Barn Owl MORPHOLOGICAL Review Techniques Guide

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The goal of the morphological work is to acquire detailed measurements from a minimum of 30 mated pairs from each of 10 or more Barn Owl (*Tyto alba*) from the Mid-Atlantic region. This Guide is designed to offer details as to what measurements to take and the methods behind them.

Specimen Location: (dec degrees): _____ lat _____ long
If museum specimen, tag location: _____
_____

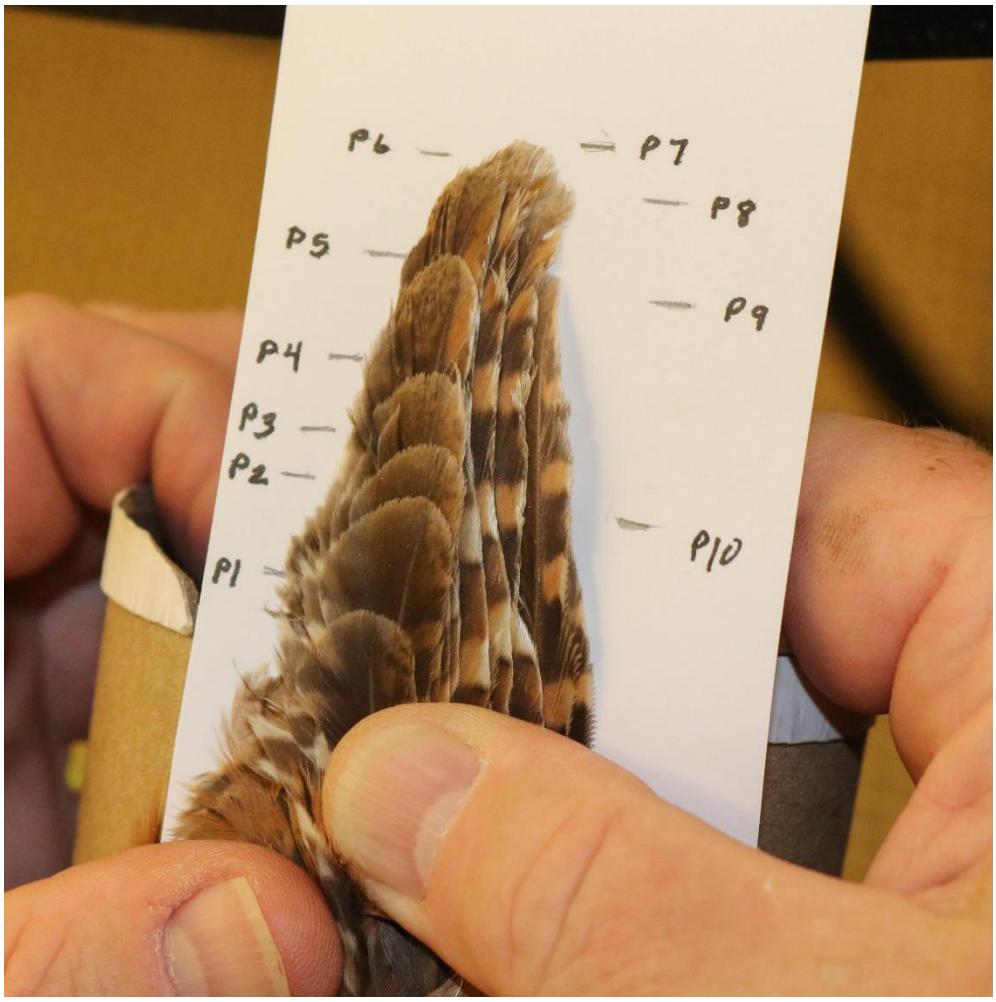
Sex: **M F Unk** (measure only adult owls; no juveniles). Females may be distinguished from males by the presence of buffy (not white) feathers on the head directly behind the facial ruff. Additionally, the beak has dusky edges rather than solid pink color of the male.
Status (circle one): **L** (live); **FD** (freshly dead/intact); **MS** (museum specimen)

