Capturing pumas with foot-hold snares

Kenneth A. Logan, Linda L. Sweanor, J. Frank Smith, and Maurice G. Hornocker

Abstract We evaluated using foot-hold snares to capture desert-dwelling pumas (Puma concolor) to inform other researchers of the efficacy of this method. During 1985–1995, we snared 107 individual pumas 209 times. Overall capture success was 1 puma/193 snare days. Initially, males and females were equally susceptible to capture. However, females in particular became snare-shy as they gained experience with snares. Snares were most efficient when set at, in descending order, puma kills, scavenged carcasses, puma scrapes, lures, and on puma travel ways. Snaring was a relatively safe method to capture pumas. Life-threatening injuries occurred in 2.4% of total puma captures. Capture by snares affected the movements of males ≤2 days post-capture, and had relatively little effect on movements of females. We also caught 89 non-target animals in snares; 16.9% died. Modifications of snares and snare-setting protocols reduced injuries to pumas and capture of non-target animals. Our use of foot-hold snares produced fewer deaths to pumas than occurred during most other intensive studies that used trained dogs.

Key words capture injuries, capture success, foot-hold snare, puma, Puma concolor

Safe and effective techniques to capture wild pumas (Puma concolor) are essential in ecological research. Because pumas are extremely cryptic and occur at low population densities, capturing and tagging individuals is the only reliable way to study demographics and social organization (Logan et al. 1996). Furthermore, wildlife managers need to use safe capture methods when the goal is live translocation for conservation (Belden and Hagedorn 1993) or managing nuisance pumas (Ruth et al. 1998).

Pumas captured for research and management usually are caught with the use of trained dogs that trail pumas by scent, then typically bay them in trees. Once bayed, pumas are chemically immobilized, then lowered to the ground for examination (Hornocker 1970, Logan et al. 1986). The success and safety of this method depend largely on the presence of trees that pumas can climb to escape pursuing dogs. Even in forested areas, however, pumas are sometimes bayed on the ground and mauled by dogs, resulting in severe injuries or death to the pumas or dogs (Shaw 1977, Barnhurst 1986, Anderson et al. 1992). Treed pumas also may be injured or die from falls during chemical immobilization (Hornocker et al. 1965, Shaw 1977, Barnhurst 1986, Anderson et al. 1992). Exertion from fleeing the dogs may result in life-threatening physiological problems for pumas (McBride 1976, Barnhurst 1986). Moreover, using dogs to capture problem pumas in urbanized areas is often not feasible.

In areas where trees are uncommon, risk of injury or death from using dogs to capture pumas may be excessive. We faced this logistical problem as we began puma research in the Chihuahua Desert in southern New Mexico, where tree cover was sparse, summer temperatures were high (often >38°C), and surface water was scarce. Thus, we developed an alternative capture method using foot-hold snares. Since its development, we have advised other researchers how to snare pumas in Arizona (Cunningham et al. 1995), California (Beier and Barrett 1993), and Texas (L. Harveson, Caesar Kleberg Wildlife Research Intitute, personal communication); jaguars (Panthera onca) in Mexico (B. Miller, Anderson et al. 1992).
principal investigator, Cuxmala Reserve, personal communication); and tigers (*Panthera tigris*) in Siberia (D. Miquelle, Hornocker Wildlife Institute, personal communication). This paper represents the first description and evaluation of the method on pumas.

**Study area**

The 2,059-km² study area was located in southwestern New Mexico and encompassed the entire San Andres Mountain Range. The climate is semi-arid, with annual precipitation averaging 43.6 cm, and annual temperature averaged 14.5°C during our research. July was the hottest month, with temperatures averaging 25.5°C. January was the coldest month; temperatures averaged 3.4°C (Logan et al. 1996). Elevations ranged from 1,280 m to 2,730 m. Merriam’s life zones represented in the San Andres included the Upper and Lower Sonoran of the Chihuahua Desert ( Larson 1970).

