Don’t put your hands into dark places, such as rock crevices, heavy brush, or hollow logs, without first investigating.
- Don’t step over a fallen tree. Step on the log and look to see if there is a snake resting on the other side.
- Don’t walk through heavy brush or tall grass without looking down. Look where you are walking.
- Don’t pick up any snake unless you are absolutely positive it is not venomous - most snake bite victims are bitten on the arms and hands.
- Don’t pick up freshly killed snakes without first severing the head. The nervous system may still be active and a dead snake can deliver a bite.

If you encounter a snake when working or recreating; *just walk around the snake, give it a wide berth--six feet is plenty. But leave it alone and don't try to catch it.*

Note: It is an offence under provincial legislation to kill rattlesnakes, as they are a protected species. •

Species at Risk

Piping Plover

(*Charadrius melodus circumcinctus*)

ENDANGERED



Length: 15-19 cm (6-7 inches)

© Environment Canada,
Photo: J. Paul Goossen

Piping Plovers are small shorebirds with a single neck-band, a orange bill with a black tip and orange legs that differentiate them from similar looking Killdeer that have two neck-bands (see photo). Plovers are found on sparsely vegetated sand or gravel beaches and alkali mud flats where they nest and raise their young.

Did you know?

- Females may desert the brood, leaving males to look after the chicks alone.
- Keeping pets, cattle and vehicles (including ATVs) off nesting beaches increases survival of plovers.



SAR Courtesy of Environment Canada

Green Scene

The Polar Bear

By Dan LeGrandeur, Bear Scare Ltd.

The polar bear is one of the few animals that occupy a realm that is largely without human population, and so some of the principal conservation issues that relate to it are unique. Whereas habitat loss is probably the most significant reason for decline in bear populations in other parts of the world, it is a less important factor with regard to polar bears. There are cases where human settlement and activity impact polar bears and their habitat, but in general we do not live with polar bears for their territory, and their range is not in decline. Similarly, conflict with human beings, perhaps the other most significant factor in the decline of bear populations, is less of an issue with regard to polar bears, because interactions with people are so limited that the number of conflicts is very low. Conflict with polar bears has the potential to be very serious, but most problems that have occurred have been confined to specific areas that make up a tiny portion of the overall range of the polar bear.

Perhaps it is partly because of its obscurity that even in its reality the polar bear is partly mythical to us. Many people believe that the great white bear is the ultimate predator, and that it kills relentlessly and without motive. One of the main reasons for such beliefs may be that the polar bear has some uniquely adapted hunting skills, and, if anything, that we observe something of our own calculating and stealth in its behavior and hunting methods. In general, we are attracted to the biggest and most powerful in any sphere, so that it is the grizzly bear and not the black bear that we hope to see the most when we visit the mountains, the lion and not the leopard when we are on safari. Seldom, when we see such animals do we report on our interaction in a calm and objective way, but, rather, we exaggerate



Photo: istockphoto.com

for our own sake, perhaps to try and profit by association. This is the way we make legends, and the polar bear is the subject of many legends. So the polar bear has found its way into our desire and imagination, because it is so powerful, and because it is so much the undisputed king of its realm.

The reality of the polar bear could perhaps disappoint some people, in that many of its behaviors and traits are similar to those of black and grizzly bears. The polar bear adapted from grizzly bears that moved north, and it is believed that the two species “separated” about 200,000 years ago. Polar bears and brown bears are so closely linked, in fact, that if they were to interbreed they could produce fertile offspring. The southernmost polar bears in the world live in the James Bay and Hudson Bay areas of Quebec, Nunavut and the Northwest Territories. The continental climatic influence on these

inland seas resulting in their being frozen for six months of the year, providing a southern peninsula of habitat that would not otherwise exist. At the southernmost extent of their range, polar bears live at the same latitude as London, England, though in a far harsher climate. At the extreme north west of the range of the grizzly bear, there is some intersection with the range of the polar bear, so, while the possibility of interbreeding is remote, if it were to happen, that is where it would be most likely. Polar bears are a true global species, existing in North America, Europe and Asia, and, in the far north, they have been documented moving round the world on the ice.

There is very little difference in the size and weight of mature adult male polar bears and Kodiaks. In each case, mature males may weigh up to as much as 2000lbs, though more commonly they

will average between 800-1200lbs. Sexual dimorphism in polar bears is very marked, with males often weighing twice as much as females, a factor which may partly be explained by males having significantly longer feeding periods than breeding females. In the Hudson Bay and James Bay areas, polar bears look very much like white grizzly bears, having short necks and broader heads with “dished” faces. Further north, the bears have a more aquiline appearance, with longer necks and smaller, narrower heads. It is possible that this is an adaptation to more time spent in water, a kind of streamlining.

Polar bears have black skin, which helps to absorb heat. This is only evident if one looks closely at a bear’s face, or if the animal has a scar. Their hair is hollow, containing a thin column of air, which gives it exceptional insulation qualities. The feet of the polar bear have a thick covering of hair between the pads, and recent research has shown that the pads themselves actually give out enough heat to very slightly “melt” the surface of the ice underfoot, enhancing grip. In combination with hooked claws, like that of a black bear, the polar bear is very well equipped to travel on ice.

Polar bears are almost completely carnivorous, being largely reliant on ringed seals for food. Like most bears they are opportunists, and they will feed on other animals or carrion, but they are most adapted to ranging over the ice looking for seals’ breathing-holes, and trying to catch them when they come up for air. As this suggests, polar bears are reliant on ice for their hunting. In the Hudson and James Bay areas, the bears only feed when the bays are frozen, which means they do not hibernate, as winter is by far their most active time. In the summer, the bears go through a period that is termed “walking hibernation”, where they are awake but conserving as much energy as possible. At this time, the bears rest and try to stay cool, as they are uncomfortable in temperatures above freezing. In some cases, they will excavate shallow dens, exposing the permafrost, and they will then lie on these ice-benches to keep cool. Apparently, during this ice-free period, polar bears spend up to 87% of their time resting.

During the brief summer months, the bears feed very little, relying instead on the fat stored by the previous winter’s hunting. They become more opportunistic

during this time, and will feed on stranded mammals and fish, small land mammals and even reindeer. They will also catch sea birds as they sit on the water, and they may eat berries if they come across them. Scat found during this ice-free period may contain some seaweed, and it is thought that the bears eat this in small quantities as a mineral supplement, much the same way ungulates will lick at mineral deposits where they come to the surface or are exposed. Feeding during this period is supplemental compared to feeding during the winter, which permits significant fat deposition.

For male bears and non-breeding

north.

Further north, where the ice is permanent, the bears do not have a fasting period, though food is less abundant, and climate and activity mean that a constant supply of food is necessary. The abundance and more moderate climate of the southern part of the range is what makes the bears’ survival through the ice-free period possible.

Mating occurs on the ice, between March and June, and pregnant females den in the fall. Dens are usually located within 8km of the coast, though in the southern Hudson Bay region, they are concentrated in a “traditional” denning area that is 30-60km inland. The protection of this

“ Given due warning of human presence, polar bears will avoid us, and they have far too pressing a task to gain and maintain fat than to be distracted by some whim to kill for pleasure. ”

females, this fasting period is generally from June or July to November, when the bays are ice-free, but for pregnant females who den from October or November until February, it is twice as long. When the female bears emerge with their cubs, having emaciated to about a quarter of the weight they carried on entering their dens, they have as long as the ice remains to regain their fat and feed their cubs adequately to allow them to survive to the next winter. As if this daunting task were not enough, the female polar bear must also defend her cubs from potential attack by males, who, like other bears, may try to kill cubs, particularly male cubs, if they have the chance. Climate change in recent years has meant that the ice in these southern areas of the polar bear’s range is forming up to two weeks later than it did in the past. Similarly, in the spring, the ice is melting that much sooner, so the net result is that the feeding period for female polar bears with cubs has shortened by about 25%. If this proves to be a long term trend, or if this reduction increases, it is likely to make these southern polar bear populations non-viable, causing them, inevitably, to shift

denning area is one of the main reasons for the designation of Wapusk National Park. Because implantation of the egg is delayed, gestation lasts from 195-265 days, and cubs are born between November and January. At birth, cubs weigh about 450 grams, and they remain in the den until March or April, by which time they weigh 10 – 20 kgs. Generally, polar bears will have twins, though singles and triplets are quite common. As with grizzly bears, quadruplets are rare. In cases of triplets or quadruplets, it is common that one or two cubs will not survive to maturity. After spending a week to 10 days close to the den, for the cubs to get used to being outside, and using their limbs, the sow will then begin heading towards the ice to begin feeding. This is a vulnerable time, as the sow will not have fed for approximately 8 months, and the cubs are completely dependent on her.

Normally the cubs will stay with their mother for two years, unless she does not become pregnant again in the fall of their second year. Initially, after separating from their mother, siblings may remain together for some time. It is quite common to see

three and four year-old bears playing and sparring together, and in many cases the bears in these situations are siblings. Play is an important part of the early years of a polar bear's life, and through it they learn about social interaction and, in the case of males, it prepares them for a time during future mating seasons, when their sparring will be more serious. Sexual maturity is reached between 5-6 years, on average, being earlier in females, and full maturity is reached at about 5 years for females and 10-11 years for males.

Polar bears, like black and grizzly bears, can live to between 25 and 30 years, and in some ways, are more likely to reach their potential longevity than any other species of bear. This is largely because there is little overlap between polar bear habitat and that of human beings, and, unlike the grizzly bear, there is little difference between their historic and present ranges. Particularly in the high Arctic, polar bears inevitably succumb to the elements of their harsh environment, old age making them less successful at hunting, leading to gradual starvation which, in turn, makes them still less able to find adequate food. Eventually, starvation and, ironically, the cold, combine to kill them. Younger, stronger bears when fighting over females during the mating period also sometimes kill older bears.

The polar bear is a formidable hunter, and that, combined with its size and the fact that so few people know very much about it, has resulted in it becoming more the subject of legend than almost any other animal. Among the many indigenous peoples who live within the range of the polar bear, the bears are often powerful symbols and spirits, playing important roles in both history and modern culture. In many other societies, the polar bear has gained a reputation for being the most dangerous animal in the world, and for attacking and killing people and other animals for no reason. While people should have a healthy "fear" and respect of the polar bear, as it is unrivaled in power and speed and adaptation to its environment, the way it is regarded is generally unfounded and based in ignorance, which is the case with many animals that acquire legendary status.

In reality, the behaviors of the polar bear are quite similar to those of other bears. Polar bears are very specialized hunters, but rather than being cold-blooded, they

simply hunt in ways that permit them to sneak up on their prey without cover. There are three main hunting methodologies, the first being the scenting of seals in their den; having approached the den, the bears use their front paws like rams to smash in its roof, giving access to the seals inside. Dens make a significant contribution to the diet of the polar bear, as seal pups are very rich in fat. The second main hunting method involves lying in wait by a seal's breathing-hole, for the seal to surface for air. As proof of how potent a predator the polar bear is, there is an account of a bear waiting by a hole in the ice through which a beluga whale surfaced for air. While the 3-ton whale still had upward momentum, the bear seized it with its claws, and dragged it out of the water onto the ice! The other main hunting methodology is "aquatic stalking", in which the bears use rivulets on the surface of the ice to approach resting seals while largely submerged.

For human beings in the arctic, polar bears are a very significant consideration, but their behavior can, in general, be compared to that of the grizzly bear. Given due warning of human presence, polar bears will avoid us, and they have far too pressing a task to gain and maintain fat to be distracted by some whim to kill for pleasure. That said, polar bears are almost completely carnivorous, and their environment is relentlessly unforgiving in demanding that they be equipped to survive in it. Because of this, there is certainly the potential that an unprepared or ill-equipped human could fall victim to a polar bear, although we are not a prey species to them. Theoretically, bears in the areas of Canada's Hudson or James bays, who do not feed during the summer could be more dangerous during their fast, though there is not specific data to back such speculation up. While the polar bear is master of its domain, human beings are, on the other hand, very poorly suited to it, and there is no doubt that out on the coverless, open ice we are at a huge disadvantage. In black and grizzly bear habitat, we can sometimes recourse to tree climbing or the use of cover

or some other defensive option in the event of an encounter, but this does not apply to polar bear habitat. In a sense, this makes polar bears more dangerous than other bears relatively, rather than absolutely, and it demands that in their domain we exercise extreme vigilance.



Photo: Dan LeGrandeur

For bear species in the temperate zone, the two most important issues are habitat loss and conflict with human beings. For the polar bear, these have less significance, although in recent times, oil and gas development has become a threat in some regions. Arguably, the greatest threat to polar bears is climate change, and specifically, global warming. While global warming is disputed in many of the temperate regions of the world, it is very hard to deny it in the polar regions. In the arctic, there is a lot of evidence of less and thinner ice, and of later freeze-ups and earlier thaws. Insufficient and weak ice will reduce the hunting potential of the polar bear and lead to an inadequate supply of food, which will mean less deposits of fat, leading to starvation. In the Hudson Bay and James Bay areas, this trend of later freezing and earlier thawing has reduced the feeding period for sows with cubs-of-the-year, by up to 25% of what it has been previously. This is a non-sustainable situation, and if it continues, these areas will cease to function as viable habitat, and the bears that presently live there will move north. **S**

Green Scene

Reclaiming the land where the bison roam

Story and photo by Tonya Zelinsky

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It's hard to see the beauty of a mine pit in the Canadian oil sands. Mountains of black sand and giant pits replace trees and green hills and, instead of lakes of blue, there are dark pools of sludge and tailings. But sometimes beauty is more than just skin deep.

On a small patch of land north of Syncrude Canada's oil sands site in the Regional Municipality of Wood Buffalo, north of Fort McMurray, Alberta, is one of nature's most beautiful landscapes and home to nearly 300 native wood bison, or buffalo, seeking refuge.

The bison project, located on what was formerly Syncrude's north mine, has been thriving since it was introduced in February 1993.

Reclamation initially started in the

winter of 1990 when dirt was used to fill the former mined area and seeding began in the summer of 1991.

Operated in co-operation with the Fort McKay First Nation, the project is on 400 hectares of land that have been reclaimed by the Canadian oil sands producer.

According to senior reclamation scientist and project leader with Fort McKay Environment LP, Brad Ramstead, the habitat is a place for the beasts to live in peace and quiet, underneath the northern Alberta blue sky.

The project was ambitious when it was first introduced by Syncrude. It marked the company's second reclamation project since it began operations in 1978 and the first time it incorporated animals into the mix.

Its first project began in the 1980s when it reclaimed land on what is now called Gateway Hill.

Located south of the site, Gateway Hill has since grown into a thriving ecosystem that blends nicely with the rest of the environment.

Passersby driving along the busy stretch of Highway 63 to the site would not suspect it had once been nothing more than a pit of oil sands.

Since then the producer has invested C\$100 million (US\$97.4 million) in the reclamation of 22% of its disturbed land, covering an area of more than 4500 hectares (45 square kilometers), and has planted more than five million tree seedlings.

In its beginnings the bison project consisted of 15 bulls and 15 cows on 30

hectares of land. Ramstead said the project wanted to “demonstrate that animals as large as bison could sustain themselves on reclaimed land”.

Since then the herd has grown to as large as 350, depending on the time of year.

In April its population included 199 adults and 98 calves. In keeping with the strict regulations Syncrude outlined in its reclamation plan approved by the Government of Alberta, it fertilizes the ground every year to increase the quality of the agronomic pasture grass, says Ramstead.

If it was not fertilized the habitat would require a larger area for grazing.

In the winter bison feed is supplemented with hay because the area is often too cold for the animals to roam.

Last winter was particularly harsh and Ramstead says the bison went through more feed in January and February than at the same time in any other year. The spring is different. With temperatures rising and vegetation coming back to life, the cows will enter their nearly nine-month gestation period and produce at least one calf per cow.

Breeding occurs annually every July and August and starts when bison hits sexual maturity at two. Cows can continue to give birth until they are about 20 years old.

To ensure the health of the animals, they are monitored regularly to make sure there are no adverse side effects from living on a former mine site.

“Every fall we do the testing on the animals, give them their yearly shots and, over the years, we still maintain our disease-free status for the herd,” says Ramstead. The pack is happy, healthy and there is “nothing out of the ordinary from any ranching scenario” he adds.

