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BLACK BEARS

Fig. 1. Black bear, *Ursus americanus*



Damage Prevention and Control Methods

Exclusion

Use heavy woven-wire or electric fences to exclude bears from apiaries, cabins, landfills, and other high-value properties.

Store food in bear-proof structures or containers, or on elevated platforms.

Cultural Methods

Use proper sanitation and solid-waste management techniques.

Remove brush and cover around farmsteads, corrals, and residences.

Confine livestock and remove carcasses.

Locate camp sites and hiking trails in areas of low bear activity.

Frightening

Install night lights and human effigies.

Blaring music, pyrotechnics, and guarding dogs may provide temporary relief from damage.

Repellents

Capsaicin spray.

Toxicants

None are registered.

Fumigants

None are registered.

Trapping

Culvert and barrel live traps.

Foot snares.

Shooting

Baiting and predator calling—bears lured within range can be shot with firearms of .30 caliber or larger.

Tracking with dogs.

Avoiding Human-Bear Conflicts

Be familiar with several safety precautions when camping or traveling in bear country. In general, never feed black bears and avoid close encounters with them.

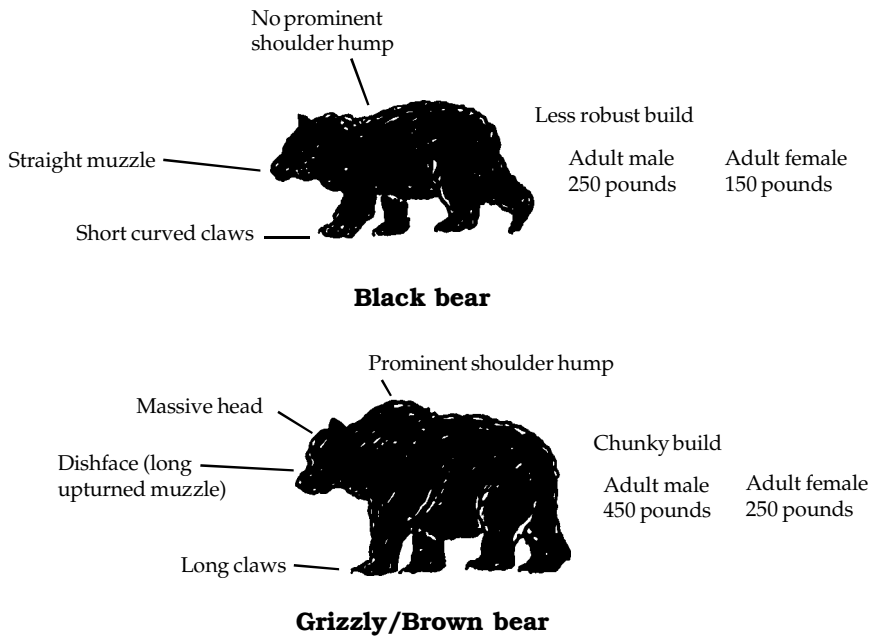


PREVENTION AND CONTROL OF WILDLIFE DAMAGE — 1994

Cooperative Extension Division
Institute of Agriculture and Natural Resources
University of Nebraska - Lincoln

United States Department of Agriculture
Animal and Plant Health Inspection Service
Animal Damage Control

Great Plains Agricultural Council
Wildlife Committee



Habitat

Black bears frequent heavily forested areas, including large swamps and mountainous regions. Mixed hardwood forests interspersed with streams and swamps are typical habitats. Highest growth rates are achieved in eastern deciduous forests where there is an abundance and variety of foods. Black bears depend on forests for their seasonal and yearly requirements of food, water, cover, and space.

Food Habits

Black bears are omnivorous, foraging on a wide variety of plants and animals. Their diet is typically determined by the seasonal availability of food. Typical foods include grasses, berries, nuts, tubers, wood fiber, insects, small mammals, eggs, carrion, and garbage. Food shortages occur occasionally in northern bear ranges when summer and fall mast crops (berries and nuts) fail. During such years, bears become bolder and travel more widely in their search for food. Human encounters with bears are more frequent during such years, as are complaints of crop damage and livestock losses.

Fig. 2. Characteristics of black bears and grizzly/brown bears.

Identification

The black bear (*Ursus americanus*, Fig. 1) is the smallest and most widely distributed of the North American bears. Adults typically weigh 100 to 400 pounds (45 to 182 kg) and measure from 4 to 6 feet (120 to 180 cm) long. Some adult males attain weights of over 600 pounds (270 kg). They are massive and strongly built animals. Black bears east of the Mississippi are predominantly black, but in the Rocky Mountains and westward various shades of brown, cinnamon, and even blond are common. The head is moderately sized with a straight profile and tapering nose. The ears are relatively small, rounded, and erect. The tail is short (3 to 6 inches [8 to 15 cm]) and inconspicuous. Each foot has five curved claws about 1 inch (2.5 cm) long that are non-retractable. Bears walk with a shuffling gait, but can be quite agile and quick when necessary. For short distances, they can run up to 35 miles per hour (56 km/hr). They are quite adept at climbing trees and are good swimmers.

It is important to be able to distinguish between black bears and grizzly/brown bears (*Ursus arctos*). The grizzly/brown bear is typically much larger than the black bear, ranging from 400 to 1,300 pounds (180 to 585 kg). Its guard hairs have whitish or silvery tips, giving it a frosted or "grizzly" appearance. Grizzly/brown bears have a pronounced hump over the shoulder; a shortened, often dished face; relatively small ears; and long claws (Fig. 2).

Range

Black bears historically ranged throughout most of North America except for the desert southwest and the treeless barrens of northern Canada. They still occupy much of their original range with the exception of the Great Plains, the midwestern states, and parts of the eastern and southern coastal states (Fig. 3). Black bear and grizzly/brown bear distributions overlap in the Rocky Mountains, Western Canada, and Alaska.



Fig. 3. Range of the black bear in North America.

General Biology, Reproduction, and Behavior

Black bears typically are nocturnal, although occasionally they are active during the day. In the South, black bears tend to be active year-round; but in northern areas, black bears undergo a period of semihibernation during winter. Bears spend this period of dormancy in dens, such as hollow logs, windfalls, brush piles, caves, and holes dug into the ground. Bears in northern areas may remain in their dens for 5 to 7 months, foregoing food, water, and elimination. Most cubs are born between late December and early February, while the female is still denning.