Ungulates vulnerable to snare capture included mule deer (*Odocoileus hemionus*), desert bighorn sheep (*Ovis canadensis*), pronghorns (*Antilocapra americana*), introduced oryx (*Oryx gazella*), and javelina (*Pecari tajacu*), plus tresspass cattle. Other carnivores susceptible to snare capture included the coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), and bobcat (*Lynx rufus*). Bears (*Ursus spp.*) were not present.

**Material and methods**

We modified foot-hold snares (Schimetz-Aldrich Spring Activated Animal Snare, Sekiu, Wash. 98381) to capture pumas (Figure 1). Hardware provided by the manufacturer included: a 107-cm-circumference foot loop consisting of a 5-mm-diameter steel cable, angle-iron lock, and cable clamp; 122 cm of 5-mm-diameter steel cable attached to a swivel or chain link with cable clamps; and a spring mechanism. We shortened the cable loop to 94–102 cm to maximize its effectiveness on pumas. When one was not provided, we inserted a 1.3-cm-diameter cast-iron swivel between the snare loop and anchor cable. The swivel allowed for rotational movement and helped prevent severe leg injury. The anchor cable was then clamped to a 122-cm length of 8-mm proof coil chain. To hold the animal at the site, a double offset hook drag (44 cm long; each hook 15 cm deep) made of 16-mm re-bar steel was attached to the end of the chain with a 9.5-mm repair link. If the puma pulled the snare free, the drag would grapple other vegetation and again hold the animal.

As the study progressed, we made additional modifications to minimize injuries to captured pumas and avoid capturing non-target animals. Beginning in June 1992, we attached 2–4 rubber bungee cords (23 cm long, stretch length of 36 cm) to the 50-cm-long segment of chain closest to the anchor cable, so that the chain could not straighten out completely even when the bungees were stretched to full length. The bungee cords absorbed shock as the animal struggled. Later (February 1993), we attached a slide stop to the foot loop by wrapping duct tape along 13–14 cm of the end of the foot loop adjacent to the angle-iron lock to a thickness that the lock could not slip over. The slide stop minimized the closure of the foot loop to 18- to 19-cm circumference and consequently maximized circulation to the puma’s foot. In addition, this allowed smaller-footed non-target animals to pull free from the loop.

We modified the spring mechanism by bolting an aluminum or tin disk (15-cm diameter) or rectangle (15 cm x 13 cm) to the trigger to enhance trigger effectiveness. We prevented the unintentional triggering of snares by small mammals by placing open-cell foam pads (5 cm thick) under the trigger pans. Each foam pad was cut slightly larger than the trigger pan to allow free downward movement when the pad was compressed by the weight of a puma. The foam pad also prevented loose soil from falling below the trigger pan, thus insuring proper function of the trigger.

Total cost of each modified snare was $32.77. This included: Schimetz-Aldrich snare assembly and spring mechanism, $16.00; double offset hook drag,
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...fall and winter to prevent excessive stress to captured pumas. In the hottest part of summer, we sometimes checked snares twice daily (again at 1600 hours). During particularly hot, cold, or snowy weather, we deactivated all snares.

We immobilized pumas captured in foot-hold snares with ketamine hydrochloride (100 mg/ml, Vetalar®, Parke-Davis, Division of Warner-Lambert Company, Morris Plains, N.J. 07959) dosed at about 12 mg/kg body weight. The drug was injected remotely, usually into the caudal thigh muscles by pole syringe (length=3.05 m) or by 3-5 ml aluminum darts fired from a CO₂-powered pistol. After induction, we quickly removed pumas from snares, covered their heads, and tethered their legs. If it was necessary to calm a puma further, we injected xylazine hydrochloride (20 mg/ml, Rompun®, Haver-Lockhart, Bay Vet Division, Cutter Laboratories, Inc., Shawnee, Kans. 66201) intramuscularly with a hand syringe; the dose was about 0.5 mg/kg body weight.