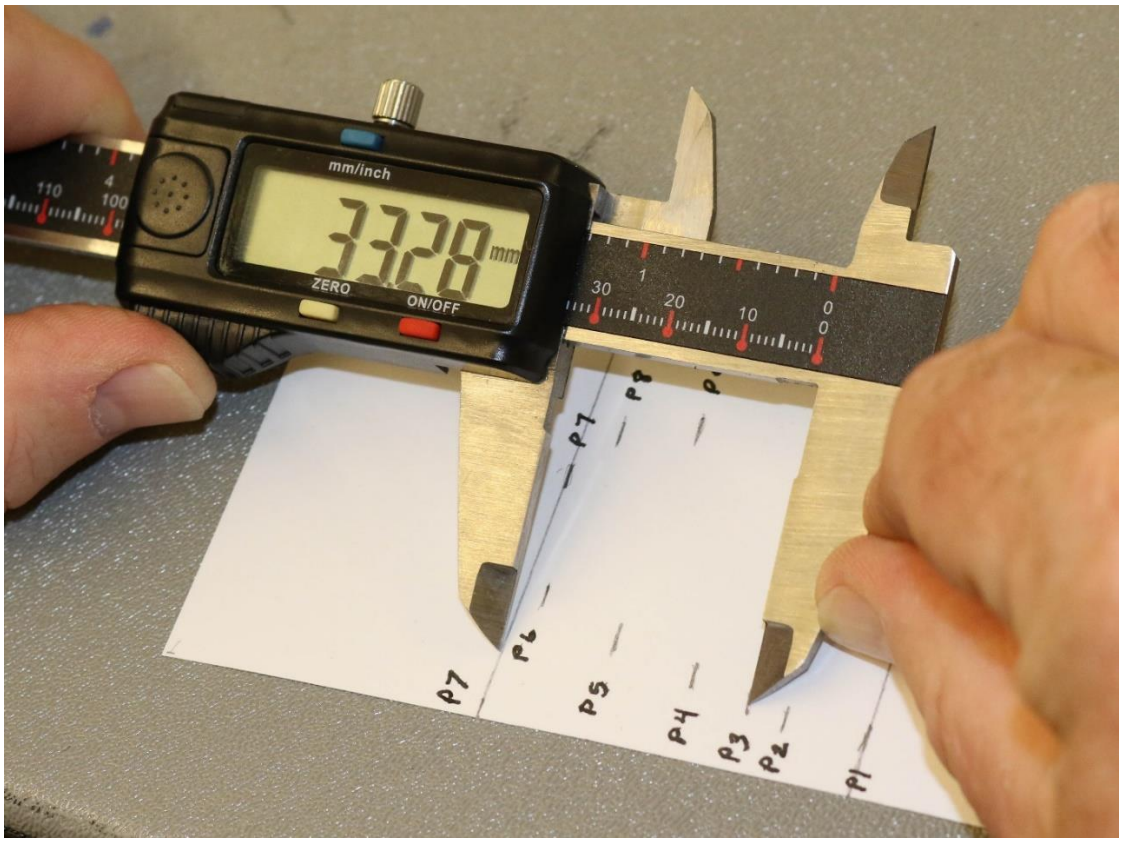
Mated Pair: Is the data from the 2 owls on the datasheet from a mated pair? **Yes No**

Wing - wrist to tip. Use wing stop ruler or regular ruler. Measure the folded, flat, wing from the leading part of the wrist joint to the tip of the longest primary. Record to nearest 1 mm. This measurement is best made while the owl is in the MorphoCan.

Primary Feather Shortfalls. The Primary "shortfall" measurement involves the tips of the Primary feathers, when the wing is folded. Use the 1 mm graph paper. Place the graph paper under the folded wing. Hold the wing such that it is perpendicular to the graph lines on the paper. With a pencil or fine-point pen, make a mark at the outer tip of each primary feather, and label each mark as "P1" "P2" etc. You must hold the wing firmly in position while you mark all Primary feathers. The objective here is to measure the distance from the line containing the mark at the tip of the longest Primary feather to the tips of the other feathers. These measurements are best made while the owl is in the MorphoCan. They offer insight into the shape of the wing. Use calipers to measure and record to nearest 1 mm. In the photos, P7 is the longest Primary, so the shortfall for P7 would be recorded as "0 mm".
P1 shortfall
P2 shortfall

