

BIRD CURATORIAL MANUAL – Preparation and Labeling Guidelines

(version 12 May 2011)

APPENDIX 1. Procedure for Filling Out LSUMNS Bird Labels – Front Side.

GENERAL: Proper labeling of a specimen is critical – in fact, the label could be considered THE most important part of the specimen. A poorly made specimen with complete, accurate, legible data is in most ways more valuable than a beautiful specimen with poor label data. In contrast to most phases of specimen preparation, in which “the faster, the better” usually applies, you should TAKE YOUR TIME when writing the label. Obviously, hasty labeling will generate inaccurate data recording. Also, you should take pride in the neatness and thoroughness of your label – remember, researchers will be using your label for (hopefully) centuries, so it is of utmost importance that your writing be legible and neat. Sloppy labels with poor penmanship reflect poorly on you – a researcher cannot help but wonder if you were so sloppy with your label, then were you not also sloppy with the data, too?

Except for highly unusual circumstances, the person who prepares the specimen is the one who writes the label and puts the specimen in their catalogue. The reason for this is that the preparator, not the collector, produces all label data, other than habitat and behavior; therefore, the accuracy of the data depends on the preparator. Furthermore, specimen preparation usually takes more time than collecting the specimen, so the “credit” in terms of cataloguing should go to the preparator. The collector must be acknowledged also (see below) so that if a researcher has questions pertaining to the bird before its death, the collector can be consulted. Although the collector has the right to prepare a valuable specimen, inexperienced bird-skinners should strongly consider letting more experienced skinners prepare rarities. In the case of rarities, it is courteous to acknowledge (on the BACK of the label) the person who originally discovered the bird, even if they neither collected nor prepared the specimen, e.g., “Found by Donna L. Dittmann.”

COUNTRY (OR STATE IN USA): Write out in full capitals and follow with colon.

POLITICAL SUBDIVISION: “depto.” (for Departamento); “prov.” (for Provincia); “Par.” (for Parish), or “Co.” (for County) are the abbreviations to be used; follow with a semicolon.

LOCALITY: In choosing a locality name, use a town, river, mountain range or other permanent spot on a map as a reference point. It is often helpful to include a general region in the locality name, such as “Yanachaga Range” or “lower Río Napo.” If the locality is within a city’s limits, then that city should be the first item in the locality following the political subdivision. In cities,

use street addresses when possible; although these might not be as permanent as we would like, they will always be on record in the official records of that city. Proceed in “reverse” order from general to specific and break each portion with commas. Put zeros before decimals in distance measures, e.g., “0.5 km N Rafan,” NOT “.5 km N Rafan” (because decimal points tend to be overlooked or lost). It is not necessary to add decimal points and zeros after a whole number in a distance measure for a generalized locality (e.g., “2 mi. S. Cameron” is fine but not “2.0 mi...”). However, if a distance IS measured to the nearest tenth, then the decimal and zero should be added. Make every effort to see if LSUMNS collectors have already visited the locality; if so, use the EXACT same locality name; it’s fairly easy to search the collection computer database for previously existing standard localities. Do not use place names not on existing maps (e.g., “Rutherford Beach, “Smith Is. Woods”). Do not use habitat designations, such as “beach” or “woods” in the locality name unless these are part of the proper names of the geographic locality; habitat belongs on the back side of the label. Do not capitalize words that are not official place names (e.g./ “junction,” “mouth,” “levee” are usually not part of official names. Use “Hwy.” for all U.S. and state highways (e.g., “Hwy. 61,” not “U.S. 61” or “LA 61”) unless there is potential confusion between state and U.S. highways with the same number, in which case use “U.S. Hwy. 61”; for interstates, it is OK to abbreviate as “I-## Fwy.” (e.g., “I-10 Fwy” for Interstate 10 Freeway).

ABBREVIATIONS: We use the following abbreviations; do not deviate from these:

“km” for kilometers (NOT “km.”)

“mi.” for miles (but avoid using miles except within USA, where “Sections” on USGS topo maps = 1 sq. mile).

“ca” for “circa” or “about” (NOT “ca”, “ca.”, or “ca.”, “~”, or “approx.”).

“m” for meters (NOT “m.” or “M”).

“E” for “east of”, etc.; NOT “E.” (which means “eastern”) or “E of, “ which wastes space.

“Hwy.” for highway.

DO NOT ABBREVIATE: “road” because “rd.” could be confused with the “rd” in, say, “23rd”; likewise for “street.” It’s OK to abbreviate Avenue (“Ave.”), Boulevard (“Blvd.”), Freeway (“Fwy.”).

ELEVATION: Do not precede with “alt.,” “el,” or “elev.” (Because that wastes space; if the label-reader can’t figure out that “2800 m” refers to elevation, then that person has no business using the data). Use “ft.” for elevation readings in feet only in the USA, where USGS topo map contours are in feet. If your altimeter reads only in feet, then convert to meters by multiplying

reading in feet by 0.305 and then ROUNDING to the nearest 25 m. In montane areas, round all readings to the nearest 25 m; anything more precise is pseudo-precision in varied terrain. Use commas only if elevation is given in feet and has more than four digits. Use “sea level” (or “below sea level”) rather than “0 ft.” or “s.l.” (but do not write elevation on labels of specimens from the Louisiana coastal plain).