During hot ambient temperatures, we protected immobilized pumas from hyperthermia by placing them in shade and by cooling them with water. In cold temperatures, we protected them from hypothermia by placing them in sunlight and by wrapping them in a thermal blanket.

We sexed, aged, weighed, measured, radiocollared, and thoroughly examined captured pumas. We recorded all externally observable capture injuries. We subjectively categorized the degree of swelling of the captured feet as severe (1.5 times normal girth, estimated by measuring the girth of the captured foot and the girth of the opposite, unaffected foot), moderate (<1.5 times normal girth), slight (swelling minimally noticeable), and none (absence of swelling). We also documented skin damage, including abrasions (rubbing or scraping away of the hair and into the skin) and cuts (openings through the skin). Skin damage was categorized as minor (<2 cuts or abrasions <2.5 cm long in aggregate) or moderate (cuts 2.5-7 cm long in aggregate; abrasions ≤2.5 cm in length might or might not be present). Also documented were more severe injuries, including apparent sprains, breaks, and self-mutilations.

We tested the research hypothesis that a puma’s movements post-capture would be adversely affected by capture (i.e., each animal would move shorter daily distances immediately after capture than during periods when the animal was not influenced by capture). For females, we examined only the movements of adults without cubs or with cubs >9 months old. We measured distances traveled from...
captures to day-bed locations 1-5 days later, then compared them to movements made by the same pumas during randomly chosen 1-5-day periods when they were not influenced by captures. Because of data non-normality, we used Wilcoxon signed-rank tests to test for differences of movements (Ott 1993).

We used chi-square tests to test the hypothesis that male and female pumas were captured by snares in proportion to the population (Ott 1993). We set α=0.05.

Results

We captured 107 individual pumas (48 males, 59 females) 209 times from 6 August 1985 through 23 February 1995. Captured pumas ranged in age from 6 months to 12 years, with 14 captures (9 males, 5 females; 6.7% of all captures) being pumas ≤12 months old. Weights of captured pumas ranged from 10.0–71.7 kg. Pumas were captured by a single front foot (91.4%), a single hind foot (5.3%), or by 2 feet (3.3%). All pumas caught by 2 feet were captured at kill caches where ≥2 snares were set.

We accumulated 40,419 snare days (1 snare day for 1 day) at 1,211 different snare sites; overall capture success was 1 puma/193 snare days. Although we tried to avoid unnecessary recaptures, we still made 31 recaptures of non-target pumas (radiocollared pumas that did not need collar replacement). Each male and female was captured an average of 2.4 (range=1–6) and 1.6 times (range=1–5), respectively.

During a 6-year period (Mar 1989 to Feb 1995) for which both detailed trapping information and accurate information on the adult puma sex ratio was available (see Logan et al. 1996:85), annual capture success averaged 216 snare days/capture (SD=60.1). The ratio of male to female captures was not significantly different from the adult sex ratio during the first 4 of the 6 years (each year X²=2.10; 1 df; P>0.1); however, captures during the last 2 years of the study significantly favored males when compared with the adult sex ratio of the population (X²=8.76; 1 df; P=0.004 for 1993–94; and X²=7.21; 1 df; P=0.006 for 1994–95). We also documented the lowest capture success during the last 2 years of the study (294 and 263 snare days/capture), primarily because of our reduced success at capturing females. Female capture success averaged 34.4 snare days/capture (SD=66.7) over the 4-year period of 1989–93, but 96.8 snare days (SD=119.5) over the last 2 years. Male capture success averaged 1/419 snare days (SD=165.2) from 1989–93, which was similar to the 397 snare days/capture (SD=66.5) during the last 2 years.

Although we caught pumas most frequently at trail sets (55% of all captures, and 54% of captures that occurred after 7 Mar 1989), trail sets also required the greatest capture effort (≈274.9 snare days/capture; Table 1). In contrast, snares set at puma kill caches resulted in a much smaller percentage of captures (12–14%) but required the smallest capture effort (≈24.2 snare days/capture). Snares set at carcasses and at scrape sites also had much better success rates/unit of effort than those set along trails; however, the benefit from using sights over simple trail sets was minimal.