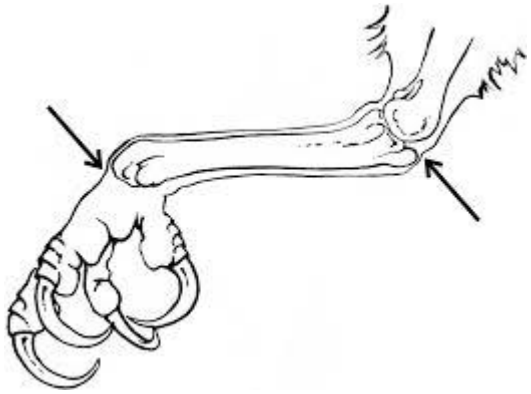
P3 shortfall
P4 shortfall
P5 shortfall
P6 shortfall
P7 shortfall
P8 shortfall
P9 shortfall
P10 shortfall





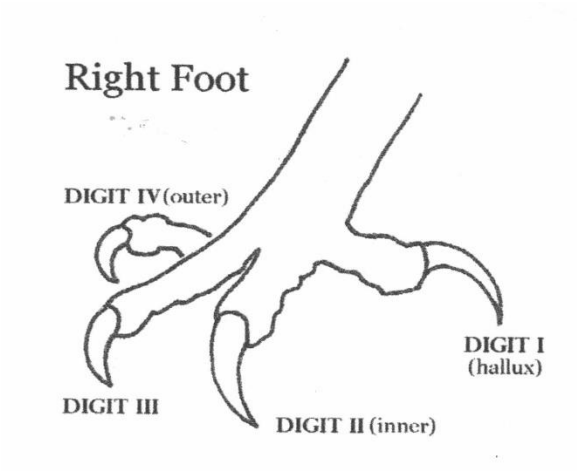
Tail length. Use straight ruler. Gently place the "0" tip of the ruler perpendicularly between the 2 central tail feathers. Slide the ruler up along the tail feather until the end of the ruler comes into firm contact with the skin between the tail feathers. Read and record the measurement. It is OK to hold the central tail feather against the ruler (just don't bend it). This measurement is best made while the owl is in the MorphoCan; record to 1.0 mm

Tarsus length. Use calipers. Take your time with this measurement. Measure from the slight dip in the "wrist" joint in the foot to the tip (end of bone) of the bent leg. This measurement best made while owl is in the MorphoCan. You should take this measurement 3+ times; do not average the measurements, rather, continue to measure until you are confident you have the exacting data. Record to 0.1 mm.



Minimum tarsus width. Use calipers, record to nearest 0.1 mm. This measurement is best made while the owl is in the MorphoCan. Measure at the thinnest part of the tarsus side-to-side, usually just above the foot.

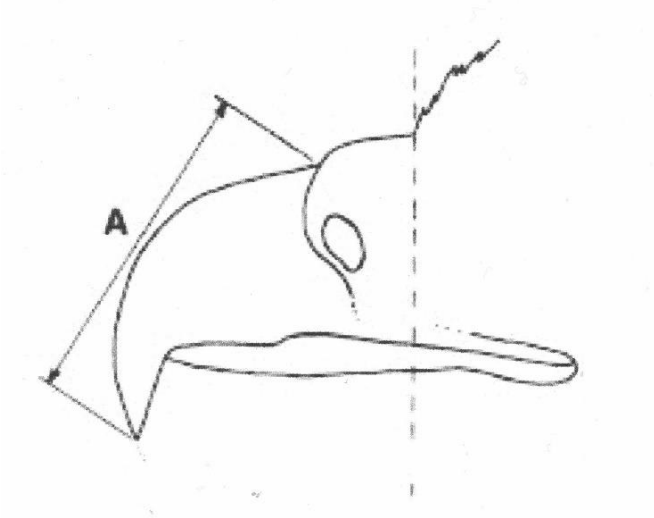
Hallux talon length. Use calipers; measure length of one fully intact Hallux talon, record to nearest 0.1 mm. Does not matter which foot. This measurement is best made while the owl is in the MorphoCan. Hallux = Digit 1 = rear toe; toe 4 is the toe that rotates in Strigiformes.

