

Leg loop Harness. Design and Method 5

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This method has been used successfully on Bearded Vultures *Gypaetus barbatus* in South Africa and Europe and on Cape Vultures in South Africa. Daniel Hegglin is acknowledged his role in the leg loop harness design and method.



Figure 5.0: Adult Bearded Vulture with satellite GPS transmitter

Materials and Equipment needed:

- Tubular Teflon ribbon: 6.4 mm wide (0.25”) and 8.4 mm wide (0.33”) (use one or both)
- Silicone cord – 2 mm thick, or clothing elastic – 5 mm wide
- Heat shrink tubing
- Two-ear clamps #5 / #7 (can also use cable ties)
- Elastic thread (white)
- Medical tape & cello tape
- Powder
- Superglue
- Transmitter (have used Microwave, NorthStar)
- Neoprene pad and glue (if not supplied by manufacturer of transmitter)
- Thin sewing needle and cotton thread
- Surgical clamps
- Long thin piece of metal/copper wire
- Scissors
- Pliers

Attachment must be prepared in advance.

Measurements and preparations: Key stages/steps

The leg loop harnesses can be made “expandable”. These harnesses have been used successfully on numerous Bearded Vultures, some even lasting more than 10 years on the bird. The expandable version provides additional elasticity (the Teflon provides some elasticity) for comfort and to date no evidence of chaffing, as a result of the additional bunched up material, has been found.

For the expandable version; use silicone cord (2 mm diameter) which is highly durable, or clothing elastic (5 mm wide) that is easily obtainable and easy to work with. For the non-expandable version (used successfully on Cape Vultures), leave out the step that involves the cord or elastic.

The measurements below are for Bearded Vultures (4–6 kg)- for a larger bird use approximately 10 cm more and for a smaller bird use 10 cm less.

- 1) Cut a 120 cm piece of the narrow (0.25”) Teflon, 115 cm piece of the wider (0.33”) Teflon and 120 cm of the silicone cord/elastic (Fig 5.2). kg. You can either use both Teflon ribbon sizes for extra strength (see below) or just one. Use the wider one (even 0.44”) for larger birds.
- 2) Thread the elastic or cord through the narrow Teflon using a piece of wire (Fig 5.3).

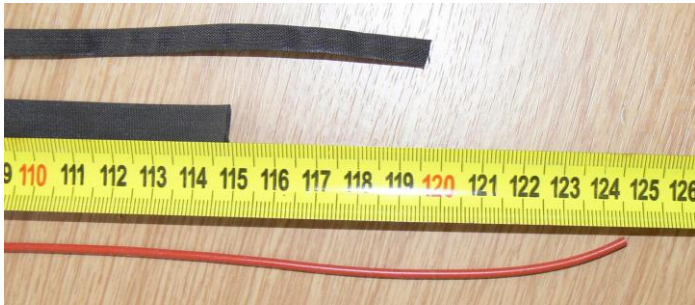


Figure 5.2

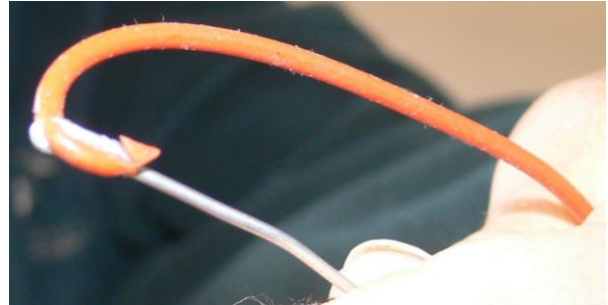


Figure 5.3

3) Place Cellotape around the ends of the Teflon ribbon to prevent fraying whilst you are working (Fig 5.4).

4) Thread the narrow Teflon ribbon through the wider Teflon ribbon, using the wire if necessary (Fig 5.4).

5) Tape the wider Teflon ribbon to the narrower one with medical tape to prevent the narrow piece from disappearing into the wider one (Fig 5.5).



Figure 5.4



Figure 5.5

6) Using the elastic thread (white is easier to see than black), tie off a 1 cm section to secure the elastic and Teflon ribbon and ensure that none of the individual pieces move when you thread them into the lugs of the transmitter. Knots can be made on alternating sides of the ribbon for 1 cm (Fig



Figure 5.6

5.6). Cut off the ends (Fig 5.7). From now on the elastic cord in the narrower Teflon both of which are in the wider Teflon will be referred to as harness material.



Figure 5.7

7) Your harness material should now be approximately 80 cm long (Fig 5.8) and 100 cm long at full stretch (Fig 5.9).



Figure 5.8



Figure 5.9.

8) Thread the harness through the lugs at the back of the transmitter (Fig 5.10). Use the ends of the elastic thread for this or the surgical clamps (Fig 5.11).