Injuries

Most puma captures (n=195; 93.3%) resulted in minor or non-detectable injuries except for swelling of the capture foot, which ranged from none to ≥1.5 times normal girth (Table 2). Most cuts and abrasions were inflicted by the snare loop or slide stop and were between the toes, on the toe pads, or around the wrist. The deepest cuts extended into the hypoderms. While struggling to get free, some pumas also received minor cuts from surrounding vege-

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Table 1. Capture success of pumas based on the type of snare set, San Andres Mountains, New Mexico, 1985–1995.

<table>
<thead>
<tr>
<th>Snare set type</th>
<th>Trail</th>
<th>Scrape</th>
<th>Kill</th>
<th>Carcass</th>
<th>Lure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trapping period:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snare daysc</td>
<td>22,815</td>
<td>6,725</td>
<td>508</td>
<td>423</td>
<td>509</td>
<td>30,980</td>
</tr>
<tr>
<td>Capture effortd</td>
<td>274.9</td>
<td>164.0</td>
<td>24.2</td>
<td>71.0</td>
<td>254.5</td>
<td>202.5</td>
</tr>
</tbody>
</table>

a 40,419 snare days were spent to capture 209 pumas for an overall capture effort of 193.4 snare days/capture. Detailed information on capture effort per set type was not collected from 6 Aug 1985 through 22 Feb 1989.
b Number of captures, males:females.
c Snare days=1 snare day for 1 day, based on the period 7 Mar 1989 to 23 Feb 1995.
d Capture effort=snare days/puma capture, based on period 7 Mar 1989 to 23 Feb 1995. Average annual capture effort for the same period was 215.5 snare days/capture.
tation, and claw cuticles occasionally became reddened or bloody. Three pumas (1 adult male, 2 adult females) damaged their teeth (broke incisors or chipped canines) while struggling to escape.

Although we documented severe swelling during 43 captures where other injuries were minor or non-detectable, the actual seriousness of swelling was unknown. Slight swelling of one female puma’s captured foot was not evident when she was recaptured by the opposite foot 3 days later. A male that experienced severe swelling to the captured foot showed no visible signs of swelling or injury to the foot when he was recaptured by his opposite front foot 20 days later. However, upon recapture, several pumas had rings of white hairs where the snare cables had previously encircled the animals’ feet, indicating skin-cell damage had occurred.

Moderate skin damage was observed during 3.4% of captures (n=7). The most serious cut consisted of a 7 cm-long laceration, caused by the cable, into the dermis of the heel of a sub-adult male.

Two pumas (1.0% of captures) suffered serious, but not life-threatening, injuries during capture. One 10.5-month-old female cub injured her foreleg while trying to free herself from the snare. The tail end of the snare loop became wrapped around thin trunks of willow baccharis (Baccharis sp.) and effectively isolated the swivel. Thus, when the female twisted and turned in her struggles, the snare loop did not freely turn with her. Her foot became severely swollen, and we suspect she suffered ligament damage (sprain or tear). She remained within 450 m of the capture site for 6 days, then rejoined her mother and 2 siblings on the seventh day. Subsequently she moved with her family. The other puma, an adult male, partially severed the third toe at the second phalange of his capture foot. We amputated the toe. Although we inspected the capture site, we could not determine how he sustained the injury. The male remained within 540 m of the capture site for 3 days, but then moved 1.6 km from the capture site on the fourth day. Subsequent locations and track observations indicated the male was traveling normally. When the wound was examined 5 months later, we found that the skin had grown completely over the stump of the toe.

