3, greater secondary covert 10, middle secondary covert 8, lesser secondary covert 3, carpal remex covert, and alular 3.

Brown-headed Cowbird. *Molothrus ater.* Examination of five specimens failed to show the secondary region neossoptile that was previously thought to be diagnostic in this species.

Scarlet Tanager. *Piranga olivacea.* Two specimens had neossoptiles distributed as follows: coronal 13, occipital 4, spinal 35, scapular 9, femoral 13, abdominal 12, crural 7, rectrices, primary 10, greater primary covert 8, secondary 2, greater secondary covert 9, middle secondary covert 8, and carpal remex covert.

Cardinal. *Richmondena cardinalis.* One specimen had the following natal pterylosis: coronal 6, occipital 4, middorsal 6, pelvic 9, scapular 8, femoral 8, greater secondary covert 7, middle secondary covert 6.

Rose-breasted Grosbeak. *Pheucticus ludovicianus.* Three specimens had the following average natal pterylosis: coronal 14, occipital 5, spinal 30, scapular 7, femoral 16, abdominal 14, crural 4, rectrices, secondary 2, greater secondary covert 10, middle secondary covert 8, and carpal remex covert.

Lark Sparrow. *Chondestes grammacus.* One specimen kindly contributed by Dr. Richard R. Graber had the following distribution of neossoptiles: ocular 2, coronal 11, occipital 5, middorsal 6, pelvic 12, scapular 8, femoral 13, abdominal 12, crural 7, rectrices, greater primary covert 6, greater secondary covert 9, and middle secondary covert 7.

Field Sparrow. *Spizella pusilla.* Three specimens corroborated previously given data. The crural downs, numbering 2, and the lower pelvic downs, numbering 6, were present characteristically.

Swamp Sparrow. *Melospiza georgiana.* Seven specimens had the following average natal pterylosis: coronal 9, occipital 4, middorsal 6, pelvic (upper) 1, (lower) 6, scapular 5, femoral 8, abdominal 3, and greater secondary covert 7. Adventitiously there were three neossoptiles on the posterior ocular region, two on the proximal secondaries, and two on the distal middle secondary coverts.

Department of Zoology and Entomology, University of Connecticut, Storrs, Connecticut.

A NEW WATERFOWL NEST TRAP[1]

BY MALCOLM W. COULTER

Special studies of territorial behavior, renesting activities, homing, and other aspects of waterfowl biology sometimes require that nesting females be marked to permit future identification. Some of the traps and techniques used to capture nesting hens were reviewed by Dzubin

[1]Contribution from the Maine Cooperative Wildlife Research Unit, Orono, Maine; Maine Department of Inland Fisheries and Game, University of Maine, Wildlife Management Institute; and the U. S. Fish and Wildlife Service cooperating. The author expresses his appreciation to Warden Erwin Bonney, Maine Department of Inland Fisheries and Game, to William Miller and Neil King, Vermont Fish and Game Service, for suggestions concerning modification of the original trap, to Howard L. Mendall, Leader, Maine Cooperative Wildlife Research Unit, for reviewing the manuscript, and to Claude Westfall, University of Maine, for the drawing.

and Munro (1956); and more recently, Weller (1957) presented details of an automatic nest trap.

Most of the methods described have practical application under some conditions or for particular species of ducks. However, none is reported to be effective in capturing most species of laying hens. During current studies of the Black Duck *(Anas rubripes)* it soon became apparent that any conspicuous object placed at the nest was likely to cause desertion. Even the less wary Ring-necked Duck *(Aythya collaris)* deserted if trapping were attempted during the early stages of incubation when any type of a conspicuous trap was employed. Our experiences are similar to those of Sowls (1955) and of Dzubin with mallards. Referring to the drop trap that he used, Sowls stated "Trapping success was high in most species of ducks, but low in mallards, which proved suspicious and wary." Dzubin (Dzubin and Munro, *op. cit.)* reported only 30 per cent success in trapping mallard hens.

To overcome these disadvantages some workers have used throw nets and hand nets. These techniques have been applied with varying success, but their effectiveness depends upon the type of nesting cover, skill of operator, weather conditions and other variable factors.

