SECTION G, CONSERVATION

Trapping and Marking Rio Grande Wild Turkeys[1]

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During a recent study of the Rio Grande wild turkey in western Oklahoma it was desired to mark turkeys in a manner which later would permit field identification of individuals. Before marking, it was necessary to catch the turkeys, preferably in large numbers. To accomplish this it was decided to use a drop-net trap, a tool then being successfully used on wild turkeys by the Oklahoma Department of Wildlife Conservation.

A literature survey revealed no published information on the construction and operation of drop-nets of the desired size. Jacobs (1958) described a small drop-net for use on prairie chickens and Burget (1957) wrote of using a drop-net of unsatisfactory design on Merriam turkeys. Burget did not elaborate on the design of his net. Baldwin (1947) described a 15 ft. x 20 ft. drop-net used successfully on eastern turkeys. This net was suspended from one point and for this reason could not practically be expanded to the size desired during the recent study. The Florida Game and Fresh Water Fish Commission also used a drop-net on wild turkeys but failed to describe it (Anon, 1952).

Following a study of drop-nets being used by the Oklahoma Department of Wildlife Conservation, one was designed and constructed by the author. Numerous modifications of this net were made during the two trapping seasons when it was used. The modified design is described in this paper.

Success in capturing large numbers of turkeys with drop-nets is directly correlated with certain design features of the net. Some of the more important ones are net clearance, net tension, reliability and ease of operation. It is also desirable that the net be easily transported and erected. The net described here incorporates these features.

It is very important that the net have at least 5 ft. clearance and be stretched tightly. Wild turkeys are reluctant to go under low nets or nets flopping in the wind. A low, flopping net sometimes hits turkeys, alarming them so that they never come under again. Therefore it is desirable to have a mechanism for the removal of slack. The release mechanism should be completely reliable and easily operated. Also, the cost of a complete 60 x 60 ft. unit should not be unreasonably high. The net described here has all of these characteristics.

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[1] Contribution of the Oklahoma Cooperative Wildlife Research Unit; Oklahoma State University, Oklahoma Department of Wildlife Conservation, Wildlife Management Institute, and U.S. Fish and Wildlife Service, cooperating. Zoology Contribution No. 323.

The net recommended is 60 x 60 ft. and has a 2 in. mesh of nylon cord not smaller than size 15. Finer cord tends unduly to cut and defeather the birds. Coarser cord would be desirable were it not for the added weight. A mesh smaller than 2 in. lessens the possibility of entanglement and thus facilitates travel under the net with subsequent escape. A larger mesh increases wing damage. Nylon netting is preferred over other materials because it lasts longer, is stronger and does not shrink. Nylon does not develop slack during weather changes.

The 60 ft. square net size permits the concentration of 70 to 100 turkeys under the net with few birds closer than 10 ft. to the edge. As a rule, the closer the trapped bird to the center of the net, the less likelihood that it will escape. To the edge of the net is laced a rope, preferably of the same substance as the netting. This prevents differential shrinking between the netting and the edge rope. Differential shrinkage produces bagging which is difficult to remove. The edge rope should be 7/16 to 5/8 in. in diameter.

The net is suspended from 9 steel posts, one at each corner, one at the center of each side and one at the center of the net. In cross-section the shape of the posts should be as pictured in Figure 1. The flaring of the sides prevents binding of the corner pull pins. To provide net clearance, the center post should be 12 to 15 ft. long. This can be accomplished by cutting a regular steel post in two near the top. A length of 1 ½ in. pipe is welded to the top portion and a 1 ½ in. collar to the bottom portion. The long post is assembled by screwing the pipe into the collar.