Black bears breed during the summer months, usually in late June or early July. Males travel extensively in search of receptive females. Both sexes are promiscuous. Fighting occurs between rival males as well as between males and unreceptive females. Dominant females may suppress the breeding activities of subordinate females. After mating, the fertilized egg does not implant immediately, but remains unattached in the uterus until fall. Females in good condition will usually produce 2 or 3 cubs that weigh 7 to 12 ounces (198 to 340 g) at birth.

After giving birth, the sow may continue her winter sleep while the cubs are awake and nursing. Lactating females do not come into estrus, so females generally breed only every other year. Parental care is solely the female's responsibility. Males will kill and eat cubs if they have the opportunity. Cubs are weaned in late summer but usually remain close to the female throughout their first year. This social unit breaks up when the female comes into her next estrus. After the breeding season, the female and her yearlings may travel together for a few weeks. Black bears become sexually mature at approximately 3 1/2 years of age, but some females may not breed until their fourth year or later.

In North America, black bear densities range from 0.3 to 3.4 bears per square mile (0.1 to 1.3 bears/km²). Densities

are highest in the Pacific Northwest because of the high diversity of habitats and long foraging season. The home range of black bears is dependent on the type and quality of the habitat and the sex and age of the bear. In mountainous regions, bears encounter a variety of habitats by moving up or down in elevation. Where the terrain is flatter, bears typically range more widely in search of food, water, cover, and space. Most adult females have well-defined home ranges that vary from 6 to 19 square miles (15 to 50 km²). Ranges of adult males are usually several times larger.

Black bears are powerful animals that have few natural enemies. Despite their strength and dominant position, they are remarkably tolerant of humans. Interactions between people and black bears are usually benign. When surprised or protecting cubs, a black bear will threaten the intruder by laying back its ears, uttering a series of huffs, chopping its jaws, and stamping its feet. This may be followed by a charge, but in most instances it is only a bluff, as the bear will advance only a few yards (m) before stopping. There are very few cases where a black bear has charged and attacked a human. Usually people are unaware that bears are even in the vicinity. Most bears will avoid people, except bears that have learned to associate food with people. Food conditioning occurs most often at garbage dumps, campgrounds, and sites where people regularly feed bears. Habituated, food-conditioned bears pose the greatest threat to humans (Herrero 1985, Kolenosky and Strathearn 1987).

Damage and Damage Identification

Damage caused by black bears is quite diverse, ranging from trampling sweet corn fields and tearing up turf to destroying beehives and even (rarely) killing humans. Black bears are noted for nuisance problems such as scavenging in garbage cans, breaking in and demolishing the interiors of cabins, and raiding camper's campsites and food caches. Bears also become a

nuisance when they forage in garbage dumps and landfills.

Black bears are about the only animals, besides skunks, that molest beehives. Evidence of bear damage includes broken and scattered combs and hives showing claw and tooth marks. Hair, tracks, scats, and other sign may be found in the immediate area. A bear will usually use the same path to return every night until all of the brood, comb, and honey are eaten.

Field crops such as corn and oats are also damaged occasionally by hungry black bears. Large, localized areas of broken, smashed stalks show where bears have fed in cornfields. Bears eat the entire cob, whereas raccoons strip the ears from the stalks and chew the kernels from the ears. Black bears prefer corn in the milk stage.

Bears can cause extensive damage to trees, especially in second-growth forests, by feeding on the inner bark or by clawing off the bark to leave territorial markings. Black bears damage orchards by breaking down trees and branches in their attempts to reach fruit. They will often return to an orchard nightly once feeding starts. Due to the perennial nature of orchard damage, losses can be economically significant.

Few black bears learn to kill livestock, but the behavior, once developed, usually persists. The severity of black bear predation makes solving the problem very important to the individuals who suffer the losses. If bears are suspect, look for deep tooth marks (about 1/2 inch [1.3 cm] in diameter) on the neck directly behind the ears. On large animals, look for large claw marks (1/2 inch [1.3 cm] between individual marks) on the shoulders and sides.

Bear predation must be distinguished from coyote or dog attacks. Coyotes typically attack the throat region. Dogs chase their prey, often slashing the hind legs and mutilating the animal. Tooth marks on the back of the neck are not usually found on coyote and dog kills. Claw marks are less prominent on coyote or dog kills, if present at all.

Different types of livestock behave differently when attacked by bears. Sheep tend to bunch up when approached. Often three or more will be killed in a small area. Cattle have a tendency to scatter when a bear approaches. Kills usually consist of single animals. Hogs can evade bears in the open and are more often killed when confined. Horses are rarely killed by bears, but they do get clawed on the sides.

After an animal is killed, black bears will typically open the body cavity and remove the internal organs. The liver and other vital organs are eaten first, followed by the hindquarters. Udders of lactating females are also preferred. When a bear makes a kill, it usually returns to the site at dusk. Bears prefer to feed alone. If an animal is killed in the open, the bear may drag it into the woods or brush and cover the remains with leaves, grass, soil, and forest debris. The bear will periodically return to this cache site to feed on the decomposing carcass.

Black bears occasionally threaten human health and safety. Dr. Stephen Herrero documented 500 injuries to humans resulting from encounters with black bears from 1960 to 1980 (Herrero 1985). Of these, 90% were minor injuries (minor bites, scratches, and bruises). Only 23 fatalities due to black bear attacks were recorded from 1900 to 1980. These are remarkably low numbers, considering the geographic overlap of human and black bear populations. Ninety percent of all incidents were likely associated with habituated, food-conditioned bears.

Legal Status

In the early 1900s, black bears were classified as nuisance or pest species because of agricultural depredations. Times have changed and bear distributions and populations have diminished because of human activity. Many states, such as Colorado, Idaho, Minnesota, Montana, New Mexico, Oregon, Utah, and Wisconsin, manage the black bear as a big game animal. Most other states either consider black bears

as not present or completely protect the species. In most western states, livestock owners and property owners may legally kill bears that are killing livestock, damaging property, or threatening human safety. Several states require a permit before removing a bear when the damage situation is not acute.

In states where complete protection is required, the state wildlife agency or USDA-APHIS-ADC will usually offer prompt service when a problem occurs. The problem bear will be live-trapped and moved, killed, and/or compensation for damage offered. In a life-threatening situation, the bear can be shot, but proof of jeopardy may be required to avoid a citation for illegal killing.

