

A COLOR BAND FOR SPOTTED OWLS

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Abstract.—We describe a plastic color band made from laminated engraver's plastic that can be used to mark Spotted Owls (*Strix occidentalis*) and other large birds. Hundreds of unique combinations can be obtained by routing geometric patterns into the plastic band and by attaching a short, flexible colored tab to the band. Of 3788 Spotted Owls that were re-observed in one or more years following initial banding, only four lost their color bands, an observed band loss rate of 0.1%. Color bands are particularly effective on Spotted Owls because they are tame and can be closely approached during the day. Color bands may not be effective on owls that are difficult to approach or that cannot be easily observed during the day.

ANILLAS POLICROMADAS PARA BUHOS

Sinopsis.—Describimos una anilla de plástico policromado hecho de plástico laminado que puede utilizarse para anillar búhos (*Strix occidentalis*) y otras aves grandes individualmente. Se pueden obtener centenares de combinaciones únicas grabando dibujos geométricos en la anilla y fijando una pequeña pihuela flexible a la anilla. De los 3.788 búhos (*Strix occidentalis*) reobservados en uno o más años después del anillaje inicial, sólo cuatro perdieron sus anillas policromadas, una tasa de pérdida de 0.1%. Las anillas policromadas son particularmente eficaces para estos búhos ya que son bastante mansos y uno puede acercarse a ellos de día. Puede que las anillas policromadas no sean eficaces para búhos a que uno no puede acercarse o que no pueden ser observados de día.

Although color bands have been used extensively for marking diurnal birds (Anderson 1980, Hill 1992, Marion and Shamis 1977, McCollough 1990, Meyers 1995, Ogilvie 1972), they have been used infrequently on owls. We experimented with several types of colored bands that could be used to mark individual Spotted Owls (*Strix occidentalis*) so that they could be visually identified each year without retrapping. The color band we developed has since been adopted by most investigators conducting

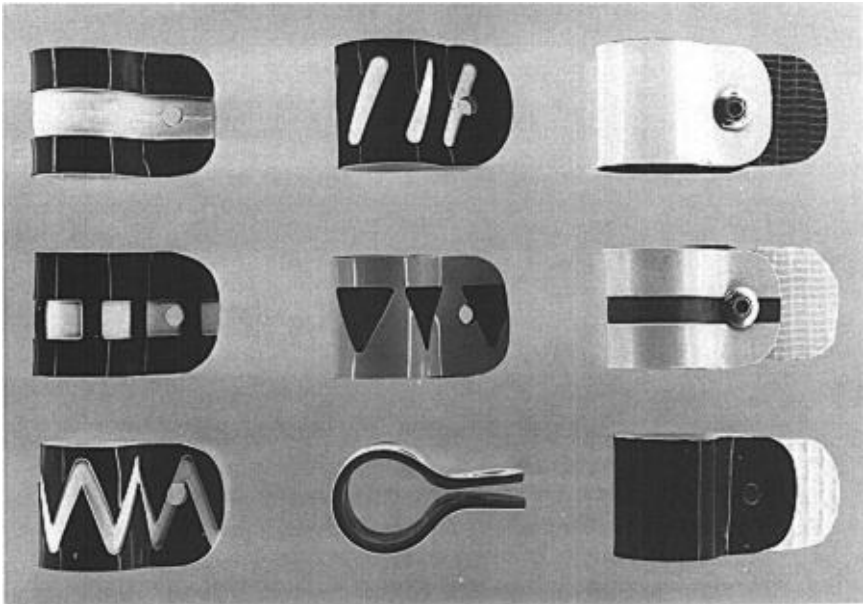


FIGURE 1. Examples of plastic leg bands used on Spotted Owls. Bands on the right are paired with colored flexible vinyl tabs or "flags" to increase the number of potential color combinations.

demographic studies of Spotted Owls. It is easy to apply, can be used in combination with colored flexible tabs to produce a large number of color combinations, is not prone to fading, and is extremely durable. We believe this color band may be useful for studies of other species, particularly diurnal raptors.

DESCRIPTION OF BAND

Bands are made from 2-mm-thick laminated (2 layers) engraver's plastic (New Hermes® brand), cut in 20×75 mm strips that are beveled along the edges that go against the leg (Fig. 1). To shape the blanks we heat them in a 115 C electric frying pan or oven, or boil them in water until the plastic softens. We then use a pair of hinged wooden handles or a pair of pliers to bend the blanks around a steel mandrel or wooden dowel, compressing the ends of the blank together in a protruding flange. Diameter of the mandrel used for Spotted Owls is 12 mm. After the blanks are bent into shape, the flanged ends are trimmed and ground smooth, leaving them protruding approximately 12 mm (Fig. 1). Although flanges could be made longer for better visibility, we do not do so because of the possibility that they might interfere with movement or break eggs when females are incubating.