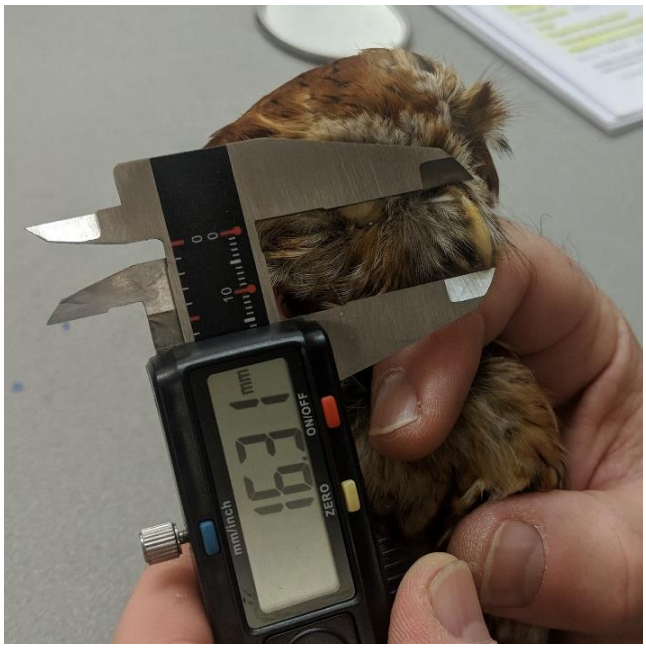


Unfeathered tarsus. *PHOTOs.* Tarsal feathering is measured from the tip of the most distal plumaceous feather to the joint of the phalanges 1-2 of digit three. Rather than trying to physically measure this in the field, we will instead take a clear photograph(s) of the legs of the owl, while the owl is in the MorphoCan. Owls should be banded (we will use the height of the band as a guide for length of the feathered/unfeathered portion of the leg). If the owl is NOT banded, please photograph the legs with the 1x1 mm graph paper immediately behind the legs (for scale). A blue sticky note must be in the photo(s), so we know the date, location, and sex of the owl involved; if banded, write band number on sticky note as well. You will use this same sticky note when taking photos of the dorsal and ventral sides of the wings of the owl (live or freshly dead).

Weight. Actual weight of the owl only, to the nearest gram. This measurement is best made while the owl is in the MorphoCan.

Culmen length. Measure from front of cere to tip of beak – use calipers; record to 0.1 mm. Measured with bird in hand.





Rictal bristle length. Rictal bristles are stiff hair-like feathers that arise around the base of the beak. This measurement requires that the bird be held in the hand. Place the 1 mm grid paper along the beak, and slide it in to the base of the rictal bristles; using the longest bristle feather, make a mark on the grid paper; use digital calipers to measure from end of card to your mark. Record to nearest 0.1 mm.

Wing Photographs. Dorsal and Ventral sides of one wing and body, for coloration and pattern. Take multiple photos, starting with directly perpendicular (straight-on) of the body and 1 outstretched wing of the owl (live or freshly dead). A blue sticky note with the date, location, sex, and band number (if banded) of the owl, in clear, BOLD, black print, needs to be included in the photo with the owl. This photography work requires 2 people: one to hold the owl at chest level, while the other person takes the photographs. Take 5 or 6 photographs, at slightly different angles, of the dorsal side of the owl, and then turn the owl around, and take another 5-6 photos of the ventral side …. showing the same wing. It does not matter if the left or right wing is photographed, just that the same wing be used in all photos. The wing needs to be fully outstretched and all feathers in order, smooth, and neat. A flash can be used if natural light is limited. Do not take photos of the wing that are backlit by the sun; or are being fluffed by the wind. Our experience is that it is fine to take the photos inside of a vehicle; the person holding the owl can wear the blue sticky on their upper chest during the photos. In addition to the primary focus of coloration and patterning, we will also gain insight into the ages of the owls from these photographs.