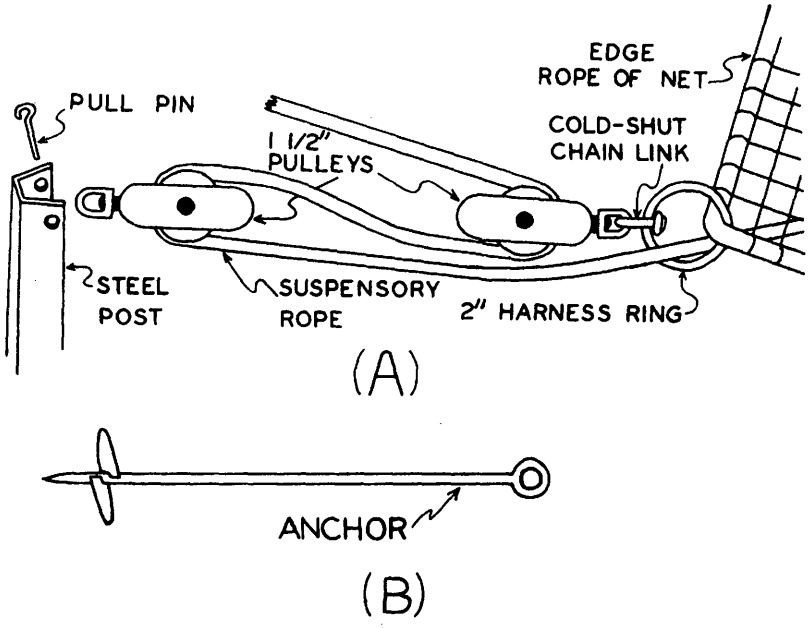

Figure 1. Drop-net trap, assembly detail
A. Attachment and tightening mechanism.
B. Anchor.

Through the top of each of the posts, holes should be drilled to accommodate the pull pins (Figure 1A). Figure 2 demonstrates how the net is attached to the posts. Once the net is suspended, a great inward force is exerted on the outside posts. To counteract this the posts must be anchored (Figure 1B). These are attached to the posts with lightweight chains approximately 5 ft. long having a hook on one end. The blank end of the chain is looped over a hook welded to the back of the post. The hook end is led through the eye of the anchor and then hooked back into the chain.

A center ring is laced into the center of the net (Figure 2). At each corner of the net and at the center of each side a small pulley is attached to a 2 in. harness ring through which the edge rope passes (Figure 1A). From the center ring a ⅜ in. nylon suspensory rope passes under the netting and outward through each of the harness rings.

To erect the net it is first stretched out on the ground. The corner posts are driven in the ground about 5 ft. from the net corners. The other perimeter posts are driven in 3 to 4 ft. from the edge of the net. Next the release pulleys are attached by pull pins to the outside posts. Then the suspensory ropes are passed through the pulleys as shown in Figure 1A. Before the net is tightened, the center post should be set, assembled

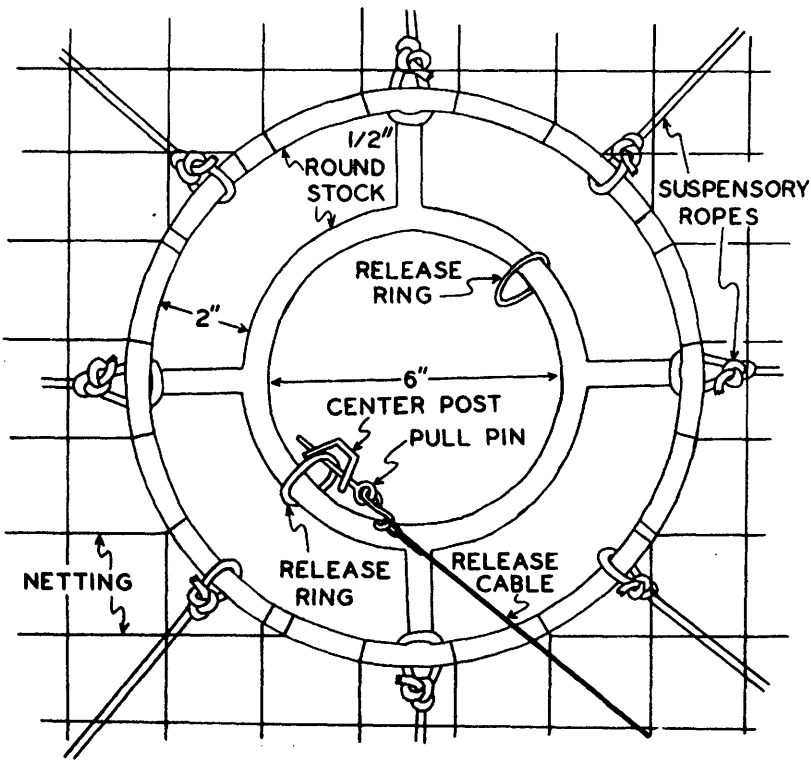

Figure 2. Drop-net trap, assembly detail
Center Ring Assembly.

and attached to the center ring. The net is then stretched tightly by pulling the suspensory ropes through the pulleys and tying them in place.