Damage Prevention and Control Methods

Exclusion

Fencing has proven effective in deterring bears from landfills, apiaries, cabins, and other high-value properties. Fencing, however, is a relatively expensive abatement measure. Consider the extent, duration, and expense of damage when developing a prevention program.

Numerous fence designs have been used with varying degrees of success. Electric fence chargers increase effectiveness. Depending on the amount of bear pressure, use an electric polytape portable fence (Fig. 4), or a welded-wire permanent fence (Fig. 5).

Fence Energizing System and Maintenance. To energize the fences, use a 110-volt outlet or 12-volt deep cell (marine) battery connected to a high-output fence charger. Place the fence charger and battery in a case or empty beehive to protect them against weather and theft. Drive a ground rod 5 to 7 feet (1.5 to 2.1 m) into the ground, preferably into moist soil. Connect the ground terminal of the charger to the ground rod with a wire and ground clamp. Connect the positive fence terminal to the fence with a short piece of fence wire. Use connec-

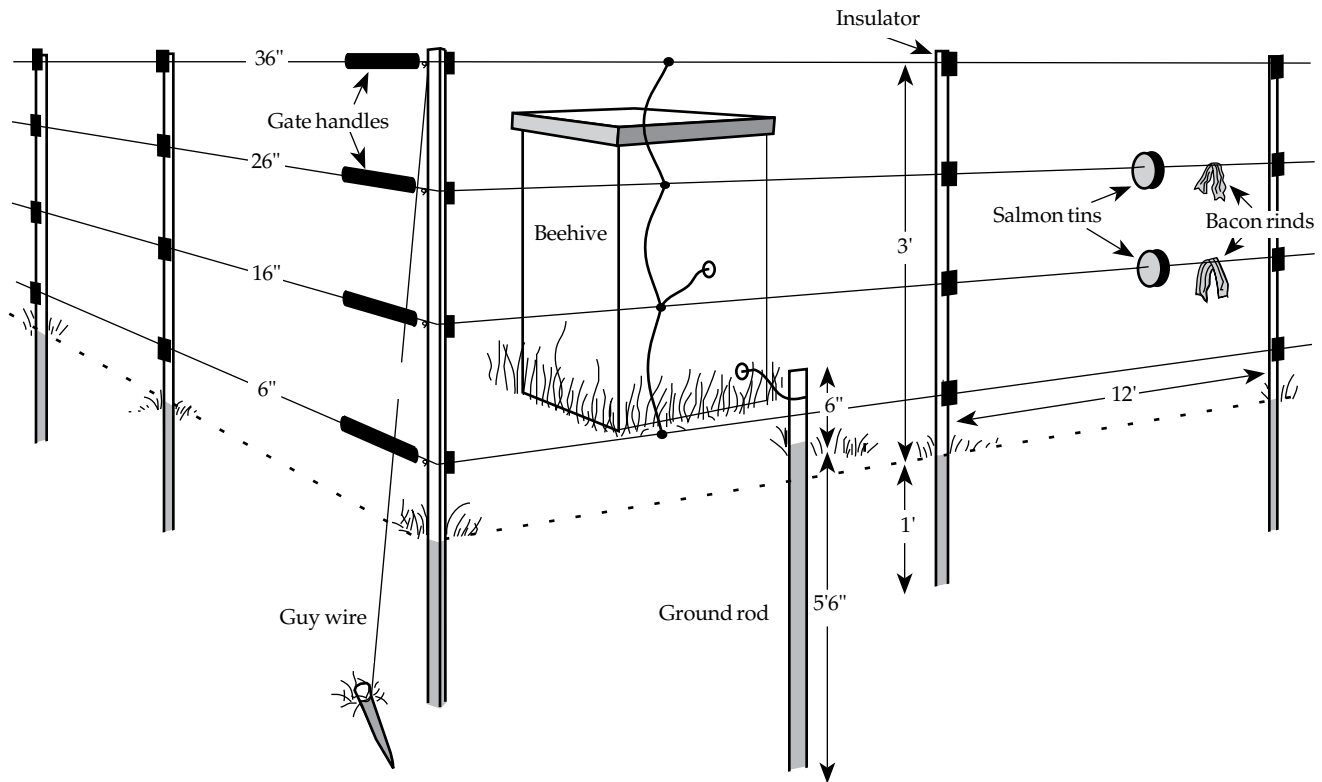
tors to ensure good contact. Electric fences must deliver an effective shock to repel bears. Bears can be lured into licking or sniffing the wire by attaching attractants (salmon or tuna tins and bacon rinds) to the fence. Grounding may be increased, especially in dry, sandy soil, by laying grounded chicken wire around the outside perimeter of the electric fence.

Check the fence voltage each week at a distance from the fence charger; it should yield at least 3,000 volts. To protect against voltage loss, keep the battery and fence charger dry and their connections free of corrosion. Make certain all connections are secure and check for faulty insulators (arcing between wire and post). Also clip vegetation beneath the fence. Each month, check the fence tension and replace baits with new salmon tins and bacon rinds. Always recharge the batteries during the day so that the fence is energized at night.

Black bears are strong enough to tear open doors, rip holes in siding, and break glass windows to gain access to food stored inside cabins, tents, and other structures. Use solid frame construction, 3/4-inch (2-cm) plywood sheathing, and strong, tight-fitting shutters and doors. Steel plating is more impervious than wood.

Bear-proof containers are available for campers in a variety of sizes. They can be used to safely store food and other bear attractants during backpacking trips or other outdoor excursions. In the absence of bear-proof containers, store food in airtight containers and suspend them by rope between two tall trees that are at least 100 yards (100 m) downwind of your campsite.

Food, supplies, and beehives can be stored 15 to 20 feet (4 to 6 m) above ground on elevated platforms or bear poles. Support poles should be at least 6 inches (15 cm) in diameter and wrapped with a 4-foot-wide (1.4-m) piece of galvanized sheet metal, 6 to 7 feet (2 m) above ground. You can also place one or two hives on a flat or low-sloping garage roof. Be sure to add extra roof braces because two hives full of honey can weigh 800 pounds



Electric polytape portable fence. One person can easily and quickly install this fence. It is economical and dependable for low to moderate bear pressures. The fence consists of four strands of electric polytape that are attached to posts with insulators. The cost per fence (33 x 33 feet) is about \$200.

