Leg Bands Cause Injuries to Parakeets and Parrots

J. Michael Meyers
U.S. Department of the Interior
National Biological Service
Patuxent Environmental Science Center
P.O. Box N, Highway 191, KM 4.4
Palmer, Puerto Rico 00721-0501

INTRODUCTION

Many exotic species of parrots have become established breeding birds in the United States and Caribbean Islands (AOU 1983). Because of their increasing populations in exotic habitats and declining populations in native habitats, I anticipate that more studies involving banding will be conducted on psittacines in the future. Most psittacines are difficult to mark because of their strong beaks and ability to manipulate items with their tongue and feet. Currently, most parrots are marked with stainless steel bands that are made from round 3.1 mm diameter rods and are not numbered in ways to trace the bander or report recovery information. Snyder et al. (1987) believed foot infections or injuries may result from use of aluminum U.S. Fish and Wildlife Service (USFWS) bands or leg bands that are made from coiled strips of plastic (flat, rather than round band material). Because of the hypothesized risks of injury, banders presently may not be using aluminum butt-end bands on parrots.

The *North American Bird Banding Manual* (Canadian Wildlife Service and USFWS 1991) lists the sizes of butt-end aluminum bands that are recommended for use on parrots and parakeets. My first objective was to determine the difference for resightings (returns) of Orange-fronted Parakeets *(Aratinga canicularis)* that were patagially marked and also banded with aluminum butt-end bands, stainless steel bands, or no bands. I also determined which of these bands caused injuries. My second objective was to determine differences in leg injuries for *Amazona* spp. that were leg banded with aluminum lock-on bands and stainless steel bands.

MATERIALS AND METHODS

I captured Orange-fronted Parakeets at Cabezas de San Juan in northeastern Puerto Rico using elevated mist nets near roosting sites (see Meyers and Pardieck 1993, Meyers 1994). All parakeets were marked on both patagia with plastic tags for individual identification (Rowley and Saunders 1980). I also banded parakeets with size 3, USFWS aluminum butt-end bands at the beginning of the study (December 1991-May 1992). Some of these parakeets were recaptured within a year, examined for leg injuries, and rebanded with round stainless steel bands after the USFWS aluminum bands were removed. The remaining parakeets were leg-banded later in the study (May 1992-January 1994) with round stainless steel bands (6 mm inside diam.). A small group of parakeets were marked only with patagial tags (i.e., no leg bands) during this time.

From December 1991 to April 1994, the parakeets were surveyed at the roosting area from 1600-1830 hours, at least one to two times per month, using 10X binoculars and 80-130X telescopes. Individual birds were identified by patagial markers and observations were made, when possible, on the condition of their legs. I used Fisher's exact test (2 x 3 contingency table) to evaluate whether the proportion of parakeets resighted or not resighted >30 days after marking was related to the type of band: flat aluminum, flat aluminum removed and replaced with round stainless steel, and no leg band (Conover 1980).

I captured *Amazona* parrots in southern and western Puerto Rico from 1991-1993 using mist nets (see Meyers 1994). I marked three Hispaniolan

Parrots *(Amazona ventralis)* and four White-fronted Parrots *(A. albifrons)* using USFWS aluminum lock-on bands (size 6) on one leg and plastic leg bands on the other (Meyers in press). The remaining parrots (Hispaniolan Parrot; Orange-winged Parrot, *A. amazonica*; Red-crowned Parrot, *A. viridigenalis*) were marked with round stainless steel bands (12 or 16 mm inside diam.) and plastic leg bands. Radio transmitters were also attached to all but two parrots (Meyers in press).

Parrots were surveyed at roosts and by radio telemetry (homing) from October 1991 to January 1994 and were observed with 10X binoculars and 80-130X telescopes. During the first year after marking, the parrots were radio tracked for one to two weeks per month and observed quarterly thereafter. During these surveys, detailed observations were made on the condition of the parrot's banded leg. I evaluated the effect of band type (aluminum lock-on and round stainless steel) versus injury or no injury (2 x 2 contingency table) using Fisher's exact test (Conover 1980). The study was conducted with methods approved by an Animal Care and Use Committee under the guidelines of the Animal Welfare Act.