In fact, the project is now partnering with the Universities of Calgary and Saskatchewan, Parks Canada, the Calgary Zoo, and the Canadian Food Inspection Agency on a genetics preservation project.

And while the habitat is on the other side of the large hill from Syncrude’s current north mine, none of the animals has been caught wandering around the oily pit. In some instances bulls will break through the gates but are herded immediately.

Shortly after the bison project was established in 1993, Syncrude created the Syncrude Bison Gateway Project a few

kilometres south of its main entrance.

This art project features seven four-metre tall siltstone bison sculptures averaging 35 tonnes each.

Its latest reclamation project is the creation of a fen wetland south of the site, where vegetation is planed over composite tailings and sand. Construction began last year and is expected to continue to 2012.

Syncrude is a joint venture owned by consortium partners Canadian Oil Sands Trust, Imperial Oil (ExxonMobil), the former Petro-Canada, ConocoPhillips, Nexen, Mocal Energy and Murphy Oil. ●



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Green Scene

Species at Risk Act (S.A.R.A)

By Dan LeGrandeur, Bear Scare Ltd.

Several hundred wild plant and animal species are currently at risk of disappearing in Canada. The Federal Species At Risk Act (SARA) was enacted in 2003 to prevent Canadian wildlife and plants from becoming extinct; to provide for the recovery of endangered or threatened species; and to encourage the management of other species to prevent them from becoming at risk. For a species to be protected under the legal authority of SARA, it must first receive a classification as extirpated, endangered, threatened or special concern through an independent scientific review by Canada's expert committee on species at risk (the Committee on the Status of Endangered Wildlife in Canada, or COSEWIC). Next, the species will undergo an extensive 'legal listing' process, where socio-economic and political concerns associated with listing a species are considered by the Federal Minister of the Environment. At this point a species may be added to Schedule 1, (the legal list of species at risk), returned back to the scientific review process, deferred for further consultation, or simply not listed.

Many different wildlife species are now fully protected, including birds, fish, mammals, amphibians, reptiles, insects and plants. The following are some examples of protected species under SARA:

- Swift Fox (Endangered)
- Whooping Crane (Endangered)
- Burrowing Owl (Endangered)
- Wood Bison (Threatened)
- Grey Fox (Threatened)
- Woodland Caribou (Threatened)

SARA makes it an offence to kill, harm, harass, capture, take, possess, collect and sell species at risk protected by the Act. It is also an offence to possess, collect, trade and sell parts or products derived from protected species. Convictions under SARA can result in fines up to a range of \$50,000 to \$1,000,000 and up to a five-



year term of imprisonment.

Under the Act, it is illegal to destroy or damage the residence of a protected species, for example the nest or den. The critical habitat of the species, necessary for their survival and recovery, can also be protected. In this way, SARA protects the space that wild species need to live, find food, reproduce and raise their young.

These prohibitions apply to:

- All endangered, threatened and extirpated species listed in Schedule 1 of the *Species at Risk Act (SARA)* found on **federal lands** such as national parks, national wildlife areas, Prairie Farm Rehabilitation Administration pastures, Aboriginal reserve lands and military training areas.
- All endangered, threatened and extirpated migratory birds listed in the *Migratory Birds Convention Act (MBCA)*, 1994, listed in Schedule 1 of SARA, anywhere they occur.
- All endangered, threatened and extirpated aquatic species listed in Schedule 1 of SARA, anywhere they occur.

What does this mean for the seismic industry? The seismic industry has always faced the challenge of conducting business in the most environmentally friendly way possible. Practices have been developed to enable the industry to keep working in the face of increasing environmental constraints. Using new technology, such as Mulchers as opposed to Cats, is an example of how exploration has remained technically effective and at the same time lessened the environmental impact. Self-regulation is often not enough, so an act such as SARA is enacted to protect those species that may be impacted by any industrial activity in our wilderness areas. The purpose of these acts may be well intentioned, but they can also put huge constraints on a proposed project or even shutdown an existing project.

An example of a high profile species of concern is the woodland caribou. Despite the large number of caribou in Canada, some subspecies, or populations, have been determined to be at risk by COSEWIC.

The widespread boreal population of woodland caribou, which occurs in the Northwest Territories, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario,

Quebec, and Newfoundland and Labrador, has been assessed as threatened by COSEWIC and is listed under SARA. The Southern Mountain population of woodland caribou, which occurs in British Columbia and Alberta, has also been assessed and listed as threatened. A threatened species is one that is likely to become endangered if nothing is done to reverse the factors limiting its survival in Canada.

COSEWIC has assessed the Northern Mountain population of woodland caribou, which occurs in the Yukon Territory, the Northwest Territories, and British Columbia, as being of special concern. It is also listed under SARA. A species of special concern is one that may become threatened or endangered because of a combination of biological characteristics and identified threats.

Caribou are susceptible to and recover slowly from population declines because of their low rate of reproduction. The main factors leading to caribou declines are habitat loss, degradation, and fragmentation, as well as predation. Habitat degradation often occurs following such events as wildfires,

timber harvesting, or due to human disturbance. Habitat fragmentation results by breaking up habitat areas with roads, timber harvest cut-blocks, pipelines, oil and gas well sites, geophysical exploration lines, and other developments.

SARA not only applies to land based activities, it regulates off-shore activities as well. Concerns have been raised by marine biologists, the environmental community and regulators about the alleged impacts on marine animals from noise generated in the water. In 2004, the Department of Fisheries and Oceans sponsored a **Review of Scientific Information on Impacts of Seismic Sound on Fish, Invertebrates, Marine Turtles and Marine Mammals**. The findings of the peer review process concluded that there was evidence that, at certain received sound levels, some marine fish, marine mammals and sea turtles can manifest behavioral changes. If seismic surveys were to occur in areas and at times when a large enough aggregation of these marine organisms were engaged in critical biological functions, the behavioral impacts might have important ecological and

population-level impacts. For example the impact may be important if it results in the displacement of breeding, feeding or nursing marine mammals, dispersion of spawning aggregations of fish in their spawning areas and diversion of aggregations of marine mammals and fish from their migration routes. The peer review process also concluded that mitigation should be used where detrimental population-scale impacts were considered, likely to occur, or where adverse impacts including death, harm or harassment of individual marine mammals or turtles listed as endangered or threatened on Schedule 1 of the Species at Risk Act were likely to occur.

Regardless of whether the seismic industry is conducting business on land or in the ocean, SARA is a significant piece of federal legislation. More than ever, the oil and gas industry is under great scrutiny, and it is up to all parties involved, to minimize the impact and footprint that they have on the environment. The Species at Risk Act will hopefully guide the industry, (without too much negative economic impact), in becoming more environmentally friendly. **S**

Species at Risk

Whooping Crane
(*Grus americana*)
ENDANGERED



© Environment Canada, Photo: Geoff Holroyd

Measuring an impressive 1.5 metres (5 feet) in height, Whooping Cranes are the tallest birds in North America. These majestic birds are snow white with black-tipped wings, and a red and black head. They nest in shallow wetlands in the northeast corner of Wood Buffalo National Park.

Did you know?

- They perform an elaborate dancing ritual where they ruffle their feathers and perform leaps and bows in an attempt to seduce a mate. They usually mate for life and can live to their mid-twenties.
- They face hardships during migration such as loss of wetlands, collisions with powerlines and the occasional accidental shooting.



SAR Courtesy of Environment Canada

Green Scene

The Beaver - Nature's Engineer

By Dan LeGrandeur, Bear Scare Ltd.



Photos: istockphoto.com

Perhaps no animal has played such a pivotal role in the shaping of a nation. After all, it was the hide, or specifically - hair, of this noble rodent that drove the fur trade, which fuelled the exploration of Canada by Europeans. The beaver (*Castor canadensis*), our largest North American rodent, is nature's equivalent of a habitat engineer. The beaver creates ponds and wetlands used by waterfowl, shorebirds, muskrats, otters, fish, amphibians, aquatic plants and other living species. Beaver ponds generally slow the water flow from drainage areas and alter silt deposition, thus creating new habitat. During drought conditions, beaver ponds create water holes for livestock and wildlife, particularly waterfowl.

The beaver is ungainly and slow on land but not in the water. An adult weighs from 16 to 32 kg and, including its 30-cm tail so as a result a large beaver may measure 1.3 m long. The beaver's body is adapted in various ways to their watery habitat. The beaver is a graceful, strong swimmer, both under water and on the surface and can attain speeds up to 7 km per hour. They see as well in the water as they do on land because of a transparent membrane that can be drawn over the eyes for protection while diving. In addition, the nostrils are small and can be closed for underwater swimming, as well as their ears.

The pelage is unusually dense, and the thick under fur is overlaid with coarse guard hairs. Color ranges from glossy brown

to yellowish brown above and brown to tawny below. The beaver has short legs and the feet have five digits with sharp claws. The hind feet are webbed, but the first and second toe are split which is believed to aid the beaver with grooming. All four feet are black, as is the tail. Flattened horizontally, the broad, paddle-like tail is covered with large scales and mostly hairless. The tail of a large beaver may be 30 cm long, up to 18 cm wide, and 4 cm thick. Although fat, the tail is flexible and muscular. In the water, the animal uses its tail as a four-way rudder and on land, the tail acts as a prop when the beaver is sitting or standing upright. It also serves as a counterbalance and support when the animal is walking on its hind legs while carrying building materials like mud, stones, or branches with its front paws.

Beaver's have exceptional teeth. They possess long and sharp incisors that grow continuously and are hardened with dark orange enamel on the forward face. Consequently, as the upper and lower incisors are ground against each other, the outer tips of these teeth are maintained chisel-sharp. With them, a beaver is able to fell very large trees. The lips can be closed behind the incisors that permit the beaver to gnaw on twigs while under water.

Being semi-aquatic, beavers are found primarily along streams and lakes with nearby growths of willow, aspen, poplar (cottonwood), birch and alder. In these habitats they build complex dams, lodges and canals. The foundation of the dam is made of mud and stones, with poles (butt ends facing upstream) and brush added on top. Mud, stones and wet plant material are used to plaster the structure, with the top rising above water level. The dam provides an area of deep, still water, where a lodge can be constructed. This habitat provides them with a safe place from predators and a storage area for food to be floated without

danger of it washing away. The lodge is constructed in the same manner as the dam, and is usually surrounded by the water that the dam has backed up. This dome shaped structure can extend more than 2 meters above the water's surface, having a diameter up to 12 meters at the base. There is a single internal chamber with a floor that is above the water level that is covered by a thick bedding of dry vegetation. The walls of the lodge can be 1 meter thick at the base, but are generally much thinner at the top of the dome. Beavers enter the lodge via one of several underwater doorways that are built below the winter ice level. The third component to the beaver's habitat is the canal. These are used to float logs to a pond and the dams may be used to hold up the water levels in these canals. Several trails can extend from these canals, over which beavers carry timbers to the water. These elaborate sequences of dams, lodges and canals are used by generations, and are repaired and used over many years.

Beavers are nocturnal, and though they do not hibernate, in the northern part of their range they may only leave the lodge during the coldest winter months to visit their food cache. The diet consists of the bark, cambium, twigs, leaves and roots of deciduous trees such as alder, willow, birch, aspen, and on many parts of aquatic plants. They particularly like the young shoots of water lilies. Social groups are known as colonies. These are comprised of 4-8 related individuals including a mated pair and the offspring from the previous two years. The colony is the basic unit of the beaver's society, and the female is the central figure. The female usually establishes the home site, and if her mate is lost, she remains with her family, and another male joins her in the mating season. If the female is killed and leaves no female offspring, the male usually abandons the site. The beaver is monogamous and there is a single breeding female per colony. Breeding occurs once each year where mating occurs in January or February and birthing occurs from April to June. Estrous cycles last for about 2 weeks, but the females are receptive for only 10-12 hours. Gestation is about 100-110 days that produce an average of 2-4 young, but as many as 9 babies may be born. Fully furred babies weigh 230-630 grams at birth and their eyes are open. They are weaned at about three months, and take solid foods at just one week old. Sexual maturity of



both males and females is reached at 1.5 - 2 years, and the young adults are usually forced out of the colony at this time.

The life span of beaver is 5 to 10 years, with some living up to 20 years. Because of their size, behavior and habitat, beaver have few enemies. Mortality is highest during the first year; coyotes, wolves, bears and other large carnivores are the main predators. Apart from occasional sickness, trapping is the only major unnatural cause of death. Research shows that beavers can maintain or increase their numbers with an annual trapping rate of 30 to 40 per cent. It is no surprise then, that beaver numbers never seem to decline significantly, even in problem areas where removal is the major method of control.

Beavers play an important role in our ecosystem by creating wetland habitat for many animals, birds and insects. In fact, beaver ponds are one of the best places to observe wildlife. Here, you are likely to see deer coming to drink, birds such as herons and red-winged blackbirds feeding and nesting, and plant species such as narrow-leaved plantain or arrow arum. Wetlands created by beaver can also provide spawning, rearing and feeding areas for fish. They also act as natural reservoirs, reducing flooding in the spring and increasing stream flow during the dry summer months. Beavers can become a

nuisance when they interfere with our use of the land or create hazardous conditions. Beaver dams and ponds can flood large areas of agricultural land and forest, wash out roads and create permanent flooding that can kill trees. When beavers cut trees they can also create hazards if branches get hung up in other trees rather than fall to the ground.

In some areas of Canada where beaver populations aren't at risk, the problem is not how to protect the beaver population, but how to prevent damage to farmlands, roads, and tree plantations from beavers' damming and cutting practices. A combination of trapping and use of flood control devices is necessary. Beavers maintain water levels and create viable habitat it is important that they be managed carefully.

No other animal has influenced Canada's history to the extent that the beaver has. When Europeans began to settle in northern North America, beaver pelts were the prizes that lured them farther and farther into the wilderness. Canadians now celebrate the beaver as a national symbol on stamps, coins, and emblems; in addition, literally hundreds of Canadian lakes, towns, rivers, and hill ranges bear the name of this interesting rodent. **S**

The Black Bear

By Dan LeGrandeur
Bear Scare Ltd.



The CAGC will be featuring a different environmental topic in each future issue of "The Source", with a focus on wildlife and habitat issues that may impact Seismic field operations.

The black bear or American black bear is the most predominant bear species in North America. They are highly evolved social animals with an intelligence comparable to that of the great apes. Black bears are not as unpredictable and dangerous as Hollywood or the media would have us believe and a peaceful co-existence between human and bears is possible. By learning about their behavior and habits it can provide a knowledge to appreciate and enjoy bears and the places they live. It may also reduce some of the human intolerance that is so detrimental to these magnificent animals.

The normal colour is black with a brownish muzzle and frequently a white patch below the throat or across the chest. Although black is the most common colour, other colour phases exist such as brown, dark brown, cinnamon, and blue-black. White phases of black bears also occur, the Keremode bear, but they are rare and found only along the west coast of British Columbia. The lighter colour phases are, more common in the west and in the mountains, than in the east. Any of these colour phases may occur in one litter, but generally all cubs in a litter are the same colour as their mother.

Black bears are widespread in most of the US and Canada, outside of

the Arctic, though the northern limit of their range depends on the tree line. Black bears exist in the same ecosystems as grizzly bears, though they occupy different niches within it. Grizzly bears and black bears have a non-interactive tolerance in terms of sharing the same ecosystem, which breaks down on occasions, generally to the detriment of the black bear. Black bears exist throughout Canada and the contiguous United States, and adapt better than grizzly bears to interactions with people. As a result, black bears can survive in relatively close proximity to people and human infrastructure in a way that grizzly bears cannot.

The peak of the black bear mating season is roughly from June to mid-July. Implantation of fertilized eggs in the uterus, however, is delayed until the fall, and embryonic development only occurs in the last 10 weeks of pregnancy, which lasts about 220 days. Cubs are born in the den between January and March, with litters being generally comprised of twins. It is not uncommon for a sow to have three or four cubs during a year where there is a high abundance of food. Cubs average 200 to 350 grams at birth, and are generally weaned at around 6-8 months. Cubs generally stay with their mother for two denning periods but on occasion will remain with her longer if

she does not become pregnant. Female black bears reach sexual maturity at 4-5 years old, while males mature about a year later.