- 1 200-yard roll of polytape
- 12 4-foot fence rods (5/16-inch diameter)
- 48 Insulators or clips
- 4 Gate handles
- 1 12-volt fence charger
- 1 12-volt deep cycle battery
- Herbicides

To install: Drive in four corner posts 1 foot deep and attach a guy wire. Clip vegetation in a 15-inch-wide strip under the fence and apply herbicide. Attach insulators on the inside of corner posts and stretch the electroplastic wire from the four posts at intervals of 6, 16, 26, and 36 inches from ground level. Hand tighten the polytape and join the ends with four square knots. Drive in the remaining posts at 12-foot intervals, attach insulators (on the outside of line posts), and insert polytape.

Fig. 4. Electric polytape portable fence

(360 kg) or more. An innovative technique for beekeepers is to place hives on a fenced (three-strand electric) flatbed trailer (8 feet x 40 feet [2.4 m x 12.2 m]). Though expensive, this method makes hives less vulnerable to bear damage and makes moving them very easy.

Cultural Methods

Prevention is the best method of controlling black bear damage. Sanitation and proper solid waste management are key considerations. Store food, organic wastes, and other bear attractants in bear-proof containers. Use garbage cans for nonfood items only.

Implement regular garbage pickup and practice incineration. Reduce access to landfills through fencing, and bury refuse daily. Eliminate garbage dumps.

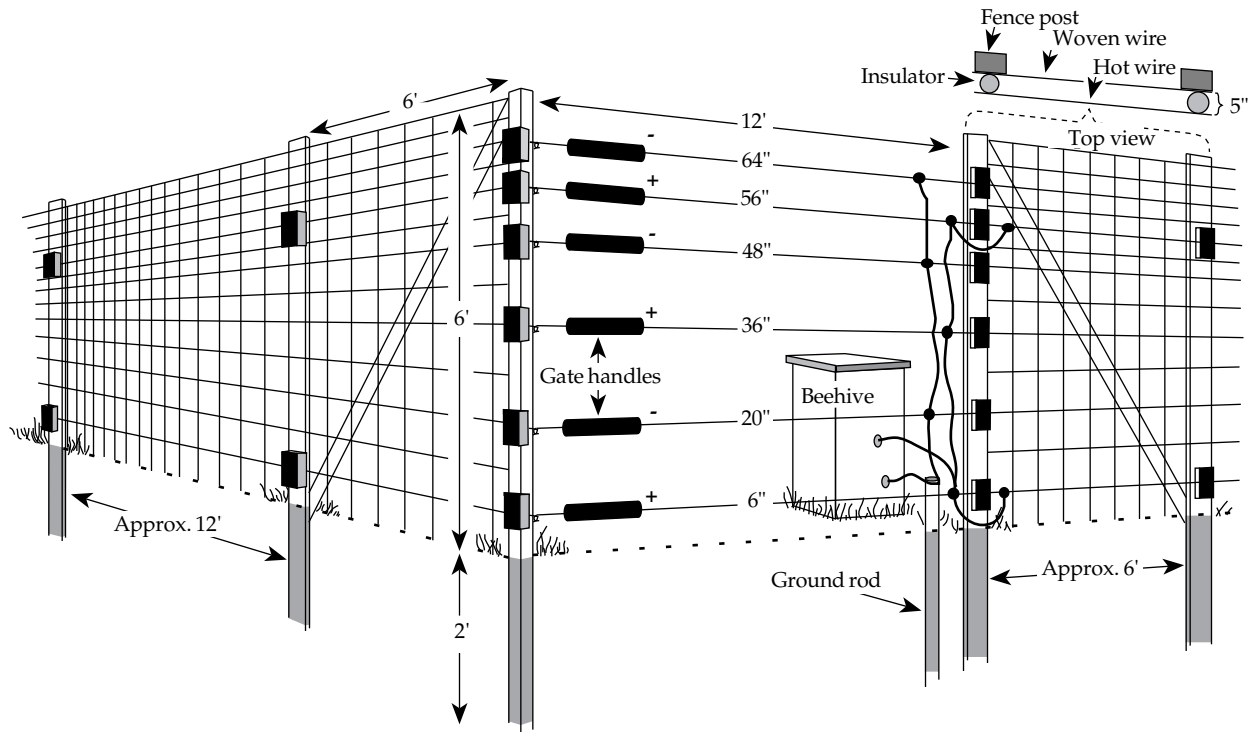
Place livestock pens and beehives at least 50 yards (50 m) away from wooded areas and protective cover. Confine livestock in buildings and pens, especially during lambing or calving seasons. Remove carcasses from the site and dispose of them by rendering or deep burial.

Plant susceptible crops (corn, oats, fruit) away from areas of protective cover. Pick and remove all fruit from orchard trees.

Remove protective cover from a radius of 50 yards (50 m) around occupied buildings and residences. Locate campgrounds, campsites, and hiking trails in areas that are not frequented by bears to minimize people/bear encounters. Avoid seasonal feeding and denning areas and frequently used game trails. Where possible, clear hiking trails to provide a minimum viewing distance of 50 yards (50 m) down the trail.

Frightening Devices and Deterrents

Black bears can be frightened from an area (such as buildings, livestock corrals, orchards) by the extended use



Woven-wire permanent fence. This fence, best used under high bear pressure, is the most durable and expensive barrier. It can be installed by two people in 8 hours. The fence consists of heavy, 5-foot woven wire, supported by wooden posts, ringed by two additional electrified wires. The cost per fence (33 x 33 feet) is about \$400.

- 1 50-yard roll of 6-inch square mesh, 5-foot woven wire
- 1 150-yard roll of high-tensile (14-gauge) smooth wire
- 24 8-foot treated wooden posts
- 40 Porcelain strain-insulators (screw-in types)
- 1 2-pound box of 1 1/2-inch fence staples
- 6 gate handles
- 1 12-volt fence charger
- 1 12-volt deep cycle battery

Herbicides

To install: Set posts 6 to 12 feet apart in 2-foot-deep holes. Align four corner posts at 5° angles from the vertical. Brace corner and gate posts from the inside with posts set at 45° angles. Clip a 15-inch-wide strip clear of vegetation under the fence and apply herbicide. Place one length of welded wire vertically into position and staple the end to a corner post. Pull the entire length of wire taut with a vehicle and staple the welded wire to the line posts. Continue until all sides, except the gate opening, are fenced. Fasten two strands of high-tensile wire to insulators positioned 5 inches away from the welded wire, at intervals of 6 and 56 inches above ground level. For a 12-foot gate opening, attach three strands of high-tensile wire to insulators on the gateposts. Space the wires at intervals of 6, 36, and 56 inches above ground level. Connect them to the two strands previously strung around the fence. These wires will be connected to the positive fence charger terminal. Attach three more wires to gatepost insulators at intervals of 20, 48, and 64 inches above ground level. These three wires will be connected together and to the ground rod. Fit insulated gate handles to the free ends of all six gate wires.

