

## Patagial Mount. Design and Method 7

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**Figure 7.1: California Condors.**

Patagial-mounted tags and transmitters are less favorable than other identification/tracking aids, but in some cases, such as the case with California Condors, they are widely preferred and used with success. These techniques stem from decades of use and application in the Condor Recovery Programme in the southwestern United States and were described well by Wallace et al. (1994). They have also been used in Andean condors in different South American countries.

It should be noted that researchers have modified techniques through time and preferences for tools vary greatly. Conserving patagial integrity/health by alternating or removing transmitters and wing tags can help prolong trackability for long-lived, long-tracked species like condors, especially when opportunities to re-trap individuals exist.

### Materials and Equipment needed:

- Patagial identification tags - e.g. vinyl coated fabric, usually polyester
- Vinyl paint (Nazdar is one such product) for painting numbers or alpha numerics
- Cattle ear tags (various sizes depending on application), male buttons made by Allflex among others, and a plastic lock strap cut from ear tag material with locking bolt, washers and nylock nut (bottom left of Item 3. below)
- Tag applicator tool (Allflex Universal total tagger applicator)
- Scissors and/or razor-edge cutters
- High quality (new) leather hole punch or piercing needle(s)
- Stainless steel bolts, washers and nylock nuts and heat shrink to cover threads
- Nut drivers and/or screwdrivers or allen wrenches for bolts, depending on type/size used, and transmitter posts (not pictured)
- Heat shrink tubing (to cover threads of bolts from both transmitter posts and tag applications without transmitters (pictured in item #7)
- Patagial Transmitters (VHF, GSM, or GPS).
- Alcohol or other cleaning disinfectant