The activity pattern of black bears varies from area to area depending on a number of factors, including human activities. In wilderness areas they are usually most active from dawn until dark, whereas bears in areas with high human activity may be mainly nocturnal to avoid contact with people. Of course, some individuals solicit human contact in hopes of obtaining a free meal.

In the fall when days become shorter and temperatures cooler, bears begin to search for a denning site. A suitable site may be under a tree stump or overturned log, or in a hole in a hillside. Most dens are only large enough to accommodate a bear when it is curled up. Generally, females line their dens with grass, ferns, or leaves; whereas males usually do not. Females usually den earlier; males frequently wait until the first snowfall before entering a den.

Weights of black bears vary significantly according to region, and to availability and quality of food in a particular locale. An adult male can weigh up to 350 kgs, and yet an average weight in a general area where such a bear may be found might be 90 - 120 kgs. It is difficult to state an

overall average weight for any age or sex class of black bear due to how widespread the species is, but in terms of region, bears in the southern rocky mountain area are generally smaller than in the northern Rockies. The Queen Charlotte Islands of British Columbia have the largest of the species due to the high abundance of salmon in the rivers. In addition the black bears of Q.C.I. don't have to compete for food as there are no grizzly bears.

The black colour phase is a very obvious distinguishing feature of black bears, but in any of the brown, or cinnamon, phases, other, more reliable features that can be used to identify a black bear are as follows: Black bears can be identified by having no shoulder hump, and they have a straight, or 'roman' nose which is often a light brown in color. Black bears also have relatively larger ears than grizzlies, and they have the appearance of sticking up

higher on the head. Black bears have short curved claws and climbing is second nature to a black bear. When startled or frightened, black bears will readily climb trees for safety. There are also a number of behavioral traits that distinguish black bears from grizzlies: Black bears are generally less aggressive than grizzly bears, and there is a good deal of evidence to show that they are normally less aggressive in response to a challenge or threat. For example, a person has a good chance of repelling a black bear, in the event of an encounter, if they make a directly aggressive display, whereas a grizzly bear, in the same situation, would be more likely to attack.

Black bears are predominantly herbivorous, though, like all bears, they are omnivores and opportunists - if they find meat, they will eat it, though the majority of what they do find will be carrion. They are somewhat predacious as in the spring

will actively hunt deer fawns and moose calves. Like grizzly and polar bears, black bears are capable of great speed, being able to reach 50 kph in a short sprint. In the wild, a black bear has the potential to live for 30 years, but the average life span is probably much lower due to the extreme likelihood of conflict, of one form or another, with human beings. **S**

**Dan LeGrandeur's
Recommended Reading**

www.bearsmart.com

Bears: An Altitude SuperGuide
by Author Kevin Van Tighem

**Bears: Monarchs of the
Northern Wilderness**
by Author Wayne Lynch

Among the BEARS
by Benjamin Kilham and Ed Gray





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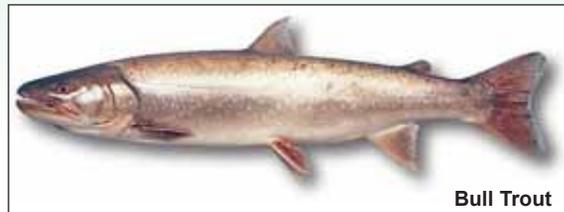
Hinterland Who's Who

by Dan LeGrandeur,
Bear Scare Ltd.

Bull trout are members of the char subgroup of the salmon family, which also includes the Dolly Varden, lake trout and Arctic char. Since the early 1900s, this species has declined in both distribution and abundance, and is now ranked as "Sensitive" in Alberta and "Threatened" under the Endangered Species Act throughout its range in the United States (lower 48 states). These declines have been attributed to the impacts of human activity. Human activities that limit bull trout abundance include migratory barriers, habitat degradation and fragmentation, angling pressure and past population management practices and the stocking of non-native fish species. However, to more clearly understand the factors leading to the decline of this species in Alberta, the complex biology and habitat requirements of bull trout must be understood.

They can grow to more than 9 kg (20 pounds) in lake environments. Bull trout that live in streams rarely exceed 2 kg (4 pounds). Bull trout and Dolly Varden look very similar and were once considered the same species. Both have small, pale yellow to crimson spots on a darker background, which ranges from olive green to brown above, fading to white on the belly. Spawning adults develop varying amounts of red on the belly. Both species also exhibit differences in size, body characteristics, coloration and life history behavior across their range. Taxonomic work has now identified bull trout as distinct from the Dolly Varden. Compared to Dolly Varden, bull trout are larger on average, with a relatively longer and broader head. Bull trout are mainly an inland species while Dolly Varden are more common in coastal areas.

Char are distinguished from trout and salmon by the absence of teeth in the roof of the mouth, presence of light colored spots on a dark background (trout and salmon have dark spots on a lighter background) and absence of spots on the dorsal fin, small scales and differences in the structure of their skeleton. Char are distributed farther north than any other group of freshwater fish except Alaskan blackfish and are well adapted for life in very cold water.



Bull Trout



Dolly Varden

Photos: Freshwater Fisheries Society of BC

Historically, bull trout were distributed throughout a much greater area of Alberta than they are today. Populations occurred in both parkland and prairie regions. They were once found downstream in the Peace River as far as the Slave River, as far east as Lethbridge in the Oldman River, as far east as Carseland in the Bow River, as far east as Morrin in the Red Deer River, and in Edmonton in the North Saskatchewan River.

Today, bull trout are generally confined to the upstream reaches of major river systems in the eastern slopes of Alberta (Peace, Athabasca, North Saskatchewan, Red Deer, Bow, and Oldman rivers). However, they do occur further from the mountains in the Peace and Athabasca drainages but at lower abundances. Migratory adults may disperse as far east as Waterton-Glacier National Park in Alberta and Montana.

Globally, bull trout are distributed throughout the western mountains and foothills of Canada and the United States. Historically, bull trout were distributed as far south as California and extended as far north as the Yukon River drainage. Bull trout have been extirpated from California and Nevada and the southern extent of their range is now the Oregon-California border. The southern limit of bull trout distribution appears to be determined by temperature and populations appear to increase in abundance in northern parts of their range.

In northwestern British Columbia, the bull trout does not extend to the coast; however, in the Puget Sound area, Washington, and the Fraser River, British Columbia, they do reach the coast. Their eastern boundary is at Waterton-Glacier National Park in western Alberta and Montana. Bull trout have been declining throughout their global native range during the last century.

Small bull trout eat terrestrial and aquatic insects but shift to preying on other fish as they grow larger. Large bull trout are primarily fish predators. Bull trout evolved with whitefish, sculpins and other trout and use all of them as food sources.

Bull trout reach sexual maturity at between four and seven years of age and are known to live as long as 12 years.

They spawn in the fall after temperatures drop below 8°C in streams with cold, unpolluted water, clean gravel and cobble substrate, and gentle stream slopes. Many spawning areas are associated with cold water springs or areas where stream flow is influenced by groundwater. Bull trout eggs require a long incubation period compared to other salmon and trout (4-5 months), hatching in late winter or early spring. Fry remain in the stream bed for up to three weeks before emerging. Juvenile fish retain their fondness for the stream bottom and are often found at or near it.

Some bull trout may live near areas where they were hatched. Others migrate from streams to lakes, reservoirs (or, in the case of coastal populations, salt water) a few weeks after emerging from the gravel. Migratory bull trout attain a greater size than resident stream fish. However, lakes and reservoirs are not good spawning habitat, so migratory bull trout may swim considerable distances to spawn when habitat conditions allow. Migration is important to maintaining healthy bull trout populations.

Bull trout are vulnerable to many of the same threats that have reduced salmon populations in British Columbia. Due to their life history requirements, bull trout are more sensitive to increased water temperatures, poor water quality and low flow conditions than many other salmonids. Past and continuing land management activities have degraded stream

habitat, especially along larger river systems and stream areas located in valley bottoms, to the point where bull trout can no longer survive or reproduce successfully. In many watersheds, remaining bull trout are small, resident fish isolated in headwater streams. Brook trout, introduced throughout much of the range of bull trout, easily hybridize with them, producing sterile offspring. Brook trout also reproduce earlier and at a higher rate than bull trout, so bull trout populations are often supplanted by these non-natives.

Hybridization with brown trout and lake trout is a problem in some areas.

Dams and other in-stream structures also affect bull trout by blocking migration routes, altering water temperatures and killing fish as they pass through and over dams, or are trapped in irrigation and other diversion structures.

Many of the actions intended to protect other declining salmonids may also help bull trout. Stream and habitat protection and restoration, reduction of siltation from roads and other erosion sites, and modification of land management practices to improve water quality and temperature are all important. Several provincial agencies have enacted regulations reducing or prohibiting bull trout harvest. Several provinces have also drafted or have adopted conservation plans to help bull trout populations recover. ●



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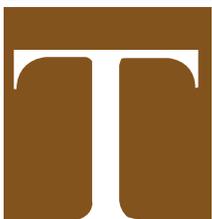
Green Scene: Hinterland Who's Who

The Burrowing Owl

written by Dan LeGrandeur, Bear Scare Ltd.



Photo: istockphoto.com



*The Burrowing Owl gained its name from a particular behaviour as it nests underground. But contrary to the impression given by the bird's scientific name, *Athene cunicularia*, which means "little digger," this owl rarely digs its own burrow. Instead, it constructs its nest in burrows vacated by small mammals like ground squirrels, badgers, and prairie dogs.*

The adult Burrowing Owl is smaller than a pigeon. It weighs between 125 and 185 grams and stands from 19 to 20 cm tall. Its body is generally brown, mottled with white flecks and barred across the chest. This earth-colored plumage provides good camouflage in the grasslands where the owl lives. The Burrowing Owl's head is rounded, and its eyes and beak are yellow. The sexes look similar, but the male is slightly lighter in colour.

While they resemble the adults for the most part, the young have rusty-colored throats and buff-colored breasts without barring; they acquire their adult-like plumage during the late summer.

To discourage predators, the Burrowing Owl can make a noise like the rattling hiss of a rattlesnake's tail. Males will repeat a doleful coo-coooo, mainly to attract females. Otherwise, Burrowing Owls make a variety of sounds to each other that are rarely heard by humans.

On the dry short-grass prairie, the Burrowing Owl is found on flat-to-gently-undulating, treeless plains. Before its range in British Columbia was restricted to the Kamloops region, the Burrowing Owl occupied dry grasslands and valley bottoms in the Okanagan valley north to Kamloops in the southern part of the province.

Wherever it lives in Canada, the Burrowing Owl needs burrows, short or sparse vegetation, and open terrain. The abandoned burrows of ground-dwelling mammals such as badgers, ground squirrels, and prairie dogs are ideal for nesting, resting, and storing food; short vegetation and tall weedy areas, where insects and rodents are most common, ensure an adequate food supply when they are located within 2 km of the burrows; and open terrain beyond these areas allows the owl to see approaching predators.

Most Burrowing Owls in Canada live in pastures grazed by livestock and dotted with burrows left where badgers have dug out squirrels for food. Thus, both badgers and ground squirrels are critical components of the Burrowing Owl's habitat in Canada.

Habitat can also occasionally be found on croplands, on roadsides, and—in urban areas—at airports and golf courses, if there are suitable burrows for nest sites.

On summer days, Burrowing Owls may be seen standing on dirt mounds near their nesting burrows or perched on nearby fence posts, ready to chase prey. When they take flight, they fly directly toward their destination, ending with long glides interspersed with quick wing beats.

While many owls are large, solitary birds that live in trees

and hunt at night, the western Burrowing Owl is a small bird that lives on the open prairie and in grasslands in Canada, where it nests underground and searches for prey day and night.

Until the 1970s, the Burrowing Owl had healthy populations in Canada's three prairie provinces but was already gone from the grasslands of British Columbia. Today, it breeds in Alberta and Saskatchewan, with some rare appearances in southwestern Manitoba. In addition, captive-bred Burrowing Owls breed in and some return to the grasslands near Kamloops, British Columbia, where they are introduced each spring. Occasionally, Burrowing Owls winter in coastal British Columbia and are seen in Ontario and Quebec during spring.

Burrowing Owls that breed in Canada remain on the breeding grounds from April to

September. At that time, the prairie owls migrate 2500 to 3500 km to south Texas and central Mexico, arriving in November. Most British Columbia owls migrate to the west coast from Washington to California; a few spend winter at the inland release sites near Kamloops. In the south, Burrowing Owls live in agricultural fields, as well as in more open, grassland country, orchards, and even thorn shrub woodlands. They often hide in burrows, culverts, or open pipes in the daytime, but sometimes they just sit under grass clumps. The owls that journey to summer breeding grounds in Canada begin their migration in late February and early March.

Many Burrowing Owls that breed in Canada do not return. Only half of the adult Burrowing Owls come back to their



northern breeding grounds, and a mere 6 percent of young owls return to breed in Canada the year after they are born. Scientists have determined that 40 percent of the young owls die in Canada before they migrate, but they do not know what happens to the rest of the owl population. They are trying to learn whether the owls that do not return are breeding elsewhere or die in winter.

The Burrowing Owl consumes a variety of small creatures. Ground insects, such as grasshoppers and beetles, make up as much as 80 to 90 percent of its diet, but most of its food mass comes from small rodents, such as mice and voles. It also eats frogs, toads, salamanders, snakes, small birds, and dead animals.

Young owls learning to hunt on their own rely mainly on insects for food. They also occasionally scavenge dead animals from roads, and will scurry after insects drawn to warm pavement at night.

The Burrowing Owl has several hunting methods, including hunting from a perch such as a mound or fence post, running after insects, hovering close to the ground before pouncing on prey, and using its feet to catch insects in mid-air.

During the summer, with young to feed, the Burrowing Owl hunts around the clock. In the winter, during its stay in the southwestern United States and in Mexico, it is a “nocturnal” creature, becoming active mainly during the night after spending the day in its burrow.

The male arrives at its summer breeding grounds in Canada first, in April, and selects a burrow that has been abandoned by badgers or other ground-dwelling mammals. The female arrives shortly afterwards. The owls spend the first two weeks performing elaborate territorial and courtship displays that include flashing white markings, cooing, bowing, scratching, nipping, stretching, and repeated short flights, and the male attracts the female using its coo-coooo call. Generally, the birds do not pair for life, although some pairs may reunite for a second summer.

Burrows are important for protection from weather and predators, for raising young, and for controlling temperature. Although the Burrowing Owl does not dig its burrow, it may remove blockages in the tunnel or widen the passage. The male lines the tunnel and nest chamber with dried plants, feathers, and dry, shredded cow manure. This lining may help to keep the burrow cool during the day and warm at night, helping to incubate the eggs. It also humidifies the burrow and may protect the owls from predators by masking the birds’ scent. After arranging the nest, the male rarely enters the burrow, but he provides food for the female, who stays underground to incubate the eggs and brood the young. The male lives in a nearby burrow. When Burrowing Owls were more numerous, they nested in burrows that were part of a

loose colony.

A Burrowing Owl can breed the summer after it hatches and every summer after that. In Canada, the female lays 4 to 12, and on average 9, white eggs that eventually stain a brownish colour from the nest material. The female incubates the eggs for about four weeks, with the eggs hatching in the order in which they were laid. The hatchlings are born blind and helpless and depend completely on their parents for warmth and food until they have developed enough to leave the nest.

The Burrowing Owl lays more eggs than it can raise in most years. On average, of the nine eggs laid, one will not hatch, while three to six young will not fledge, or reach the stage where they are capable of flying. Most nestlings die from starvation; the males are unable to provide enough food to keep all the young alive during their first two to three weeks. Cannibalism of young is also common during natural food shortages. The female helps provide food when the young no longer require brooding.

The hatchlings stay underground for two to three weeks. By early to mid-June, downy young appear at the burrow opening. At around four weeks, some of the young owls move to nearby burrows, where they wait at the entrances for the adults to feed them. This allows for even food distribution among the young, avoids crowding, and lessens the chance of a predator killing the entire group.

Young owls are capable of short flights in early July, and, by about seven weeks of age, they can make sustained flights. They learn to hunt on their own at about seven or eight weeks. By the time they are nine or 10 weeks old, the young have become independent, in time for the beginning of the southward migration in mid-September. The Burrowing Owl’s normal lifespan is three to four years. On rare occasions, a Burrowing Owl may live as long as eight years.

