

Protecting Your Camp from Bears: Electric Fencing

Tom S. Smith, Ph.D.
Research Ecologist - Bears
USGS – Alaska Science Center



Bears should prevent no one from being out in the wilderness. What concerns some most, however, is camping. No one wants to be sound asleep in a tent when a curious bear pokes around camp. Nor is there any reason for bears to be able to approach your camp at night. Electric fencing, now lighter and more economical than ever, can dissuade curious bears from approaching your camp, thus allowing you to sleep safely... and soundly.

But does everyone using the backcountry need a fence? I recommend that electric fencing be used primarily for the following situations: 1) long-term field camps (such as used by state and federal agencies to conduct management and research functions), 2) for hunting camps where game meat and trophies (e.g., hides, horns, etc.) may be stored, 3) in locations where bear numbers are known to be high, and 4) where problem bears have been known to frequent. One might also justify fencing if its deployment is the only way persons fearful of camping in bear country will go. The bottom line is that the use of electric fencing is up to the user but no bear experts will suggest it should be used by everyone.

Sometimes people openly ask "are you that afraid of bears that you need a fence?" I turn the question around, however, and ask "are you willing to allow a bear to determine when your trip is over? Because, that is precisely what will happen if you camp in some areas where bear numbers are high." Look at it this way as well - when I deploy a field camp with upwards of 6-10 tents, a single, curious bear could destroy \$4,000 to \$5,000 of tents in as little as a half hour should everyone be out conducting research. Bears that destroy tents aren't being aggressive...they're just being...well, bears. They ask questions with their jaws and claws "what's this?" crunch. "what's this" smack. A little Q&A session like that can reduce my field camp to ruin in minutes, putting me out of business. Worse, the bear may get some sort of reward by probing around like that. All around it is bad business to leave gear unattended in bear country. Yet we often have to do it to get our work done. So I use electric fencing which not only protects my gear but also teaches bears (when they put their nose to the fence) that this place is to be avoided... "Don't come near camps!" is the message powerfully conveyed when a bear gets 5 kilovolts across its nose. As bear trainer Doug Seuss once said "you don't have to teach a bear something twice." In this regard, as long as there are going to be camps in bear country, we need to take a pro-active stance in preventing camp destruction and by training bears to avoid them.

For years the term "electric fence" was synonymous with images of 40-pound chargers, snarls of steel wire, heavy poles, car batteries and heavy steel grounding rods. But recent technological advances have resulted in lightweight, economical, electric fence systems that one should seriously consider purchasing and using. Recently, I camped in an area with a lot of bears.... they were everywhere. Before turning in for the night I counted 35 brown bears in a meadow near camp. It wasn't a matter of if, but when a bear would come poking around camp. Deploying an electric fence around my tent took about 20 minutes. The weight of the entire system (poles, wire, charger, and grounding rods) was less than 10 pounds. No, I didn't backpack it into the wilderness.... I'd come by floatplane. I didn't worry about curious bears destroying my \$600 tent or other gear while I was out and about, and I enjoyed 10 uneventful nights of restful sleep. I am continually amazed at the



number of cabins, camps, boat and watercraft that are needlessly destroyed by bears each year. Nothing is 100% effective but so far in the past ten years I've camped amongst the densest grizzly populations in the world, I've not had a single bear breach the fence. Not that they haven't tried. A couple years ago 5 bears - and one wolf - were deterred by the camp's electric fence during a single 2-week outing. I also used a perimeter alarm system in conjunction with the fence (the alarm is a separate system and I won't discuss it here), so when the alarm went off I knew that a bear had been trying to push through the fence. In a word: electric fences work.

There are many ways to set up electric fences, but for most short-term field camp operations an easily deployed, lightweight fence will be adequate. Let's explore a few basic principles about electric fences.



How do electric fences work?

Electric fences are comprised of three basic components:

- Wires suspended on poles carry an electric charge. This is the "hot," aboveground part of the system.



- An energizer (also known as a charger) pushes power through the fence wire. For safety, most systems deliver power in a series of pulses, usually about one per second. The downtime between pulses allows animals to break free of the fence (a continuous current can cause an animal to "lock on" to the fence due to sustained, involuntary muscular contractions).
- A grounding system, usually a metal rod sunk into the earth and connected to the energizer via a wire. The ground system attracts the charge through the animal and returns the current to the energizer through the ground wire.

