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ABSTRACT

Nightlighting, bait trapping, drive trapping, and rocket netting were compared to determine their effectiveness for capturing Ring-necked Pheasants *(Phasianus colchicus)* in north-central Kansas. We trapped pheasants during February and March 1998. Two methods of nightlighting were tested: vehicle and walking in. Bait traps consisted of lily-pad shaped funnel traps. We tested four methods of drive trapping: lily-pad without canopy, lily-pad with canopy, swinging wire-door traps, and mist nests. We also tested two different rocket net mesh sizes. Rocket nets had the highest catch per man hour and was the most effective and efficient trapping method for pheasants for the conditions in north-central Kansas. Bait trapping is recommended as a secondary capture technique. Walking in nightlighting, swinging wire-door drive traps, and mist nets were ineffective trapping methods for capturing pheasants.

INTRODUCTION

Ring-necked Pheasants *(Phasianus colchicus)* have been captured by various methods for banding, tagging, and attachment of radio transmitters. Nightlighting has been the most common method used for capturing pheasants (Egbert 1968, Hanson and Progulske 1973, Boyd and Richmond 1980, Penrod et. al 1986). Bait traps have been used in winter months when food is scarce and birds can be lured into the traps (Ligon 1946, Lyon 1967, Egbert 1968). Drive traps have not been used successfully in capturing pheasants (Buss 1946, Ligon 1946). Wilson et al. (1990) used rocket nets in Missouri to capture pheasants for relocation. The efficiency of capturing pheasants with nightlighting, bait trapping, drive trapping, and rocket netting, has not been compared. The purpose of this study was to determine which of these methods was the most effective for capturing pheasants in Kansas.

Study Area - Glen Elder Wildlife Area, 5,602 ha in size, is located in Mitchell and Osborne counties in north-central Kansas. Topography of the area is flat-to rolling terrain surrounding a 5,102-ha U. S. Bureau of Reclamation irrigation and flood control reservoir. The Kansas Department of Wildlife and Parks manages the area for public hunting Contract farmers plant dryland wheat, grain sorghum, corn, cane sorghum, and sunflowers; main hay crop is alfalfa. Other vegetation types in this area include undisturbed weedy patches, fallow crop fields, cool-season grasses, native warm-season grasses, and shelterbelts.

METHODS

Nightlighting - Two different nightlighting techniques—vehicle and walking in—were used Vehicle nightlighting used a one-ton truck equipped with a set of floodlights mounted on the cab and platforms mounted to the brush guard on the front. A netter and a person with a hand-held spotlight stood on the platforms. We also used a smaller pickup with hand-held spotlights and the netter riding in the bed of the truck. Vehicle methods were modified to work with available equipment from those described by Labisky (1968). We also walked into heavy roosting cover carrying a net and battery-powered, hand-held

spotlight. We tried vehicle nightlighting three times and walking-in two times on clear nights and on cold, windy, and overcast nights during February and March. Various habitat types from grass to wheat stubble and weedy fields were traveled. To reduce the amount of time nightlighting, birds were observed in the evening to determine roost sites.

Bait trapping - Six bait traps were set throughout the wildlife area from mid-February until the end of March. Our bait traps were lily-pad shaped (small kidney shaped; Bub 1991:57), with a funnel entrance at both ends. Funnels were 30 x 20 cm wide, necked down to 30 x 13 cm and were made of 5 x 10 cm (2" x 4") welded wire. Traps were 1.8 m long and 91 cm wide and also constructed of 5 x 10 cm welded wire. Tops were comprised of knotless netting with a mesh of 2.5 cm to prevent injury to birds. Corn and grain sorghum was set out in early February to bait pheasants to the trap area. Once pheasants were using the bait, a trap was set up without a lid. The lid was left off for a week or more depending on whether pheasants were entering the trap through the funnels. Traps were checked every evening around sunset.

Drive trapping - We used four different drive trapping methods: lily-pad trap without a canopy, lily-pad trap with canopy, wire swing door trap, and mist net. Drives were made with two to 15 volunteers; ATVs were used to aid in driving the larger areas of cover. The lily-pad trap without canopy was made of 5 x 10 cm welded wire with one opening. The opening was 71 x 61 cm with the entire trap measuring 3.6 m wide x 4.2 m long and 71 cm high. The top of the trap was covered with chicken wire. Drift fences, made of chicken wire 0.9 m high, ran out on an angle from the opening of the trap and were held up by electric fence posts at varying distances. Drift fences varied from 3 to 30 m in length depending on the width of the field in which the trap was set. The drift fence made a V-shape in the field, along a path that was mowed or compacted through heavy cover to provide a travel lane. We placed the lily-pad drive traps in thick weedy cover, standing corn, or grain sorghum. A single lily-pad drive trap without canopy took approximately one hour for two people to set up. The lily-pad trap was driven nine times with from one to six traps driven/day.

