

EVALUATION OF A PLASTIC WING-MARKER FOR GULL STUDIES

By WILLIAM E. SOUTHERN

Various methods have been used for the identification of individual birds under field conditions. Many of the devices described by Anderson (1963), Hester (1963), Hewitt and Austin-Smith (1966), and Thomas and Marburger (1964) were designed to provide information supplemental to that obtained from the recovery of Fish and Wildlife Service leg bands and to do so without the necessity of recapturing or killing the bird.

In 1967 I initiated a project designed to determine the migration routes, winter ranges, and dispersal patterns of Ring-billed Gulls (*Larus delawarensis*) from various Great Lakes populations. Adult gulls were cannon-netted in two Michigan breeding colonies, one located near Rogers City (Presque Isle County) on Lake Huron and the other on Ile aux Galets (Emmet County) in Lake Michigan. In addition to Fish and Wildlife Service leg bands 2,545 plastic wing-markers were attached to adult gulls between 1967 and 1970. This paper describes the marker and briefly evaluates its contribution towards realization of the project's goals. Reports summarized herein were received between June 1967 and May 1970. Birds marked during the 1970 breeding season are not included in the tabulations.

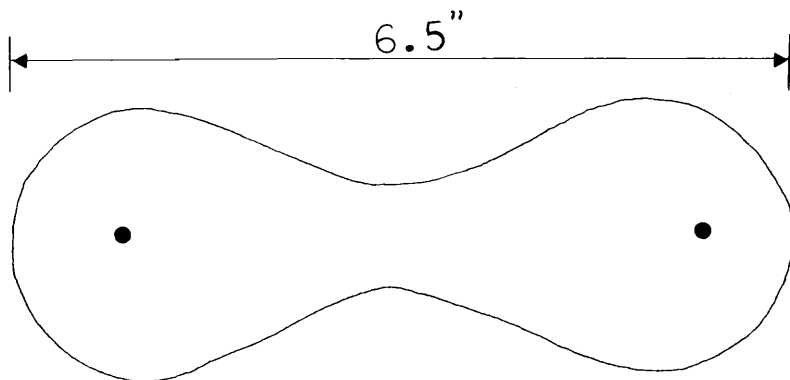
MATERIALS AND METHODS

The material used for the tags is a plastic-coated nylon fabric called "SafFlag" by the manufacturer (Safety Flag Company of America, P. O. Box 1005, Pawtucket, Rhode Island). The colors Blaze Orange and Dark Blue proved to be most satisfactory for my purposes although Light Blue was also used for one season. Many of the available colors are so similar that they are likely to be confused by field observers.

The marker design found to be most suitable after a series of preliminary tests is illustrated in Figure 1. Black numerals or patterns were painted on some of the markers with RamCote paint (5950 South Pulaski Road, Chicago, Illinois). The 6.5 x 2.25 inch dumbbell shape was decided upon because it was large enough to be conspicuous under most field conditions but apparently not so large as to produce obvious changes in the gull's flight capabilities.

The marker was attached by folding the narrow central portion (about 0.87 inch) over the leading edge of the humerus between the secondaries and the scapulars. A single metal eyelet was put through the holes indicated in Figure 1 and crimped to hold the marker in position. This size of marker weighed less than three grams and the cost of each, excluding labor, was 13 cents.

Figure 1. Design of wing-marker used on Ring-billed Gulls.



RESULTS AND DISCUSSION

The first markers were attached to Ring-billed Gulls captured in the Rogers City colony during May and June of 1967. Only 164 markers were applied during the first season because I wanted to ascertain whether a significant number of reports of wing-marked birds could be received to justify the time required to attach markers in addition to leg bands. No publicity was given to the project during the first season, therefore, it was necessary for reports to be directed to me through the Bird Banding Office at Patuxent. Even under these circumstances I received 155 reports between June 1967 and May 1968 (see Table 1). The following spring I observed at least 50 of the marked gulls in the colony. These results seemed to justify more extensive use of the technique and I expanded the project to include the Ile aux Galets colony and made an attempt to acquaint potential observers with the project.