At one time, the Burrowing Owl was common in the four western Canadian provinces. Now, it is one of the most endangered birds in these areas. The decline in population began in the 1980s and accelerated during the 1990s to an average rate of 22 percent a year. In 1977, more than 2 000 breeding pairs of Burrowing Owls lived in Canada; by 2000, the number of pairs had dropped to fewer than 1 000.

Human activity has a great impact on the Burrowing Owl. Chemical pesticides, applied to control ground squirrels and grasshoppers, sometimes poison the Burrowing Owl. Pesticides also kill animals and insects that the Burrowing Owl eats. This may force the bird to hunt far from the safety of its nesting site, making it more susceptible to predators and other dangers. The extermination of burrowing mammals, particularly badgers and ground squirrels, often killed as “pests,” reduces the number of suitable homes for the

Burrowing Owl. Fewer of these digging animals means fewer nests and nearby roost, or resting, burrows for the birds.

Habitat loss and changes in the quality of habitat reduce hunting and nesting territories and are associated with low birth and high death rates among Burrowing Owls. In Canada, less than 24 percent of the original prairie habitat remains. Native grasslands lost to housing, farming, roads, and energy exploration have eliminated some of the bird's living space or changed it into something that the Burrowing Owl can no longer use.

The Burrowing Owl has many natural predators. Badgers, foxes, skunks, weasels, raccoons, and snakes dig up or enter burrows, eating eggs, nestlings, or adult females; other owls, hawks, falcons, domestic cats and dogs, and coyotes prey upon adults and young outside the burrow. Features that humans have added to the Burrowing Owl's territory, such as fences, utility poles, hedgerows and artificial nests for hawks, may give some of the Burrowing Owl's predators more vantage points than they once had.

In 1995, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) declared the Burrowing Owl "endangered," meaning that it may soon no longer exist in the wild in Canada. The Burrowing Owl has been designated "at

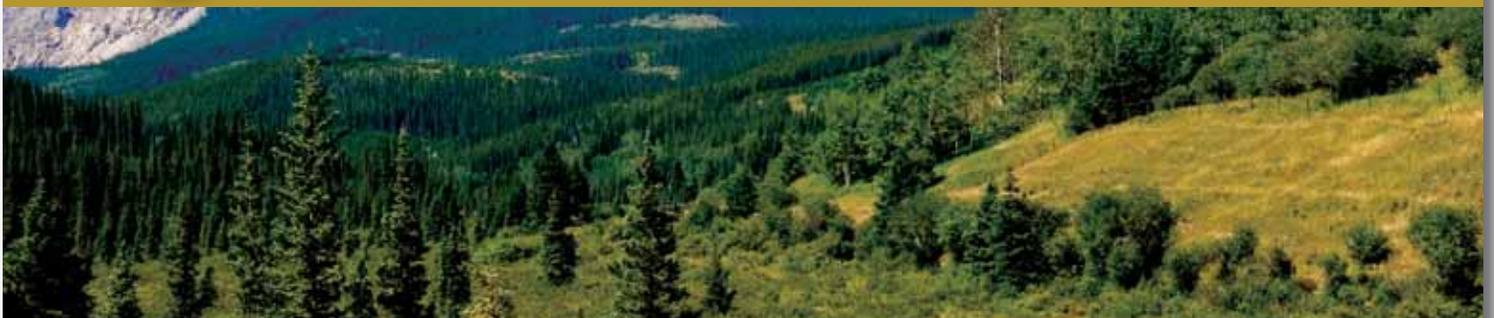
risk" in all four western Canadian provinces and is protected under provincial wildlife acts from capture, harassment, trade, killing, or nest disturbance. The Convention on International Trade in Endangered Species also protects the Burrowing Owl.

A number of governmental and nongovernmental programs in Canada's four western provinces are conserving habitat for the bird, studying its habits, banning the use of some pesticides, and raising awareness about the needs of the Burrowing Owl. Through two nongovernmental programs alone—Operation Burrowing Owl in Saskatchewan, which began in 1987, and Operation Grassland Community in Alberta, which started in 1989—more than 700 landowners have conserved roughly 70 000 hectares of Burrowing Owl nesting habitat.

By increasing our knowledge about the Burrowing Owl's habits and changing some of the practices that harm the owls in their nesting areas, we hope we can help the Burrowing Owl regain its healthy numbers in Canada. **S**



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The Green Scene:

Hinterland Who's Who

the Caribou

by Dan LeGrandeur
Bear Scare Ltd.

The caribou (*Rangifer tarandus*) is a medium-sized member of the deer family. There are three types of caribou in Canada: peary, woodland, and barren-ground. Caribou are the only member of the deer family where both males and most females carry antlers

The peary caribou (*Rangifer tarandus pearyi*) is a small, light-coloured caribou found only in the islands of the Canadian Arctic. Average weights are 70 kg for bulls and 55 kg for cows. The peary caribou is listed as endangered.

The woodland caribou (*Rangifer tarandus caribou*) is a large, dark caribou that is usually found in small herds in boreal, or northernmost, forests from British Columbia to Newfoundland and Labrador. Average weights are 180 kg for bulls and 135 kg for cows. Several distinct herds throughout Canada are listed as endangered or threatened.

The barren-ground caribou is somewhat smaller and lighter coloured than the woodland caribou and spends much or all of the year on the tundra from Alaska to Baffin Island. The Alaskan form, Grant's caribou (*Rangifer tarandus granti*), lives west of the Mackenzie River and the Canadian form (*Rangifer tarandus groenlandicus*) lives to the east. Average weights for the smaller Canadian form are 145 kg for bulls and 90 kg for cows.

Caribou have a soft medium brown coat that fades during the winter. In bulls, the head and neck are often white or greyish white, with a mane on the underside of the neck. The tail and rump area are also a grey color. Caribou have high erect antlers that are a "C" shape with bulls having a brow tine that extends down over their forehead.

Lichens are the caribou's primary source of food for much of the year. This distinguishes them from all other large mammals and has enabled them to survive on harsh northern rangeland. Caribou use their excellent sense of smell to locate food under the snow. They use their large, concave hooves as scoops when they paw through the snow to uncover lichens and other food plants. In the summer they feed on flowers, grasses, and leaves of shrubs.

Caribou may make up to four migrations each year and these migrations are dependent on the species or region they inhabit. The barren ground caribou are known for their large

migratory herds that can consist of thousands of animals. The rutting season for the caribou is the shortest of all members of the deer family. The majority of the breeding occurs in a one week period in the middle of October. Gestation averages seven to eight months and calves are born in late May to early June and single births are most common.

Caribou are susceptible to and recover slowly from population declines because of their low rate of reproduction. The main factors leading to caribou declines are habitat loss, degradation, and fragmentation, as well as predation. Loss of caribou habitat, which is permanent, occurs when forest is cleared for agriculture, for example. Habitat degradation means a reduction in the amount or quality of caribou habitat, as happens following such events as wildfires or timber harvesting, or through human disturbance. Habitat fragmentation is the breaking up of habitat areas by roads, timber harvest cut-blocks, pipelines, oil and gas well sites, geophysical exploration lines, and other developments.

Caribou in the boreal forest require large tracts of relatively undisturbed, older forest habitat in order to spread out so they are harder for predators and hunters to find, and to avoid the linear corridors that predators and hunters use to gain easier access to their prey. Older forests tend to be richer than younger forests in the lichens caribou depend on. They are also less favored by moose and deer, which as prey species of the wolf; attract this primary predator of caribou.

A wolf eats a variety of prey but requires food equivalent to 11 to 14 caribou a year. Some wolf packs will follow migrating herds of caribou from summer to winter range and back. Other predators of caribou include grizzly and black bears, cougars, wolverines, lynx, coyotes and golden eagles.

This increased predation which can often be triggered by resource exploitation that fails to take caribou needs into account, along with over hunting -- legal and illegal - all play a factor in the decline of many caribou populations.

Recently there has also been a lot of concern about the potential impact of climate change on caribou, especially in the north. Deeper snow, faster spring melt, warmer summers, freezing rain, and the high annual variability of all these factors will have an impact on the ability of the species to thrive in its environment. **S**

the GREENSCENE

Hinterland Who's Who

by Dan LeGrandeur,
Bear Scare Ltd.

Few animals inspire more in the human psyche than the grizzly bear. At once loved and despised, revered and feared, the grizzly bear simultaneously fulfills the role of nurturing spirit and nemesis, for human beings. There is perhaps no greater symbol of wilderness than the grizzly bear, and, indeed, where the grizzly survives in viable populations it is a general sign of the integrity of that ecosystem. Despite its image of ferocity and strength, the grizzly bear's place in the ecosystem sits in a fine balance and is intolerant of much disturbance. This, combined with a slow reproductive rate linked to very high maternal investment, means that the loss of just one or two bears, or an ecological disturbance resulting in habitat marginalization, can result in serious population reduction or even regional extinction. There are many places that we see as wilderness, because they are devoid of the structures we associate with developed areas, but the levels of disturbance or human activity in them may mean that grizzly bears no longer exist there. Their absence is the first sign of wilderness status having been lost, and, like the keystone of a bridge being removed and the whole structure collapsing afterwards, so the interactions of the other species in an ecosystem are disrupted by the loss of the grizzly bear.

The grizzly (brown) bear was apparently named by early European explorers and settlers in North America because of a combination of the appearance of its coat, and character traits they observed in its behaviour (grisly)! The grizzly bear ranges today from the Yellowstone ecosystem in north-west Wyoming to the northern coast of Alaska and Canada's Yukon and Northwest Territories. While brown bears in general are omnivores, the Kodiak bear is largely



Photos: Dan LeGrandeur



carnivorous, and the grizzly bear is about 90% herbivorous. All bears are opportunist feeders, and much of the 10% of meat in the grizzly bear's diet is comprised of carrion. The lower—protein, more herbivorous diet of the interior or mountain grizzly means that it is significantly smaller than its Alaskan coastal cousin, the Kodiak.

The grizzly bear was originally an animal of the Great Plains, but it may have begun a retreat to the west when the Plains Indians began to use horses for hunting. It was then pushed out of the plains and into the mountains by the westward advance of European settlers in North America, in the 18th and 19th Centuries. As recently as the early 1920's grizzly bears still existed as far south as California and Arizona, populating every western state of the continental United States between there and the Canadian border. In only 80 years since, however, the exponential growth of the human population in the west, and all its attendant development, has reduced this range to a contiguous area encompassing Montana from the Rocky Mountains west, and northern Idaho. Technically separated from this, the Greater Yellowstone Ecosystem still supports a good population of grizzly bears. Otherwise, the only grizzly bears remaining south of Canada are in the North Cascades of Washington State.

Grizzly bears mate between May and July, while implantation of eggs into the uterus is delayed until October or November. The total gestation period is between 180 and 266 days, with the cubs being born between January and March, when the mother is hibernating. Cubs generally stay with their mother for two years, although they will stay for three or four if the sow does not become pregnant in the fall of their second year. Pregnancy triggers a reaction in the sow

through which she drives the cubs off and hibernates on her own in preparation for giving birth to new cubs the following spring. Cubs will often spend their first hibernation together, and three-year olds observed in frequent close proximity in the spring are most likely to be siblings who have denned together. Female grizzly bears become sexually mature at between 4 and 6 years old, though growth continues later than that, while first pregnancies occur on average between the ages of 5 and 7.

Grizzly bear are extremely good mothers, and, consistent with the high level of investment they make in their cubs to ensure their survival, they are very protective of them. Because of this, encountering a grizzly bear, indeed any bear, with young can be very dangerous. During the first two years of their lives, the sow will teach her cubs everything they need to know to survive on their own. She will literally school them in finding and exploiting different food sources, and the cubs spend significant time observing her actions and learning them for themselves. This can be very clearly seen in footage from McNeil Falls or Brooks Camp, in Alaska, where cubs will sit watching their mother catch fish. Because this high level of input is critical if cubs are to survive on their own after separation from their mother, it is easy to understand why cubs that lose their mother in their first year are severely disadvantaged. Many bears that become what we term nuisance animals as adults were orphaned as cubs and as a result did not learn all they needed to from their mother. Because bears are adaptable and intelligent, many that are classed as nuisance animals are in fact improvising on what is available for their survival. If one considers that many cubs lose their mothers due to human action or negligence, it seems doubly hard on the bear that it should then be dealt with as a nuisance or problem bear for adapting to its surroundings in the absence of its mother's teaching.

Interestingly, while adult grizzly bears seldom climb trees (although they have the ability by utilizing tree limbs), cubs do; a sow may tree their cubs as a defensive measure. Grizzly bears have long straight nails for digging, that are not good for climbing, though it has been argued that there is no need for the grizzly bear to climb as, technically, no other animal preys on it. Black bears, which do climb, have short, curled nails that are better suited to climbing. The polar bears has similar nails to the black bear, though in its case, they are designed for gripping on the ice, when running or climbing out of water, and for tearing apart prey.

A grizzly bear boar may weigh 700lbs, averaging perhaps 350-500lbs, while a healthy, mature adult male would not

generally be much lower than 350-400lbs. A large sow could weigh 500lbs, though mature females might average between 300-400lbs. By comparison, an Alaskan coastal grizzly bear boar could weigh between 800-1200 pounds and a female could range between 600-800lbs. Male Kodiak bears can weigh as much as 2000lbs, though an average weight for mature animals would be between 1200-1500lbs. A female Kodiak might weigh 1000lbs, though an average adult weight might be around 700lbs.

One of the characteristics that separate bears from dogs is the ability to free stand on their rear legs, a trait that allows them a better view of their surroundings. An adult male grizzly bear may stand at 7-9 feet tall, while a female may reach 6-8 feet. A male Alaskan coastal grizzly might be between 9-10 feet while a Kodiak bear could reach 11 feet. Kodiak bears may, in extreme cases reach up to 13 feet, but an average height for a mature male would be nearer 11 feet. Females might reach 9-10 feet.



Grizzly bears begin hibernation in the fall, between October and December, with pregnant females being the first to do so, and males the last. They are not true

hibernators, but, rather, go into a state of torpor in which their metabolic rate is significantly reduced. They may wake from this, periodically, and, on some occasions, they may leave the den for a while to look for food. The hibernation period is correspondingly less in the southern reaches of the range. Grizzly bears generally dig their own dens, which are normally located on sheltered alpine slopes, and make a bed out of dry vegetation. They may use a particular den repeatedly. A bear of 700lbs may come out of hibernation at 450-400lbs, while a bear of 350-400lbs might come out of hibernation at 250-200lbs. A large female of 500lbs, that was breeding, might come out of the den at 200lbs, while smaller breeding females entering the den at 350-400lbs can deplete to a little as 150lbs. Males will come out of hibernation first, sometimes appearing as early as February, though on average the hibernation period ends between April and May.

Grizzly bears have a potential lifespan of about 30 years in the wild, although in reality few live that long. Bears that range in any close proximity to a human population all too often fall victim to hunting, traffic, or being killed because of a conflict or nuisance situation. In the wild, older bears, past their prime, can be killed by younger animals during the mating season, or, exceptionally, if they were very weak, they could be killed by wolves. Unfortunately, grizzly bears, like black bears, rarely reach their potential longevity in the wild now, in a world where they are constantly under pressure from human encroachment and development. ●

The GREENSCENE

Hinterland Who's Who

by Dan LeGrandeur
Bear Scare Ltd.

Moose (*Alces alces*) are the largest members of the deer family and one of the largest land mammals in North America. Adults may stand as tall as 2.3 m high and the males are larger than females possessing elaborate, widened antlers that can measure up to 2 meters in total width, from tip to tip. These are the largest antlers carried by any mammal, worldwide and are shed and re-grown annually. Bull moose range from 2.5 to 3.2 meters in total length and weigh from 360 to 600 kg. females from 2.4 to 3.1 meters. Moose have thick, brown fur that ranges from light to almost black in color and the individual hairs are 15 to 25 cm long and hollow, resulting in excellent insulation. Moose are also distinguished by their long head with a long, flexible nose and upper lip, very long legs and a dewlap of skin on the throat.

Mating takes place in September and October. There is an eight month gestation period and females give birth synchronously during late May and early June. Females generally produce single young, although twins are common and calves lack the spots that are characteristic of most offspring in cervids. Males and females are sexually mature at two years of age but full growth potential isn't reached until 4 or 5 years of age. At that age females are at their reproductive peak and males have the largest antlers. Calf moose weigh 11 to 16 kg and stay with their mother for at least a year after birth, until the next young are born.