The net release mechanism is illustrated in Figures 3 and 4. It was discovered that automobile engine valves, with a hook welded to the top and the "keeper" ring ground off, make excellent pull pins. The holes in the posts should be large enough to permit the distal end of the pins to swing towards the net when they have been pulled free of one side of the post. If the pin swings inward, the release pulley slides off and the net drops; if not, the pulley will not slide off until the pin is nearly extracted, causing the pin to bind.

Once the pins are in place, it is necessary to attach the release cables to all pins and arrange these so that all pins will be pulled nearly simultaneously. Figure 4 is a schematic drawing showing how this is done. The release and pull cables, each with a loop formed on one end, are made of 3/16 in. or 1/8 in. soft lead cable. The corner levers are made of 1 x 1/4 in. steel. All except the pivot holes in the levers are tapped to receive 1 x 5/16 in. bolts. The levers are attached to the tops of the posts by welding a nut to the post (Figure 3) and bolting the lever to this.

Before installing the cables the levers are bolted firmly to the tops of the posts as shown in Figure 4. Next the pull pins are extracted until they barely pass through both holes in the post. Then all cables except the center one are put in position and all of the slack removed as shown in Figures 3 and 4. Small cable clamps are used for attaching the spurs and for adjusting all cables. All levers are then loosened and the center release cable is put in place. This should be adjusted so that it will pull ahead of the others. By dropping the center first the tension on the outside pins is immediately relaxed and they pull much easier.

When the net is attended for trapping the pull pins should barely pass through both holes. At other times they should be fully inserted. If slack is removed from the net after the release cables have been adjusted, they should be readjusted.

Two shortcomings of the drop-net trap are its bulk and the time required to accustom turkeys to it. It was believed that these difficulties might be overcome by using a cannon net. Therefore, a cannon net designed for use on geese by Marquardt (1960) was tried. The net was made of size 26 gill netting.

This cannon net was found to be superior to the drop-net with respect to ease of setting, portability and time required to accustom turkeys to the trap. Turkeys actually were trapped the first day the net was set. It was learned during this trapping that the net possessed several undesirable attributes. Excessive defeathering occurred and several turkeys were lacerated noticeably. It is thought that these faults could be overcome by using 2 in. mesh netting made of number 15 cord. Such netting is considerably heavier than the gill netting used by Marquardt. Therefore a heavier charge would be needed to propel the heavier net. Marquardt (1960) showed that his modification of the Miller type cannon is capable of such charges. Consequently it appears that more turkeys could be trapped during one season with a cannon net of proper design than is now possible with 2 or 3 drop-nets of comparable size.

Trapping Procedure

Selection of the trapsite is all-important. It should be ¼ to ½ mile from the roost and preferably along known turkey travel-ways. To reduce