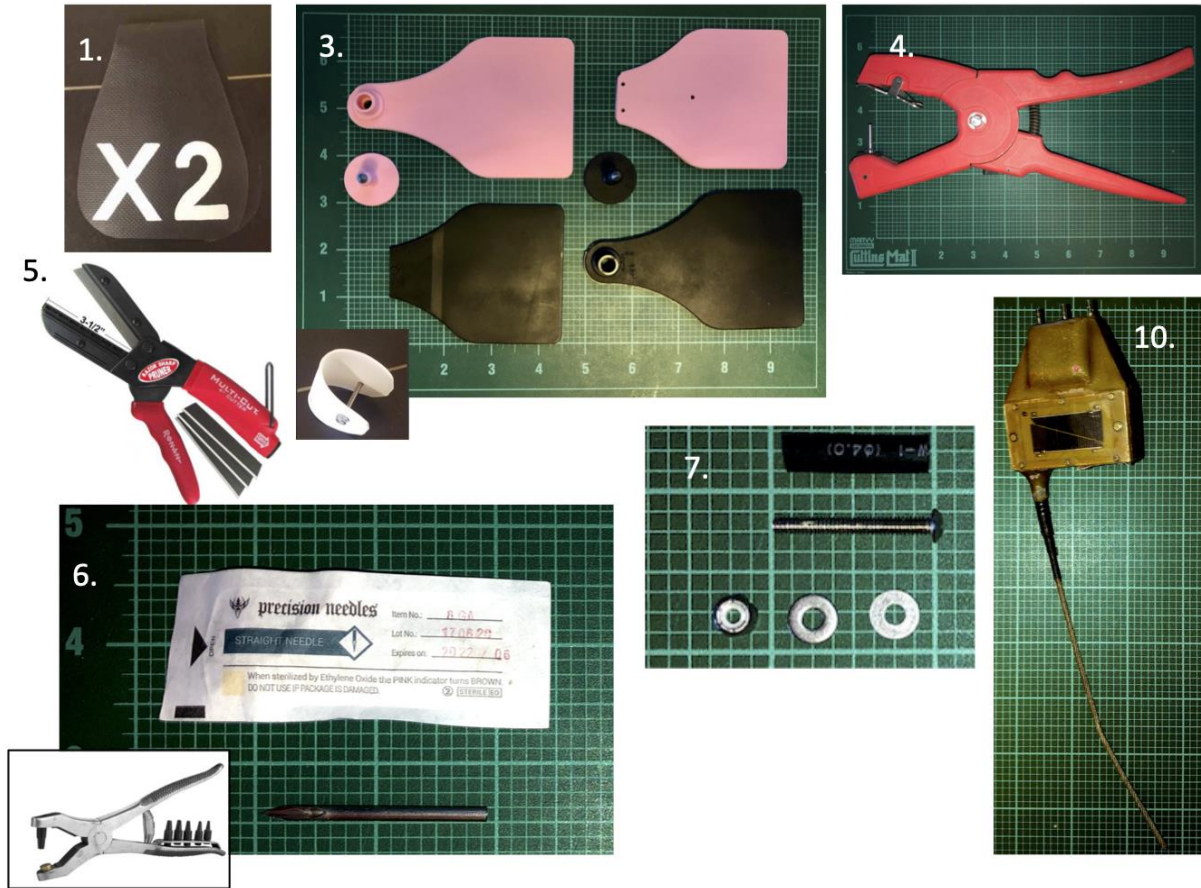
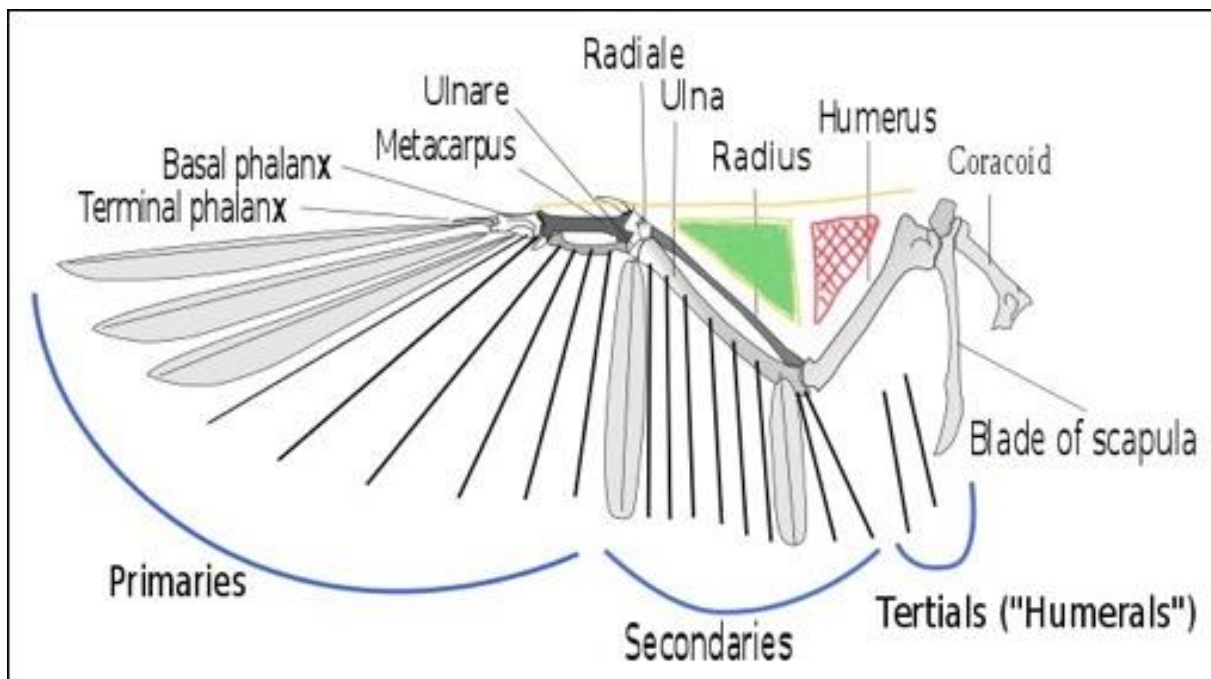


Figure 7.2

**Identification (I.D.) Tag Attachment:**

The patagium, a web of skin that stretches between the shoulder and carpus to form the leading edge of a wing when fully extended, creates somewhat of a triangle of skin bordered on the leading edge by a tendon while the radius and humerus bones create the other two arms of the triangle (Fig. 7.3). When split into two right triangles, the triangle containing

the radius (green), or the section farthest from the body, is the section where holes (as small and precise as possible) can be pierced/punched allowing for outer- and under-wing visibility of the identification tag without impingement of the humeral-side of the triangle while wing is folded, extended or in flapping flight.