Wingspan (mm, intact adult specimen). This measurement requires two people: one person should fully stretch the wings of the owl out, while a 2nd person makes the markings. The owl is laid on its back, with wings fully stretched straight out. Gently, but firmly, fully outstretch the wings, as if the owl was in full flight position. A mark is made at the tips of the longest primary feather on each wing, and a tape measure is used thereafter; record to the nearest 1 mm. It is OK to place a small sock ("hood") over the head of a live owl. There should be NO TALKING, WHISPERING or ANY NOISES DURING THIS PROCESS; NO PEOPLE OR DOGS WALKING AROUND.

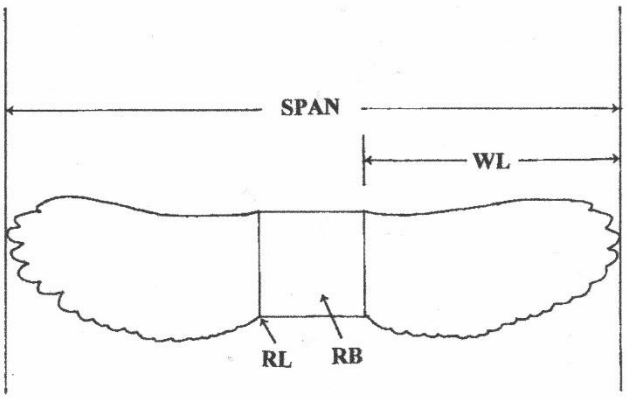


Figure 1.—Wing span is the wingtip-to-wingtip distance (in mm), with wings spread out to the sides to their fullest extent. WL = wing length, as measured (in mm) from the wing root line to tip of the longest primary. RL = root line, a straight line depicting the interface between the wing and the owl's body. RB = root box, (in cm²). This (reduced) tracing is from a male Western Screech-owl (Otus kennicottii).

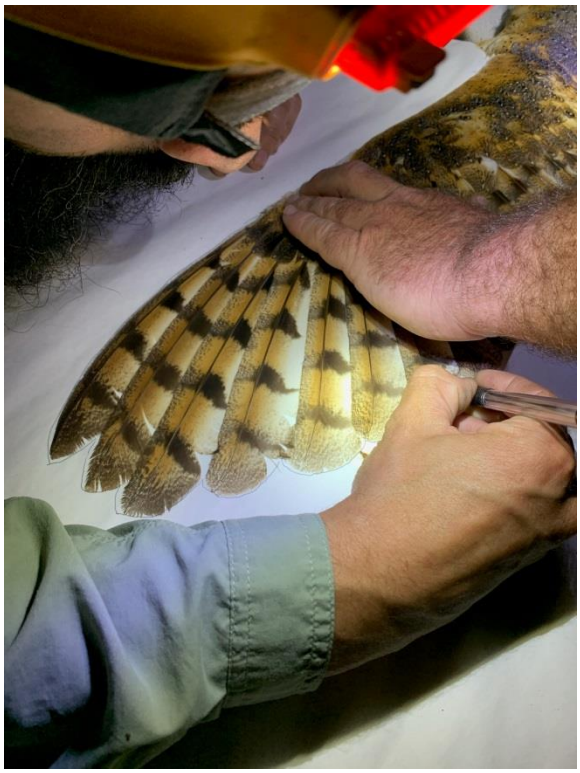
Wing Area and **Wing Length**. These two metrics are determined from wing tracings from live or freshly dead (but intact) owls. Wing tracings require 2 people. Person 1 will hold the owl (chest down), alongside a smooth wooden board covered with a sheet of white paper (typically meat-wrapping paper). The body of the owl is held immediately adjacent to the board, such that one outstretched wing is completely on the paper. Person 1 will hold