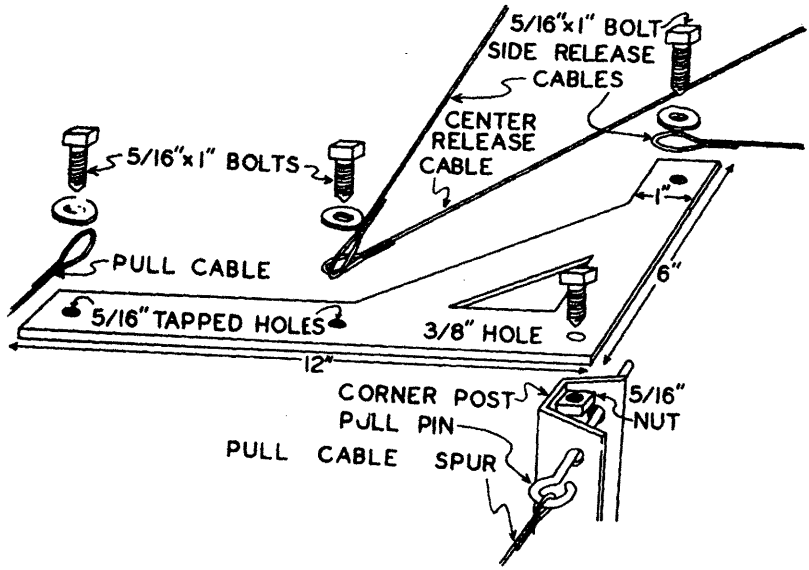

Figure 3. Drop-net trap, assembly detail
Release lever mechanism.

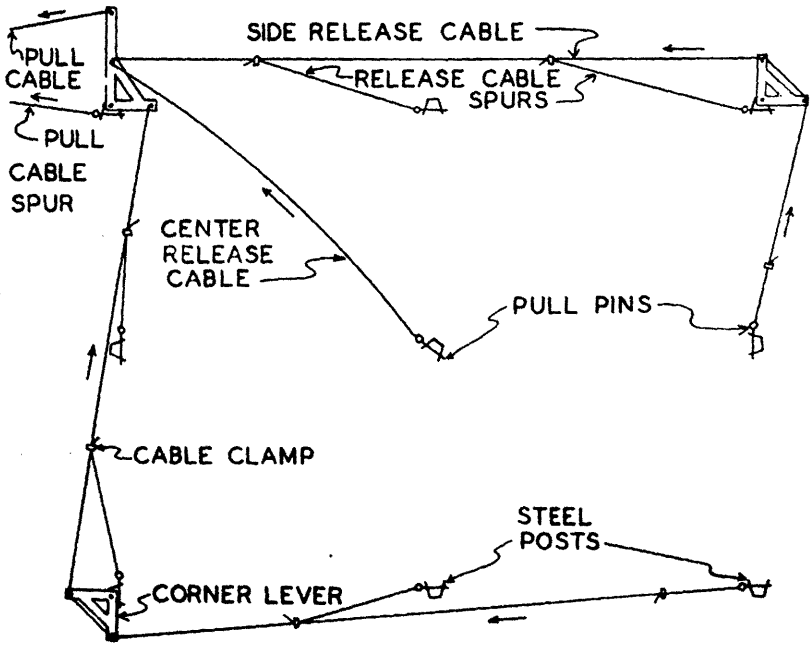

Figure 4. Drop-net trap, assembly detail.
Release mechanism schematic. Top view.

molesting and public misunderstanding, it should not be visible from a highway. It is recommended that the trapping site be a grassy spot and that the grass be mowed prior to setting the net. Mowing permits the net to lie flat when dropped. Should vegetation hold the net up as much as 10 in. turkeys will sometimes move under the netting and escape.

After the trap site has been chosen it should be baited. An excellent bait is maize. It is highly palatable to turkeys and is so small that a turkey must feed for about 30 minutes before he is satisfied. This gives the trapper a greater opportunity to obtain the desired grouping under the net.

Baiting on the ground is preferred to the exclusive use of automatic feeders. Raccoons and deer may be wasteful of grain in feeders. Also fewer turkeys can eat at one time from feeders than from the ground. The area baited should be a spot which will correspond to the center of the net and should be of such a size that the periphery of the baited spot will be no closer than 10 ft. from the edge of the net. This is particularly important when the bait site is on sod. Should bait be put on sod near the edge of the net, the more cautious turkeys will be able to find bait there for several weeks and therefore not be attracted under the net when the operator wishes to trap. Nonetheless, sod makes an excellent trap-site. The grass will hold a large quantity of bait and it hides the bait so that turkeys spend much time trying to find it all. Such sites require less frequent baiting.

After the area has been baited, it should be checked as frequently as necessary to keep bait available. In all cases the baiting as well as setting and attending the net should be done during mid-day to prevent disturbing the birds, which feed mostly during the hour after sunrise and the hour before sunset.

