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CATCH EFFECTIVENESS AND SELECTIVITY OF SEVERAL TRAPS ^{1/}

Edward P. Hill ^{2/}

ABSTRACT

The effectiveness and selectivity of several traps and trap modifications were field-evaluated and compared in Alabama from 1977 to 1980. No. 220 Conibear traps placed in baited open-end boxes (TB) on the ground posed a hazard to dogs and were not recommended for general use in terrestrial sets. They may be effective to control feral dogs in special situations or areas. TB devices attached to tree trunks 1 m above the ground eliminated the hazard to dogs, but rendered the trap ineffective for taking small mammals.

No. 220 Conibear traps with selective position treadle triggers placed in trail water-sets were significantly less effective for taking raccoon and other small mammals than standard jaw traps.

No. 120 Conibear TB baited with putrified deer meat or fresh fish were found in field evaluations to take one opossum or raccoon per 8.4 trap nights and caused no mortality in dogs. Visitation at trap sites by bobcats, dogs, foxes, ducks, and rabbits was evidenced by numerous tracks, but

nontarget species taken consisted of one rice rat, one cotton rat, and two house cats. The No. 120 Conibear TB appears to be an effective means for selectively taking 2 to 7 kg mammals, particularly with prebaiting.

Animal induced trap-snaps in No. 2 coil spring traps with standard and offset jaws were similar, but animal pull-outs were significantly greater in the traps with offset jaws.

INTRODUCTION

The increase in the amount of income received for properly handled raw furs during the 1970s stimulated an increase in the number of licensed furtakers in the Southeastern United States. There is also believed to have been an increase in the intensity with which fur was collected and sold. During winter months for example, fresh carcasses of road-killed furbearers were rare by comparison to other seasons.

With hunters, houndsmen, and trappers competing for use of the furbearer resource at an increased rate, conflicts arose among the resource user groups. These conflicts frequently developed into legislative proposals. Nine bills affecting harvest or management of fur resources were introduced in the 1977 Alabama Legislature.

One of the major complaints of houndsmen, particularly fox and raccoon hunters, was that their dogs were frequently caught and maimed in jaw-type traps. The development of techniques and devices that would selectively take furbearers, or reduce potential risk to nontarget species and dogs seemed appropriate. The use of modified traps, and traps that are proven through field evaluations to be relatively dog proof, offered the

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potential for alleviating dog owner apprehensions. The purpose of this study was to: (1) evaluate No. 120 and 220 Conibear traps for raccoon and opossum in two sets that appeared relatively dog proof, and (2) compare injury levels between animals taken in No. 2 coil-spring traps with offset jaws and those taken in No. 2 standard traps.

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METHODS

The catch effectiveness and characteristics of No. 220 Conibear traps placed in the open end of a wooden box and baited with putrified deer meat or fresh fish were compared to alternately placed standard No. 2 coil-spring traps in dirt-hole sets. Boxes were constructed of 2.5 x 20.3 cm unplanned lumber. Sides were 30.5 cm long and the top and bottoms were 40.6 cm and 45.7 cm, respectively. The back of boxes was covered with hardware cloth. The open end was 16 cm wide and 18 cm high. The overhanging top and bottom of the box formed a shelf which held the trap in a position where it would not likely be tripped from above by the foot of a long-legged quadruped. The No. 220 Conibear trap-box combinations (TBs) in three configurations were compared when placed flat on the ground, turned open end down at the base of the tree, and attached to a tree about one m above the ground, open end up.

Catch effectiveness of the No. 220 Conibear TB was also compared to that of No. 120 Conibear TB placed alternately along trap lines. Boxes for the smaller traps were of 3/4 inch

pine 30 to 36 cm in length with a back made of 11 mm mesh hardware cloth. The opening of each box was 14 x 14 cm inside. Slots 2.5 cm wide were cut about 8 cm down the sides to accommodate the springs of the trap when inserted into the open end of the box.

Catch effectiveness in No. 220 Conibear traps modified with selective position mounts (Woodstream Corp.) operable by a pedal trigger was compared to No. 2 coil-spring traps. The two types of traps were placed alternately in unbaited trail sets in water.

To compare the catch effectiveness and nature of trap injuries from the standard No. 2 coil-spring trap with jaws to those of traps with offset jaws, 12 of each type trap were field tested by 10 trappers in dirt hole sets a total of 1118 and 1195 trap nights, respectively. Traps were checked at 24-hour intervals, the catch and injury data were recorded, and the results tabulated. Chi square procedures and contingency tables were used to test differences between traps at $P < 0.05$.