Pumas sustained severe, life-threatening injuries in 5 of 209 snare captures (2.4%); 4 pumas (1.9%) subsequently died. One adult female appeared to have suffered minor capture injuries (slight swelling, minor skin damage); however, she died 5 days post-capture. She aborted 3 fetuses (approximately 56 days gestation) 3–4 days after being captured by both a left fore and right hind foot. A necropsy and subsequent consultation with M. Roelke (D.V.M., Florida Panther Recovery Project, personal communication) suggested that the female suffered a fatal injury to the lumbar region of the spine as she struggled against the snares. Tracks indicated paralysis of the hind legs just prior to death. The other 4 pumas (1 adult male, 2 adult females, 1 female cub) suffered fractures to the ulna and radius of the capture leg. Each puma had wrapped the distal end of the foot loop around a single-stemmed bush or tree so that the stem was between its leg and the swivel. As the pumas twisted the cables, the lower leg bones torqued, causing them to break. Two of these pumas subsequently chewed off 1 or more toes of the injured leg and were euthanized. We attempted to have the fractures of 2 females (mother and her 14-month-old cub) repaired. Although the mother died during surgery, the daughter was rehabilitated and returned to her natal area 6 months after injury; there she

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Table 2. Injuries sustained by pumas from snare captures (n=209) in the San Andres Mountains, New Mexico, August 1985–January 1995.

<table>
<thead>
<tr>
<th>Type of injury (excluding swelling)</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>None apparent</td>
<td>17:14b</td>
<td>19:10</td>
<td>20:19</td>
<td>50:22</td>
<td>70:50</td>
</tr>
<tr>
<td>Minor skin damagec</td>
<td>5:5</td>
<td>11:15</td>
<td>9:8</td>
<td>12:10</td>
<td>37:38</td>
</tr>
<tr>
<td>Moderate skin damaged</td>
<td>1:0</td>
<td>1:1</td>
<td>2:2</td>
<td>4:3</td>
<td></td>
</tr>
<tr>
<td>Ligament or muscular</td>
<td>0</td>
<td>0:1</td>
<td>0:1</td>
<td>0:1</td>
<td></td>
</tr>
<tr>
<td>Broken toe</td>
<td>0:1e</td>
<td>0:1e</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertebral or spinal</td>
<td>0:2f</td>
<td>0:2f</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leg bone fractures</td>
<td>0:2f</td>
<td>0:2f</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Swelling of capture foot: 0=no swelling; 1=slight swelling; 2=swelling ≤1.5 times normal girth; 3=swelling >1.5 times normal girth.

b. No. males: no females.
c. Minor skin damage: ≤2 cuts or abrasions ≤2.5 cm long in aggregate.
d. Moderate skin damage: cuts 2.5–7 cm long in aggregate; abrasions ≤2.5 cm long might or might not be present.
e. Puma died or was euthanized.
f. One puma rehabilitated, other died during surgery.
established adult residency and reared cubs.

Effects of capture on subsequent movements

The straight-line distances traveled by males during the 1-day and 2-day periods post-capture averaged 1.4 km and 2.9 km, respectively, compared to their movements of 3.2 km and 4.8 km, respectively, when they were not influenced by capture. Post-capture movements were significantly shorter for both the 1-day ($t=164$, $n=34$, $P=0.01$) and 2-day ($t=41$, $n=20$, $P=0.008$) periods. However, there were no significant differences in movements for 3-day ($t=98.5$, $n=20$, $P>0.1$), 4-day ($t=74$, $n=17$, $P>0.1$), and 5-day ($t=44$, $n=14$, $P>0.1$) periods. Females did not move shorter straight-line distances during 1-day or 2-day intervals post-capture than during those same time intervals when they were not influenced by capture ($n=15$–18, $P>0.1$). Although sample sizes were small ($n=7$–9), no differences were found for 4-day or 5-day movements either ($P>0.1$). However, females moved significantly farther during 3-day intervals when they were not influenced by captures ($t=25$, $n=14$, $P=0.05$).