Moose are active throughout the day with activity peaks during dawn and dusk. Moose are good swimmers, able to sustain a speed of 6 miles an hour. They deceptively fast on land and can run as fast as 56km/h (about 35 miles per hour). Moose mainly stay in the same general area, though some populations migrate between sites favorable at different times of the year and these migrations can exceed 300km in some populations.

Most of a moose's time is spent eating. Moose eat twigs, bark, roots and the shoots of woody plants, especially willows and aspens. In the warm months, moose feed on water plants, water lilies, pondweed, horsetails, bladderworts, and bur-reed. In winter, they browse on conifers, such as balsam fir, and eat their needle-like leaves.

Moose are solitary animals with the strongest social bond being between the mother and the calf. Mothers are very

protective of their calves, frequently charging people if they get too close and using their sharp hooves to strike at attackers. Moose are also extremely competitive during the mating season. Unless you are actively hunting, do not under any circumstance "call" the animal in an effort to get close to it. A worked up bull moose may perceive you as a competitor for his female and a territorial attack may be the end result.

To avoid confrontations give all moose plenty of room. **DO NOT APPROACH.** Moose, like other animals,

have a distance around them, that if entered may cause them to react. This is the fight or flight syndrome. In most cases they will flee but on occasion the moose may feel that it has to fight in order to survive.

- Keep a safe distance and never approach even if the animal appears calm
- Assess the animal's behavior. Moose use body language as a method of communication. Understanding this language will help being able to assess the situation. The following are signs of stress or agitation:
- Staring intently in your direction and lowering of the head
- Raised hair on the shoulders and neck
- Ears are laid back
- Pawing of the ground
- Licking of the lips, expelling air through the nose
- Look for an avenue of escape or cover (tree, vehicle,



building)

- Increase your distance from the animal

Most charges will be bluff charges - a warning. If the animal gives chase, look for a solid obstruction such as a tree. Climb the tree and get high enough to get out of danger. If climbing is not an option, use the tree as an obstruction; you can run around a tree faster than a moose can. If the animal knocks you down, it may continue running or start stomping and kicking with all four feet. Curl up in a ball, protect your head with your arms, and lie still. Don't try to move until the animal moves a safe distance away or it may renew its attack.

Each year, thousands of people are injured or killed when their vehicles collide with free-ranging wildlife, especially moose. Roads do not serve as natural barriers to wildlife and roadways will often attract them which increase the risk of traveling on these roads. Workers are at risk at all times but the frequency wildlife is found along roads varies throughout the year. Wildlife is most active during the two hour period around sunrise and sunset although, workers should be alert to wildlife collisions at all times during the day. About 40% of all wildlife collisions occur between 7:00 pm and midnight. During the spring and fall migrating animals use roads and corridors to travel from their summer and winter ranges. In the winter and spring, wildlife is attracted to right of ways to lick the salt used to melt snow and ice.

The best way to avoid collisions with moose is to change

driver behavior. The following suggestions may help reduce the chances of a collision with all wildlife.

- Be alert for wildlife at all times, but especially during dusk/dawn and/or Fall/Spring
- Drive within your headlights and/or reduce your speed at night
- Search and scan the roadway/roadside ahead
- If you see one individual expect to see others
- Expect more wildlife near wildlife crossing warning signs
- Beeping your horn and/or flash your headlights
- Keep your windshield clean and ensure seatbelts are worn
- Keep your headlights adjusted, and use your high beams where possible

It's difficult to see a dark colored animal such as a moose on a dark highway. Unlike deer, their eyes usually are not reflective and their hair seems to absorb light from headlights. In addition, young animals are more susceptible to being involved in a collision than mature ones. Young, inexperienced animals haven't developed "road sense" and are apt to panic when a vehicle drives by, often running down the road instead of across it, or slipping and falling in their haste to escape. 

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The GREENSCENE

Hinterland Who's Who

by Dan LeGrandeur,
Bear Scare Ltd.

The forests of the Pacific Northwest are among the last remaining old-growth forests in North America. They are also the primary remaining habitat of the Northern Spotted Owl (*Strix occidentalis caurina*) -- a medium-sized owl with a chocolate-brown body spotted with white and sporting prominent facial disks around its eyes. Like most owls, spotted owls are adapted for hunting at night, with highly developed senses of sight and hearing and feathers specially modified so they can fly silently. They are agile predators, feeding principally on small mammals. They need to roost in old-growth forests because these habitats offer cool, damp conditions, with plenty of holes and cavities to roost in. These trees also harbor rodents, one of the owls' main prey items. Northern spotted owls don't build nests in the usual sense; they find naturally occurring sites like crevices and ledges of cliff faces or tree cavities. These cavities are often found in fallen old-growth trees. The fibrous, grainy structure of old growth is precisely the feature that makes this wood so valuable to lumber companies -- and this demand has put the Northern Spotted Owl at the center of one of the most heated environmental debates in history.

Northern Spotted Owls are dark-to-chestnut brown with round or oval white spots on their head, neck, back and underparts. Their flight feathers also are dark brown in color and barred with light brown or white. Unlike most owls, spotted owls have dark eyes. Although this species is often referred to as a medium-sized owl, it ranks among the largest in North America. The average adult size is about 18 inches tall with a wing span of approximately 48 inches. They weigh between 17-29 ounces. The female is larger than the male.

Suitable spotted owl habitat includes old-growth forest areas with multi-layered canopies of trees that are high and open enough for the owls to fly between and underneath them. Preferred areas have large trees with broken tops,



deformed limbs and large cavities, capable of supporting the owls' nesting materials.

Northern Spotted Owls enjoy a variety of prey, including flying squirrels, woodrats, mice and other small rodents. They also eat birds, insects and reptiles. These owls are very territorial and intolerant of habitat disturbance. Even though they do not migrate, they may shift their ranges in response to seasonal changes. Each pair needs a large amount of land for hunting and nesting. They have a distinct flight pattern, involving a series of rapid wingbeats interspersed with gliding flight.

Pairs of males and females form in February or March and two or three white eggs are laid in March or April.

The female incubates the eggs for 30 days. After hatching, it takes the young birds 34-36 days to fledge - or acquire the feathers necessary for flying. After the eggs hatch, the female sits with the offspring for 8-10 days. During this time, the male brings the female food.

The Northern Spotted Owl is a permanent resident throughout its range, which extends along coastal forests from southwestern British Columbia to southern California, and along the southern Rocky Mountains from central Colorado to central Mexico. In British Columbia, the owl occurs north to Anderson Lake, east to Mowhawkum Creek, and west to Capilano River.

In 1984 there was no information on the number of Northern Spotted Owls residing in British Columbia, but an estimate based on habitat availability suggested a declining population of 25-100 birds. In 1999, there were less than 100 pairs of and the population has declined by 40% since 1992.

Habitat and prey availability are probably the most important limiting factors for this species. Within the range of the Northern Spotted Owl in B.C., about 3000 ha of forest is harvested annually. This logging impacts the owl, because it alters forest structure and composition; isolates individual nesting pairs; and fragments and isolates forest stands to the extent that they become unsuitable for owls. Since the food

supply available to Northern Spotted Owl is determined by forest type, structure and composition, forest management practices have an important effect on prey populations and ultimately on owl densities. Other threats include predation by great horned owls, competition with barred owls; and toxic pollution resulting in thinned eggshells.

The Northern Spotted Owl is protected under the federal Species at Risk Act (SARA). More information about SARA, including how it protects individual species, is available in the Species at Risk Act: A Guide.

The Northern Spotted Owl is protected under provincial legislation throughout Canada. Under this legislation, it is prohibited to destroy, harm, or collect adults or eggs, or to destroy active nesting sites without a permit. ●



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The '15th Annual Alberta Business Awards of Distinction' hosted by the Alberta Chambers of Commerce were held on February 22nd at the Hyatt Regency Hotel in Calgary.

The CAGC congratulates Bear Slashing Ltd who were successful in the category for those organizations that embrace diversity in their workforce; that encourage respect and inclusion; that eliminate discrimination and barriers; and, that create welcoming and inclusive workplaces and communities.

Distinguished guests in attendance included Presidents and CEO's from very large, medium and small corporations that have achieved excellence in the Alberta business community, Provincial Ministers, First Nation's Chiefs and Elders and a host of guests who support the aims of the Alberta Chambers of Commerce.

In the photograph, Danny Dion, President & Owner of Bear Slashing Ltd (right), is shown accepting the award from Commissioner Beth Bryant (centre), with Chief Walter Janvier of the Chipewyan Prairie First Nation (left).

Danny's acceptance speech was emotionally charged, heartfelt and reflected his humility in the credit he paid to his clients, employees and management team. He gave special mention to Chief Walter Janvier, Chief of the Chipewyan Prairie First Nation, who he sincerely thanked for the respect and trust shown in the development of a strong and mutually beneficial business relationship.

Danny extended his thanks to all of the Bear Slashing 'Team' that truly made this award possible.

The GREENSCENE

Hinterland Who's Who

by Dan LeGrandeur,
Bear Scare Ltd.

The Trumpeter Swan (*Cygnus buccinator*) is the largest and rarest swan in the world. It is listed as a vulnerable species, and without active management and protection, this species could easily become threatened or endangered in Canada.

Adult Trumpeter Swans are large birds with white feathers and black legs and feet. The feathers of the head and the upper part of the neck often become stained orange as a result of feeding in areas rich in iron salts. The lack of colour anywhere on the swans' bodies distinguishes them from other white species of waterfowl, such as snow geese, which have black wing tips.

The male swan, or cob, weighs an average of 12 kg. The female, or pen, is slightly smaller, averaging 10 kg. Adult birds may have a wingspan of 3 m. Young of the year, or cygnets, can be distinguished from adults by their grey plumage, their yellowish legs and feet, and until their second summer of life, their smaller size.

Canada has two species of swans that are native to the country, the Trumpeter and Tundra. Both are very similar and often the shape and colour of the bill is the only way to identify Trumpeter and Tundra swans in the field. Trumpeters have all black bills; Tundra Swans, also called Whistling Swans, have more sloping bills, usually with a small yellow patch in front of the eye. If this patch is missing, it is quite difficult to distinguish between the two birds unless the voice is heard.

Trumpeter Swan and the Tundra Swan have quite different voices. The Trumpeter Swan has a deep, resonant, brassy, trumpet-like voice; the voice of the Tundra Swan is softer and more melodious.

During the early part of the winter, when the weather is mild and wet, the swans may be widely dispersed, feeding in freshwater and estuarine wetlands and flooded farm fields along the coast. When the freshwater areas freeze, the swans congregate on the estuaries, which do not freeze because of the combined influence of tides and salt water.



The two dominant activities of Trumpeters on the wintering grounds are feeding and resting. On the British Columbia coast, feeding is strongly influenced by cycling of tides in the estuaries. The birds feed at times during the day and night when the preferred amount of water covers their plant food. In some parts of the winter range, such as Vancouver Island, more of each 24-hour period is spent resting than feeding, probably thanks to relatively mild temperatures and the availability of foods rich in carbohydrates, which provide ample heat energy.

Trumpeter Swans are well adapted for the harsh environments in which they sometimes live.

Their unusually dense layer of down, which can be up to 5 cm thick, seems to make them almost impervious to the cold. It is not unusual for Trumpeter Swans to tolerate extended periods with temperatures as low as -30°C .

Trumpeter Swans are found in Canada year round and at present, biologists recognize three populations of Trumpeter Swans; the Pacific Coast Population, the Rocky Mountain Population, and the Interior Population. Birds from the Rocky Mountain Population are in Canada only in the summer, whereas birds from the Pacific Coast Population winter in British Columbia, after spending the summer in Alaska. Trumpeter Swans leave the Grande Prairie region of Alberta, Yukon, and the Northwest Territories in late October, when freeze-up is well advanced, for their journey south to the U.S.

Spring migration for the Pacific Coast Population begins in mid- to late February, depending on the weather. By mid-March most Trumpeters have disappeared from the coast, not to appear on the Alaskan breeding grounds until mid- to late April. After the swans leave the estuaries, they cross the Coast Mountains. Once east of the mountains they fly north, stopping at various large lakes in central British Columbia and southern Yukon on the way.

Swans belonging to the Rocky Mountain Population arrive on their breeding grounds at Grande Prairie, Alberta,

southern Yukon, and the Northwest Territories in mid-April to early May. Many of the ponds where they breed are still frozen when they arrive, but some of the larger bodies of water may have open leads, where the swans congregate. Young from previous seasons usually gather in small flocks, remaining together throughout the summer on lakes not occupied by breeding pairs. Breeding birds select nest sites that are surrounded by water from 10 cm to several metres in depth. They frequently construct their nests on old beaver houses and dams, but they also build on emergent vegetation, either floating or anchored to the bottom. Pairs often begin to build or repair their nest even before a site is completely free of ice. Most nests are used year after year, usually by the same pair. Rebuilding does not usually involve much more than adding plant material to an already substantial mound.

The female, or pen, lays one egg about every two days, until she has produced an average of five or six eggs, or occasionally up to nine. She incubates, or keeps the eggs warm, for 32 days until they hatch while the cob helps to defend the nest from predators and intruders. The peak of the hatching period in the Grande Prairie region is about June 15; in the Yukon and Northwest Territories it is nearer July 1.

During summer, Trumpeters feed on leaves, tubers, and roots of aquatic plants at depths up to 1 m, which they reach by dipping their heads and necks, or by up-ending. The cygnets, or young, feed predominately on insects and other invertebrates for the first few weeks of life but may start feeding on plants before they are two weeks old. On their wintering grounds in coastal British Columbia, the birds eat primarily roots and tubers of emergent plants, or plants rooted in the water but with most of the growth above the water, on tidal flats. The swans prefer to feed in a shallow covering of water, as the tide floods or recedes.

The adults moult their feathers in summer and are flightless for a month or more. The pen usually loses some of her flight feathers about the time her cygnets hatch and is flightless during their most critical period. The cob becomes flightless about the time the pen regains her flight. In this way, one flightless parent remains with the cygnets during the brood period.

The cygnets grow from approximately 300 g at hatching to approximately 7 kg at fledging, or first flight. Feathers first start to appear at about 28 days, and the cygnets are usually fully feathered in nine or 10 weeks. They start to fly in the second half of September in the Grande Prairie area, and in early October in the Northwest Territories.

Trumpeter Swans have survived in captivity for up to 35 years, but in the wild most swans live for less than 12 years.

Except for people, wild Trumpeters have few natural enemies. Eagles, owls, coyotes, and mink may take swans at certain times but these instances are infrequent and usually affect very young birds or adult birds that have become weakened and unable to fend off predators. Diseases and parasites, alone or combined with bad weather or local food

shortages, may also result in some deaths.

Trumpeter Swans used to breed in boreal, parkland, and prairie habitats throughout Canada with the birds nesting throughout the central regions of Alberta, Saskatchewan, and Manitoba as well as along the James Bay coast of Ontario and Quebec. Although the total population size was unknown, the species was abundant.

By the early 1900s, Trumpeter Swans were nearly extinct. Large numbers of birds had been shot for their down, feathers, and meat. Increasing settlement had also disturbed suitable nesting areas, particularly in the southern part of their range. By 1930 only small remnant flocks existed in Alberta, Alaska, Montana and Wyoming.

An international program to save Trumpeter Swans from extinction began in the 1930s when the birds and their remaining habitat were granted additional protection. The public was made aware of the problem and encouraged to report sightings of trumpeters or their nests and to reduce human activity near nesting areas. As a result, Trumpeter Swans responded well to the restoration program. Populations in the United States increased steadily to where the birds have been removed from the endangered species list in the U.S. Trumpeters are still considered vulnerable in Canada, with approximately 550 swans nesting in 1990. Locations of breeding flocks include the Yukon, northern B.C., southwestern Northwest Territories and the Grande Prairie/Peace River region of Alberta. A major part of the Alberta flock is concentrated on lakes and sloughs near Grande Prairie. This population has increased slowly and steadily from approximately 120 birds in 1975 to 321 birds in 1990. In addition, a few Trumpeter Swans breed locally near Cardston, Edson, and various lakes north of Peace River and St. Paul. In 1990, a total of 156 birds were counted in these other areas.