RESULTS

No. 220 Conibear TB versus No. 2 coil-spring trap

Comparisons of the effectiveness and selectivity of the No. 220 Conibear TB against that of the standard No. 2 coil-spring trap revealed that their catch attributes, with one exception, were not significantly different (Table 1). The major exception was that the catch taken in No. 2 coil-spring traps was releasable, whereas that taken in No. 220 Conibear TBs was almost always dead. The trap mortality in nontarget animals taken in No. 220 Conibear TBs was sufficiently high to make them unsuitable for conventional terrestrial trapping in the Southeastern United States, except for special situations such as for control of feral dogs, or predator populations

on specific areas or during rabies epizootics.

Catch effectiveness comparisons of the No. 220 Conibear TBs in three configurations revealed that placing the TB 1 m above the ground on a tree trunk reduced catches of both furbearers and nontarget animals (Table 2). One furbearer per 16.4 trap nights was caught in tree mounted TBs compared to 8.2 trap nights per furbearer in TBs placed on the ground. Apparently the bait in TBs above the ground elevated the scent above the line of movement of many of the furbearers that passed downwind. No. 220 Conibear TBs placed open-end-down at the base of a tree were visited by opossums and raccoons, but they apparently climbed up on the box and attempted to enter it from above through the hardware cloth back. They also occasionally dislodged the trap. These problems plus difficulties in keeping bait in the back of the box rendered them ineffective, and led to elimination of this configuration from further consideration.

No. 220 Conibear trap with selective position mounts versus standard No. 2 coil-spring trap

The catch in unbaited No. 220 Conibear traps placed upright on selective position mounts in shallow water trail sets was significantly less than that taken in alternate sets using unbaited standard No. 2 coil-spring traps (Table 3). The poorer catch in the No. 220 Conibear trap may have been related to a reluctance in small mammals to move through the opening in the trap frame sitting crossways in trails. Although the treadle type trigger presents a large surface on each side of the trap, the trap did not appear likely to catch long-legged quadrupeds. The trap jaws close from above and below rather than in an upward motion from each side as in most leghold traps. The bottom jaw of the treadle mounted Conibear trap would move across the top of the foot pad and meet the upper

jaw midway up and in front of the animal's leg.

In addition to the poor catch, the No. 220 Conibear trap and the selective position mount cost about 4 times as much as the standard No. 2 leghold trap. Moreover, in most cases nontarget animals or immature furbearers could have been released from leghold traps, but not from the No. 220 Conibear trap.

No. 220 Conibear TB versus No. 120 Conibear TB

No. 220 and No. 120 Conibear TBs were operated 648 and 504 trap nights, respectively, at 2 locations during 2 years (Table 4). The catch of nontarget animals was greater in the No. 220 TB. Moreover, the No. 220 TB caught and killed a total of 7 long-legged canines. The quick-kill attributes of the Conibear trap preclude the use of No. 220 and larger sizes in situations where it presents a hazard to domestic animals. However, the No. 120 smaller version Conibear was not found hazardous to domestic animals, ducks, songbirds, or shorebirds in this study. In catch effectiveness, the 2 traps were not significantly different for taking small furbearers. The nontarget animals taken in the smaller No. 120 Conibear trap-box were 1 cottonrat (*Sigmodon hispidus*), 1 rice rat (*Oryzomys palustris*), and 2 domestic cats (*Felis domestica*).

Standard No. 2 coil-spring trap versus No. 2 coil-spring trap with offset jaws

Although the number of the trap snaps was not significantly different between the standard No. 2 coil-spring and the No. 2 coil-spring with offset jaws, there was a significantly greater catch in the standard trap (Table 5). Participating trappers quickly became unhappy with the offset jaw trap because of the number of traps found empty where trap site evidence indicated escapement, and

because some trappers had furbearers pull out of the traps as they approached them.

In comparing superficial trap injuries of the standard versus the offset jaw trap, bone fractures and skin cuts or lacerations were pooled. Although the injury differences were not significant at $P < 0.05$, traps with offset jaws had significantly fewer injuries at $P < 0.10$ (Table 6).

CONCLUSIONS

From a trapper's point of view, the No. 120 Conibear TBs have some advantages over conventional sets with leghold traps. They can be checked from a distance, from a vehicle, or boat. They can be set quickly, rebaited with less difficulty, and remain operable in rainy, freezing weather, whereas leghold traps frequently become inoperable. Conibear 120 TBs can be prebaited effectively.

Perhaps more important is that the 120 Conibear TBs did not appear to be hazardous to medium and large dogs typically used for deer, fox, and raccoon hunting.

The trap functioned well and appeared adequate for taking opossums, raccoons, and similar size mammals.

Trap position in the box was apparently favorable to insure that when the trigger was activated there was a minimum of struggle, and that mortality occurs quickly.