the body of the owl with one hand, and will use the fingers on their other hand to hold the outstretched wing (as if the owl was in full flight), by placing their fingers near the base of Primaries 10-6. This will serve to extend the wing and press it flat. The 2nd person will simultaneously hold the outstretched wing in position, while also carefully tracing the outer perimeter of the entire wing. Care must be taken to insure that, prior to and during tracing work that all primary and secondary feathers are in their correct, full, and smooth positions. Double-check to insure that all feathers are in their correct and full positions before starting to trace. Begin tracing along the lower neck of the owl, then outward along the leading edge of the wing. Trace along the outer edge of the feathers; do not press into the feathers. Trace around each individual feather, and finish by tracing up alongside the lower portion of the inner secondaries (e.g., 20-30 cm along the body). You will not be able to finish the polygon with the owl in position at this point; after all measurements are completed and the owl is released, you will use a straight-edge ruler to complete the polygon (along the body proper). The wing tracing of this wing is completed; now turn the owl around and trace the outline of the other wing.

Write all data about the owl, date, location, sex, location, etc. completely inside the boundary of the wing tracing polygon. If a tracing mistake is made, do not try to erase it, just make the corrected line, and then put an "X" over the incorrect line. During a tracing session, if the wing is not correctly positioned, simply start over. One at a time, trace BOTH WINGS of the owl. While it is intuitive that the owls' wings are symmetrical, your wing tracings will not be. We will use the wing tracing that contains the largest cm^2 value. Be patient, careful, and relaxed; it normally requires about 20 owl wings before you become consistent and efficient in your tracing work. If you have any recently dead specimens, practice tracing with them. The biggest problem that folks have is that they do not fully outstretch the owls' wing for the tracing; envision the owl in full flight. See Johnson 1997 for more info about wing tracing. It is OK to place a small sock ("hood") over the head of a live owl. There should be NO TALKING or ANY NOISES DURING THIS PROCESS; ONLY WHISPERING (IF ABSOLUTELY NECESSARY). NO PEOPLE OR DOGS WALKING AROUND.

Wing area (cm^2, based on wing tracings). This metric is determined in the office from the original tracings. A software program is used to determine wing area, using the actual wing tracing. We will use the wing tracing that contains the largest cm^2 value, and multiply it by two for the calculations of Wing Area.

Wing length (mm, based on wing tracings). This metric is determined in the office from the original tracings. A mid-point mark is made along the body line on the wing tracing proper, and a ruler is used to measure from this mid-point mark to the tip of the longest primary. Recorded to the nearest 1 mm.



MorphoCan - Storing Raptors/Owls [*from Hull and Bloom, The North American Bander's Manual for Raptor Banding Techiques. North American Banding Council, April 2001]*

Raptors and owls can be stored in tubes or cans for short periods prior to and during banding. Tubes for this purpose can be made from two cans joined to make a long tube with one end open, and one closed that is pierced by a number of ventilation holes for breathing. Vent holes must be flattened or smoothed on the inside to avoid injuring birds. One method to keep the raptor from backing out of the tube is to use a Velcro strip that can be fastened across the open end.

After putting the raptor in a tube, place it in a cool, dark spot, away from the main activity of the banders, but within view and hearing. The tubed bird should always be placed in a horizontal position with its dorsal side up; never place a tubed raptor on its head for storage. When temperatures are extreme, holding a raptor/owl for any length of time may endanger its life. Raptors cannot cool down in a tube. Never allow the tubed raptor to be placed in direct sunlight. Monitor all stored raptors for signs of stress by observing the tail pumping. Vigorous tail pumping and struggling indicate stress.

Fit is crucial when storing a raptor in a tube. The fit must be snug but not so tight as to restrict breathing or abrade feathers. A range of tube sizes, adequate to properly fit the species and sexes that are likely to be captured, should always be on hand. If a proper fit cannot be achieved, the bird must be banded, processed immediately, and released. After the raptor is slipped into the tube, secure a Velcro strap across the back of the tube or place a small rock in the back of the can to keep the bird from backing out.

We suggest that the size of the MorphoCan for handling Barn Owls be 200 mm tall and 110 mm in dia. We suggest that a slot (140 mm long x 50 mm wide) be cut, and smoothed in the MorphoCan so that one wing of the owl can be positioned in it for ease of measurements. The bottom of the slot is 60 mm above the bottom of the MorphoCan. The 7 vent holes drilled in the bottom are each 5 mm in dia.

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2020 Annual Report

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