Figure 5.10



Figure 5.11

9) Create a weak link to thread through the front attachment points of the transmitter. The weak link is to ensure that the harness will drop off after some time. Create a weak link by cutting a piece of narrow Teflon ribbon, that when sewn together as a loop (Fig 5.12), will fit through the front lug and extend on either side by about 5–8

mm (Fig 5.13; enough to thread the harness material through). The “strength” of the weak link will depend on the number and position of stitches. Use cotton for sewing the weak link- dental floss is too durable and will last >10 years. Even cotton will last >8 years. Adding Superglue to the stitches will increase durability of the thread.



Figure 5.12

10) To secure the harness on the back end of the transmitter, cut a piece of heat shrink tubing (black plastic) just longer than the length of a two-ear clamp (or two clamps to make it more secure). Thread the heat shrink tubing on the harness material and thread the clamp over this. Use pliers to flatten/tighten the clamp (Fig 5.14). Ringing



Figure 5.14

11) Place another piece of heat shrink tubing on each end of the harness material and insert one or two clamps on this. The heat shrink tubing protects the Teflon from being cut by the clamp. Thread the ends of the harness material through the weak link loops prepared in 9) and then back onto itself and insert the end into the heat shrink tubing and clamp (Fig 5.16). Do not close these clamps- this is the end that will be adjusted once on the bird, and the clamps will be tightened after final adjustments have been made (see below).

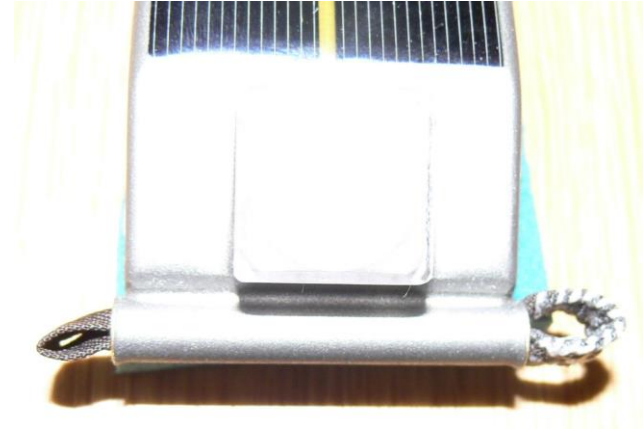


Figure 5.13

pliers will allow you to crimp the ears of the two-ear clamp. Note, plastic cable ties (easily obtainable and as durable?) may be used instead of clamps, but be sure to have no sharp edges that can injure the bird- hence flat metal clamps are preferable (Fig 5.15).

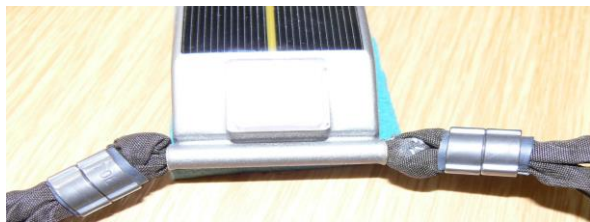


Figure 5.15

Once the harness has been adjusted on the bird and the clamps tightened, the end that has been threaded through can be cut off. Superglue can be placed on the cut end to stop fraying; care must be taken not to get glue on the feathers of the bird. Place a piece of paper underneath when gluing. Powder can be placed on the glue to dry it quicker.

Depending on the type of attachment the transmitter has, it may not be possible to thread the harness material through the lugs on the