Unaware of the trials by Gollop and Munro with a technique described as the blanket net trap (Dzubin and Munro, *op. cit.)*, we began to experiment with an almost identical technique in 1954. Unframed pieces of two-inch mesh gill net were laid over the cover at nests situated in sites with a dense overhead canopy of shrubs. This technique is very successful at some kinds of nest sites. Some hens, however, do become wary of the overhead net and slip from the nest at the slightest hint of danger. Use of two-inch mesh netting, rather than one-inch mesh, proved more effective in that the hen becomes well entangled and is not as likely to work out of the net.

The need for a device with more universal application resulted in attempts to develop a simple trap that could be concealed at the nest. It also appeared desirable that such a trap should not require excessive alteration of the dense cover characteristic in many of the northeastern breeding marshes, since too much disturbance of cover also causes some desertion and encourages predation.

The trap described in this paper has been used since 1954 with slightly over 80 per cent success. Thirty-two hens have been taken in a variety of marsh and upland sites. Failures have resulted largely from trapping attempts under unusual conditions where it was impossible to approach within 100 yards of the nest site without causing the hen to flush, or walk from her nest. Occasional failures have also resulted when the trap was improperly set, or when a nesting hen disturbed the set in some of our earlier trials before we learned how to overcome this.

We have not yet had an opportunity to attempt to trap hens during the first half of the laying period. However, females have been taken from nests that were in all stages from the late laying period to late incubation.

The trap resembles a basketball net in general appearance. It consists of a stiff, but flexible, hoop with a 26-inch cylinder of two-inch mesh netting. The open end of the netting is provided with a purse

string. In operation, the netting is folded on the hoop and then the entire ring, consisting of hoop and netting, is placed around the nest (Fig. 1). The hoop is pegged to the ground. The pull cord is attached to the draw string and placed through a loop that is fastened to a stake, bush or limb over the nest. A quick pull of the cord at a point 30 to 100 yards from the nest causes the net to extend up and over the bird. At the same time this action purses the open end of the net.

Each 17-inch diameter trap requires the following materials:

Hoop—53 inches No. 6 electrical cable or similar material. It is important that the hoop be stiff, yet flexible enough to permit adjustment to conform with the irregular nature of the terrain at the nest site.

Net — 1 piece nylon netting, 2-inch mesh, 53 inches long, 26 inches wide. Actually, it is more satisfactory if the net is made on the hoop, much in the same manner that an ordinary dip net is constructed. A 26-inch cylinder of netting, for a 17-inch diameter trap may be woven from approximately 105 yards (less than one ounce) of size .022 inch nylon twine. The open end of the net should be provided with a series of loops for a draw cord, or purse string. The color of the net should blend with the materials usually associated with the nest sites.

Purse string—Approximately 70 inches of any hard finish, strong cord. To avoid tangling of lines, it is helpful, when setting the trap, if the color of this cord is slightly different from that of the netting.

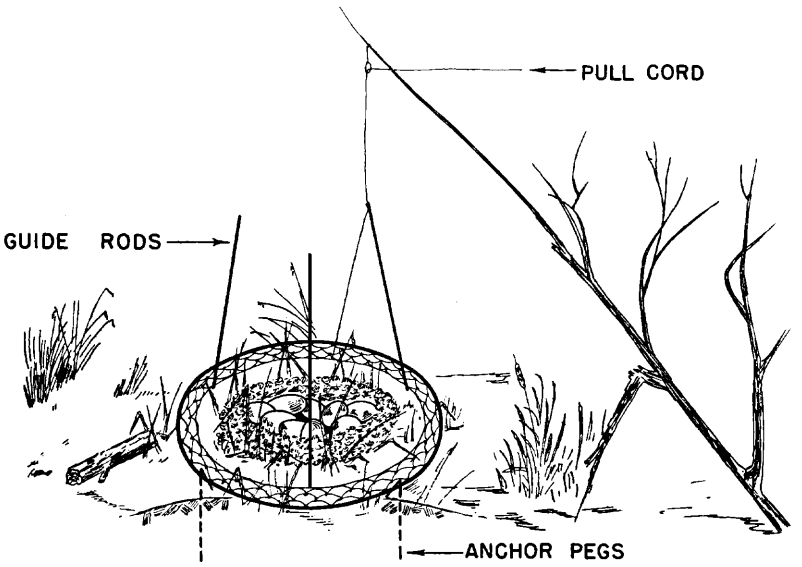

Fig. 1. A sketch showing details of the nest trap and of a completed set.