Fig. 5. Woven-wire permanent fence

of night lights, strobe lights, loud music, pyrotechnics, exploder canons, scarecrows, and trained guard dogs. The position of such frightening devices should be changed frequently. Over a period of time, animals usually become used to scare devices. Bears often become tolerant of human activity, too. At this point, scare devices are ineffective and human safety becomes a concern.

Black bears are occasionally encountered in the backcountry on trails or at campsites. They can usually be frightened away by shouting, clapping hands, throwing objects, and by chasing. Such actions can be augmented by the noise of pots banging, gunfire, cracker shells, gas-propelled boat horns, and engines revving. It is important to attempt to determine the motivation of the offending bears. Habituated, food-conditioned bears can be very dangerous. Aggressive behavior toward a black bear should not be carried so far as to threaten the bear and elicit an attack.

Black bears can be deterred from landfills, occupied buildings, and other sites by the use of 12-gauge plastic slugs or 38-mm rubber bullets. Aim for the large muscle mass in the hind quarters. Avoid the neck and front shoulders to minimize the risk of hitting and damaging an eye. Firearm safety training is recommended.

Repellents

Capsaicin or concentrated red pepper spray has been tested and used effectively on black bears. The spray range on most products is less than 30 feet (10 m), so capsaicin is only effective in close encounters. Capsaicin spray may become more popular where use of firearms is limited.

Toxicants

None are registered.

Fumigants

None are registered.

Trapping

Culvert and Barrel Traps. Live trapping black bears in culvert or barrel traps is highly effective and convenient (Fig. 6). Set one or two culvert traps in the area where the bear is causing a problem. Post warning signs on and in the vicinity of the trap. Use baits to lure the bear into the trap. Successful baits include decaying fish, beaver carcasses, livestock offal, fruit, candy, molasses, and honey. When the trap door falls, the bear is safely held without a need for dangerous handling or transfer. Bears can be immobilized, released at another site, or destroyed if necessary. Trapped bears that are released should first be transported at least 50 miles (80 km), preferably across a substantial geographic barrier such as a large river, swamp, or mountain range, and released in a remote area. Remote release mechanisms are highly recommended. Occasionally, food-conditioned bears will repeat their offenses. A problem bear should be released only once. If it causes subsequent problems it should be destroyed.

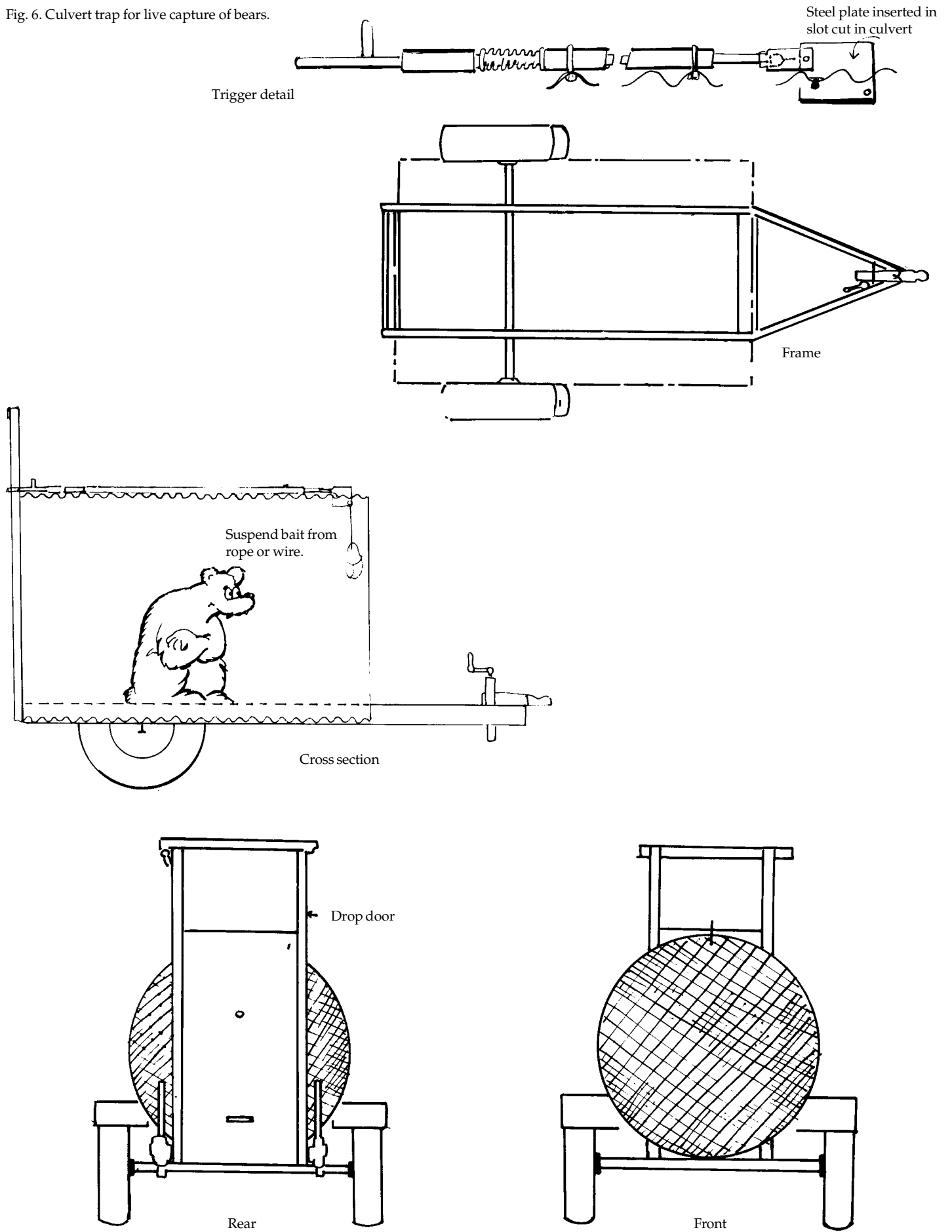
Foot Snares. The Aldrich-type foot snare (Fig. 7) is used extensively by USDA-APHIS-ADC and state wildlife agency personnel to catch problem bears. This method is safe, when correctly used, and allows for the release of nontarget animals. Bears captured in this manner can be tranquilized, released, translocated, or destroyed. Use baits as described previously to attract bears to foot snare sets.