The most serious threat to the continued well-being of the Trumpeter Swan is the loss of habitat resulting from expanding human populations. The Pacific Coast Population is currently increasing and expanding its range, especially within its Alaskan breeding areas. At the same time the oil and gas industry is rapidly invading productive lowland areas of Alaska, including the Trumpeters' nesting range. The industrialization of Alaska may prove to be as detrimental to Trumpeter Swans as was the settlement of the plains.

The Rocky Mountain Population also continues to grow, although not as rapidly as the Pacific Coast Population. This population is vulnerable to catastrophic losses from disease, habitat destruction, or exceptionally cold weather while the birds are concentrated on their Tri-State (where the states of Idaho, Montana, and Wyoming meet) wintering grounds. Any long-term expansion of this population will depend on the enhancement of existing wintering habitat.

Various management programs have been used to directly or indirectly benefit Trumpeter Swans. An international swan management plan has been outlined and goals for the

minimum breeding population in each area have been established. Annual fall surveys are used to identify areas and habitats used by swans and to estimate the population size throughout their range. In many areas, dams and dikes are used to stabilize water levels and ensure that specific lakes remain suitable for swans and other waterfowl species throughout the summer.

In order to study migration and survival, biologists in both Canada and the United States have marked Trumpeter Swans with colored collars. In addition, they have marked a number of swans by coloring areas of their white feathers with yellow-orange dye. Anyone who sees any of these birds is asked to provide information about the sighting to the Natural Resources Service or the Canadian Wildlife Service.

The awareness and concern of the public is perhaps the most important factor in restoring the Trumpeter Swan population in Canada and the United States. In particular, the residents in and around Grande Prairie adopted the Trumpeter Swans in their area and support efforts to protect the nesting habitat and reduce human disturbance near nests. They also cooperate in protecting areas used by non-breeding birds as feeding, loafing, and moulting habitat.

In general, Trumpeter Swans in North America are a conservation success story. The outlook for the swans in Alberta and the rest of Canada is promising. The flock at Grande Prairie is increasing and appears to be re-establishing in some of its earlier range. Continued success depends on a reduction of disturbance of breeding pairs in these areas and the ability to spread breeding and wintering birds onto new range. Public awareness and support of the birds and the various management programs is high. ●



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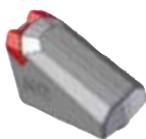


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Green Scene: Hinterland Who's Who

A Winters Sleep

written by Dan LeGrandeur, Bear Scare Ltd.



Photos: Dan LeGrandeur

Winter is the season of highest mortality for most northern mammals. But not for black bears, which are masters of winter survival. Their winter death rate of less than one percent is their lowest of the year.

Once considered not true hibernators because of their high body temperatures in winter, black bears are now known to be highly efficient hibernators. They sleep for months without eating, drinking, urinating, or defecating. Hibernators with lower body temperatures, such as chipmunks, woodchucks, and ground squirrels, cannot do this. These other mammals must awaken every few days, raise their temperatures to over 34°C, move around in their burrows, and urinate. Some of them must also eat and defecate during arousals. Black bears, however, develop far more insulative pelts and have lower surface-to-mass ratios than the smaller hibernators. As a result, the bears' body heat is lost very slowly, enabling them to cut their metabolic rate in half and still make it through winter, maintaining temperatures above 31° which is within six degrees of their normal summer temperature. This, in turn, means that a black bear can react to danger faster than most

other hibernators whose body temperatures may be less than four degrees. New knowledge of hibernation processes has led biologists to redefine mammalian hibernation as simply a specialized, seasonal reduction of metabolism concurrent with the environmental pressures of food unavailability and low environmental temperatures.

In most bio-regions of Canada bears commonly go for five to six months without eating from mid-November until mid-March. To do that and remain in good condition requires changes in physiology, and some of these changes create conditions in bears that would cause problems in people. How bears remain healthy in winter, and how their adaptations may be used to improve human medicine, have recently become subjects of study at some of the leading medical research centers in the country. For example, bears that are living off their fat have cholesterol levels more than twice as high as

their summer levels and more than twice as high as the cholesterol levels of most humans. Yet bears have no known problem with hardening of the arteries or with the formation of cholesterol gallstones. Medical studies have shown that bears in winter produce a bile juice, ursodeoxycholic acid, which may help them to avoid problems with gallstones. When given to people, this acid dissolves gallstones, eliminating the need for surgery. Black bears also greatly reduce their kidney function in winter. They do not urinate for months but still do not poison their bodies with waste products such as urea. The urea is somehow broken down and the nitrogen from it is reused to build protein. This ability to build protein while fasting allows the bears to maintain their muscle and organ tissue throughout the winter. They only use up fat. Evidence is accumulating that the physiological changes that occur in hibernating black bears are controlled by hormone-like substances. These substances also produce hibernation-like effects when injected into other species - both other hibernators and non-hibernators, suggesting possible uses in human medicine.

Hibernation for the black bear, as for other mammals, is primarily a mechanism to conserve energy through seasons of no food or water.

The process, however, does not work in summer. If there is insufficient food in summer, bears lose weight and starve, much as we would. In western Canada summer and fall are the only seasons when enough of the right foods exist for bears to gain weight. In other seasons, the right foods are either lacking or so scarce that the bears lose weight. Grass, which bears eat in great quantities in the spring, is not easily digestible. Black bears in western Canada begin to fatten up for winter in July, with the ripening of carbohydrate-rich berries. The weight gain in summer depends mainly on the availability of good crops of berries. When these and other digestible foods disappear in September and October, energy conservation becomes the rule until the following May or June.

One exception to this rule concerns bears that are

kilometers outside their usual home ranges when food becomes scarce in the fall. They have to expend considerable energy returning home for winter. A second way in which black bears expend, rather than conserve, energy in the fall is by preparing a different den each year. Why they do this - often with the den of the previous year still intact - is not known.

For their dens, the black bears generally choose burrows, caves, rock crevices, hollow trees, or excavated depressions under fallen trees or brush piles. Hollow trees, in areas where they are common seemed to be preferred for dens because they probably provide the best insulation and protection from hunters and predators. Entrances to underground dens or tree cavities are usually just large enough for the occupant to squeeze through, opening into a chamber that is typically one to two meters wide and 1 meter in height.

Black bears usually spent considerable time in the fall gathering nest material and arranging it in their dens. Most sows arrive at their den locations well before snow covers the nesting materials, usually in late September or early October. After digging a burrow or depression or renovating a rock cave that another bear had used in years past, bears spend most of their time resting in and around the den or gathering nest material until they entered their dens to stay, usually in late October. Whenever cedar trees are present, bears have been observed stripping the fibrous bark from them to use in making nests. The narrow strips of bark, up to several meters long, make a

durable bed that does not partially disintegrate and lose insulation value by spring in the way that beds made of finer materials such as leaves, grass, and moss often do. These less sturdy materials are generally the only ones available so most nests are built with them. Male black bears wait until snow covers the ground to start the work of creating a nest and these are mainly bears that have access to an unusually long-lasting food supply, such as salmon, mountain ash berries, or garbage.

From late September through mid October in 2002 I had



the opportunity to observe a family of bears settle in for the winter. During the previous week, the animals had completed a burrow under the roots of a fallen pine and with all three cubs (of the previous winter) helping their mother, had begun to rake up bedding from a 20 meter radius around it. The cubs raked leaves, grass, and forest litter, backing toward the den as they pulled piles of material with their front paws. The five-year-old mother did the same, but in addition, she bit branch tips from willow bushes and pulled up supple fern plants with her teeth, dropping them on her own piles. She also took charge of arranging all the nest material in the den. The cubs could have done a good job of this, too, as orphaned cubs have demonstrated, but the mother had her own ideas about the nest. Twice she scooped all the material out of the den, sending it flying backward between her hind legs and then putting it back her own way. Except for these vigorous remodeling jobs and instances when the cubs quickly grouped behind their mother after hearing a strange noise, all the actions I observed during this period of den preparation were languid and listless. There was no play. The bears were active only during the day, and during the three weeks of observation the activity decreased from a few hours per day to a few minutes before ceasing altogether.

Temperatures in the dens depended on snow cover as bears, with their low metabolism, do little to warm the space. In winters with several feet of snow, den entrances are often covered and temperatures inside are only slightly warmer than the soil, a few degrees below freezing. In winters with light snow, den entrances remain open and temperatures in the dens are about the same as that of the outside air.

The main insulation for a bear in winter is its fur, which more than doubles in insulative value during the fall. The fur is thickest on the back, neck, and sides and thinnest on the muzzle, legs, and underside. A hibernating bear sleeps in a curled-up position so that its crown is against the den floor and its nose is near its tail. This position minimizes a bear's surface area and reduces heat loss from the thinly furred areas. For extra insulation, bears sleep on a nest of leaves, grass, and other material that they rake into the den. These nests also insulate cubs from the ground.

Females usually give birth to two or three cubs every two years; cubs are born in January and weigh about 200 grams with practically no hair. After the birth the sow will lick them clean in order to stimulate defecation. She'll eat their feces then move the cubs into position to facilitate nursing. She keeps the cubs warm and dry and usually responds to their cries.

The cubs do not hibernate. They suckle and sleep



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snuggled warmly against their mother's sparsely furred underside and reach weights of two to three kilograms by the time they leave the den at three months of age.

From early fall to late spring most black bears lose between 15 and 30 percent of their body weight. Lactating mothers can lose as much as 40 percent. The mothers that lose the most weight are the ones with the heaviest litters.

Most bears emerge from their dens by early April although mothers with undersized cubs are sometimes delayed until early May. In years of light snow and early melt some bears leave as early as mid-March. On occasion bears will emerge from the den during periods of mild winter days or as a result of the den being disturbed, which is common in areas where there is a significant amount of industrial activity.

After den emergence bears are active only by day with the sows beginning to forage within 150 meters of their dens, leaving the cubs in the dens or playing around the entrances. The cubs will retreat into the dens at any strange sound, and their will mothers return every ten minutes or less to check on them.

With all the study of hibernating bears, a basic question remains: How do bears know when to go into or leave their dens? Certainly the bears live by some kind of internal clock, but what sets this clock – day length or some other cue – is unknown. Time of denning and emergence seems to vary to some extent with food supply, weather, and genetics, but how these and other possible factors interrelate is still unknown. For the native Indians the answer was simple: the black bear is a clever and intelligent animal. **S**

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The GREENSCENE

Hinterland Who's Who

by Dan LeGrandeur,
Bear Scare Ltd.

The grey wolf, commonly referred to as tundra wolf or timber wolf, is the largest of all wild canines. The largest wolves occur in the farthest northern reaches of its distribution, with males measuring over 75 cm at the shoulders and weighing up to 80 kgs. Coloration is quite variable but tending to mimic the background color of the habitat, ranging from a creamy white through sandy-reddish to shades of grey and black, with color often changing with age. Grey wolves often live 8 to 16 years in the wild, depending on the availability of food, but have been documented to live in excess of 20 years in captivity. The wolf is a territorial animal with boundaries patrolled and defended by all adult members of the pack. Territories vary greatly in size, from 15 to 30 square kilometers up to more than 8,000 square kilometers, depending on the abundance and availability of prey.

Highly social animals, the grey wolves form packs of 2 to 12 individuals which are influenced by the abundance of prey. The social structure within the pack is a strict hierarchy based ultimately on submission to the strongest male. Younger individuals constantly seek to improve their status within the hierarchy and are ready to assert themselves as soon as an older wolf shows any signs of weakness. Within the pack structure, only dominant male and female wolves, known as "alpha" individuals, are likely to breed. Their aggressive behavior deters other members of the pack from mating, ensuring the best chance of survival for the leader's pups.

Mating may occur anytime from January, in low altitude, to April in higher altitude. Courtship may extend for days or months, with estrus lasting 5-15 days. Following mating and a gestation period of approximately 62 days, two to 11 pups are born in an underground den, often an enlarged burrow taken over from other animals, or a small cave. The dens, which are used only for the rearing of young, are often situated in elevated areas

near water when possible. The average litter size is 6 pups that weigh about 450 grams at birth and are born blind and deaf. The pups are completely dependent on their mother for their first two months of life. Their eyes open during their

second week and they begin to explore outside the den by three weeks. The pups are generally weaned by the age of 6-8 weeks, with the help of the other members of the pack helping feed the young by regurgitating partially digested meals. Young grey wolves reach sexual maturity by the age of one and may leave the pack at the age of two, adopting a solitary lifestyle for some time, before pairing up and establishing a territory of their own. Mortality is highest among the young. In times of declining food supplies, all pups may be severely underweight or die from malnutrition, and reproduction may even cease.

Movement of the grey wolves is extensive during the daylight hours and at night time under normal conditions, although diurnal activity increases in extremely cold weather. During the summer, the pack usually sets out in the early evening and returns to the den by the next morning. In winter, when the pack is not restrained by maintaining a den site, the animals wander further and do not necessarily return to a particular location. Wolves tend to move in single file over a long distance, generally skirting lakes, rivers and streams where prey accumulates. Wolves often travel in excess of 40 kms in one day, covering the territory in a characteristic trot of 8-10 km/h. Although the wolf has been clocked up to 70 km/hr in a sprint, most

hunting pursuits are designed to identify weak prey species and a prolonged chase of 15-20 km/hr is normal.

Wolves generally hunt in packs consisting of all the adults and yearlings that are not guarding the pups, as they require several wolves to efficiently and safely bring down the large prey which they pursue. The hunt is not a complex strategic



Photos: Bear Scare Ltd.



affair; in general they simply outrun the prey species, drag it down and tear at it until it is too weak to fend off the pack. Prey is located by chance encounter, airborne scent or following a fresh scent trail on the ground or in the snow. The pack generally stalks prey, when conditions allow, to get as close as possible and save energy. The stalk also allows the wolves to evaluate the overall condition of the prey species and identify any individually showing signs of weakness or distress. The chase may cover as little as 100 m, or extend beyond 5000 m on some occasions, with successful hunts occurring in about 30% of the attempts. If the object of the pursuit turns out to be a large and healthy individual, who stands its ground, the pack will sometimes retreat not risking an attack unless they are extremely hungry.

The grey wolf is primarily a predator of mammals larger than itself, such as deer, elk, moose, caribou, bison, musk ox and mountain sheep. Smaller prey consisting of rabbits, hares, beaver and smaller rodents are taken only when the larger prey species are scarce or an easy kill presents itself. Once a kill has been made by the pack, wolves generally consume large amounts of meat in a noisy, snarling scramble most often dominated by the alpha male and female. An adult wolf can consume in excess of 15 kg of meat at one time, with the pack remaining the vicinity of a kill for several days until the remains have been consumed. Where human encroachment or other forms of habitat degradation has not altered the natural environment of the wolf, predation acts to improve prey species by eliminating weak and inferior individuals. There is a natural balance between predator and prey. Wolf populations tend to increase when the number of sick or weak individuals within the herd increases which is often due to overgrazing the available forage within the habitat. Wolf numbers will then tend to decrease as the herds are thinned and hunting success diminishes. This allows the natural vegetation to recover, and individual herd members are better fed and able to evade the attacking wolves.

Wolf population density and home range varies considerably from one habitat to another, apparently depending on prey availability and season. The home range of a pack generally corresponds to a defended territory with little or no overlap between the ranges of neighboring packs. Under natural conditions, wolf packs avoid areas and buffer zones between home ranges, where they might encounter other packs. Although territories are relatively stable, when food shortages induce stress, wolves move into the buffer zones between ranges to hunt and eventually trespass onto the ranges of neighboring packs. Meeting between packs,

during these stressful times, are antagonistic and often result in savage fighting and mortality. Although packs are hostile to one another, the grey wolf is among the most social of all carnivores. Packs usually contain 2 to 12 individuals, but have been reported to have in excess of 40 individuals. The number of wolves in a pack seems to increase with the size of the usual prey.

The wolf pack is essentially a family group, consisting of an adult pair, which mates for life, and their offspring of one or more years. The leader is usually a male, often referred to as the "alpha" male, who initiates activity, guides movements, and takes control in critical times such as hunts. The males and the females appear to have separate dominance hierarchies, reinforced by aggressive behavior and elaborate displays of greeting and submission by subordinate members. Generally only the most dominate pair mate, and they inhibit sexual activity in the other members of the pack with threats and attacks. Social status is rather consistent, and the alpha male may retain its position for years, but is challenged by subordinate males or outsiders if he should become vulnerable through injury or old age. A young wolf generally does not remain with the parental pack past breeding age which is about 24 months. As it approaches maturity, it may actively explore the fringes of the parental territory, joining a lone wolf from another pack, or establishes itself in an area and awaits a member of the opposite sex. A new pack territory is relatively small, and often incorporates a portion of the parental territory.