Modifications to reduce injuries

Number of females exhibiting no or slight swelling of the capture foot increased from 44% (34 of 77 captures) to 68% (13 of 19 captures) once we began using bungees. Bungees alone did not greatly reduce the percentage of serious or life-threatening injuries suffered by females (5.3% of 76 captures before using bungees versus 5.0% of 20 captures after). However, their use in conjunction with slide stops appeared substantially to help reduce risk of injury; in 11 captures where we used both modifications, only 1 female suffered severe swelling of her capture foot, and other injuries were limited to minor skin injuries.

Unlike females, male pumas did not appear to benefit from the slide modifications. Proportions of males exhibiting no or slight swelling before and after the use of bungees were similar (48.0% of 77 captures before versus 47.2% of 36 captures after). Additionally, the only life-threatening injury to a male occurred while both bungees and snare stops were being used.

Capture of non-target animals

We captured 89 non-target animals during 30,980 snare days between 7 March 1989 and 25 February 1995. Animals included 72 mule deer, 6 oryx, 7 coyotes, 2 gray foxes, and 2 feral cows. One deer was caught at a lure set; the rest of the non-target animals were captured at trail (78.6%) or scrape site (20.2%) sets. Thirteen deer and 2 oryx subsequently died, most from apparent muscle myopathy. A puma killed 1 deer while it was in the snare. Prior to using the slide stop on the foot loop, we captured 81 non-target animals during 20,352 snare days for 1 capture/251 snare days. After we employed the slide stop, we captured 8 non-target animals (4 deer, 4 oryx) during 10,628 snare days, resulting in 1 capture/1,385 snare days. The only other non-target species we captured during the research was javelina ($n=2$); these were snared and released before we began to collect complete records on non-target captures.

Discussion and recommendations

Snared pumas suffer from hazards similar to animals captured by dogs, including mechanical injuries and thermoregulation and water stress. However, snared pumas also are at risk of discovery by and death from other large predators or humans. Nevertheless, the percentage of capture-related deaths we documented from using snares on pumas (1.9% of 209 captures) was lower than the percentages reported in most of the intensive studies in which dogs were used. In Idaho, 3.7% of 109 pumas captured with dogs died (Hornocker 1970). Of 110 pumas captured with dogs in Colorado, 4.6% died (Anderson et al. 1992). In Utah, 8% of pumas caught by dogs died (Lindzey et al. 1989). The only long-term intensive study with a mortality-free capture record was conducted by Ross and Jalkotzy (1992) in Alberta; they captured 68 pumas 129 times with dogs.

Snares cause less injury than steel traps. Van Ballenberghe (1984) found that wolves (Canis lupus)
caught in foot-hold snares experienced fewer serious injuries of feet, limbs, and oral tissues than wolves caught in steel traps. Severe leg injuries, including broken limb bones, occurred in 41% of wolves caught in traps, but never occurred in wolves caught in snares. Tooth breakage in wolves caught in steel traps has been reported at rates of 34%-46% (Kuehn et al. 1986, Van Ballenberghe 1984, respectively); we observed such injuries only 3 times in snare-captured pumas.

Initially, both sexes of puma appear to be equally susceptible to being caught by snares. However, as individual pumas, especially females, gain experience with snares, they often avoid snares by circumventing or jumping over them. Although we improved snare concealment as our study progressed, our overall effort/capture still increased. This occurred principally because of 2 snare-shy females that we unsuccessfully targeted for recapture. Five pumas, a male captured 5 times and 4 females each captured 1-3 times, learned how to remove the foot loop, apparently by using their teeth. During their second captures, we observed 2 other pumas (a male and a female) attempting to open the foot loops by inserting their upper canines between the cable and foot and pulling outward. Researchers should be aware that long-term projects using snares to capture pumas might have problems with trap-wise animals.

We found the most efficient snare set types were at puma kill caches and carcasses. Field workers targeting individual pumas for capture (e.g., pumas that kill livestock, particular study animals) would maximize efficiency by setting snares at kills.