The tools required for the pipe set are an Aldrich foot snare complete with the spring throw arm, a 9-inch (23-cm) long, 5-inch (13-cm) diameter piece of stove pipe, iron pin, hammer, and shovel. Cut a 1-inch (2.5-cm) slot, 6 1/2 inches (16.5 cm) long, down one side of the pipe. Place the pipe in a hole dug 9 inches (23 cm) deep into the ground. Cut a groove in the ground to accommodate the spring throw arm so that the pan will extend through the slot into the center of the pipe. The top of the pipe should be level with the ground surface. Anchor the pipe

securely to the ground, where possible, by attaching it to spikes or a stake driven into the ground inside the can. Bears will try to pull the pipe out of the ground if it "gives." The spring throw arm should be placed with the pan extending into the pipe slot 6 inches (15 cm) down from the top of the pipe. Pack soil around the pipe 1 inch (2.5 cm) from the top. Leave the pipe slot open and the spring uncovered. Loop the cable around the pipe, leaving 1/2 inch (1.3 cm) of slack. Place the cable over the hood on the spring throw arm, then spike the cable to the ground in back of the throw arm. The cable is spiked to keep it flush to the ground so that it will not uncoil or spring up prematurely. Cover the cable loop with soil to the top of the pipe. Anchor the cable securely to a tree at least 8 inches (20 cm) in diameter. Cover the spring throw arm and pipe slot with grass and leaves. Place a few boughs and some brush around the set to direct the bear into the pipe. The slot in the pipe and the spring throw arm should be at the back of the set. The bear can approach the set from either side or the front. Melt bacon into the bottom of the pipe and drop a small piece in. The bacon should not lie on the pan. Other bait or scent, such as a fish-scented rag, may be used. Place a 15- to 20-pound (6.8- to 9-kg) rock over the top of the pipe. Melt bacon grease on the top of it or rub it on. The rock will serve to prevent humans, birds, nontarget wild animals, and livestock from being caught in the snare. The bear will approach the set and proceed to lick the grease off the rock. It will then roll the rock from the top of the pipe and try to reach the bait with its mouth. When this fails, it will use a front foot, which will then be caught in the snare.

The bear will try to reach the bait first with its mouth and may spring the set if the pan is not placed the required 6 inches (15 cm) below the top of the pipe. Pipe sets are more efficient, more economical, and safer than leghold traps. Sources of bear foot snares are found in **Supplies and Materials**.

Fig. 6. Culvert trap for live capture of bears.



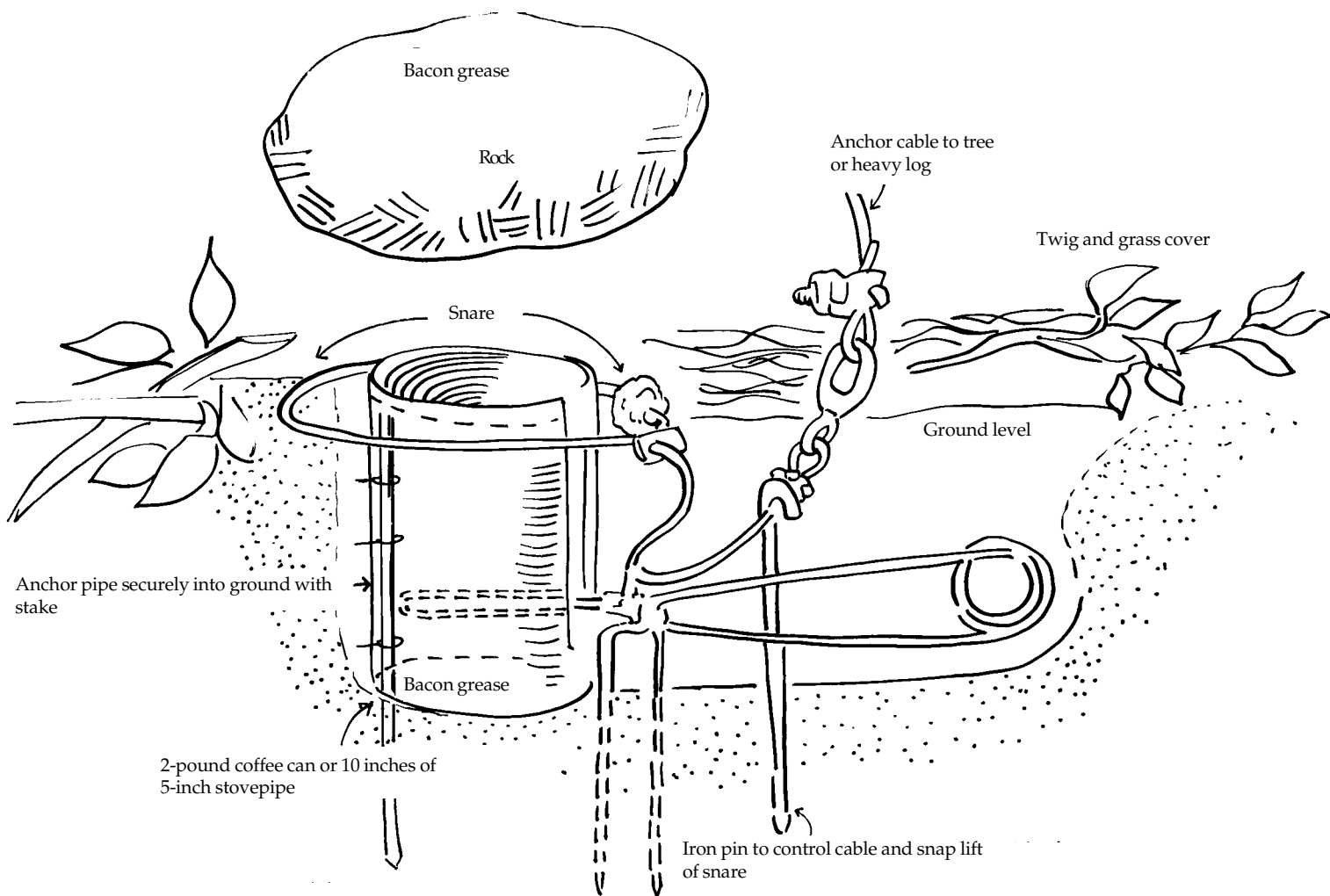


Fig. 7. Pipe snare set with Aldrich foot snare.