TABLE 1. THE NUMBER OF RING-BILLED GULLS WING-MARKED IN EACH COLONY AND THE TOTAL REPORTS RECEIVED EACH YEAR

Year	Rogers City Colony		Ile Aux Galets		Both Colonies Combined	
	Number Wing-marked	Number of Reports	Number Wing-marked	Number of Reports	Number Wing-marked	Number of Reports
1967-68	164	155	164	155
1968-69	240	252	536	148	776	400
1969-70	270	823	550	373	820	1,196
Total	674	1,230	1,086	521	1,760	1,751

Between 1967 and 1969, my assistants and I attached 1,760 wing-markers to Ring-billed Gulls from the two colonies. Table 1 indicates the number of birds marked each year and also the respective number of recoveries. Table 2 compares the number of reports for wing-markers with the recoveries received from 2,502 Fish and Wildlife Service leg bands applied to adult Ring-billed Gulls during this same period. Although more birds were banded than wing-marked, the number of wing-marker reports received from outside the colony area was considerably larger (1751 compared to 137).

This type of marker remained on some gulls for over three years and they were still recognizable at the end of this time. Considerable fading had occurred with some of the orange material appearing yellow and some almost flesh-colored. The amount of wear after this length of time also varied with some markers being badly frayed while others remained intact. In some instances the eyelets were badly rusted. It is impossible to estimate the number of markers removed by birds, because of the unknown rates of mortality and emigration to other colonies. On three occasions we found two- or three-year-old markers on the ground in the colonies indicating that it becomes possible for some gulls to remove markers after this length of time. At this moment I am unable to explain the differential rates of wear but it may be correlated with the relative amounts of time spent in salt water areas.

TABLE 2. COMPARISONS OF THE NUMBER OF REPORTS RECEIVED FOR WING-MARKERS AND FOR LEG BANDS, 1967-70

Colony	No. Adults Banded	Number of Recoveries	Number of recoveries made in and away from colony		No. Adults marked Wing-	Wing-marker Reports for previous column
			In	Away		
Rogers City (orange)	1,119	70	34	36	674	1,230
Ile aux Galets (blue)	1,383	141	40	101	1,086	521
Total	2,502	211	74	137	1,760	1,751

In spite of such losses, at least 15 per cent of the markers attached to ring-bills at Rogers City during 1967 and 1968 were recorded as being birds present in the colony in May 1970. An exact count was not possible because the markers were not numbered but I am certain that this figure represents the minimum number actually present. In addition, I recorded 117 of the 270 sequentially numbered markers that I attached during 1969.

The birds were able to "preen" the markers in and out of view

to the observer. Thus a series of observations is usually necessary to reveal accurately the number of marked birds actually present.

The Bright Orange markers are most obvious under field conditions as is verified by the smaller number of reports submitted for the blue markers even though more blue ones were used (Table 2). Furthermore, the blue material appears to wear more rapidly and the RamCote paint peels from it sooner. The black numerals were still recognizable on most of the orange markers after one year whereas they were not on the blue. The blue fabric, however, does not appear to fade as rapidly as the orange.

Numerous reports of both colors of marker have come from as far south as southern Florida and Texas. Birds known to have wintered in Florida have been recorded back in the breeding colony the following spring. Other gulls with numbered markers have been reported from several localities during fall migration thereby providing information about their specific flight paths.

The presence of markers does not apparently interfere with breeding activities or success since I have recorded marked birds as being mated to unmarked birds as well as paired to wing-marked individuals. Such combinations existed during the initial year of marking and also during subsequent breeding seasons. Tagged gulls have been filmed successfully defending territory, copulating, and caring for young.

The markers may cause some wear to the coverts and if fastened too tightly around the humerus some integumental callousing may occur. Neither condition appears to be serious. I have retrapped and examined several hundred previously marked gulls, many of which had carried markers for as long as three years, and tissue damage was noted in only a few instances.

LITERATURE CITED

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*Dept. of Biological Sciences, Northern Illinois University,
DeKalb, Illinois 60115.*

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