Bands are installed by spreading the flanges and slipping the band

around the tarsus. We then use a hand-operated rivet puller to lock the band in place with an aluminum rivet inserted through a hole in the flanges (Fig. 1). Although not absolutely necessary, small aluminum washers can be installed on both ends of the rivet to reduce the possibility of cracking the band. On Spotted Owls, we install a color band on one leg and a U.S. Fish and Wildlife Service 7B lock-on band on the opposite leg. Installation of the color band takes 2–5 min.

To increase the number of possible color combinations, we use a variety of brightly colored flexible tabs or “flags” in combination with the plastic color bands (Fig. 1). Flexible tabs are made from a tough vinyl-impregnated nylon cloth (e.g., 90-weight Herculite®) and are relatively short (10–15-mm long) so that they do not interfere with prey capture or handling. Each flexible tab is made by (1) doubling the material for added resistance to wear and tear, (2) gluing the two layers together, (3) rounding the exposed end with scissors, and (4) punching a hole through the tab that corresponds with the hole through the band. Tabs are installed by sandwiching them between the flanges of the color band and running the rivet through the band and the tab. Before installing the rivet, we use a thin layer of Super-glue® to glue the tab in place between the flanges of the band. This keeps the tab from rotating around the rivet.

The exterior-rated, laminated plastic that we use for bands (New Hermes® brand) is available in a variety of colors that are relatively bright and easy to see in the field. Because the band material is laminated, with the backing color different than the face color, many different combinations can be achieved by routing away the outer layer to produce bi-colored patterns (Fig. 1). When these patterns are used in combination with colored vinyl tabs, several hundred combinations are possible.

Band blanks can be produced by local engraving firms. Costs range from about US\$0.45 for a single-color band to US\$0.95 for bands with complex routed patterns (e.g., polka-dots).

RESULTS AND DISCUSSION

We and other researchers color banded over 8000 Spotted Owls between 1986–1995. Many of these birds have been observed for 5–8 yr after banding. Of 3788 individuals that were banded and subsequently resighted or recaptured in one or more years, there were four cases where a plastic band was lost, an observed band loss rate of 0.1%. Flexible tabs are prone to higher loss than bands, but even when they are heavily abraded, some small piece of the tab can usually be detected upon close visual inspection with binoculars. Tabs made from vinyl pressed into nylon cloth (calendar process) are more durable than tabs made by painting the vinyl coating onto the nylon cloth.

Occasional loss of color bands or flexible tabs on Spotted Owls is not likely to produce any bias in survival or turnover estimates because the normal procedure in demographic studies of Spotted Owls is to immediately trap and remark any bird whose color band cannot be detected or whose flexible tab is heavily abraded. Thus, any loss of color bands or

tabs is quickly detected by confirming the Fish and Wildlife Service band. With species that are more difficult to retrap, occasional loss of color markers could be a more serious problem.

We do not know if our band is strong enough to work on species with very powerful beaks. McCollough (1990) reported that Bald Eagles (*Haliaeetus leucocephalus*) removed all laminated plastic bands (1-mm-thick) within 4 yr. Meyers (1995) reported that 2 of 35 Bald Eagles removed bands made of 1.5-mm-thick laminated plastic. Whether this problem could be solved by using thicker laminates is unclear. Meyers (1995) used 1.5-mm-thick laminated plastic bands on 17 *Amazona* parrots, with only one case of band loss during a 1.8-yr study.

Although some types of color bands are subject to fading (Anderson 1980, Lindsey et al. 1995) we had no problems with colors fading when bands were made from engraver's plastics rated for exterior use. However, bands on Spotted Owls are mostly covered by the feathers on the legs, and are only exposed to direct sunlight during brief periods when owls extend their legs to scratch or move around during the day. We are aware of only one study where our bands were used on a diurnal raptor (Dunk and Cooper 1994). In that study, bands were placed on 33 Black-shouldered Kites (*Elanus caeruleus*) for 5–24 mo, with no evidence of band loss or color fading (J. Dunk, pers. comm.).

Researchers contemplating use of color bands on owls should be aware that colored leg bands are difficult to see on owls, even under good conditions. Spotted Owls are somewhat unique in that they are extremely tame and can easily be lured within a few meters of the observer with a live mouse or rat. As they fly in, perch nearby, capture mice or rats, and then handle the prey, the observer can use binoculars to get a series of close-range views of the color band. Color bands may be less useful for owls that are not as receptive to the live-lure technique, that are strictly nocturnal, or that will not allow close approach by humans.

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