RESULTS

Orange-fronted Parakeets with flat aluminum leg bands were resighted less frequently (Fishers' exact, $P = 0.0009$) than parakeets without leg bands or with aluminum bands that were removed during the first 120-438 days (Table 1). Parakeets marked with flat aluminum bands and recaptured within 120-160 days (n = 3) had developed calluses and skin overgrowth on their legs above and below the band. By 238 days after banding, the flat aluminum band caused severe swelling on the leg, above and below the band of one parakeet. Four of six parakeets recaptured 400-435 days after banding exhibited open wounds caused by the flat aluminum leg bands. One parakeet with a flat aluminum band lost its leg, presumably caused by the band. The parakeet was resighted four times and later recaptured two years after banding. Three parakeets that were rebanded with stainless steel bands and later recaptured, successfully recovered from previous injuries caused by the flat aluminum bands.

All parakeets banded with flat aluminum bands (n = 29) and later recaptured (n = 11), showed potential leg injury within 120 days of banding. None of the parakeets marked with round stainless steel bands (n = 110) and later recaptured (n = 23) showed evidence of leg injuries. During the last 22 months of the study when continuous marking and surveying were conducted, 77% of the parakeets banded with round stainless steel bands were resighted >30 days after banding (range = 41-454 days).

Amazona spp. marked with flat aluminum lock-on bands sustained more leg injuries than those marked with round stainless steel bands (Fisher's exact test, $P = 0.0006$). None of the ten parrots marked with stainless steel bands sustained leg injuries; whereas, six of the seven parrots marked with flat aluminum lock-on bands developed leg injuries. One of seven parrots marked with a lock-on band was recovered dead at 13 months after banding. It died from a severe leg infection and wound caused by the lock-on band rubbing the leg above the band. The band was not damaged.

DISCUSSION

The flat aluminum or lock-on leg bands that are currently issued by the USFWS Bird Banding Laboratory (BBL) should not be used on psittacines. Even though the largest recommended size was used on Orange-fronted Parakeets, the bands caused injuries. The aluminum butt-end bands were not damaged by the parakeets (e.g., crushed), but may have rubbed the leg. This problem may be alleviated by using bands with extra space between the inside of the band and leg. Bands should cover <50% of the tarsus to prevent rubbing at the top and bottom of the tarsus. The aluminum lock-on bands were not damaged by parrots, but the inside diameter (e.g., recommended fit similar to passerines, with little space between the band and leg) and height of the band (10 mm) probably caused the leg injuries. Bands for psittacines can be flat, however, and still not injure them. Bands applied with 4-5 mm total space between the inside of the band and leg, and also with a band width (height) <50% of the length of the tarsus did not injure parrots, e.g., plastic bands 5-7 mm high for certain *Amazona* spp. (Meyers in

press). Bucher also used aluminum bands on 753 Monk Parakeets *(Myiopsitta monachus)* without injury to the birds (Beissinger and Bucher 1992).

Leg bands for psittacines should be manufactured from round stainless steel (3.1 mm diam. #302 steel for most *Amazona* spp.) that is slightly flattened and with a lock-on design. Other light weight but hard alloys may be acceptable. Also, an official USFWS number, code, and address could be imprinted on these bands as needed. Banders may obtain USFWS numbers from the BBL for these special bands (pers. commun., K. Klimkiewicz, BBL, Laurel, MD 1993) and thereby increase the recovery rate for banded psittacines.

SUMMARY

I marked parakeets (146) and parrots (17) for individual identification using patagial markers, colored leg bands, and radio transmitters. Parakeets were also leg banded with USFWS, size 3 aluminum bands, round stainless steel bands (6 mm inside diam.), or no band. Parrots were leg banded with USFWS size 6 aluminum lock-on bands or round stainless steel bands (12-16 mm inside diam.).

