Evaluation of Wild Turkey Trapping Techniques in West Virginia

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Abstract: We studied efficiency of the rocket, rocket box, and cannon-net trapping techniques and the effects of the techniques on the physical condition of eastern wild turkeys (*Meleagris gallopavo silvestris*). We trapped 1,168 wild turkeys during a 5-year period (1989–1994). There were no differences in trapping efficiency ($P > 0.05$) among techniques. Fall (Sep–Oct) and winter (Jan–Apr) trapping efficiencies were not different ($P > 0.05$). Trappers with ≥1 year of experience had higher trapping efficiency ($P < 0.0002$) than trappers with no prior experience. There were differences in trapping efficiency by year ($P < 0.006$). Techniques used averaged <2% severe injuries or mortalities. Training of new trappers appears warranted to improve trapping efficiency.

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Wild turkeys in the eastern United States are commonly captured with nets projected by rockets, the rocket box, and cannon (Kurzejeski and Vangilder 1992). The cannon or mortar-projected net was developed for trapping waterfowl by Dill and Thornsberry (1950) on Swan Lake National Wildlife Refuge in Missouri. It was first used to trap wild turkeys in the 1950s on the Francis-Marion National Forest in South Carolina (Holbrook 1957) and in Missouri (Sadler 1954). A later development in trapping technology was the recoilless cannon or rocket (Kurzejeski and Vangilder 1992). Hawkins et al. (1968) were the first to use rocket-propelled nets to capture white-tailed deer (*Odocoileus virginianus*) in Illinois. This technique is commonly used to trap eastern wild turkeys. The most recent development in wild turkey trapping

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techniques is the rocket box (Wunz 1984), which was developed to keep nets dry and eliminate the effect of snow and ice on nets. As part of a study of wild turkey population dynamics, we trapped turkeys during a 5-year period and evaluated rocket, rocket box, and cannon trapping techniques. Objectives in this study were to compare efficiency among techniques and to determine physical condition of wild turkeys trapped with the 3 techniques.

We thank the wildlife managers and biologists that spent thousands of hours trapping wild turkeys, and we appreciate their willingness to try some trapping techniques they had never used before. We are grateful for the assistance in data analysis by R. Menendez, and we thank J. I. Cromer for reviewing the manuscript. Financial support for our study was provided by the West Virginia Division of Natural Resources, Wildlife Resources Section, under Pittman-Robertson Project W-8-R, the National Wild Turkey Federation, and the West Virginia Chapter of the National Wild Turkey Federation.

Methods

Research was conducted on both private and public lands throughout West Virginia. The topography of West Virginia is mountainous, with elevations ranging from 73 m to 1,524 m. Strausbaugh and Core (1978) categorized the vegetation in the state into 3 physiographic provinces: the Western Hill Section, the Allegheny Mountain and Upland Section, and the Eastern Ridge and Valley Section. Vegetation in the Western Hill Section varies from oak-pine (*Quercus-Pinus*), oak-hickory (*Carya*), and cove hardwood to floodplain communities. The Allegheny Mountain and Upland Section is divided into northern hardwood and northern evergreen cover types. The Ridge and Valley vegetation is best described as oak-hickory-pine.

Trapping occurred during fall (Sep–Oct) and winter (Jan–Apr), 1989–1994. Net sizes ranged from 9.14×9.14 m to 12.19×18.29 m. Personal preference and availability dictated net size used by trappers. Turkeys were captured at sites baited with small grains and cracked corn. Normally, bait sites were at the edges of fields, but bait sites were created occasionally in woodland habitat or along woodland roads and trails where there was room to deploy a net. The standard baiting procedure used was to run bait trails several directions into bait sites. At the bait sites, vegetation was placed in piles to resemble the shape of cannons, rockets, net, or rocket-box prior to deployment of the trapping equipment and blind. Under most circumstances, trappers allowed turkeys to take bait twice before placing trapping equipment. After capture, turkeys were immediately placed into turkey boxes supplied by the National Wild Turkey Federation.

All captured birds were sexed, aged (adult, yearling or juvenile), weighed, and examined for physical condition. For physical condition, wild turkeys were classified into 1 of 3 categories (good, fair, or severe/mortality). Turkeys classified as good had no injuries of any kind, turkeys considered in fair condition had minor feather loss, bruises, or abrasions. The severe/mortality classification included Turkeys with open wounds, bleeding, broken bones, or those killed during trapping. Leg length, primary

molt pattern, breast feather coloration, and pattern and length of post juvenile primaries VII and VIII were used to determine the age and sex of birds trapped in the fall (Healy and Nenno 1980, Swanson 1993).

Captured wild turkeys received leg bands and monel tags were placed on the patagium. We equipped 594 hen wild turkeys with radio transmitters (Advanced Telemetry Systems and Telonics) attached with a backpack harness. Total weight of radio and harness was approximately 117 g. Only hens weighing > 1.6 kg and classified in good or fair condition were fitted with a radio.

Trappers were personnel with the Wildlife Resources Section of the West Virginia Division of Natural Resources and were responsible for trap site selection, baiting, trap placement, and capturing wild turkeys. Copies of papers written by Bailey et al. (1980) dealing with proper trapping procedures and by Wunz (1984) showing how to use the rocket box were provided to many of our trappers. Trapping experience among personnel ranged from 0 to >20 years. Each trapper was classified as experienced (≥1 year) or inexperienced (<1 year). Inexperienced trappers were reclassified as experienced trappers in subsequent years. Trapping efficiency (%) was calculated by dividing the number of turkeys trapped by the number feeding on bait times 100. Efficiency was calculated for each trapper every time a capture of turkeys occurred.

