

## SUITABILITY OF VELCRO® LEG TAGS FOR MARKING HERRING AND GREAT BLACK-BACKED GULL CHICKS

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**Abstract.**—The suitability of Velcro leg tags for marking Herring (*Larus argentatus*) and Great Black-backed (*L. marinus*) Gull chicks was assessed. Tag loss was inversely related to frequency of colony-site visitation, as was tag-related injury, and directly related to species size. Differences in tag loss between species were attributed to differential growth rates. Velcro tags are unsuitable for Herring and Great Black-backed Gull productivity studies, but may be useful for short-term studies.

### EFICACIA DE LA UTILIZACIÓN DE VELCRO® PARA PONER MARCAS EN LAS PATAS DE PICHONES DE *LARUS ARGENTATUS* Y *L. MARINUS*

**Sinopsis.**—Se determinó cuán eficaz es la utilización de velcro para marcar en la pata a pichones de las gaviotas *Larus argentatus* y *L. marinus*. La pérdida de los marbetes (marcadores) estuvo inversamente relacionada con la frecuencia de visitas a las colonias, como lo fue la relación directa de daños por el uso de marbetes, al tamaño de las gaviotas. La diferencia en la pérdida de marbetes, entre especies, fue atribuida a tasas diferentes de crecimiento entre los pichones. Los marbetes de velcro son inadecuados para estudios de productividad con ambas especies de gaviotas, pero podrían ser útiles, para estudios a corto alcance.

The lack of a universal, long-lasting, easily read tag suitable for identifying large numbers of individual birds has led to the development of marking systems appropriate for some, but not all, avian taxa. Willstead and Fetterolf (1986) developed a numbered Velcro® tag that was durable, easily read, and quickly and easily applied. They marked 129 Ring-billed Gull (*Larus delawarensis*) chicks, none of which were known to have lost tags applied for 7–13 d (Willstead and Fetterolf 1986). The suitability of these tags for Ring-billed Gull studies led Willstead and Fetterolf (1986:312) to conclude that these tags “provide a valuable identification technique for many precocial and semi-precocial birds.” Here, however, we report on problems encountered while using these tags to mark Herring (*L. argentatus*) and Great Black-backed (*L. marinus*) Gull chicks.

### METHODS

Velcro leg tags were used to identify chicks during a 2-yr study of gull productivity on Monomoy National Wildlife Refuge, Chatham, Massachusetts (41°37'N, 69°57'W). Tags were 7.5 × 1.25 cm strips of coachman green Velcro (color 650, Velcro USA) and were constructed as described in Willstead and Fetterolf (1986). We used two 1.5 × 1.25 cm strips of hooked Velcro, sewn back-to-back with nylon thread, to connect the ends of a tag. Tags were fastened to the upper leg so that they were loose enough to turn freely, but tight enough so that they could not pass

over the tibiotarsus. We used these tags to mark a total of 341 Herring and 207 Great Black-backed Gulls.

We attempted to identify individual gulls, for hatching to fledging (approximately 7 wk), by repeatedly locating tagged chicks. We visited the colony-site approximately twice per week in 1988 and twice per month in 1989. In both years, colony-site visits were conducted during the 9-wk period after the first chick was tagged, and a final search conducted 3 wk later. Typically, chicks were first tagged at 0–4 d of age in 1988 and 0–14 d of age in 1989. During each colony-site visit we secured or loosened tags as necessary and intensively searched study plots for lost tags. Velcro tags found on the ground and either partially or entirely open were considered lost by a bird. Tags found closed were typically associated with body parts (i.e., attached to a carcass or with broken bones) and considered representative of a mortality rather than a tag loss. Not all tagged chicks were encountered during each visit to the colony-site and no records were kept of which tags were adjusted.

We used two-way contingency tables and Chi-square ( $\chi^2$ ) analysis (Stastix 3.1, Analytical Software, St. Paul, Minnesota) to test for differences in tag loss within species between years and between species within years. All tests involved two classes ( $df = 1$ ), and tag losses were considered to differ significantly when  $P < 0.05$ . Percentages of tags lost were calculated by dividing the number of chicks tagged by the number of tags lost, and multiplying the product of this division by 100%.