Because a reduction in injury was noted in the retained catches in coil spring traps with an offset jaw, it may initially appear more humane than the standard trap. However, the extent of injury and potential loss of animals that were trapped and escaped from traps with offset jaws remains unknown. In addition to humane concerns, poor catch efficiency makes the trap with offset jaws unacceptable to the trapper. Its catch effectiveness on foxes for example, was one fox per 63 trap nights, or almost a 50 percent reduction when compared to one fox per 32 trap nights in the standard trap.

Of additional interest in this study is the catch by species, per unit of effort, or trap night.

Table 1. Catch comparisons in No. 220 conibear trap-boxes (TB) in sets on the ground and standard No. 2 coil-spring traps in dirt hole sets.

	No. 220 conibear TB	No. 2 coil-spring trap
Trap nights	320.	327.
Trap snaps	48.	52.
Trap catches	43.	36.
Trap nights per snap	6.7	6.3
Trap nights per catch	7.4	9.1
Snaps per catch	1.1	1.4
Raccoon catch	5.	6.
Opossum catch	34.	23.
Non-target catches	5.	7.
Trap nights per raccoon	64.	54.5
Trap nights per opossum	9.4	14.2

Table 2. Catch comparisons in No. 220 conibear trap-boxes (TBs) in sets attached to tree trunks one meter above the ground and in sets on the ground

	No. 220 conibear trap on the ground	No. 220 conibear trap one meter above ground
Trap nights	320.	410.
Trap snaps	48.	27.
Trap catches	43.	25.
Trap nights per snap	6.7	15.2
Trap nights per catch	7.4	16.4
Snaps per catch	1.1	1.1
Raccoon catch	5.	3.
Opossum catch	34.	22.
Non-target catches	4.	0.
Trap nights per raccoon	64.	136.7
Trap nights per opossum	9.4	18.6

Table 3. Catch comparisons in No. 220 conibear traps placed on selective position mounts and standard No. 2 coil-spring traps placed alternately in shallow water, trail sets.

	No. 220 conibear	No. 2 coil-spring
Trap nights	355.	355.
Trap snaps	38.	54.
Trap catches	6.	30.
Trap nights per snap	9.3	6.8
Trap nights per catch	59.2	11.2
Snaps per catch	6.3	1.8
Raccoon catch	4.	14.
Opossum catch	0.	8.
Nontarget catch	2.	8.
Trap nights per raccoon	88.8	27.3
Trap nights per opossum	--	44.4

Table 4. Catch comparisons in No. 220 and No. 120 conibear trap-boxes (TBs) at 2 locations.

	Location A		Location B		Total	
	No. 220	No. 120	No. 220	No. 120	No. 220	No. 120
Trap nights	328.	233.	320.	271.	648.	508.
Trap snaps	25.	27.	48.	64.	73.	91.
Trap catches	24	18.	43.	47.	67.	65.
Trap nights per snap	13.1	8.6	6.7	4.2	8.9	5.5
Trap nights per catch	13.6	12.9	7.4	5.8	9.7	7.8
Raccoon catch	16.	14.	5.	21.	21.	35.
Opossum catch	3.	3.	34.	23.	37.	26.
Nontarget catch	3.	1.	4.	3.	7.	4.
Trap nights per raccoon	20.5	16.6	64.0	12.9	30.8	14.4
Trap nights per opossum	98.0	77.7	9.4	11.8	17.5	19.4

Table 5. Catch comparisons in standard No. 2 coil-spring traps and No. 2 coil-spring traps with offset jaws.

	Standard No. 2 coil-spring	No. 2 coil-spring with offset jaws
Trap nights	1118.	1195.
Trap snaps	206.	176.
Trap catches	139.	92.
Trap nights per snap	5.4	6.8
Trap nights per catch	8.0	12.9
Snaps per catch	1.5	1.9
Raccoon catch	15.	15.
Opossum catch	38.	29.
Fox catch	35.	16.
Bobcat catch	1.	3.
Skunk catch	9.	1.
Nontarget catch	41.	28.
Trap nights per raccoon	74.5	79.7
Trap nights per opossum	29.4	41.2

Table 6. Comparison of leg injuries to trapped animals in standard No. 2 coil-spring traps and No. 2 coil-spring traps with offset jaws.

	Standard No. 2 coil			No. 2 coil with offset jaws		
	bone fracture	laceration	dead	bone fracture	laceration	dead
Raccoon	8	3	2	2	3	0
Opossum	8	9	1	3	16	0
Gray fox	7	12	2	1	3	0
Red fox	0	10	0	1	7	0
Bobcat	1	0	0	0	0	0
Skunk	2	0	2	0	0	0
Dog	0	0	0	1	0	0
House cat	0	3	0	1	0	0
Mink	0	0	1	0	0	0