This same lily-pad drive trap design was also used with a 2.7 m wide chicken wire canopy. We added the canopy to prevent birds from flying over drift fences and force them to follow the drift fence to the trap. The canopy ran parallel to the drift fence and was stretched out on number nine wire attached to steel fence posts. The canopy was 1.2 m high in front and sloped to 46 cm to 61 cm along the drift fence. The drift fence on the canopy trap were 23 m long and consisted of a lily-pad trap at the junction of the drift fence and one on each outer end of the drift fence. We also placed this trap in heavy weedy cover with a path mowed for the drift fence. Setup of the canopy drive trap took four people approximately eight hours. The canopy trap was tested twice in two different locations.

Swinging wire-door drive traps (Bub 1991: 61) were made 4.9 m wide x 2.4 m long x 36 cm high. The wire door which made up one complete side of the trap was made of 6.4 mm steel rods welded to 12.7 mm steel tubing. The steel rods, which made up the door, were spaced 3 cm apart. The tubing was placed over a 6.4 mm steel rod that allowed the wire to swing freely in one direction. The frame of the trap was made of 6.4 mm steel rod and covered in 5 x 10 cm welded wire. The chicken wire drift fences were 91 cm high and ran out at an angle from the door of the trap. The drift fences were 15 m in length and held up by electric fence posts at an angle to make a slight canopy. The traps were also placed in thick weedy cover. The swinging wire-door drive trap was tested three different times. We used from two to four swinging wire-door traps in a day.

The fourth drive trap method we tried included two 9.1 x 2.1 m and one 18.3 x 2.1 m Japanese mist nets with 5 cm mesh that were placed on poles with the bottom of the net either flush with the ground or at 90 cm above ground. Mist nets were placed outside of heavy cover in hayfields or on paths and used a total of five times in three different locations.

Rocket netting - We used two rocket net sizes: 17.4 x 11.3 m net with 5 cm mesh and three rockets, and a 30.5 x 12.2 m net with 3.2 cm mesh and 8 rockets. The rocket nets were set in hayfields and sorghum stubble with very little preparation of the site.

Table 1. Capture rate (pheasants captured/100-man-hr effort) for Ring-necked Pheasants in north-central Kansas using different methods.

	Bait Trapping	Nightlighting		Drive Trapping				Rocket Netting
		Vehicle	Walk-In	Lily Pad Without Canopy	Lily Pad With Canopy	Swinging Wire Door	Mist Net	
Setup								
Baiting Time (wk)	2	0	0	0	0	0	0	2
Set-up Time (hr)	0.5	1	0	2	32	2	1	2
Individuals*	1 - 2	3 - 5	1 - 2	3 - 15	3 - 15	3 - 15	3 - 5	2 - 3
Capture								
No. Attempts (n)	40	3	2	9	2	3	5	9
Males Captured	17	4	0	0	0	0	0	12
Females Captured	7	1	0	4	5	0	0	68
Total Work (hr)**	**60**	**24**	**6**	**125**	**90**	**40**	**10**	**40**
Capture Rate	**40**	**4**	**0**	**3**	**6**	**0**	**0**	**200**

*** Number of individuals involved in working method.**
**** Approximate total hours worked (workers x hours worked summed for all n attempts).**

When a suitable site was not located near a large concentration of birds, an area larger than the net was mowed in the heavy cover and baited for one to two weeks before placing the net there. Nets were set parallel or perpendicular to the heavy cover. Rocket nets required one to two hours for two people to set up, depending on the size of the net, and were used nine different days.

RESULTS

Catch per 100 man-hour was used to compare the effectiveness of nightlighting, bait traps, drive traps, and rocket nets in capturing pheasants. Efforts and results are presented in Table 1. Eight of the 17 cocks captured at baited traps were recaptured from two to five times.