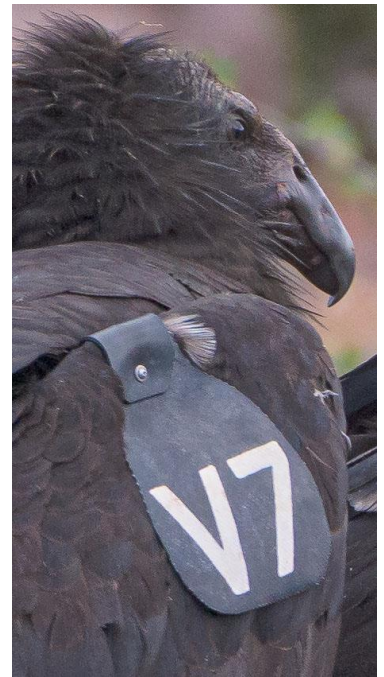
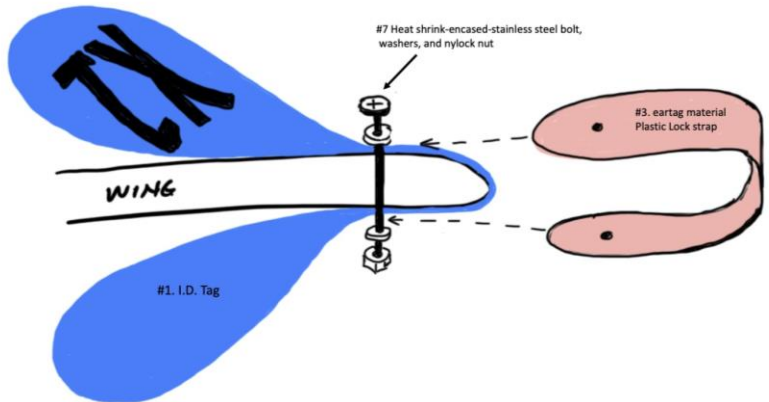
**Figure 7.3:** Wing anatomy. Original image from wikiwand.com and modified.

### Fitting to the bird

1) After carefully cleaning the selected area, pierce or punch a hole within the radius-side right triangle (green) while maintaining the correlation of upper and lower layers of skin by pinching firmly with the hand opposite of the one running the needle or leather punch (sometimes the two layers of skin will slip thus ending up with the holes out of alignment).

2) If using the tubular-style piercing needle, one can slide the heat-shrink-tubing-encased stainless steel bolt inside of the needle's back end

so that the needle passes through and the bolt is thereby left in place of the needle's shaft and ready for attachment on the inside of the wing by the plastic lock strap. This, however, would require one lobe of the tag, washer, and bolt be pre-loaded and applied to the outside of the wing so that once the post is placed through the patagium, the remaining side of the tag and plastic lock strap fold over the leading edge of the wing, locked down with washer and nylock nut (Fig. 7.4).



**Figure 7.4:** Patagial-mount number tag using plastic lock strip.

3) Make sure that the apparatus is not pinching the patagium. It should be firmly attached as to not allow severe movement independent of the wing, but not pinch or in any way restrict movement of blood flow. Additionally, feathers should be dressed as to not impinge, although

sometimes (as pictured below) feathers do twist or move after placement. Alternatively, if the patagial hole is punched or pierced slightly larger in diameter, cattle ear-tag buttons, (equipment #3) can be attached with the Tag Applicator Tool (equipment item #4) (Fig. 7.2).



**Figure 7.5:** Cattle ear-tag button tag method.

**Transmitter/I.D. Tag attachment:**

Transmitter placement follows the same steps as affixing an I.D. tag with the bolt and plastic lock technique but the post from the transmitter replaces the stainless steel bolt and the plastic lock strip is

replaced by a full-size ear tag, trimmed of the button portion of equipment item #3, and attached to the top, or leading edge of the transmitter (Fig. 7.6).

