



Using a Large-Scale Electric Fence to Prevent Conflict at Liard River Hot Springs

INTRODUCTION

Despite the continued use of electric fencing as a successful bear attractant management solution, many people continue to be skeptical of implementing them, especially at large publicly managed sites like campgrounds. Even for those that believe in the underlying technology and understand bear behaviour, questions remain about the practicality of electric fencing as a solution to some of North America's most persistent conflict sites.

In 2021, Margo Supplies constructed a multi-species electric exclusion fence around the entirety of the Liard River Hot Springs campground and day-use area in northeastern British Columbia. Located at a remote section of the famous Alaska Highway, these hot springs are the second largest natural hot springs and one of the few attractions for hundreds of miles on a major summer tourist route.



An arial and eye-level view of Liard River Hot Springs.

HISTORY OF CONFLICT

Although the source of the springs is natural, the pools were built during the construction of the Alaska Highway during World War II. The location is an extremely remote section of the road and is surrounded by undisturbed wilderness. The geothermal supported microclimate is vibrant and the valley is extremely productive for black bears and other wildlife. Bears have even been observed to soak in the hotpools themselves.

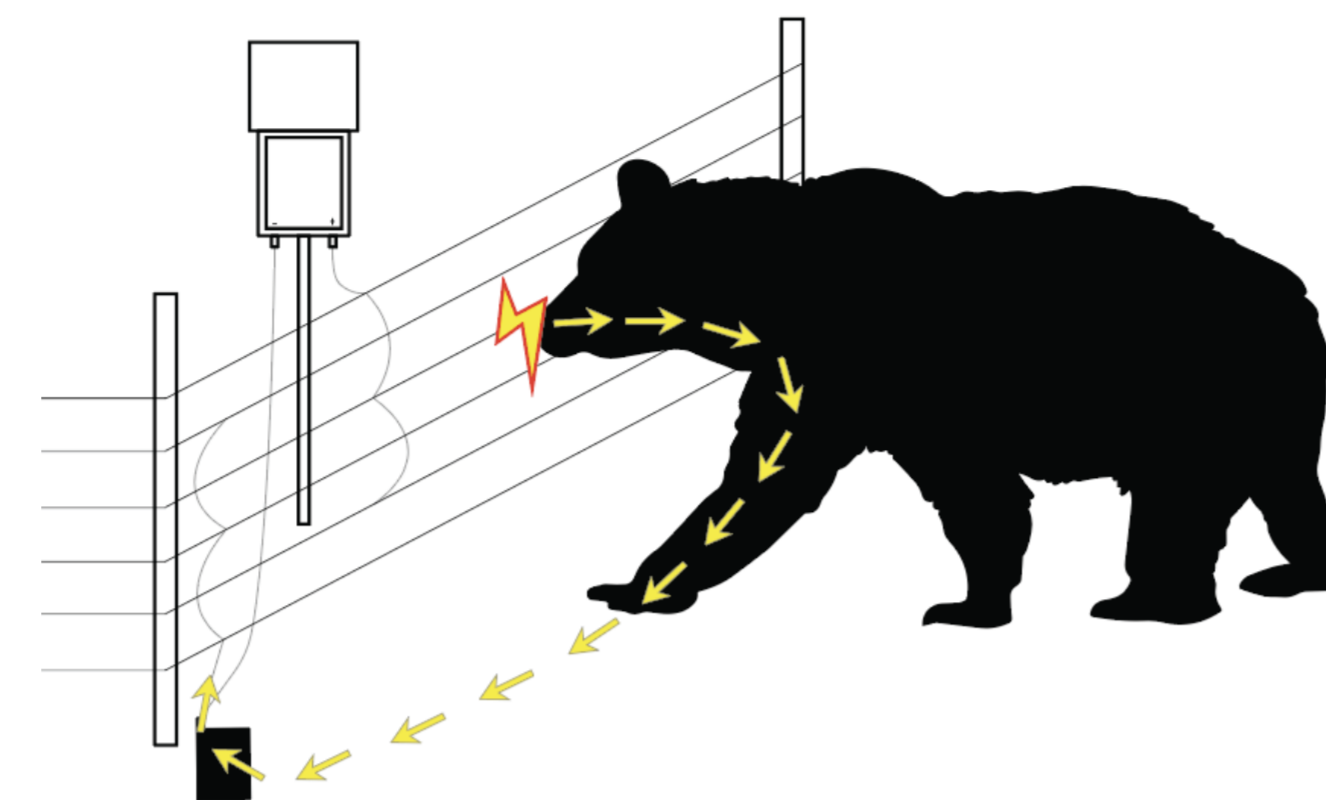
The hotpools are the second largest in Canada are the only major attraction for hundreds of miles so many travelers on the Alaska Highway stop for a soak or to camp. The combination of concentrated bear population and non-natural attractants made this a heavy conflict zone.