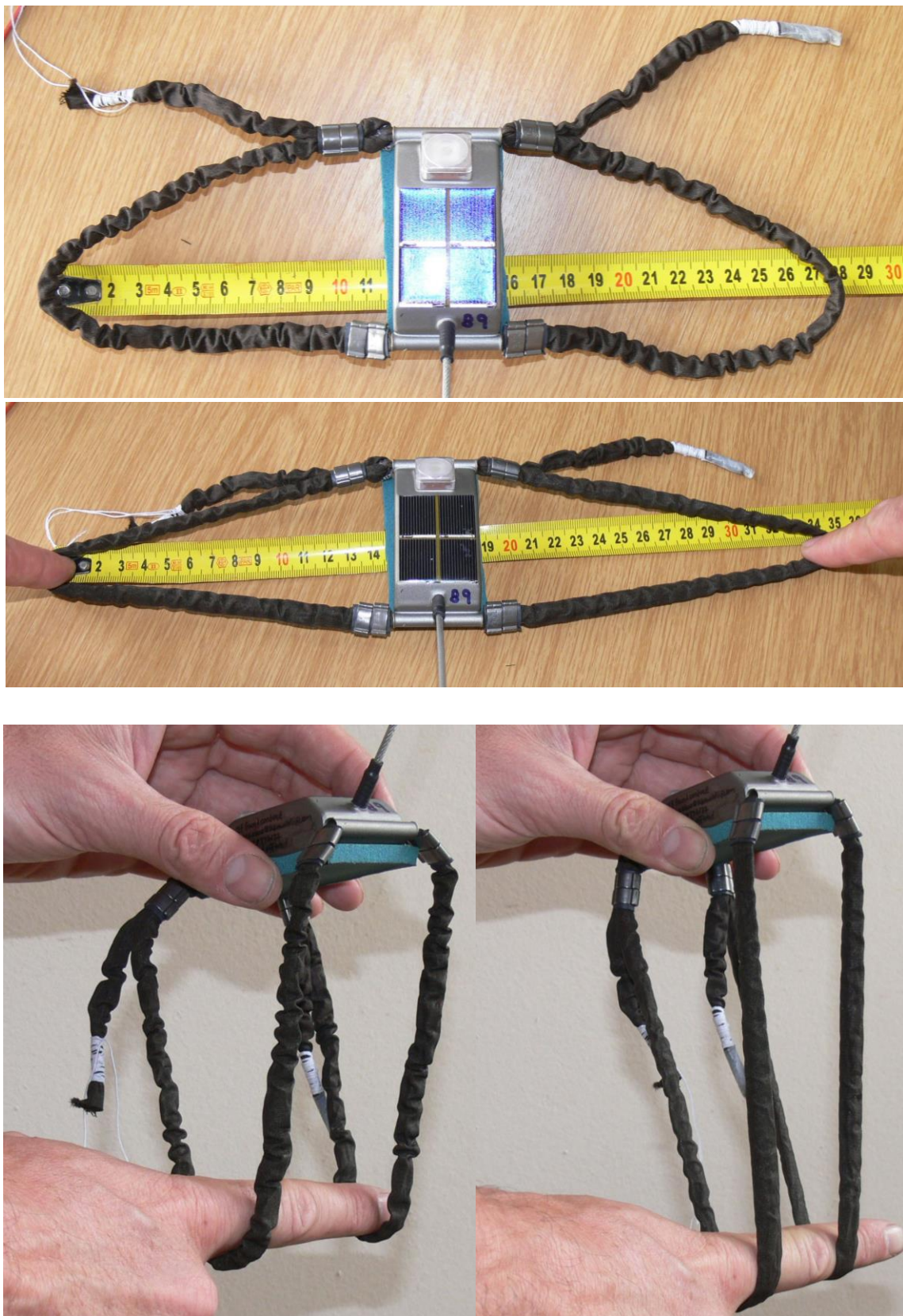
transmitter. In this instance, you may need two weak links (front and back) and two pieces of the harness material to thread through the lugs of the transmitter, one at the front of the transmitter and one at the back. Ideally and if the attachments are wide enough, you should be able to thread the entire length through both ends (see 12).

12) The harness is now ready for fitting. Ensure that it has been tested before fitting to a bird. Make sure solar panels are fully charged before fitting. Keep the magnet on (if the transmitter is activated by removing a magnet) until the bird is ready to be released.



Figure 5.16

13) If elastic was used, then the elasticity of the harness is as depicted in Figs 5.17-20.



Figures 5.17-20

14) Make sure your contact details are on the transmitter (Fig 5.21).

15) Make sure a neoprene pad has been glued to the bottom of the transmitter (with a bit of

overlap) if the transmitter did not come complete with a pad.



Figure 5.21

Restraint and hooding

At this stage an additional person is needed to hold the bird whilst the tag is being attached. It is recommended that the bird is held breast downwards with legs retracted (Fig 5.22). When fitment is completed and the clamps have not yet been tightened, both legs should be stretched backward (or the bird made to stand) before final

adjustments are made. The bird can be held on the ground or on someone's lap to make it easier to manoeuvre the harness on.

In order to keep the bird calm while restrained, a loose material tube (or a sock with the toes cut off - Fig 5.22) can be used to cover the head. A hole in the end is needed so that the bird will not choke if it regurgitates food whilst hooded.



Figure 5.22

Fitting to the bird

1) The two leg loops can be stretched over the leg one at a time (Fig 5.24) until the material settles nicely in the leg joint on either side (Fig 5.25). The device should be positioned on the

lower back in the approximate position where it will lie. Run a finger along the harness material to ensure that it lies smoothly in the leg joint and that no feathers are obstructed.



Figure 5.23



Figure 5.24

2) The two loose ends of harness material should then be pulled evenly to tighten the harness. Assess the fit of the harness by putting two fingers (side by side) between the tag and the bird's back (Fig 5.26). It should be possible to

move the fingers but without there being a gap. It is helpful to stand the bird on its feet (though still restrained) whilst assessing the fitting. As a guide you can compare the lengths of the two ends of the harness material (Fig 5.27).



Figure 5.25



Figure 5.26

3) Once the harness has been adjusted on the bird, close/tighten the two-ear clamps using pliers (Fig 5.28). The end that has been threaded through can be cut off (Fig 5.29). Superglue can be placed on the cut end to stop fraying, but care must be

take not to get glue on the feathers of the bird (Fig 5.30). Place a piece of paper or your finger underneath when gluing. Powder can be placed on the glue to dry it quicker.



Figure 5.27



Figure 5.28



Figure 5.29

- 4) Remove the magnet (if the transmitter has one) to activate the transmitter before releasing the bird.



Figure 5.30