After the turkeys have discovered the bait and have become accustomed to feeding on it the net can be erected. When this is done small bait lines should be extended from the net about 30 yds. in 1 or 2 directions. These should, when possible, be put on bare ground so that they will be quickly and completely cleaned up, leaving no grain embedded in the sod to attract turkeys when trapping is attempted. The bait lines serve to keep turkeys in the vicinity of the net until they become accustomed to it, and later to lure the more venturesome individuals under the net. As soon as droppings and scratchings are noted at the edge of the net further baiting should be done inward from there. It normally takes from 3 to 12 days for turkeys to familiarize themselves with the net enough to go under. Once a few do, most of the others will soon follow. When sign indicates that the flock is feeding under the center of the net, trapping may be attempted.

The release mechanism should be installed and adjusted on the day preceding trapping. A good practice is to arrive at the blind before daylight the day before trapping. After observing the turkeys come, feed and leave, the release mechanism can be installed. By doing this it may be learned at what time the turkeys can be expected, which turkeys are not going under and how long they might be expected to feed.

On the morning set for trapping, the operators should arrive at the net early enough to bait and adjust the release mechanism before daylight. It is to be kept in mind that turkeys sometimes arrive at the net when there is scarcely enough light to see the ground. Usually they will arrive within the hour after sunrise, unless the roost is further than ½ mile away.

When the turkeys have arrived and begun feeding, and when the operator is satisfied that he has under the net those turkeys he seeks, he drops the net. Immediately 2 operators should run to adjacent corners of the net, grasp the edge rope, and while stretching it tight, roll it back under the netting, thereby pocketing any turkeys which are near the edge and might otherwise escape. Next the turkeys should be covered with light weight, light-tight canvas, to quiet them. The turkeys are then removed singly and put into burlap sacks.

Sacks are excellent containers for transporting turkeys provided the birds are not kept confined for more than 8 to 10 hours. Sacked turkeys usually fly strongly when released, but may have some broken and abraded flight feathers. Skinned legs and heads seldom occur among sacked birds. Furthermore, the turkeys can be weighed, sexed and marked while in the sacks.

In Oklahoma, trapping is not profitable until the winter flocks have formed, normally during October. The most fruitful trapping period is during the coldest part of the winter. However, turkeys can be successfully trapped in Oklahoma from November through March.

Marking

During the recent study it was desired to mark birds in such a manner that they could be individually identified in the field. This was accomplished through the use of 2 marker systems, both used on every bird and each sufficient for individual identification. One system employed the use of plastic legbands placed in various combinations. An aluminum band, a part of the leg band code, and carrying a serial number and the phrase "Notify Game Farm, El Reno," was put on each turkey.

It was found desirable to put the same number of plastic bands on each turkey. This enabled the observer to detect lost bands and thereby reduce misidentifications. For example, if a turkey had lost one of 3 original bands, he might be mistaken for a 2-band bird.

The plastic bands used were supplied by National Band and Tag Company, Newport, Kentucky and listed as the size 12 "Bandette" type. Size 14 is more suitable for toms. These bands come in a variety of colors and are constructed similar to a clock spring.

Experimentation with game farm turkeys indicated that many of the plastic bands were quickly lost. Therefore it was decided to cement the overlapping portions with a plastic cement. On December 8, 1958, 32 wild turkeys were so marked. Three months later 27 of the 32 birds were retrapped. It was then learned that 63 per cent of the plastic bands had been lost. Of those yet in place, 80 per cent were well sealed. However, the others easily could have been removed by the turkeys. When these turkeys we re-marked, cement was again used since no other method for securing the bands was then available.

The second method used for securing the bands employed small copper wire. This required that the band be notched on one side (Figure 5). To affix the band the wire was placed around it in the position of the clamp in Figure 5, and then twisted. Between January 20 and February 25, 1959, copper wire was used to secure plastic bands on 36 wild turkeys. Soon after the last of these had been marked, it was noted through field observations that retention of these bands was very poor. It was obvious that any useful plastic band would have to be of rugged construction. Consequently the practice of using copper wire was discontinued and a better method for securing the plastic bands was sought.