The grey wolf has a variety of visual, olfactory, and auditory means of communications. Vocalization include growls, barks, and howls. Howling functions to bring packs together, announce the beginning of hunting forays and sometimes a contagious exercise upon waking from a sleep. Defecation and especially urination are olfactory messages that announce a wolf pack's ownership of a territory as well as breeding condition. Scent marking not only helps to define the boundaries of a territory but acts in bringing new pairs together to establish new packs.

The wolf is often reported to be a direct threat to man, although in North America there have been no documented attacks of wolves which resulted in the death of a human. A far more substantive basis for the confrontation between humans and the grey wolf is predation on domestic livestock, most notably, cattle and sheep. The wolf has been persecuted, especially in the 20th century, because of its alleged threat to populations of wild ungulates that are desired for sport and subsistence hunting. **S**

Green Scene

The Trumpeter Swan

By Dan LeGrandeur, Bear Scare Ltd.



Photo: istockphoto.com

Following a brush with extinction, Trumpeter Swans (*Cygnus buccinator*) are making a comeback in North America. In 1933, overhunting by early European settlers had reduced the numbers of Trumpeters to just 77 breeding adults in Canada and 50 breeding adults in the United States. The swans were hunted for their prized skins and feathers, and their largest flight feathers were believed to make superior writing quills. Today, there are approximately 16,000 individuals in North America as a result of reintroduction programs, habitat conservation efforts and sanctuaries that have successfully complemented a ban on hunting. Adult Trumpeter Swans are large birds with white feathers and black legs and feet. The feathers of the head and the upper part

of the neck often become stained orange as a result of feeding in areas rich in iron salts. The lack of colour anywhere on the swans' bodies distinguishes them from other white species of waterfowl, such as snow geese, which have black wing tips.

The male swan, or cob, weighs an average of 12 kg. The female, or pen, is slightly smaller, averaging 10 kg. Adult birds may have a wingspan of 3 m. Young of the year, or cygnets, can be distinguished from adults by their grey plumage, their yellowish legs and feet, and until their second summer of life, their smaller size.

Canada has two species of swans that are native to the country - the Trumpeter and the Tundra. Both are very similar and often the shape and colour of the bill is the only way to identify Trumpeter and Tundra swans in the field. Trumpeters have

all black bills; Tundra Swans, also called Whistling Swans, have more sloping bills, usually with a small yellow patch in front of the eye. If this patch is missing, it is quite difficult to distinguish between the two birds unless the voice is heard.

Trumpeter Swan and the Tundra Swan have quite different voices. The Trumpeter Swan has a deep, resonant, brassy, trumpet-like voice; the voice of the Tundra Swan is softer and more melodious.

During the early part of the winter, when the weather is mild and wet, the swans may be widely dispersed, feeding in freshwater and estuarine wetlands and flooded farm fields along the coast. When the freshwater areas freeze, the swans congregate on the estuaries, which do not freeze because of the combined influence of tides and salt water.

The two dominant activities of Trumpeters on the wintering grounds are feeding and resting. On the British Columbia coast, feeding is strongly influenced by cycling of tides in the estuaries. The birds feed at times during the day and night when the preferred amount of water covers their plant food. In some parts of the winter range, such as Vancouver Island, more of each 24-hour period is spent resting than feeding, probably thanks to relatively mild temperatures and the availability of foods rich in carbohydrates, which provide ample heat energy.

Trumpeter Swans are well adapted for the harsh environments in which they sometimes live. Their unusually dense layer of down, which can be up to 5 cm thick, seems to make them almost impervious to the cold. It is not unusual for Trumpeter Swans to tolerate extended periods with temperatures as low as -30°C.

Trumpeter Swans are found in Canada year round and at present, biologists recognize three populations of Trumpeter

Swans: the Pacific Coast Population, the Rocky Mountain Population, and the Interior Population. Birds from the Rocky Mountain Population are in Canada only in the summer, whereas birds from the Pacific Coast Population winter in British Columbia, after spending the summer in Alaska. Trumpeter Swans leave the Grande Prairie region of Alberta, Yukon, and the Northwest Territories in late October, when freeze-up is well advanced, for their journey south to the U.S.

Spring migration for the Pacific Coast Population begins in mid- to late February, depending on the weather. By mid-March most Trumpeters have disappeared from the coast, not to appear on the Alaskan breeding grounds until mid- to late April. After the swans leave the estuaries, they cross the Coast Mountains. Once east of the mountains they fly north, stopping at various large lakes in central British Columbia and southern Yukon on the way.

Swans belonging to the Rocky Mountain Population arrive on their breeding grounds at Grande Prairie, Alberta, southern Yukon, and the Northwest Territories in mid-April to early May. Many of the ponds where they breed are still frozen when they arrive, but some of the larger bodies of water may have open leads, where the swans congregate. Young from previous seasons usually gather in small flocks, remaining together throughout the summer on lakes not occupied by breeding pairs. Breeding birds select nest sites that are surrounded by water from 10 cm to several metres in depth. They frequently construct their nests on old beaver houses and dams, but they also build on emergent vegetation, either floating or anchored to the bottom. Pairs often begin to build or repair their nest even before a site is completely free of ice. The same pairs use most nests year after year, usually. Rebuilding does not usually involve much more than adding plant material to an already substantial mound.

The female, or pen, lays one egg about every two days, until she has produced an average of five or six eggs, or occasionally up to nine. She incubates, or keeps the eggs warm, for 32 days until they hatch while the cob helps to defend the nest from predators and intruders. The peak of the hatching period in the Grande Prairie region is about June 15; in the Yukon and Northwest Territories it is nearer July 1.

“In general, Trumpeter Swans in North America are a conservation success story. The outlook for the swans in Alberta and the rest of Canada is promising. Continued success depends on a reduction of disturbance of breeding pairs in these areas and the ability to spread breeding and wintering birds onto new range. Public awareness and support of the birds and the various management programs is high.”

During summer, Trumpeters feed on leaves, tubers, and roots of aquatic plants at depths up to 1 m, which they reach by dipping their heads and necks, or by up-ending. The cygnets, or young, feed predominately on insects and other invertebrates for the first few weeks of life but may start feeding on plants before they are two weeks old. On their wintering grounds in coastal British Columbia, the birds eat primarily roots and tubers of emergent plants, or plants rooted in the water but with most of the growth above the water, on tidal flats. The swans prefer to feed in a shallow covering of water, as the tide floods or recedes.

The adults moult their feathers in summer and are flightless for a month or more. The pen usually loses some of her flight feathers about the time her cygnets hatch and is flightless during their most critical period. The cob becomes flightless about the time the pen regains her flight. In this way, one flightless parent remains with the cygnets during the brood period.

The cygnets grow from approximately 300 g at hatching to approximately 7 kg at fledging, or first flight. Feathers first start to appear at about 28 days, and the cygnets are usually fully feathered in nine or 10 weeks. They start to fly in the second half of September in the Grande Prairie area, and in early October in the Northwest Territories.

Trumpeter Swans have survived in captivity for up to 35 years, but in the wild most swans live for less than 12 years.

Except for people, wild Trumpeters have few natural enemies. Eagles, owls, coyotes,

and mink may take swans at certain times but these instances are infrequent and usually affect very young birds or adult birds that have become weakened and unable to fend off predators. Diseases and parasites, alone or combined with bad weather or local food shortages, may also result in some deaths.

Trumpeter Swans used to breed in boreal, parkland, and prairie habitats throughout Canada with the birds nesting throughout the central regions of Alberta, Saskatchewan, and Manitoba as well as along the James Bay coast of Ontario and Quebec. Although the total population size was unknown, the species was abundant.

By the early 1900s, Trumpeter Swans were nearly extinct. Large numbers of birds had been shot for their down, feathers, and meat. Increasing settlement had also disturbed suitable nesting areas, particularly in the southern part of their range. By 1930 only small remnant flocks existed in Alberta, Alaska, Montana and Wyoming.

An international program to save Trumpeter Swans from extinction began in the 1930s when the birds and their remaining habitat were granted additional protection. The public was made aware of the problem and was encouraged to report sightings of Trumpeters or their nests and to reduce human activity near nesting areas. As a result, Trumpeter Swans responded well to the restoration program. Populations in the United States increased steadily to where the birds have been removed from the endangered species list in the U.S. Trumpeters are still considered vulnerable in Canada, with approximately

550 swans nesting in 1990. Locations of breeding flocks include the Yukon, northern B.C., southwestern Northwest Territories and the Grande Prairie/Peace River region of Alberta. A major part of the Alberta flock is concentrated on lakes and sloughs near Grande Prairie. This population has increased slowly and steadily from approximately 120 birds in 1975 to 321 birds in 1990. In addition, a few Trumpeter Swans breed locally near Cardston, Edson, and various lakes north of Peace River and St. Paul. In 1990, a total of 156 birds were counted in these other areas.

The most serious threat to the Trumpeter Swan is the loss of habitat resulting from expanding human populations. The Pacific Coast Population is currently increasing and expanding its range, especially within its Alaskan breeding areas. At the same time the oil and gas industry is rapidly invading productive lowland areas of Alaska, including the Trumpeters' nesting range. The industrialization of Alaska may prove to be as detrimental to Trumpeter Swans as was the settlement of the plains.

The Rocky Mountain Population also continues to grow, although not as rapidly as the Pacific Coast Population. This

population is vulnerable to catastrophic losses from disease, habitat destruction, or exceptionally cold weather while the birds are concentrated on their Tri-State (where the states of Idaho, Montana, and Wyoming meet) wintering grounds. Any long-term expansion of this population will depend on the enhancement of existing wintering habitat.

Various management programs have been used to directly or indirectly benefit Trumpeter Swans. An international swan management plan has been outlined and goals for the minimum breeding population in each area have been established. Annual fall surveys are used to identify areas and habitats used by swans and to estimate the population size throughout their range. In many areas, dams and dikes are used to stabilize water levels and ensure that specific lakes remain suitable for swans and other waterfowl species throughout the summer.

In order to study migration and survival, biologists in both Canada and the United States have marked Trumpeter Swans with coloured collars. In addition, they have marked a number of swans by colouring areas of their white feathers with yellow-

orange dye. Anyone who sees any of these birds is asked to provide information about the sighting to the Natural Resources Service or the Canadian Wildlife Service.

The awareness and concern of the public is perhaps the most important factor in restoring the Trumpeter Swan population in Canada and the United States. In particular, the residents in and around Grande Prairie adopted the Trumpeter Swans in their area and support efforts to protect the nesting habitat and reduce human disturbance near nests. They also cooperate in protecting areas used by non-breeding birds as feeding, loafing, and moulting habitat.

In general, Trumpeter Swans in North America are a conservation success story. The outlook for the swans in Alberta and the rest of Canada is promising. The flock at Grande Prairie is increasing and appears to be re-establishing in some of its earlier range. Continued success depends on a reduction of disturbance of breeding pairs in these areas and the ability to spread breeding and wintering birds onto new range. Public awareness and support of the birds and the various management programs is high. **S**

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Green Scene

Hinterland Who's Who: Wildlife Awareness Training

written by Dan LeGrandeur, Bear Scare Ltd.



Photo: istockphoto.com

An aspect of training that is often overlooked in a company's training regime is wildlife awareness. Anytime a worker is engaged in any activity outside of our urban borders they may come in conflict with wildlife and such conflict on occasion may prove fatal. Some companies have recognized this and offer basic bear safety training. The level of instruction varies wildly and unless the training is being delivered by a reputable source, any misinformation may cause more harm than good and actually put the worker at risk. In our wilderness areas it is not just bears that may cause people harm. Encounters with elk or moose, collisions with wildlife, noxious plants, insects, spiders and reptiles all pose a threat to worker safety. Wildlife may also transmit disease to humans that can be fatal or cause a permanent disability.

Did you know that worldwide more people are injured or killed by large ungulates than by large predators?

These injuries are usually a result of a motor vehicle collision but on occasion a large ungulate may attack a human. These attacks can be divided into two categories: territorial

and defensive.

Bison for example, travel in herds and have a strict hierarchy; subordinate animals must keep their distance from dominant individuals. When the "personal space" of a dominant animal is encroached upon a territorial attack may be provoked. This is usually a result of someone trying to get as close as possible to wildlife. A large ungulate attacking during the period of the "rut", the breeding season can also be categorized as a territorial attack. Males during this period are extremely competitive with other males in their search for receptive females. Encountering a "love struck" male during this period may result in the animal asserting his dominance in order to drive off his competitor. Moose and elk are best known for this type of behavior but caution should be exercised with any large ungulate during the mating season.

An animal's usual reaction when it feels threatened is to hide, flee or keep its distance. However, when an animal is cornered, trapped or constrained it may feel that its best chance to survive is to attack. Animals will use whatever mechanism is available to them in an attempt to inflict pain;

bison use their horns to gore, moose will use their front legs to stomp and kick. Female ungulates have also been known to attack humans to defend their young. Cow moose are extremely protective of their calves and will become aggressive if she feels threatened.

Each year, thousands of people are injured or killed when their vehicles collide with free-ranging wildlife. Roads do not serve as natural barriers to wildlife and roadways will often attract them, which increase the risk of traveling on these roads. Workers are at risk at all times but the frequency wildlife is found along roads varies throughout the year.

Do you know what a “Zoonose” is?

Zoonose literally means “diseases from animals”. Zoonoses are human diseases for which vertebrates serve as reservoirs or hosts for the disease organism. Workers in the wilderness where contact with wildlife is present may be exposed to disease that on occasion may be fatal. The number of zoonoses contracted to humans is vast but Rabies, Hantavirus Pulmonary Syndrome, West Nile Virus and Lyme disease are the most common.

Did you know that in extremely rare situations, a person could get rabies without being bitten by a rabid animal?

Humans have acquired rabies without being bitten (non-bite exposure). Exposure to rabid animal saliva or brain matter that comes in contact with open wounds, scratches, or mucous membranes, such as an eye or open mouth or breathing the airborne virus can inflict a person with the rabies virus.

Did you know that regardless of species, most bear attacks are defensive in nature?

Therefore, the best way to avoid an encounter is to ensure you make your presence known to the bear to prevent surprising it and to take the proper precautions to not attract bears into your camp or work area. When traveling or working in bear country a person should be aware of their surroundings. Look for signs of bear activity such as droppings, tracks and feeding areas. The type of tracks that

are observed can provide valuable clues to what species and age class of bears are in the area. Feeding areas can be indicated but are not limited to the presence of overturned rocks, torn up stumps or logs, berry patches or salmon streams. **Did you know that bear spray is more effective than firearms when you have a close encounter with a bear?**

A 20-year study of the effectiveness of bear spray in Alaska showed that bear deterrent spray is an effective tool for defusing bear-human conflicts in a nonlethal manner. In Alaska, bear spray was highly effective in dealing with all 3 species of North American bears. Persons working and recreating in bear habitat should feel confident that they are safe if carrying bear spray. Although bear spray was 92% effective by their definition of success, it is important to note that 98% of persons carrying it were uninjured after a close encounter with bears.

Enform has developed an awareness course that answers all these questions and more. The Wildlife Awareness course will provide field workers with a basic knowledge for working safely in remote and wilderness habitats at the same time promoting the safe coexistence with wildlife.

This is a highly interactive internet-based course that is suitable for novice, intermediate and supervisory level workers. Wildlife Awareness has a total run-time of approximately four to six hours and the course delivery format makes ample use of multi-media in a variety of situations. Several topics are covered in detail and include Regulations for wildlife protection, Large Ungulates, Noxious plants, insects, spiders and reptiles, Transmissible diseases associated with wildlife contact, and encounters with bears and other carnivores.

The Wildlife Awareness course is a great example of how the oil and gas industry is becoming more environmentally responsible. The course is endorsed by the CAGC, CAPP, PSAC and SRD. **S**

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Green Scene

Zoonoses

By Dan LeGrandeur, Bear Scare Ltd.