Fewer parakeets banded with flat aluminum butt-end bands were resighted (Fisher's exact, P = 0.0006) and more had leg injuries when compared to unbanded parakeets or parakeets with aluminum butt-end bands removed within 13 months of banding. Flat aluminum lock-on bands caused more leg injuries to parrots (Fisher's exact, P = 0.0006) than round stainless steel bands.

I recommend that the currently available flat aluminum or lock-on bands not be used on psittacines. Leg bands for these birds should be made of stainless steel or another hard alloy, narrow in height (<50% of tarsus length), and fitted so that the inside of the band has at least 4-5 mm total space between the band and leg for a medium-sized parrot; e.g., Hispaniolan Parrot.

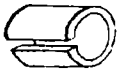
ACKNOWLEDGMENTS

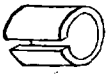
I thank Keith L. Pardieck and Morris S. Ford for their assistance in capturing, marking, and radio-tracking psittacines during this study. Rafael de Leon and Jennifer D. Horn assisted with trapping during the first months of the study. Helpful comments on earlier drafts of the manuscript were provided by Deanna K. Dawson, Brian R. Chapman, and M. Kathleen Klimkiewicz. This project would not have been possible without the assistance of Betsey Payne of The Conservation Land Trust of Puerto Rico, Antonio Sotomayor-Rios of the USDA Tropical Agricultural Research Station, and Juan Gonzalez of the Central Aguirre Golf Course, Puerto Rico, who kindly allowed me access to sites for conducting the study.

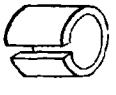
Table 1. The number of patagial marked Orange-fronted Parakeets resighted and not resighted by type of leg band at Cabezas de San Juan, Puerto Rico, 1991-1994.

	Type of Leg Band[1]		
Status	Aluminum	Aluminum Removed[2]	None
Resighted	7[3]	11[4]	6[5]
Not resighted	11	0	1

[1] Fisher's exact test (2-tailed), P = 0.0009.
[2]Aluminum bands (butt-end, size 3 USFWS) removed upon recapture.
[3]Maximum number of days from banding to resighting = 451-775.
[4]Maximum number of days from banding to resighting = 400-838.
[5]Maximum number of days from banding to resighting = 174-634.







LITERATURE CITED

American Ornithologists' Union. 1983. Check-list of North American birds, 6th ed. American Ornithologists' Union, Allen Press, Inc., Lawrence, KS.

Beissinger, S.R. and E.H. Bucher. 1992. Sustainable harvesting of parrots. Pages 73-116 *in* S.R. Beissinger and N.F.R. Snyder, eds. New world parrots in crisis. Smithsonian Institution Press, Washington, D.C.

Canadian Wildlife Service and U.S. Fish and Wildlife Service. 1991. North American bird banding volume 1. Minister of Supply and Services, Ottawa, Ontario, Canada.

Conover, W.J. 1980. Practical nonparametric statistics, 2nd ed. John Wiley & Sons, New York, NY.

Meyers, J.M. 1994. Improved capture techniques for psittacines. *Wildl. Soc. Bull.* 22:511-516.

_____. in press. Evaluation of three radio transmitters and collar designs for *Amazona*. *Wildl. Soc. Bull.* 23.

_____ and K.L. Pardieck. 1993. Evaluation of three elevated mist-net systems for sampling birds. *J. Field Ornith.* 64:270-277.

Rowley, I. and D.A. Saunders. 1980. Rigid wing-tags for cockatoos. *J. Aust. Bird Study Assoc.* 1:1-7.

Snyder, N.F.R., J.W. Wiley, and C.B. Kepler. 1987. The parrots of Luquillo: natural history and conservation of the Puerto Rican Parrot. Western Foundation of Vertebrate Zoology, Los Angeles, CA.