The last and most successful method for attaching the plastic bands employed a clamp made of 14-gauge galvanized wire (Figure 5). These

clamps were formed into a J-shaped structure with a throat wide enough to fit into a notch cut on the edge of the band. The short leg of the "J" was left about 3/16 in. long and the long leg about 2 in. After the band was placed on the turkey's leg, the throat of the clamp was fitted into the notch with the short leg to the outside. The bend of the clamp was then grasped with pliers and held firmly while the long leg was bent over the outside of the band. Before the long end was bent flat against the outside it was cut off rather short. The finished product is shown in Figure 5. With practice a band can be put on in this manner in 15 to 20 seconds.

Field observations of marked birds has produced information which permits an evaluation of the relative merit of the 3 methods discussed for securing plastic bands to turkeys' legs. Through these records it was learned approximately how long certain bands were retained and about when others were lost. For purposes of the evaluation the term "band-day" was selected to represent one band worn one day by a turkey. A comparison of banding techniques can be made by comparing the ratios of known band-days realized to known band-days lost during a specified period of time. A band-day lost represents each day during the observation period when a band is absent from its position on the turkey.

During the 1958-59 winter plastic bands were placed on 39 turkeys with cement, on 26 with copper wire and on 14 with clamps. These turkeys were then observed over a 400-day period and notes were taken on band retention. From this information (Table 1) it was determined, in the case of each manner of securing the bands, the ratio of known band-days realized to the known band-days lost. Also in Table 1 is a similar ratio representing 98 turkeys marked with clamped bands during the 1959-60 winter and observed over a 150-day period.

It may appear puzzling why the clamped bands put on during the 1959-60 winter seemed to stay so much better than those put on during the 1958-59 winter. There are three explanations for this. The second winter turkeys were observed only 150 days. Had they been observed for 400 days as the others were, it is likely that the retention of bands would have been more equal. However, it is thought that a great difference would still exist because the rate of band loss is apparently highest during the initial 30 days.

TABLE 1. RETENTION OF PLASTIC LEGBANDS AFFIXED TO WILD TURKEYS BY THREE METHODS IN WESTERN OKLAHOMA, 1958-1960.

Method of affixing bands	Observation period, days	Possible band-days	Number known band-days realized	Number known band-days lost	Ratio of known band-days realized to known band-days lost
Plastic cement	400	15,600	6,630	116	57:1
Wired with copper wire	400	10,000	1,147	3,523	0.33:1
Clamped with 14 Ga. wire	400	6,400	3,881	118	33:1
Clamped with 14 Ga. wire	150	17,550	6,535	19	344:1

A second explanation is that the sample size of the first winter birds was so small—8 observations—that those data may be misleading. Data representing the second winter were obtained from 61 sightings. Still another explanation concerns the banding technique. During the first winter's operations attention was not paid to the location of the notch on the bands. Therefore, it is probable that some bands were lost by unspiraling after breakage of the free outside end.

In view of information presented in Table 1, it is obvious that wiring the bands with small copper wire is futile. It is suspected that the turkeys managed to sever the wire and then to unspiral the bands. Table 1 suggests that the cemented bands were retained relatively well. As previously noted, most of the cemented bands retained possessed a good bond. Where bonds are not formed the cause may be pecking by the turkey while the cement is drying. It is suggested that better results might be achieved with cemented bands if, after the turkeys are banded, they could be put back into the sack for 30 minutes to one hour while the cement dries. Experience gained during the period following the 1959-60 banding season suggests the superiority of securing plastic bands with clamps made of 14 gauge galvanized wire.

In addition to legband codes, a second and independent marker system was used. This employed a neck marker modified from one described by Wint (1951) for use on bob-white quail. The author was often able to identify turkeys with this marker when legbands had been lost or were hidden by vegetation.