Shooting

Shooting is effective, but often a last resort, in dealing with a problem black bear. Permits are required in most states and provinces to shoot a bear out of season. To increase the probability of removing the problem bear, shooting should be done at the site where damage has occurred. Bears are most easily attracted to baits from dusk to dark. Place baits in the damaged area where there are safe shooting conditions and clear visibility. Use large, well-anchored carcass baits or heavy containers filled with rancid meat scraps, fat drippings, and rotten fruit or vegetables. Establish a stand roughly 100 yards (100 m) downwind from the bait and wait for the bear to appear. Strive for a quick kill, using a rifle of .30 caliber or larger. The animal must be turned over to

wildlife authorities in most states and provinces.

Calling bears with a predator call has been reported to offer limited success. If nothing else works, it can be tried. It is best to use two people when calling since the bear may come up in an ugly mood, out of sight of the caller. As with any method of bear control, be cautious and use an adequate-caliber rifle to kill the bear. Call in the vicinity of the damage, taking proper precautions by wearing camouflage clothing, orienting the wind to blow the human scent away from the direction of the bear's approach, and selecting an area that provides clear visibility for shooting. See Blair (1981) for bear-calling methods.

Some states allow the use of dogs to hunt bears. Guides and professional

hunters with bear dogs can be called for help. Place the dogs on the track of the problem bear. Often the dogs will be able to track and tree the bear, allowing it to be killed, and thus solving the bear problem quickly.

Avoiding Human-Bear Conflicts

Preventing Bear Attacks. Black and grizzly bears must be respected. They have great strength and agility, and will defend themselves, their young, and their territories if they feel threatened. Learn to recognize the differences between black and brown bears. Knowledge and alertness can help avoid encounters with bears that could be hazardous. They are unpredictable and can inflict serious injury. NEVER feed or approach a bear.

To avoid a bear encounter, stay alert and think ahead. Always hike in a

group. Carry noisemakers, such as bells or cans containing stones. Most bears will leave a vicinity if they are aware of human presence. Remember that noisemakers may not be effective in dense brush or near rushing water. Be especially alert when traveling into the wind since bears may not pick up your scent and may be unaware of your approach. Stay in the open and avoid food sources such as berry patches and carcass remains. Bears may feel threatened if surprised.

Watch for bear sign—fresh tracks, digging, and scats (droppings). Detour around the area if bears or their fresh sign are observed.

NEVER approach a bear cub. Adult female black bears are very defensive and may be aggressive, making threatening gestures (laying ears back, huffing, chopping jaws, stomping feet) and possibly making bluff charges. Black bears rarely attack humans, but they have a tolerance range which, when encroached upon, may trigger an attack. Keep a distance of at least 100 yards (100 m) between you and bears.

Bears are omnivores, eating both vegetable and animal matter, so don't encourage them by leaving food or garbage around camp. When bears associate food with humans, they often lose their fear of humans and are attracted to campsites. Food-conditioned bears are very dangerous.

In established campgrounds, keep your campsite clean, and lock food in the trunk of your vehicle. Don't leave dirty utensils around the campsite, and don't cook or eat in tents. After eating, place garbage in containers provided by the campground.

In the backcountry, establish camp away from animal or walking trails and near large, sparsely branched trees that can be climbed should it become necessary. Choose another area if fresh bear sign is present. Cache food away from your tent, preferably suspended from a tree that is 100 yards (100 m) downwind of camp. Hang food from a strong branch at least 15 feet (4.5 m) high and 8 feet (2.4 m) from the trunk

of the tree. Use bear-proof or airtight containers for storing food and other attractants. Freeze-dried foods are light-weight and relatively odor-free. Pack out all noncombustible garbage. Burying it is useless and dangerous. Bears can easily smell it and dig it up. The attracted bear may then become a threat to the next group of hikers. Always have radio communication and emergency transportation available for remote base or work camps, in case of accidents or medical emergencies.

Don't take dogs into the backcountry. The sight or smell of a dog may attract a bear and provoke an attack. Most dogs are no match for a bear. When in trouble, the dog may come running back to the owner with the bear in pursuit. Trained guard dogs are an exception and may be useful in detecting and chasing away bears in the immediate area.

Bear Confrontations. If a bear is seen at a distance, make a wide detour. Keep upwind if possible so the bear can pick up human scent and recognize human presence. If a detour or retreat is not possible, wait until the bear moves away from the path. Always leave an escape route and never harass a bear.

If a bear is encountered at close range, keep calm and assess the situation. A bear rearing on its hind legs is not always aggressive. If it moves its head from side to side it may only be trying to pick up scent and focus its weak eyes. Remain still and speak in low tones. This may indicate to the animal that there is no threat. Assess the surroundings before taking action. There is no guaranteed life-saving method of handling an aggressive bear, but some behavior patterns have proven more successful than others.

Do not run. Most bears can run as fast as a racehorse, covering 30 to 40 feet (9 to 12 m) per second. Quick, jerky movements can trigger an attack. If an aggressive bear is met in a wooded area, speak softly and back slowly toward a tree. Climb a good distance up the tree. Most black bears are agile climbers, so a tree offers limited safety, but you can defend yourself in a tree with branches or a boot heel.

Adult grizzlies don't climb as a rule, but large ones can reach up to 10 feet (3 m).

Occasionally, bears will bluff by charging within a few yards (m) of an unfortunate hiker. Sometimes they charge and veer away at the last second. If you are charged, attempt to stand your ground. The bear may perceive you as a greater threat than it is willing to tackle and may leave the area.

Black bears are less formidable than grizzly bears, and may be frightened off by acting aggressively toward the animal. Do not play dead if a black bear is stalking you or appears to consider you as prey. Use sticks, rocks, frying pans, or whatever is available to frighten the animal away.

As a last resort, when attacked by a grizzly/brown bear, passively resist by playing dead. Drop to the ground face down, lift your legs up to your chest, and clasp both hands over the back of your neck. Wearing a pack will shield your body. Brown bears have been known to inflict only minor injuries under these circumstances. It takes courage to lie still and quiet, but resistance is usually useless.