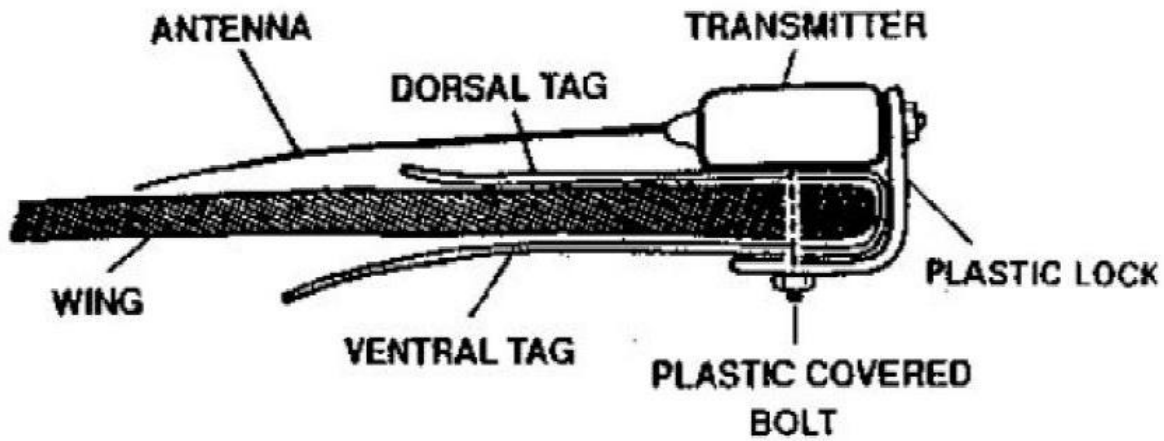


Figure7.6: Original illustration from Wallace et al. 1994.

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## References

- Bodey, T.W., Cleasby, I.R., Bell, F., Parr, N., Schultz, A., Votier, S.C. & Bearhop, S. (2018). A phylogenetically controlled meta-analysis of biologging device effects on birds: Deleterious effects and a call for more standardized reporting of study data. *Methods in Ecology and Evolution*. 9: 946–955.
- CMS Raptors MoU (2018). Report of the third meeting of the technical advisory group to the Raptors MOU (Convention of Migratory Species). 12-14 December 2018, Sempach, Switzerland.
- Gilbert, M., Watson, R.T., Ahmed, S., Asim, M. & Johnson, J.A. (2007). Vulture restaurants and their role in reducing diclofenac exposure in Asian vultures. *Bird Conservation International* 17: 63–77.
- Hirschauer, M.T., Wolter, K. & Forbes, N.A. (2019). A review of vulture wing anatomy and safe proapatagial tag application methods, with case studies of injured vultures. *Journal of Wildlife Rehabilitation* 39: 7–13.
- Kenward, R.E. (2001). *A Manual for Wildlife Radio Tagging*. Academic Press, London: UK.
- Rappole, J.H. & Tipton, A.R. (1991). New Harness Design for Attachment of Radio Transmitters to Small Passerines. *Journal of Field Ornithology* 62: 335-337.
- SAVE (2020). A Blueprint for the Recovery of Asia’s Globally Threatened Vultures. Accessed from [www.save-vultures.org](http://www.save-vultures.org) July 2020.
- Sergio, F., Tavecchia, G., Tanferna, A., López Jiménez, L., Blas, J., De Stephanis, R., Marchant, T.A., Kumar, N. & Hiraldo, F. (2015). No effect of satellite tagging on survival, recruitment, longevity, productivity and social dominance of a raptor, and the provisioning and condition of its offspring. *Journal of Applied Ecology* 52: 1665–1675.
- Wallace, M., Fuller, M., & Wiley, J. (1994). Patagial transmitters for large vultures and Condors. In *Raptor Conservation Today* (B.-U. Meyburg & R.D. Chancellor eds.) pp. 381-387. World Working Group on Birds of Prey, Berlin.

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