Unfortunately, this deadly combination resulted in two human fatalities in 1997. Partially as a result of this history, lethal control was often used as the primary mitigation strategy for human-bear conflict.



News coverage with dated terminology after the 1997 fatal bear conflict in Liard River Hot Springs.

ELECTRIC FENCING 101



Electric fencing works by deploying a shock when the animal makes contact with the wires. The shock is unpleasant for the animal and deters it from attempting to enter the area in the future.

Electric fences can be constructed in a variety of configurations and use multiple materials. If all of the proceeding principles of electric fencing are followed, the fence will successfully prevent bear access:



Voltage
A minimum of 7,000 volts measure at any point in the fence.



Grounding
Always use purpose built electrical ground material.



Tight Wires
Must have enough tension to separate the hair of an animal and deliver a shock to the hide.



Wire Spacing
Wires must be spaced so animals cannot go through, under, or over the fence.

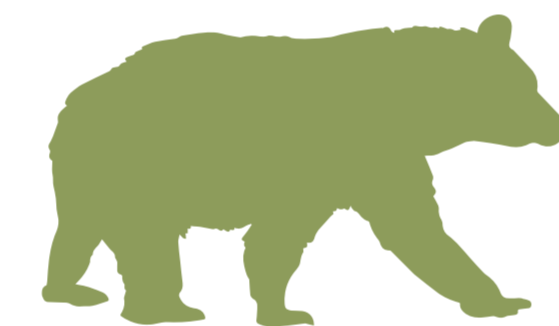


No Obvious Weaknesses
Bears are intelligent and opportunistic and will exploit any weaknesses such as dig or climb spots.

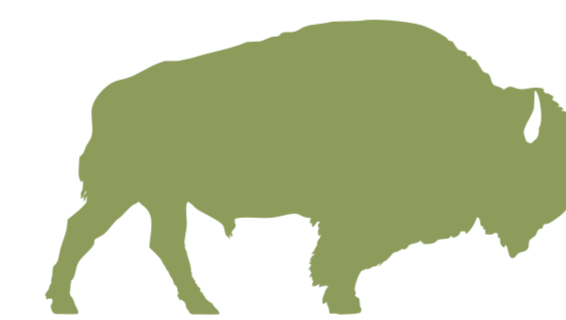


Maintenance and monitoring
Fence line should be constructed away from brush and regularly checked.

