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A NEW METHOD OF CAPTURING NOCTURNAL ALCIDS

By C. JOHN RALPH and FRED C. SIBLEY

INTRODUCTION

During the work of the Point Reyes Bird Observatory on the Farallon Islands, 26 miles west of San Francisco, estimates of the number of Cassin's Auklets (*Ptychoramphus aleuticus*) which breed on the islands were desired. Direct counts were impossible since this is a nocturnal species that flies to the islands by tens of thousands only after dark. Burrow counts did not prove practical because of the difficulty of determining which were occupied. The "Lincoln Index" method of mark-recapture (see Hayne, 1949 for discussion) was the obvious solution, provided that a method of randomly capturing large numbers of auklets could be developed.

Cassin's Auklets nest over most of the island surface, adapting to all varieties of terrain. They fly to the island shortly after dark, traveling slowly and evidently at the altitude of their burrow, most birds arriving within a half-hour period. In the morning the auklets leave the island from about two hours before dawn until daybreak. In this latter flight, they travel very rapidly, head directly for the sea and most fly between five and twenty-five feet above the ground.

During 1967 the Observatory attempted to use mist nets as earlier investigators had done (Kridler and Newton, 1961). This proved satisfactory during the incoming flight, but not during the morning flights when the birds were traveling at speeds probably

exceeding 35 mph. Most birds went through the nets, and those that were stopped damaged the mesh with their claws.

Observatory personnel also tried spotlighting birds on the ground and capturing them with long-handled nets (Smail, 1967) as others have done (Campbell, 1968). Large numbers of birds were captured in this manner, but workers tended to concentrate on areas where auklets were most abundant or easily accessible. This non-random capture ruled out application of the "Lincoln Index."

DESCRIPTION OF METHOD

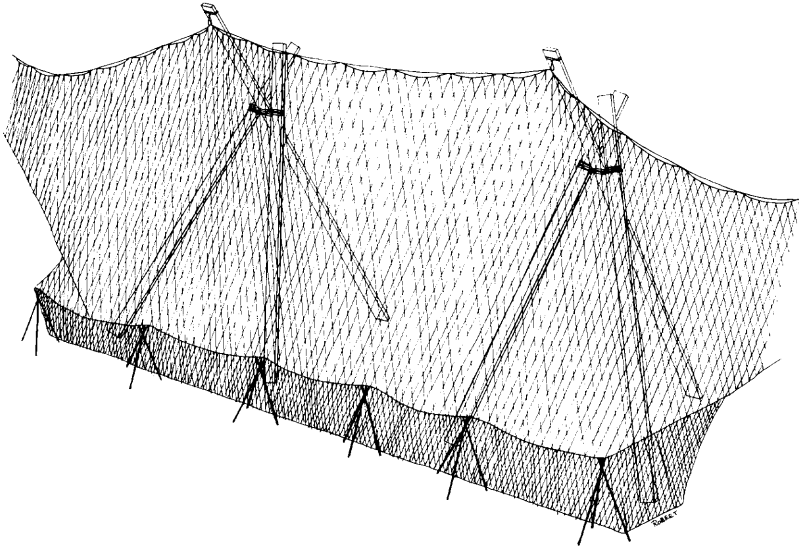
In the spring of 1968 we strung large fish nets across flight lines and obtained random samples of the population with a minimum of effort. This method should be applicable to other Cassin's Auklet populations and probably to other alcids.

A fish net 60 feet long and 20 feet wide was erected between the two houses on the island, wooded tripods being used in the middle to hold the net about 15 feet off the ground (Figure 1). The bottom of the net was then pulled in the direction from which the birds would come and curled up to form a catchment basin about three feet wide and two feet deep. The net was placed parallel to the shore-line at the base of the hill. By suspending the net from three wooden tripods the need for tying to the buildings was eliminated and the apparatus could be transported to other areas of the island. Short tripods were useful in holding up the outer edge of the net to form the catchment basin. Later modification by Dr. L. Richard Mewaldt has incorporated commercially available nylon netting which is much lighter and thus much easier to erect. A net of this material can be supported by single well-secured aluminum poles rather than by tripods. The prime consideration is of course to make the net as high and wide as possible.

Birds coming down the slope in the morning level off at five to twenty-five feet above the ground and birds flying below fifteen feet hit the net and tumble down the sloping net into the pocket at the bottom. One or two people patrol this pocket picking up birds and putting them in sacks for later processing. This method would be unsuitable for most other groups of birds, but alcids are limited in their maneuverability and cannot take off in the limited space of the catchment basin.

Experimentation showed that mesh sizes greater than 1/4 inch (not stretched) allowed auklets to go through the net or become badly tangled; with 1/4 inch mesh there was no tangling. In high winds about half the birds escaped from the pocket at the bottom of the net even with constant patrolling. Rigging of a higher net did not produce a markedly larger catch as few birds fly over 15 feet and a large proportion of birds bouncing off a higher net overshoot the pocket at the bottom and escape capture. During trials with various net settings, about 100 birds were captured during each evening flight and often more than 200 during the morning flight. A large proportion of birds in the evening flight regurgitated when captured and this could cause starvation-related mortality in the colony.

Figure 1. Design of alcid net. Length as shown is shortened; actually the tripods are 35 to 40 feet apart in the two-tripod set-up shown.



EFFECTIVENESS

Application of the "Lincoln Index" to the evening flights gave vastly different estimates of the population, apparently because of the small number of birds caught and the small area from which they must have come. It appears that there is considerable wandering during the evening flight so that birds from a great distance may be captured. On the other hand, estimates derived from mark-recapture of birds in the morning flight gave consistent results. All birds came from the area uphill from the net as indicated by observation of late leaving birds in the vicinity of the houses. An estimated 5000 birds used the space between the houses as a flight line, and we were capturing about four percent of these each morning. In the second location where netting was attempted there were an estimated 2500 birds uphill from the net, about eight percent of them being caught each morning. With a low wind, 1/4 inch mesh nets, and the net set at 15 feet, one should expect to pick up about ten percent of the birds. Moonlight will make the nets more visible and thus increase the number of auklets going over the top of the net.

Net losses from birds running into the wooden tripods were less than one bird a night and no injuries were noted from birds hitting or being entangled in the netting. More than ten auklets placed in a burlap sack soon overheat and some mortality might result.

This mortality would be increased by placing the bag in a heated room or leaving the bag in the sun while processing other birds. The banding crew should process all birds within an hour after first light. If necessary the nets should be taken down early to avoid capturing too many birds. Gull predation can result from releasing birds after first light as the auklets will run to the nearest hole or rock rather than flying, and the more exposed birds are easy prey for gulls. However, if birds are thrown into the air they quickly orient themselves and fly out to sea.

This capture system has many advantages over other methods—ease of operation, low net mortality, high capture rate, insignificant disturbance to the nesting areas, and highly random capture and recapture. Two men can easily transport this net system to various localities, erect it in less than 20 minutes, and obtain a random sample of considerable size with minimal disturbance to the area. The net set can easily be duplicated in other years or at other times of the year.

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