Photo: istockphoto.com

Zoonoses literally means “diseases from animals”. Zoonoses are human diseases for which vertebrates serve as reservoirs or hosts for the disease organism. Few disease organisms can exist outside a living body for very long. Without a wildlife species to serve as a host, most zoonoses would cease to exist.

The “*Plague*” was a common zoonose contracted through contact with infected mammals (usually rodents). Although it is rare to contract this disease in North America, it is still prevalent in Asia and Africa. Zoonoses are a reality that dates back centuries which is depicted in a popular nursery rhyme.

“Ring around a rosy, a pocket full of

posey, ashes, ashes, we all fall down.” This was written in the Middle Ages which helped children face their fear about contracting the plague. The rhyme describes the plague’s symptoms: (ring of rosy), purported cures (pocket full of posey), and its consequences – death (all fall down).

Workers in the wilderness where contact with wildlife is present may be exposed to disease which on occasion may be fatal. The number of zoonoses contracted to humans is vast but the following are the most common.

Rabies

Rabies is a disease caused by a virus that can affect the nervous system (brain

and spinal cord) of any kind of mammal, including humans.

Animals that are infected with rabies can spread the disease through their saliva or brain matter. People may be exposed to rabies when bitten by an infected wild or domestic animal. Rabies occurs in areas throughout Canada. Between 1925 and 1985, 22 people died of rabies in Canada. Since 1985, no cases were reported until September 2000, when a 9-year-old boy died of rabies in Quebec after a bat exposure. Because of widespread animal vaccination programs, people in Canada rarely get rabies; rabies is more common in developing nations.

In Canada, the rabies virus is found almost exclusively in wildlife. Bats, raccoons, skunks, foxes, and coyotes are



the most common hosts of rabies. The striped skunk is the major carrier for rabies in central Canada and the U.S and foxes (Arctic, Red and Grey) have spread the disease throughout Canada. The animals most likely to be affected can vary by region, although bats are becoming a primary source of infection among humans in many areas of Canada. Report all animal bites, especially those from wildlife, to the medical officer of health and the nearest Canadian Food Inspection Agency veterinarian, and they can tell you which species pose a threat for rabies in your area. This will help determine the need for preventive treatment.

In extremely rare situations, a person can get rabies without being bitten by a rabid animal. Humans have acquired rabies without being bitten (non-bite exposure) by:

- Exposure to rabid animal saliva or brain matter that comes in contact with open wounds, scratches, or mucous membranes, such as an eye or open mouth.
- Breathing airborne virus, which may occur very rarely in places where the virus exists in high quantities, such as a cave filled with bats.

Your risk for developing rabies depends on how you were bitten. If the bite went directly into your skin, your risk is higher than if you were bitten through your clothing. A bite on your face puts you at higher risk than if you were bitten on the

arms or legs. Your risk also increases if you were bitten more than once.

Signs of rabies in animals may include having excessive saliva or sometimes foaming at the mouth, paralysis or no fear of humans in a wild animal.

Initial symptoms of rabies in humans include a tingling sensation and pain around the bite and weakness or trembling developing in the affected limb. Patients progress into a hyperactive phase with a great sensitivity to visual, auditory or tactile stimuli (sense of touch). Once a rabies infection has progressed to the point where symptoms appear, it is almost always fatal to humans (only two people in recorded history have survived symptomatic rabies).

Once rabies symptoms appear the disease progresses rapidly, and there is no cure. If medical treatment to prevent rabies is provided before symptoms develop, the virus almost always is eliminated before it can cause serious damage. Workers who have come into contact with saliva, body fluids, or tissue of animals suspected of having rabies must take the following steps without delay.

Immediately clean and flush the wound to full depth with water for several minutes. This will help wash out the virus. If available, use soap or detergent to help kill the virus. Washing the wound is the most effective procedure in the prevention of rabies. While this is being done, shield the eyes, nose, and mouth from spray from the wound. After cleaning the wound and removing all traces of soap, apply an

antiseptic. Remove any clothing that may be contaminated, place it in a plastic bag properly labeled and wash it promptly and separately from other clothing.

People who have had contact with the rabies virus require both a rabies immune globulin and the rabies vaccine as soon as possible.

Immunization may be considered after contact in the following situations:

- the animal appeared to have rabies
- the animal may possibly have had rabies
- the animal was wild, from a region where rabies is known to be a problem

Immunization is usually recommended if the animal makes contact by biting, or if the animal's saliva, body fluid or tissue makes contact with a rash, scratch, open wound, eyes, nose, or mouth.

Visit a health professional to see if additional care is needed. A doctor and local medical officer of health can help determine the risk of exposure to rabies. Rabies vaccinations will be administered promptly if the risk of exposure to the virus is high.

West Nile Virus

West Nile virus (WNV) causes an infection that can lead to inflammation of the brain (encephalitis). In a few cases the infection can be fatal. WNV is spread by mosquitoes. Birds are a reservoir for WNV, meaning that the virus multiplies in them. Certain species of mosquitoes become infected when they bite infected birds. These mosquitoes then may spread the virus to humans and animals, such as horses and dogs. However, the virus cannot be spread by these animals to other animals or people, or from person to person.

Anyone exposed to mosquitoes can become infected. However, adults are more likely than children to be bitten by mosquitoes, and men are bitten more often than women.

In Canada, WNV was first discovered in 2001 in birds and mosquitoes in Ontario. By the end of 2003, confirmed human infections by the virus had occurred in Ontario, Quebec, Alberta, Manitoba, and Saskatchewan. The majority of human cases of the virus have been reported in Alberta and Ontario. Confirmed human infections have also been reported in British Columbia, Nova Scotia, New Brunswick,

and Yukon Territory, but these cases are thought likely to be due to infections picked up while traveling outside the province or territory.

Most WNV infections cause either no symptoms or symptoms that are so mild people do not realize they have been infected. When symptoms do appear, they develop a few days to a couple of weeks after infection and include fever, headache, and body aches, occasionally with skin rash and swollen lymph nodes.

On rare occasions, the infection affects the brain or spinal cord, causing encephalitis or paralysis. Encephalitis symptoms may include headache, high fever, stiff neck, reduced attention to surroundings, disorientation, tremors, convulsions, muscle weakness or paralysis, and coma.

People usually recover fully from WNV infection, but permanent problems may develop in those who have encephalitis, especially children and older people. They may have seizures, memory loss, personality changes, or brain damage.

Treatment for severe WNV infection involves supportive care in a hospital to help the body fight the illness on its own. Supportive care is often used when no specific treatment exists for an illness.

Workers can reduce their risk of WNV infection by using insect repellent when going outdoors in the summer and early fall. Wear long-sleeved shirts and long pants if you know you will be in areas with lots of mosquitoes. You also can reduce mosquito breeding grounds. Do not keep open containers of water near your worksite. Standing water is a breeding site for mosquitoes.

Hantavirus Pulmonary Syndrome (HPS)

Hantavirus pulmonary syndrome (HPS) is a potentially deadly respiratory illness caused by certain types of Hantaviruses, which are viruses found in the saliva, urine, and droppings of some rodents.

While Hantaviruses are found worldwide, the first outbreak in the United States was identified in 1993 and in Canada in 1994. Later research identified cases occurring in Canada as early as 1989. Most cases of HPS in Canada have been reported in the western provinces, primarily Alberta, British Columbia, Saskatchewan, and Manitoba. In the United States, most HPS cases have been reported in the

southwestern region, in the “four corners” states of New Mexico, Arizona, Colorado, and Utah. However, 31 states have reported cases of the infection.

HPS tends to occur in desert areas in seasons of above-average rainfall. Although HPS can develop throughout the year, most cases have occurred in the spring and summer.

In Canada and the United States, most cases of HPS are caused by one strain of Hantavirus primarily carried by the deer mouse. People can become infected by:

- Breathing in tiny airborne particles formed when rodents urinate.
- Coming into direct contact with infected rodent urine, saliva, or droppings.
- Being exposed to dust particles contaminated with the virus.

No cases of person-to-person spread have been reported in Canada or the U.S. HPS has not been spread to people from farm animals, pets, or insects. However, a pet may bring an infected rodent into contact with you.

HPS causes people who are generally healthy to suddenly become very sick. About 2 weeks (possibly a range of 1 to 5 weeks) after being infected with the virus, the person develops a fever and muscle aches. Other symptoms of HPS may include headache, chills, nausea and vomiting, abdominal pain, and shortness of breath.

Within a few days, these symptoms may become worse and may be accompanied by coughing and severe shortness of breath. Breathing becomes rapid and more difficult as the lungs fill with fluid (pulmonary edema). After people become short of breath, they may die within hours. Most deaths caused by HPS occur within 1 to 2 days of when severe shortness of breath first began.

During the initial outbreak of the virus in 1993, about 70% of people who developed HPS died. Today, the death rate has fallen to 40%, perhaps because of improved treatment with fluids and other supportive care early in the course of the illness.

In order to be accurately diagnosed with HPS, tests must show that the virus is or has been in your blood or tissues along with having symptoms of the condition. Once symptoms of HPS develop, immediate

intensive treatment is needed. Treatment is mainly supportive; including using assisted mechanical breathing (mechanical ventilation) and maintaining fluid and electrolyte balance and blood pressure.

Since human infection occurs through inhalation of contaminated material, clean-up procedures must be performed in a way that limits the amount of airborne dust. Workers involved in the clean-up should wear rubber gloves, rubber boots and respiratory protective equipment that are equipped with a high-efficiency particulate air (HEPA) filter. Workers involved with general clean-up activities where there are not heavy accumulations of droppings should use a disposable HEPA mask.

Dead mice, nests and droppings should be soaked thoroughly with a 1:10 solution of sodium hypochlorite (household bleach). The contaminated material should be placed in a plastic bag and disposed of by burning or burying. Gloves and other equipment used in the cleaning process should be disposed of in the same manner as other contaminated material. Thoroughly wash hands with soap and water after removing the gloves.

The best way to prevent infection with Hantaviruses is to avoid contact with rodents and their droppings. If it is believed the worksite may have a rodent infestation, set metal traps to catch rodents and close all possible rodent entries. Clear possible rodent bedding sites from around the worksite, and keep garbage in tightly covered containers. Use extreme caution when cleaning rodent-infested areas. If you have an area that is heavily infested with rodents, call a professional exterminator to remove them.

Lyme Disease

Lyme disease (Lyme borreliosis) is caused by a bacterial infection that is spread by ticks. Most often these bacteria cause a mild illness that is sometimes accompanied by a peculiar skin rash. In some cases, however, the bacteria can spread to the joints, heart, and brain and cause serious problems. Lyme disease is an occupational concern for people who work outdoors in certain areas infested with ticks. It affects people differently most often going unnoticed but sometimes it causes serious problems. If left untreated, it can cause disability.

Lyme disease is caused by the bacteria

Borrelia burgdorferi. When ticks are infected with these bacteria, they can transmit it by biting humans or animals. Once infected with these bacteria, you may develop Lyme disease in a few days or weeks.

The risk of Lyme disease is highest during the spring, summer, and early fall months (May through August), when young (nymph stage) ticks are most active and people spend more time outdoors.

In different parts of Canada and the United States, three types of ticks carry the bacteria that can cause Lyme disease:

- Deer ticks spread Lyme disease in the northeastern and upper Midwestern United States. Small populations of infected ticks are known to occur in southern Ontario and Quebec. Individual Lyme-infected ticks from a number of deer tick species have been found in Prince Edward Island, New Brunswick, Nova Scotia, Quebec, Ontario, and Manitoba.
- Western black-legged ticks spread the disease on the Pacific coast. Populations of infected ticks are also found in limited areas in southern British Columbia, but individual Lyme-infected ticks have been found in other areas of BC.
- Rabbit ticks infected with Lyme bacteria have been found in Alberta.

In the nymph stage, a tick is about the size of a pinhead and its bite is usually painless. Lyme disease is usually spread by ticks in this early stage of development. Once engorged with blood the tick is somewhat larger and more visible. Adult ticks are also larger and can transmit the disease, but since they are larger and more likely to be seen and removed from the body within a few hours, they are less likely than nymphs to have enough time to transmit the infection. The chances of developing Lyme disease increase if the tick remains on the body for more than 24 hours.

Lyme disease may progress in stages from mild symptoms to serious long-term disabilities if left untreated. The stages and symptoms of Lyme disease are as follows.

From 1 to 4 weeks after being infected with the bacteria that cause Lyme disease, up to 90% of people develop an expanding, circular red skin rash. While most people develop a red rash that may spread out

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in the shape of a circle, about 40% will develop what is called a “bull’s-eye” EM rash, with a pale centre area surrounded by a bright red rim.

For people who work in areas where Lyme disease most often occurs (in Canada in southern Ontario and Quebec and in southern British Columbia), the circular EM rash is usually a sure sign of Lyme disease, especially when it appears during the summer months.

The rash is accompanied by flu-like symptoms in up to 50% of people who have Lyme disease. The flu-like symptoms can include:

- Fatigue (the most common symptom).
- Headache and stiff neck.
- Fever and chills.
- Muscle and joint pain.
- Swollen lymph nodes.

As many as 25% have only flu-like symptoms (no rash) or have no symptoms at all.

If Lyme disease is not detected and treated

while early symptoms are present, or if a person does not have early symptoms that trigger the need for treatment, the infection can spread to the skin, joints, nervous system, and heart. Heart and nervous system problems may develop weeks to months after the initial infection.

If Lyme disease is diagnosed early, antibiotic treatment usually gets rid of the infection quickly and completely so that no further complications develop. If Lyme disease goes undetected or is not properly treated, problems involving the skin, joints, nervous system, and heart may develop weeks, months, or even years later. These problems usually improve after antibiotic treatment, but in rare cases the disease may cause permanent damage. Recent studies show that most people with Lyme disease who are diagnosed early and treated appropriately with antibiotics have no long-term disabilities resulting from the disease.

The best way to prevent Lyme disease is to avoid areas where ticks are prevalent. If you do notice a tick on your body, remove

it promptly to reduce the risk of Lyme disease.

A Lyme disease vaccination was available for people in high-risk areas; however, that vaccine was removed from the market in Canada and the U.S. in 2002 due to uncertainty over its effectiveness and lack of demand. The vaccination was used for prevention of Lyme disease and not treatment of existing Lyme disease.

One recent study indicates if you receive a single dose of the antibiotic doxycycline within 72 hours after being bitten by an infected tick in a high-risk area, your chance of developing Lyme disease may be reduced by up to 87%. However, doxycycline can cause side effects, including nausea, in up to 30% of people given this medication.

Doctors also recommend infected people be treated regardless of symptoms because a small number of people who are not treated develop a chronic infection. **S**

Species at Risk

Swift Fox
(*Vulpes velox*)

ENDANGERED



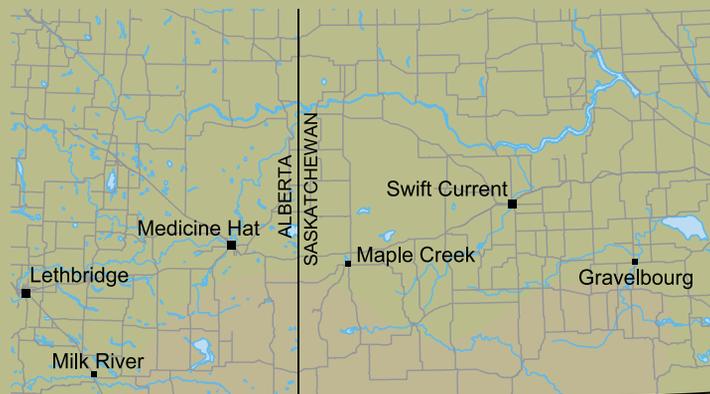
© Photo: Lu Carbyn

Height at shoulder: 30-32 cm
(12-13 inches); Length (including tail):
77-80 cm (30-32 inches)

Swift Foxes are about the same size as jack rabbits or large house cats. Their small size and black-tipped tail distinguish them from Red Foxes. Their dens are usually on hills near water bodies, and they roam the open prairie in search of grasshoppers, small mammals and dead animals.

Did you know?

- Named for their remarkable speed, this slender member of the dog family can run faster than 60 km/hr.
- Once completely extinct from Canada, they are making a come-back thanks to a successful re-introduction program and on-going support from landowners.



SAR Courtesy of Environment Canada