#### RESULTS AND DISCUSSION

Rates of tag loss varied within species between years and between species within years (Table 1). Herring Gull tag loss was significantly higher ( $\chi^2 = 5.48$ ,  $P = 0.0192$ ) in 1989 than in 1988, whereas no significant difference ( $\chi^2 = 0.42$ ,  $P = 0.5180$ ) was observed between years for Great Black-backed Gulls. In 1988 Great Black-backed Gulls had significantly higher tag loss than did Herring Gulls ( $\chi^2 = 7.11$ ,  $P = 0.0077$ ). In 1989 Great Black-backed Gull tag loss was also higher than for Herring Gulls, although not significantly so ( $\chi^2 = 2.44$ ,  $P = 0.1183$ ).

Tag loss was inversely related to the number of visits to the colony-site. As chicks appear to ignore Velcro tags shortly after attachment (Willsted and Fetterolf 1986, pers. obs.), it is likely that most losses were due to chicks outgrowing tags. As the girth of a chick's leg approached the size of the tag's opening, the tag began to constrict the leg. Additional growth typically resulted in a partial separation of the loop and hook sections of Velcro, proximal to the chick's leg. This partial separation increased the likelihood of tag loss. If chicks could be captured often enough, and tag diameters adjusted, then tag loss should be minimized. We believe the higher levels of tag loss in 1989 were the result of fewer colony-site visits and corresponding increases in chick size between visits. This problem was previously unreported for Velcro tags, presumably because the tagging period of Willsted and Fetterolf (7–13 d; 1986) did not allow enough time for Ring-billed Gull chicks to outgrow their tags.

TABLE 1. Numbers of Herring and Great Black-backed Gull chicks fitted with Velcro® tags and percentages of tags lost.

Species	1988		1989	
	#	%	#	%
Herring Gull	149	3.4	192	9.9
Great Black-backed Gull	80	12.5	127	15.7

Infrequent tag adjustment may also cause problems for birds that retain tags. In 1989 we observed abscesses on the legs of two (1.6%) Great Black-backed Gull chicks (15 and 30 d after tagging). These abscesses occurred above and adjacent to tags and caused chicks to limp. We observed no such abscesses in 1988, when tags were adjusted frequently. No abscesses were observed on Herring Gull chicks in either year, nor were any reported by Willstead and Fetterolf (1986). We believe these abscesses resulted from the failure of some tags to expand during periods of long-term tagging with infrequent adjustment.

Thread failure resulted in minor tag loss. In 1988 two (1.3%) Herring and one (1.3%) Great Black-backed Gull tags were lost as a result of separation of pieces of back-to-back, hooked Velcro. Separation was due to incomplete stitching, and was eliminated during the 1988 field season by inspecting the remaining tags before use and discarding incompletely sewn pieces. Willstead and Fetterolf (1986) avoided this problem by using a Velcro tape that had hooks on both sides. Contact with the manufacturer (Velcro USA, Inc., Manchester, New Hampshire) in 1988 indicated this back-to-back tape was unavailable, so pieces of back-to-back, hooked Velcro were used instead. We believe carefully sewn and inspected pieces of hooked Velcro an appropriate substitute that does not increase the incidence of tag loss.

Tag loss may also be related to species size. In 1988, when tags were adjusted frequently, Great Black-backed Gull tag losses were greater than Herring Gull tag losses, suggesting Great Black-backed Gulls outgrew tags more rapidly than did Herring Gulls. If so, Velcro tags may be unsuitable for larger species of gulls even when tags are adjusted frequently. Information on tag loss versus growth rates of tibia girth, for species of various sizes, would make an important contribution in the evaluation of the suitability of Velcro tags as a marking technique.

Our findings indicate Velcro leg tags are less suitable for identifying gull chicks than previously suggested. For Herring and Great Black-backed Gulls, tags must be frequently adjusted to minimize tag loss and tag-related injury. As disturbance is known to affect gull productivity negatively (e.g., Fetterolf 1983, Hunt 1972, Mosseau 1984), any benefits gained by frequently adjusting tags may be lost by researcher-induced decreases in productivity. Velcro tags, therefore, are better suited for short-term uses (e.g., identification of individual chicks for behavioral studies)

rather than marking chicks from hatching until fledging, as suggested by Willsted and Fetterolf (1986).

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