Pull cord or trip cord—20 to 100 yards of strong, hard finish cord. This cord should not have excessive "stretch."

No other materials except anchor pegs and guide pins are needed for operation. These may be cut on the spot from any convenient tree or bush. The guide pins may consist of rigid, smooth stems of local plants or of metal rods 18 inches to 24 inches long.

Preparations for use of the trap at a nest site involve the following:

1. *Provision for an anchor above the nest.* To provide the vertical motion for the trap, the pull cord must be anchored through a loop attached to some object 3-5 feet above the nest. Sometimes a bush or a limb already over the nest will serve this purpose. Usually, however, it is necessary to place a stake, 5 to 7 feet long and 1 to 1½ inches in diameter near the nest and in such a manner that it leans over it. A pole with a few small branches and leaves is suitable and blends with the cover better than a bare pole.

2. *Determination of the best approach for operation of the trip cord.* Points to consider include behavior of the hen, density of cover, prevailing winds, nearness to other known nests, and the usual route taken by the duck when she leaves and returns to her nest.

A person working with nesting waterfowl will, from past experience, have some idea as to how the species in question reacts to disturbance and how its reaction varies with different cover and weather conditions. In situations where a bird is inclined to be wary, a long pull cord (60 to 100 yards) is needed.

3. *An examination of the character of the ground or marsh at the nest site.* The hoop of the trap should be firmly anchored if possible. Soft, floating bog sites often require anchor pegs 18 inches long, whereas at nests on firm loam 6- or 8- inch pegs are sufficient.

The trap may be set when the nest is first located. However, it is usually best to wait one day or more to permit the duck to make at least one return trip to the nest before any additional disturbance to the site is made. Even though the trap is well concealed, some disturbance to the nest site and the surrounding cover is unavoidable. A female that is especially wary may not desert, but she will often slip from her nest and stand beside it at the slightest hint of danger.

The trap is set and operated in the following manner:

1. The observer proceeds to the nest with trap and with pre-cut anchor pegs and guide pins. All materials should be ready for use. This is important since any extra movement to obtain pegs, cord, or trap disturbs the cover more than is necessary. With a little practice it should be possible to make most sets by merely walking to the nest, remaining with feet in one position, and leaving the nest without disturbing much of the cover around it.

2. The pull cord is inserted in the loop in the overhead limb or stake. One end is attached to the drawstring on the top of the net. The pull cord should be on that side of the nest from which the duck is expected to attempt to depart. This is because the side of the netting attached to the cord will lift slightly ahead of the rest of the perimeter of the netting.

3. The trap is carefully lowered over the nest. To accomplish this it may be necessary to part the plants around the nest site. This should be done in such a manner as to break as few stems as possible.

4. The hoop is bent to conform closely with the terrain about the nest and is anchored in place by the pegs. Depending upon the ground cover, the hoop and pegs should be virtually concealed with the material at hand.

5. The net is carefully folded over the hoop or close to it. It, too, may be almost completely concealed if this seems necessary for the situation in question.

6. Guide rods are inserted inside the circle of folded netting (see Fig. 1). The guide rods serve two functions, viz., they insure that the net will not purse or close until it has passed above the hen; also the rods prevent the bird from pulling the netting out of place. During laying and the early stages of incubation, nesting ducks gather new material by reaching out to grasp that which is within their reach while on their nests, as described by Sowls (1955). The guide rods prevent the hen from disarranging the netting to the extent that it will not pull properly when the trap is sprung.

7. When the set is complete the pull cord is pulled through the loop, provided in the overhead limb or stake, far enough to take up any slack cord about the trap. To keep the cord from blowing in the wind, and also to reduce the chance of the bird plucking at it and disrupting the set, the cord must be anchored. This is easily accomplished by making a slit in the end of one of the guide rods. The cord is placed in this slit (see Fig. 1). It is thereby anchored sufficiently to prevent the wind or the bird from moving it too far. Yet, it will readily slip out when the operator pulls the far end of the cord.