Since electricity will only travel through a closed circuit, the fence wire, energizer and ground rod are three parts of a circuit waiting to be closed; when a bear touches the wire, it closes the circuit, and electrical current flows through the bear. Consequently, the bear will feel a shock, really rather a sharp jolt of electricity, which strongly discourages him from touching the fence again. Most bears I've witnessed getting shocked cannot put enough distance between themselves and the fence fast enough. The strength of the shock depends on the energizer's voltage and amperage:

- Voltage, measured in volts (V) or kilovolts (kV), is the force or pressure with which a current flows through the circuit. The higher the voltage, the farther the current can travel through the wire before resistance slows it down; higher voltage also causes a stronger "zap" from the shock.
- Amperage (amps) measures the magnitude, or strength, of the current flowing through the wire. The higher the amperage, the greater the sensation the current will cause when it enters a body.

Consequently, fence chargers are high voltage and extremely low amperage. Although bears are the intended targets of electric fences, anything else that comes in contact with both fence and ground will also complete the circuit. Blades of grass and tree branches will allow a small amount of power to travel from the fence to the ground rod and you should make an effort to keep the fence clear of these power-sappers. A bear may still get a jolt from a fence with some grass leaning up against it but too many grasses can literally short the fence out, rendering it useless. When I set up a camp with boat or plane access I toss a pair of grass clippers in just for the purpose of clearing the fence line.

Do electric fences pose a threat to bears or people?

The current (amperage) flowing through a fence is miniscule and will not injure you or bears. The voltage, however, is high (5-7 kV) and can knock you down due to the involuntary contraction of your muscles from the jolt of electricity. For safety considerations, chargers (or energizers as they are also called) send the charge in pulses, usually one per second. This allows the bear to break free of the fence. The sting a bear, or person, feels when they touch an electric fence isn't particularly painful but it is unpleasant to the point that it deters future investigation.

How effective are electric fences for deterring curious bears?

Remember, most bears that approach your camp or gear are curious, but alert, as they approach. Once the bear gets jolted it will usually huff, bawl and run quickly away. Over the past decade I have tested many fences in many settings - all of them thick with bears - and have never had an electric fence fail to keep bears out.

How sturdy does the fence have to be?

My experience has shown that you don't need to build a concentration camp-style enclosure. Whether you have 10 wires supported by wooden posts or 2 wires on thin fiberglass wands, the shock is the same strength and it is the shock that deters the bear, not the fence's appearance. I believe that misunderstandings regarding the need for elaborate and stoutly constructed fences have arisen from the fact that there is a big difference between trying to keep livestock in an enclosure and in keeping a bear out. To the best of my knowledge bears cannot jump like a quarter horse (or at least they don't, thank heavens) and so the fence need not be very high. Also, once a bear gets zapped they don't loiter around. The key, then, is to present a charged wire in such a way that a curious bear will nudge it with his nose. The resultant "zap!" on his nose will convince him that there are many other things he'd rather be doing ... elsewhere... right now. Therefore, 2 wires have worked well for me. When using 2 wires I string one about a foot high and the other 3 feet high. I flag the top wire with a small piece of fluorescent flagging midway between poles to encourage the curious bear to nose it, perhaps even bite it, and that takes care of his curiosity. Flagging also keeps bears from walking into an otherwise invisible wire which the bear can easily break.

Any other advice regarding fences?

- I would check the fence at least once daily to make sure it is working. I carry a fence tester made for electric fences.
- Place the charger inside the enclosure. Bears notice novel objects and if it is outside of the fence it may get munched.
- Use common sense in bear country. Don't camp along high use areas - even if you have a fence. Give bears a chance.
- Do not do what some have suggested in the past: bait the fence by hanging sardines or some other attractant. Why would anyone ever want to draw a bear to their camp? Many bears I've watched walk right past our camp seemingly paid no attention to it at all. However, had I had some attractant (other than the small piece of flagging) they may have come up and gotten shocked. Why do that? It puzzles me.