Many people who work in or frequent bear habitat carry firearms for personal protection. High-powered rifles (such as a .458 magnum with a 510-grain soft-point bullet or a .375 magnum with a 300-grain soft-point bullet) or shotguns (12-gauge with rifled slugs) are the best choices, followed by large handguns (.44 magnum or 10 mm). Although not a popular solution, killing a bear that is attacking a human is justifiable.

Economics of Damage and Control

Black bear damage to the honey industry is a significant concern. Damage to apiaries in the Peace River area of Alberta was estimated at \$200,000 in 1976. Damage incidents in Yosemite National Park were estimated to be as high as \$113,197 in 1975, with \$96,594 resulting from damage to vehicles in which food was stored. Thirty percent of all trees over 6 inches (15 cm) tall

were reported to be damaged by black bears on a 3,360 acre (1,630 ha) parcel in Washington State. In Wisconsin, one female black bear and her cubs caused an estimated \$35,000 of damage to apple trees during a two-day period in 1987. In general, black bears can inflict significant economic damage in localized areas.

Some states pay for damage caused by black bears. In western states, losses caused by black bears are usually less than 10% of total predation losses, although records are not complete. The extent of claims paid are not high but usually are greater than the license income that state wildlife agencies receive from black bear hunters. Deems and Pursley (1983) listed the states and provinces that pay for black bear depredations.

Acknowledgments

Much of the text was adapted from the chapter "Black Bears" by M. Boddicker from the 1986 revision of *Prevention and Control of Wildlife Damage*.

Figure 1 from Schwartz and Schwartz (1981).

Figure 2 from Graf et al. (1992).

Figure 3 from Burt and Grossenheider (1976), adapted by Dave Thornhill, University of Nebraska-Lincoln.

Figures 4 and 5 from Hygnstrom and Craven (1986).

Figure 6 from Boddicker (1986).

Figure 7 courtesy of Gregerson Manufacturing Co., adapted by Jill Sack Johnson.

Figure 8 from Manitoba Fish and Wildlife agency publications, adapted by Jill Sack Johnson.

Figure 9 by M. Boddicker.

For Additional Information

- Blair, G. 1981. Predator caller's companion. Winchester Press, Tulsa, Oklahoma. 267 pp.
- Boddicker, M. L., ed. 1980. Managing Rocky Mountain furbearers. Colorado Trapper's Assoc., LaPorte, Colorado. 176 pp.
- Bromley, M., ed. 1989. Bear-people conflicts: proceedings of a symposium on management strategies. Northwest Terr. Dep. Renew. Resour. Yellowknife. 246 pp.
- Burt, W. H., and R. P. Grossenheider. 1976. A field guide to the mammals, 3d ed. Houghton Mifflin Co., Boston. 289 pp.
- Davenport, L. B., Jr. 1953. Agriculture depredation by the black bear in Virginia. J. Wildl. Manage. 17:331-340.
- Deems, E. F., and D. Pursley, eds. 1983. North American furbearers: a contemporary reference. Int. Assoc. Fish Wildl. Agencies and Maryland Dep. Nat. Resour. Annapolis, Maryland. 223 pp.
- Erickson, A. W. 1957. Techniques for live-trapping and handling black bears. Trans. North Amer. Wildl. Conf. 22:520-543.
- Graf, L. H., P. L. Clarkson, and J. A. Nagy. 1992. Safety in bear country: a reference manual, rev. ed. Northwest Terr. Dep. Renew. Resour. Yellowknife. 135 pp.
- Herrero, S. 1985. Bear attacks: their causes and avoidance. New Century Publ. Piscataway, New Jersey. 288 pp.
- Hygnstrom, S. E., and S. R. Craven. 1986. Bear damage and nuisance problems in Wisconsin. Univ. Wisconsin Ext. Publ. G3000. Madison, Wisconsin. 6 pp.
- Hygnstrom, S. E., and T. M. Hauge. 1989. A review of problem black bear management in Wisconsin. Pages 163-168 in M. Bromley, ed. Bear-people conflicts: proceedings of a symposium on management strategies. Northwest Terr. Dep. Renew. Resour. Yellowknife.
- Jonkel, C. J., and I. McT. Cowan. 1971. The black bear in the spruce-fir forest. Wildl. Monogr. 27. 57 pp.

- Johe, K. L. 1985. Implications of grizzly bear habituation to hikers. Wildl. Soc. Bull. 13:32-37.
- Kolenosky, G. B., and S. M. Strathearn. 1987. Black bear. Pages 442-454 in M. Novak, J. A. Baker, M. E. Obbard, and B. Malloch, eds. Wild furbearer management and conservation in North America. Ontario Ministry of Nat. Resour. Toronto.
- McArthur, K. L. 1981. Factors contributing to effectiveness of black bear transplants. J. Wildl. Manage. 45:102-110.
- Meehan, W. R., and J. F. Thilenius. 1983. Safety in bear country: protective measures and bullet performance at short range. Gen. Tech. Rep. PNW-152. US Dep. Agric., For. Serv. Portland, Oregon. 16 pp.
- Rogers, L. L. 1984. Reactions of free-ranging black bears to capsaicin spray repellent. Wildl. Soc. Bull. 12:58-61.
- Rogers, L. L., D. W. Kuehn, A. W. Erickson, E. M. Harger, L. J. Verme, and J. J. Ozoga. 1976. Characteristics and management of black bears that feed in garbage dumps, camp grounds or residential areas. Int. Conf. Bear Res. Manage. 3:169-175.
- Rutherglen, R. A. 1973. The control of problem black bears. British Columbia Fish Wildl. Branch, Wildl. Manage. Rep. 11. 78 pp.
- Schwartz, C. W., and E. R. Schwartz. 1981. The wild mammals of Missouri, rev. ed. Univ. Missouri Press, Columbia. 356 pp.
- Singer, D. J. 1952. American black bear. Pages 97-102 in J. Walker McSpadden, ed. Animals of the world. Garden City Books, Garden City, New York.
- Van Wormer, J. 1966. The world of the black bear. J. B. Lippincott Co., Philadelphia. 168 pp.
- Wynnyk, W. P., and J. R. Gunson. 1977. Design and effectiveness of a portable electric fence for apiaries. Alberta Rec., Parks, and Wildl. Fish Wildl. Div. Alberta, Canada. 11 pp.

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