The neck marker used is represented in Figure 5. It was made by cutting strips 2.5 in. wide from a large piece of cloth-backed Duran upholstery plastic. These strips were then folded and the edges sewn to produce a double-thickness strip 1.25 in. wide. The strips were then cut into 3.75 in. lengths, each length being one neck marker. Two small holes, 7/16 in. apart, were punched midway between the ends of the marker and about ½ in. from the folded edge. Identifying symbols were then inked on the marker using a vinylite ink purchased from the California Ink Company, 711 Camelia Street, Berkeley, California. Symbols made with this ink apparently did not fade throughout a 2-year period. Bushings were made to serve as buffers between the markers and the pig rings with which the markers were attached. The bushings were made from ¾ in. lengths of extruded plastic tape, described by Downing and Marshall (1959). Holes were punched in the bushings to accommodate the pig rings.

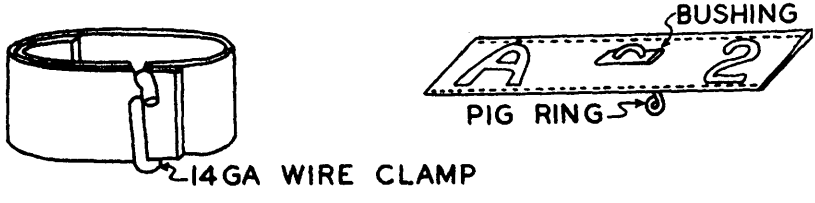

Figure 5. A. Plastic legband with wire clamp.
B. Neck marker

The neck markers were attached to the turkeys in the following manner. The marker and bushing were placed on the pig ring (Figure 5). The ring was then placed in ringing pliers and the wings of the marker were folded back to clear the throat of the pig ring. With the pliers held between the thumb and the last 3 opposing fingers and with the wings of the marker restrained by the index finger, the operator is prepared to attach the marker. Experience has taught that many mistakes are possible with this operation. Care should be exercised so that the ring is not closed down over a wad of feathers and barely catching the skin. To prevent this the feathers should be parted and a good fold of skin included by the closed pig ring. Care should also be taken to insure that the marker is placed squarely on the back of the neck about 4.5 in. below the occiput. If placed higher the turkeys are able to reach them with the foot and thus claw them off. If not placed squarely on the back of the neck, the marker will have a tendency to hang to one side. When the marker is in place the folded edge should be closest to the turkey's head.

During the 1958-59 winter 80 wild turkeys were marked with neck markers similar to the one just described but were made of a plastic material lacking the cloth backing and were shaped in the form of a man's bowtie. One of these has remained in place 2 years. At the end of one year, 2 out of 3 of these turkeys identified in the field still retained their neck markers. It should be added that many turkeys probably failed to be identified as a result of having lost the neck marker. Legbands are more difficult to see than neck markers.

There are 2 reasons why many of the markers put on during the 1958-59 winter were lost. First, inexperience accounted for numerous errors in attaching them. Second, evidence gained from retrapped birds indicated that the plastic often cracked between the attachment holes and the border. Thus some markers literally fell apart. For this reason cloth-backed plastic was used during 1959-60 winter.

During the 1959-60 winter 98 wild turkeys were marked with neck markers made of cloth-backed plastic material. One-half of these were 4 x 1.5 in. and the others were 3.75 x 1.25 in. At the end of 3 months, information gained from 61 observations suggested that about ¼ of the neck markers had been lost. It was noted that the larger markers, being heavier, had a greater tendency to hang off of one side of the neck. In this position the turkey would be more cognizant of it and, it is thought, would thereby exert a greater effort to rid himself of it. If this is correct, most of the neck markers lost should be the large ones. This appeared to be the case. However, most of the sightings concerned turkeys with the larger markers since that flock was headquartered around the investigator's residence. Only 11 sightings were made on turkeys with the smaller markers. One of these was known to have lost his neck marker within the first 70 days. The others all had neck markers when observed during the period between 70 and 90 days after marking.

Twelve wild turkeys were marked with the 3.75 x 1.25 in. cloth-backed neck markers during the 1958-59 winter. Four of these were observed wearing their neckmarkers 564 days after being marked.

Different colored neck markers were used to denote different trapsites. This enabled the observer to chart movements even though he was not always able to identify the turkey as an individual. Different colored neck markers can also be used to denote the turkey's age or marking date.

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