The standard least squares factorial analysis (SAS 1995) was used to test the effects of technique, experience, season, and year on trapping efficiency. The number of turkeys on bait was used as a weighting factor in the analysis. A 2-way ANOVA was used to test the hypothesis that there were no differences in physical condition of trapped turkeys by year and technique.

Results

A total of 1,168 turkeys was captured during this study by 41 trappers from 85 net firings with rockets, 47 with rocket boxes, and 26 with cannons. Wild turkeys were captured in 28 of the 55 counties in West Virginia and in all ecological regions. Efficiency of trappers ranged from 0% to 100%. Only 8 incidences of 0% efficiency occurred (7 with the rocket box and 1 with rockets). The mean number of turkeys on bait was 11.05 (range: 1–35). The mean number trapped per trapper was 7.08 (range: 0–22). Most turkeys were trapped with rockets (644), followed by rocket boxes (356), and then cannons (168) (Table 1). Interactions among the main effects were not significant ($P > 0.54$). Trapping efficiency did not differ among the 3 techniques ($P = 0.13$) or season ($P = 0.29$).

Trapping efficiency was affected by trapper experience ($P < 0.0002$) and by year ($P < 0.006$). Trappers with ≥1 year of experience had an overall 70% efficiency rating compared to only 48% for inexperienced trappers (Table 2). In addition, trapping efficiency during the first year of the project showed an extremely low rate for inexperienced trappers.

We had data on the physical condition of 1,053 of the 1,168 wild turkeys captured; 98.2% of the birds were classified in good or fair condition. Condition of the birds was similar among techniques ($P = 1.00$) and year ($P = 0.99$). A total of 19

Table 1. Percent of wild turkeys captured by season, combined seasons and trapping technique in West Virginia, 1989–1994.

	Rockets			Rocket box			Cannons		
Year	Fall	Winter	Combined	Fall	Winter	Combined	Fall	Winter	Combined
1989–90	58	38	46	70	60	62	33	59	58
1990–91	68	89	73	60	70	63	64	ND[a]	64
1991–92	74	53	63	41	63	52	100	71	74
1992–93	79	57	71	64	65	64	52	100	60
1993–94	80	78	80	57	67	58	76	ND[a]	76
Totals	73	55	65	60	60	60	65	68	66

[a]ND = No Data

Table 2. Trapping efficiency of wild turkeys as affected by experience in West Virginia, 1989–1994.

	Experienced (>1 year)		Inexperienced (≤ 1 year)	
Year	Turkeys trapped	% Trapped	Turkeys trapped	% Trapped
1989–90	160	71	76	36
1990–91	130	66	35	69
1991–92	190	66	85	51
1992–93	206	72	48	54
1993–94	220	75	18	62
Total	906	70	262	48

(1.8%) of the turkeys trapped were classified in severe/mortality condition. These birds were actual mortalities at the time of capture, died before they were banded or radioed, or were in such poor physical condition that they had to be destroyed or be treated for an injury prior to releasing. Observed injuries included broken legs, broken wings, gross external lesions, dislocated humerus, and internal damage to organs caused by the net.

Discussion

The results indicated similarities in trapping efficiency and physical condition of wild turkeys trapped using rockets, rocket boxes, and cannons. Wunz (1984), however, indicated that the rocket box was more efficient than the conventional techniques of rocket or cannon-propelled nets that are set up on the ground.

A criticism of our method of evaluation may be that each trapper did not test each technique. Although this would have been beneficial, it was not feasible. Trappers used the equipment most available and familiar to them during the trapping season. However, most trappers used 2 of the techniques, and several used all 3.

Trappers must take into consideration environmental and trapping site conditions when deciding on a specific technique to use to trap turkeys. For example, the rocket

box requires a relatively large area to deploy the net from the box and cannot be used easily at trap sites with limited space. However, the problems of nets freezing or net concealment can be a problem when deploying nets from the ground with rockets or cannons. The weather in West Virginia is quite variable, but the state normally does not have continuous snow cover throughout the winter months. One reason for the near-equal success of the 3 techniques may be that trappers picked days to avoid the effects of frozen or snow-laden nets.

Our results demonstrated that capturing turkeys with rocket and cannon-projected nets are safe and efficient techniques. The relatively low loss of turkeys using the 3 techniques and our classifications of injury were supported by our findings with telemetered wild turkeys. During the 5 years of the study, only 26 (4%) of the 594 turkeys classed as in good or fair condition died during the first 2 weeks after release. Considering normal loss that would be expected during any 2-week period in the fall or winter, adjustment to the radio, and hazards of flock regrouping, our classification of injury appears accurate and losses from trapping were minimal. Lewis (1959) mentioned that the disadvantage of the net in capturing turkeys was feather loss, but he suspected that it was not fatal. Our findings support his conclusions.

It was surprising that trapping success with rockets, rocket box, and cannons did not differ. It was expected that rockets would be better than cannons, and the rocket box would be more efficient than rockets. Rockets project a net faster than a cannon. The rocket box appears to have an advantage over rockets because it eliminates the variables of aiming rockets or cannons each setup, weatherproofing the net, and concealing the trapping equipment.

The fact that experienced trappers had better success than inexperienced trappers suggests that trapper experience is more important than the equipment used. Our findings suggest that it would be beneficial to train new trappers to improve trapping success. Based on our experience, we recommend inexperienced trappers work with an experienced trapper until their skills have improved.

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