

Trap and Release Apiary-raiding Black Bears

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Abstract: From December 1980 to June 1988, 66 nuisance black bears (*Ursus americanus*) were captured and released at beeyards to create an aversion to beeyards. In most instances, bear depredations at a beeyard stopped after a bear was trapped, handled and released at the site. Of 63 bears released with tags, 14% were recaptured 1–3 times after causing additional apiary damage. These repeat offenders were mostly adult males. Two bears that continued to raid apiaries after being trapped 3–4 times in a year were relocated when it became apparent that these bears were not deterred by trapping. When used in conjunction with a working electric fence, trap and release may further condition bears to prevent apiary depredation.

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In a survey of black bear depredation problems, Will (1980) reported that beeyard destruction by bears was the most frequent source of bear-human conflicts. This problem was documented in Florida by Maehr and Brady (1982), who estimated that annual beeyard losses in 1981 exceeded \$100,000. Electric fencing around an apiary will prevent most of this damage (Brady and Maehr 1982), but some bears will cross an electric fence. The most common approach used by state agencies in dealing with nuisance bears is to trap and relocate the bear (Will 1980).

Aversive conditioning of bears using lithium chloride to create a taste aversion to honey has been tested as a means to reduce apiary damage, but Dorrance and Roy (1978) found the technique ineffective. Brady and Maehr (1982) tested a method of controlling repeated apiary damage that involved trapping, handling, and releasing the nuisance bear at the apiary depredation site. They found that only 1 of the 9 captured bears returned to a beeyard, but recommended additional study of this technique. The purpose of this study was to further evaluate the effectiveness of trapping, handling, and releasing nuisance black bears at beeyards as a method of controlling beeyard damage.

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Methods

Bears were captured and released using the methods described by Brady and Maehr (1982). Captures were made most frequently in Aldrich snares set in trails leading to the apiary. Bears were tranquilized with ketamine hydrochloride and xylazine hydrochloride, and in most cases they were then weighed, ear-tagged and lip-tattooed. A premolar was extracted for ageing. Bears were classified as cub (≤ 1 year old), subadult (1–2 years old), or adult (≥ 3 years old). Bears were released at the capture site. Trapping was conducted from December 1980 to June 1988 in 11 counties in northern Florida, concentrated in and around Apalachicola National Forest. Bears caught from December 1980 to June 1981 ($n = 9$), previously reported by Brady and Maehr (1982), were included here because it is believed that these bears were available for recapture.

Radio collars were placed on 3 bears captured at beeyards, and when possible, these bears were located at least once weekly. The radio collared bears were an adult female, monitored from 28 April 1986 to 1 June 1988; a subadult female, monitored from 23 July 1987 to 16 May 1988; and a subadult male, monitored from 15 May 1984 to 28 May 1985. Home range was determined by the convex polygon method.

Results

Sixty-six nuisance black bears (42 males, 24 females) were trapped and released at beeyards. Although bears were captured throughout the year, 86% were caught in April, May, and June.

Ages at the time of initial capture were assigned to 39 males and 20 females. Of the females aged, there were 2 cubs, 6 subadults, and 12 adults. The males aged included 1 cub, 17 subadults, and 21 adults.

The rate of recapture for 63 tagged bears was 14%. Eight of 41 (19.5%) tagged males were recaptured, but only 1 of 22 (4.5%) tagged females was recaptured. The female recaptured was an adult. Ages were assigned to 7 of the 8 recaptured males: 2 were subadults and 5 were adults. Because 1 of the aged subadult males was released without tags, only 16 aged subadult males were available for recapture. The recapture rate was 12.5% for subadult males and 24.0% for adult males.

The time between recaptures ranged from 6 days to 3 years. Three bears were captured at apiaries twice in the same year, 1 bear 3 times in 1 year, and 1 bear 4 times in a year. Three other bears were recaptured the year after their original capture. One recapture was trapped in 1981, 1983, and 1986.

Following a capture, depredations at that beeyard typically stopped for the

year. Exceptions were observed if more than 1 bear was visiting the yard, but in 2 instances, captured bears quickly returned to a beeyard where they had been recently trapped. In 1 case, an adult male bear was trapped 4 times in < 2 months. Two of the captures, spaced 11 days apart, were at the same beeyard. In the second case, a subadult male that was missing his left front foot was trapped 3 times in 4 months at 1 beeyard. A third bear was captured twice at 1 beeyard, first in 1981 and again in 1986. This bear also was captured in 1983 but at a different apiary.

Three of the bears trapped at beeyards were relocated. Two of these were bears that repeatedly damaged the same beeyards, and the third was moved at the landowner's request after the bear's second capture. Two of the relocations could be considered successful because the bears were not heard from again. However, the bear that had been caught 4 times was found feeding in a dumpster behind a restaurant about 1 month after relocation. Once again he was relocated. One week later, he was killed by a vehicle on an interstate highway.

Radio tracking of 3 bears, none of which were recaptured, indicated that they remained in the area of the beeyard/capture site. The beeyard was located on the edge of the home range of 2 bears, a subadult female and a subadult male. The third bear, an adult female, was frequently located within 200 m of the beeyard, which was in the approximate center of her home range. She is not believed to have disturbed the yard since her capture. However, during the 2 years that she was monitored, 2 other nuisance bears were trapped at this beeyard.

Discussion

The results of this study support the earlier findings of Brady and Maehr (1982). In all but a few cases, depredations at a beeyard stopped after a bear was trapped, handled and released at the site. This was observed at yards that were protected by electric fences both before and after the capture. Thus, it appeared that the depredation was stopped by trapping the bear.

We recognize that the recapture rate is partially dependent on factors other than a captured bear returning to an apiary. One of these factors, trap avoidance, was minimized by primarily using unbaited trail sets. A second factor, which would influence the recapture rate, is whether or not bears remain in the area where we trapped. This condition was known for 3 radio-collared bears who caused no known additional apiary damage, even though they remained in the area of the capture site. Some of the subadult males that were captured, however, may have dispersed from the area where they were trapped (Rogers 1987). Assuming that dispersal distances in Florida are similar to those in other states (Alt 1978, Rogers 1987), we doubt that dispersing bears moved out of the area where we trapped.

Florida's current policy in dealing with apiary depredations places the burden of hive protection on the beekeeper. Following a depredation complaint at an unfenced yard, technical guidance is provided on fence design, construction, and maintenance. Properly constructed and maintained electric fences are effective in preventing most bear damage to apiaries, although some bears will cross an electric

fence (Brady and Maehr 1982). This may occur because the charge is weak, the fence is poorly built, or possibly because the bear contacts the wires with his chest or neck and never receives a shock (McKillop and Sibly 1988). We believe that in cases where a fully charged electric fence has not prevented depredations, trap and release is an effective option for solving the problem that avoids the common responses of relocating or killing the bear. Individual bears that are trapped repeatedly may require relocation, but these are a small number compared to those that are effectively stopped by 1 capture.

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