Life-threatening injuries occurred in less than 3% of puma captures. Females were more prone to serious injuries than males (5.2% versus 1.8%); this may partly be a result of their smaller-diameter (hence more fragile) leg bones. Self-mutilation of capture feet occurred only in animals that had broken their leg bones.

Movements of male pumas were apparently affected by capture for at least 2 days post-capture; however, any adverse effects of capture on the subsequent movements of females was not generally detected. Although straight-line distances between locations may not accurately represent the real distance traveled (Sweanor 1990:53), they do indicate the capability of animals to travel long distances. The influence of capture on puma movements may be easier to measure in males because they tend to travel long directional distances on a daily basis (Sweanor 1990); minor foot injuries may discourage such long-distance travel. Females have smaller home ranges and generally travel shorter distances (Sweanor 1990); minor foot injuries may not impede this kind of travel. Males also may have suffered greater, but undetected, injury because the slide stops we installed to accommodate the average wrist diameter of females were ineffective on the larger wrists of males. Hence, if male pumas are targeted for capture, we recommend that field workers lengthen the slide stop to 18 cm.

We learned by experience that the best way to enhance safety of snares for all pumas was through wise choice and modification of the snare location. We probably would have experienced a greater injury rate if we had not begun setting snares far enough apart to prevent 2-footed captures. The back injury sustained by 1 female may have resulted from the torque suffered while pulling with both her front and hind legs. All other serious injuries occurred when pumas wrapped the foot loop around single-stemmed bushes or small trees, causing the swivel on the snare mechanism to be ineffective. Consequently, we stress that snares should not be used at those sites, or that dangerous trees or bushes should be removed. In 2 other studies, snared pumas have climbed trees, then accidentally hung from branches until death (J. Rutledge, personal communication, Texas Parks and Wildlife Department; Pittman 1995). Additionally, we do not recommend using snares during extended periods of freezing ambient temperatures because of the risk that an animal’s capture foot will freeze.

Slide stops that we installed on the foot loops greatly decreased the capture of small-footed non-target animals. Capture of non-target animals also can be minimized simply by avoiding the use of snares in busy travel ways of those animals. We do not recommend using snares in areas where large-footed non-target animals are common (e.g., elk [Cervus elaphus], cattle, bears). Field workers also must be cognizant of the dangers of capturing large animals capable of pulling the drag free from its anchor. Animals could leave the capture site and never be found or potentially attack approaching investigators. Three female pumas charged us as we delivered the immobilizing drug, but the drag restrained their movements.

Pumas captured alive for research, conservation, or translocation are dependent entirely upon their human handlers to be able to resume their lives unimpeded. In desert mountain habitat, we
effectively captured wild pumas from 6 months to 12 years old with foot-hold snares. Snares were relatively inexpensive, and workers rapidly learned how to use them. The equipment also was compact and easily carried into remote areas. We urge other researchers intending to use snares to capture pumas or other large felids to heed our safety precautions and to develop others to accommodate differing environmental conditions and animal behaviors.

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Literature cited


Kenneth A. Logan (shown at left) and Linda L. Sweeney have been research scientists for the Hornocker Wildlife Institute for 13 years. Ken received a B.S. in range and wildlife management from Texas A & I University, an M.S. in zoology and physiology from the University of Wyoming, and is presently pursuing a Ph.D. in wildlife sciences from the University of Idaho. Ken and Linda co-supervised a 10-year study on the ecology of pumas in the Chihuahua Desert; this paper was a result. Linda has a B.S. in zoology and wildlife biology from Colorado State University and an M.S. in wildlife sciences from the University of Idaho. J. Frank Smith (right) was a depredation control officer for the New Mexico Department of Game and Fish for 32 years, then spent 7 years as part of the Hornocker Wildlife Institute team studying desert pumas. Maurice G. Hornocker received his B.S. and M.S. from the University of Montana and his Ph.D. from the University of British Columbia. He was leader of the Idaho Cooperative Wildlife Research Unit from 1968-1985. He is currently the Director of the Hornocker Wildlife Institute, which he founded in 1985.

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