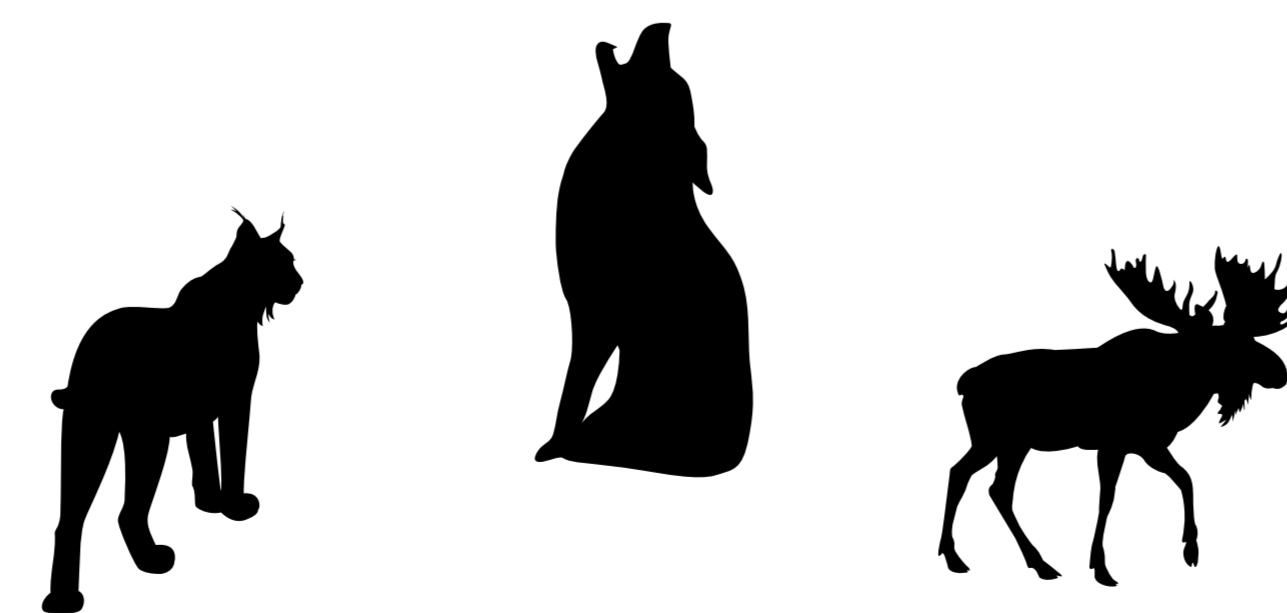
SPECIES



The valley around the spring is particularly productive for black bears. Campers create an abundance of bear attractants and bears were anticipated to be highly motivated to access fenced areas. Bears do not generally jump over fences but are extremely capable climbers and diggers. Careful design standards needed to be incorporated to ensure no fenceline weaknesses could be exploited.



Bison posed a unique challenge. The cleared grass areas in the campground is a valuable food source and the local population was assessed to be extremely motivated to access fenced areas. Bison are large and powerful animals that are known to both jump over and even physically break through fences. The fence required 8 foot height and to be made of strong material that would not easily give way.



Secondary species of concern included grizzly bears, lynx, moose, coyote, and wolves. Small predators can exploit weaknesses and bears will often follow and expand these access points. The majority of the fence features non-electrified game wire to prevent access of smaller animals

HUMAN ELEMENTS

VISITORS

When attempting to solve for potential human-bear conflicts, the human element cannot be understated. An effective solution must be safe and easily understandable for the average park visitors including non-english speaking park visitors. Adequate signage is present at any points where the public comes into contact with the fence to mitigate the potential for them to unintentionally harm themselves. Gates use self-closures so there is no reliance on visitors to secure the premises.

SEASONAL WORKERS

Seasonal workers create a unique hurdle for electric fencing projects because they need to have a baseline knowledge of how the fences work and the maintenance they require to be effective. We supplied the a detailed site map indicating the fencing perimeter, energizer and gate locations as well as an explanation of how to check the charge of the fence in each area. By educating staff and addressing this issue early on, we can reduce the possibility of user error resulting in ineffective conflict mitigation.



Perimeter fencing at Liard River Hot Springs (top)
Pedestrian and vehicle entrance (bottom)

CONSTRUCTION



This site featured challenges beyond most electric fencing projects and was one of the most involved electric fence construction projects completed. A small specialist team was able to solve these issues – proving that electric fencing is a practical solution at even the most challenging sites.

SITE SIZE: The total fence line was surveyed at 1,600m. This is a moderately large electric fence in total distance. Adding substantial grounding and breaking the fence into two separately energized sections ensured an effective shock would be delivered at any spot on the fence.

FENCE LINE SELECTION: The fence was constructed around the perimeter of the park facilities, camping and day-use areas, with all visitor parking contained within the fence. As the campground was already constructed, there was little room between the camping pads and wetland area which was Department of Fisheries designated critical habitat for endemic snails. Precision surveying, fence line preparation, and 31 direction changes along the fence line allowed construction within these constraints.

FENCE LINE PREPARATION: Much of the fence line was located in heavily forested area. It is important that a fence line is prepared both for construction as well as for ongoing monitoring. Wildlife should have a chance to clearly see a fence through a cleared area rather than bumping into a fence in the midst of heavy forest. We used an industrial mulcher to clear the right-of-way, which also helps in suppressing vegetative re-growth. As the area has had indigenous use an archeologist supervised construction and identified a number of culturally modified trees.

VEHICLE ACCESS: A fence must simultaneously exclude animals while allowing easy human access. The requirement for easy and frequent vehicle access demanded a more user-friendly solution than a simply gate. A custom designed electrified wildlife guard (similar to a cattle-guard) was designed and installed to allow un-restricted vehicle access while excluding animals.

VISUAL IMPACT ON PARK GUESTS: Electric fencing can be intimidating for anyone who is not experienced with dealing with them. The fence was designed to remain visually appealing while also including necessary signage to ensure proper use of the fencing system. The fencing around the picnic site was made out of wood rail material with electric fence outrigging to maintain park aesthetics in the most visible areas of the fenceline.