8. The pull cord is laid out over the surrounding cover to a point that the operator has selected. This point should be well beyond the anticipated flushing distance of the hen. The cord is tied to a stake at this location. If the cover is dense, the route that the operator will take to reach the end of the trip cord should be clearly marked.

The operator may return to spring the trap anytime when he knows or suspects that the female is on the nest. On our areas the birds under observation usually returned to their nests after periods of 1½ to 3 hours. We have found it convenient to set the traps before 10:00 a.m., devote several hours to work in another section of the area, and then return to spring the traps between 2:00 and 4:00 p.m. In some situations we have set the traps one day and returned to spring them sometime within the next three days. However, the greater the interval, the more chance that the activities of the hen or the influence of weather factors (winds, heavy rains, changing water levels) may render the set ineffective.

The trap is sprung by a fast pull on the end of the pull cord. This causes the net to extend rapidly over the hen and close. The end of the cord may be tied to a stake while the operator approaches the trap to remove the duck.

At some sites (for example, nests on rocky ledges) it will be impossible to secure the hoop with pegs. Sometimes it can be tied to plant

roots. Or, as William Miller and Neil King of the Vermont Fish and Game Service have suggested, the hoop could be made of heavy lead cable to help hold it down. In situations when the trap cannot be anchored as firmly as desired, it is necessary to restrict the length of the action of the pull cord. This may be accomplished by placing a knot in the pull cord between the trap and the overhead anchor loop. The knot should be placed at a point that will permit enough action at the trap to cause it to extend and close over the hen, but not pull far enough to cause the poorly anchored hoop to rise from the ground.

There are several other minor details involved in setting and operating the trap, but they may best be learned from experience under the existing conditions. Needless to say, this technique, like any trapping technique, requires careful attention to many small details.

In the five cases where we have trapped, marked and banded incubating females and left their nests unmolested, each has returned to complete incubation. Some ducks have been trapped twice within a period of three to four weeks.

It seems likely that the trap described may be of use in trapping other nesting birds when this is necessary. With modifications in size it might be adapted for a variety of species. Our initial traps were constructed from scrap material including two-inch mesh gill netting. Later models were made from good grade nylon twine by an experienced net maker at a total cost of $3.00 each.

LITERATURE CITED

DZUBIN, ALEX and D. A. MUNRO. 1956. Nest Trapping *in* Guide to Waterfowl Banding. U. S. Fish & Wildlife Service, Sec. 2700-2790.

SOWLS, LYLE K. 1955. Prairie Ducks. The Stackpole Co., Harrisburg, Pa. 193 pp.

WELLER, MILTON W. 1957. An Automatic Nest-trap for Waterfowl. *Jour. of Wildl. Mgt.*, **21** (4) : 456-458.

Maine Cooperative Wildlife Research Unit, Orono, Maine.

GENERAL NOTES

Behavior Notes on the Ipswich Sparrow.—During the spring of 1958, while engaged in migration banding operations on the northern coast of Massachusetts with Carl W. Helms, the author was able to make a few field notes on the behavior of Ipswich Sparrows, *Passerculus princeps*. This species breeds only on Sable Island (off Nova Scotia) and winters uncommonly along the Atlantic coast, and as such has not been studied extensively by field workers. Observations reported below were made on April 5, 6, 13, and 20 at the Parker River National Wildlife Refuge on Plum Island, Mass. Most of the individuals observed were feeding in the same areas with Savannah Sparrows *(P. sandwichensis)* at the water's edge of the man-made empoundments on the western (inland) side of the island. A few were also observed in a brush area where banding mist nets were set up, and one Ipswich was banded, along with several Savannahs. The actual sand dune areas, often cited as the only habitat of the Ipswich, were not investigated.

Feeding and non-social behavior were observed in several individuals. Feeding of the Ipswich resembles that of many ground-feeding emberizines. A bird will move along the ground, pecking intermittently, and then may fly a short distance and begin searching again. The actual pecking movement consists of lowering the head swiftly, while the body is held almost horizontally, and the tail is flicked