DISCUSSION

Traditionally, nightlighting has been the preferred method for capturing pheasants for research (Hanson and Progulske 1973, Dumke and Pils 1979, Whiteside and Guthery 1983, Snyder 1984). Nightlighting has been used mostly on intensively farmed lands, which have short vegetation (Labisky 1968, Warner and Etter 1989). This is largely why Labisky (1968) suggested searching roosting cover such as hayfields, small grain stubble, and pastures for birds; however, on the Glen Elder Wildlife Area most of the preferred roosting sites are fallow fields and undisturbed areas with tall vegetation. In these areas, locating the birds and placing a net over them was extremely difficult. Large plants held the net up high enough for the birds to escape from under it. In heavy cover the cryptic coloration of hens made them harder to see. Cocks, however, are much easier to see at night than hens, which is probably the reason more roosters were caught using nightlighting. Nightlighting requires that the ground is either frozen or dry, which limits the opportunities for using this technique.

The smaller pickup was not effective for nightlighting because the vehicle was too low to allow the spotlighter and netter to see birds in heavy cover. It was also difficult for the netter to get to the bird fast enough from the bed of the pickup. Nightlighting with a hand-held spotlight did not work because it was too hard to walk up on birds in heavy cover and birds were often not seen until they flushed.

Bait traps were relatively inexpensive to build and operate. The primary cost of bait traps is bait and

manpower to check the traps. Approximately eight to 10 traps could be built from a 20 m roll of welded wire. Pheasants appeared reluctant to enter funnels of the bait traps. Cocks were less cautious than hens entering funnels; however, Leopold et al. (1938) felt that cocks were less likely than hens to enter a confined space. The fact that several birds were recaptured indicates that these birds were unaffected by handling or the traps themselves. Bait traps worked best in those areas having few agricultural fields and limited natural foods.

Drive traps were more expensive to build and required more manpower to run than bait traps. They also took longer to set up than any other method. The lily-pad drive trap without a canopy was more effective in standing corn where birds could run down the rows and into the trap. Buss (1946) also found that pheasants could be driven along drift fences in cornfields. In heavy cover birds would run a short distance along the drift fence and then fly over the fence. Ligon (1946) also found that pheasants had a tendency to fly over the drift fence rather than follow it.

When using swinging wire-door drive traps, birds would get near the doors of the trap, but would fly over the trap instead of running through the trap's doors. This may have been because the wires of the trap looked like an obstacle rather than a way to get out.

No pheasants were captured with mist nets when nets touched the ground. Pheasants that did run into the nets were able to break loose; some birds ran at the net several times before flying over it. When nets were set above the ground, birds would either fly around or over the net, or run under it and then flush.

Rocket nets were the most effective and efficient way to capture pheasants on the Glen Elder Wildlife Area. Once pheasants were using a bait site, rocket nets could be set and monitored until sufficient birds were positioned within the netting area. Up to 30 birds could be enticed into the net area at a time. The more pheasants that were feeding at the site the more nervous the birds became. Wilbur (1967) felt that cannon nets were selective for hens and juvenile birds. Both cocks and hens could be lured in to the bait; however, more hens were usually present because of the heavy hunting pressure on the area.

Since two different mesh sizes of rocket nets were used, a comparison could be made on the effectiveness of 5.0 cm and 3.2 cm mesh. The 5.0 cm mesh net caught birds around the shoulders and allowed their heads to go through the net, which could result in injury, the 3.2 cm mesh net allowed birds to move around beneath the net and lessened the potential for injury. Less time was needed to remove pheasants from 3.2 cm mesh netting than 5.0 cm mesh netting since birds were not tangled in the smaller mesh size.

Our recommendation for trapping pheasants in conditions similar to those found at Glen Elder Wildlife Area is to use rocket nets with 3.2 cm mesh to capture large numbers of birds and to use bait traps as a supplement. If cock pheasants are of interest to the study, rocket netting and bait trapping are comparable. If hens are of primary interest, rocket netting is superior to all other methods.

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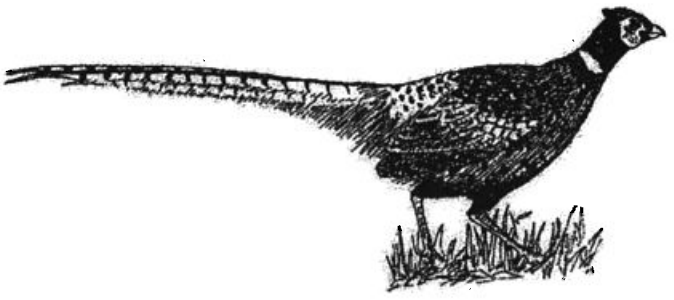

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