DATE: Day precedes month, and month and year should not be abbreviated.

SEX: Mark appropriate symbol near right margin. If sex determined by plumage alone, put “by plum.” next to sex symbol. If sex cannot be determined, write “sex?” (do not leave blank, do not write a “?” by itself!). Use of “o?” or “o?” is discouraged; if you’re not 100% certain, do not tempt someone to include a possibly mis-sexed specimen in an analysis or risk a researcher’s overlooking the “?” To avoid confusion, do not put sex symbol next to your catalogue number – the symbol can look like an additional digit. Also, some older LSUMNS labels still in use may have a preprinted “o” for the sex symbol; if you don’t use it, then make sure that it is crossed out. For undissected spirit specimens, leave sex blank unless it can be determined unambiguously from the plumage.

NAMES: Preparator should use their professional, publishing name (unless it’s too long for the space allotted), followed directly with personal catalogue number (do NOT precede the number with “#” symbol). If the specimen was collected or prepared by someone else, then indicate this on the FRONT of the label by writing “coll. by” or “prep. by” in front of their name (and be sure to write their name in the same way that they do on their own labels). “Collected” includes salvaging or independent mist-net operations in addition to shooting.

APPENDIX 2. Procedure for Filling Out LSUMNS Bird Labels – Back Side.

GENERAL: Orient label with thread holes on the left so that front and back can be read simply by flipping the label. Leave enough room at the top so that an identification can be written in. Do not write the identification yourself UNLESS the specimen is a skeleton, spirit or nestling, in which case you MUST write in the identification IN INK. If the I.D. of a skeleton or spirit is uncertain, then reference it to a skin of the same species, e.g., write “same species as JPO 6237.” Make certain that you do make reference skins for anatomicals of difficult-to-identify species.

If the specimen is a skeleton of a small bird (smaller than a cardinal), then do not write anything to the left of the thread holes because this will be clipped off to fit the label into one of the small skeleton boxes. References to tissue samples, skins, skeletons, or spread wings

saved from the same specimen should be written across the end of the label so that they stand out more clearly.

The precise order or arrangement of the data on the label is not important, but each preparator should develop their own structured format to minimize omissions and facilitate retrieval of the data. One approach is to begin with data that are already available prior to skinning (weight, wingspan, soft parts colors, how collected, habitat, etc.) followed by necropsy data. Another approach is to delay writing back side label data until all categories have been assessed (i.e., through skull ossification), and then to list data in order of potential importance to researchers and to cluster related types of data in a logical sequence. So, for example: 1) wingspan; 2) gonads, cloacal protuberance, etc.; 3) bursa + skull oss.; 4) molt; 5) weight + fat + crop/stomach contents; 6) how collected + habitat; and 7) soft parts colors (plus Tissues B-#####, spread wing saved, etc. written vertically across end of label).

WINGSPAN: Record wingspan on any specimen that has both wings and longest primaries more or less intact. Place bird on back on ruler and extend both wings as far as naturally possible. Use millimeters for measurements up to 999 mm, and centimeters for ≥ 100 cm.

SKULL OSSIFICATION: We prefer to use "ossification" rather than "pneumatization." Write "skull ###% oss." (Do not abbreviate skull as "sk."). Use "0%" for completely unossified skulls ("unoss." or "not oss." could be interpreted as simply <100% oss.) There is little point in using percentages other than the following: 0, 5, 10, 25, 50, 75, 90, 95, 100. Consult frequently with experienced preparators until you have a "feel" for estimating extent of ossification. Beware of frozen specimens in which 100% oss. skulls may at first appear only partly ossified due to cerebral hemorrhaging or shrinkage. For badly damaged skulls, it may be impossible to accurately determine ossification; for some skeletal specimens, it may be advisable to determine ossification after the skull has been cleaned.

GONAD DATA: For males, give length and width of largest testis in millimeters, e.g., "left testis 5 x 2 mm." If the right testis is the larger one (unusual), then also include measurements of the left (DO NOT abbreviate as "L." or "R."). If both testes are < 0.5 mm diameter (a condition usually restricted to juveniles of small passerines), then write "testes minute." If you measure gonads to the nearest half millimeter, then use "1/2" rather than using a decimal point (e.g., write "2 ½ mm" instead of "2.5 mm"). If the testes are not the usual fleshy or creamy color, note the color (unless it seems obvious that they are discolored from hemorrhaging or decomposition). In breeding males, check for "cloacal protuberance," a glandular swelling of tissues in the cloaca, and for evidence of an incubation/brood patch.

For females, record length and greatest width of ovary, diameter of largest ovum (e.g., "largest ova/ovum 5 mm dia."; do not use "lg." to abbreviate largest, do not use "follicle"

instead of ovum), and flat width of the oviduct near the midpoint, all in millimeters. Note whether the oviduct is “straight” (immature condition) versus “convoluted” (breeding or post-breeding condition). If all ova are $\leq 1/2$ mm, then write “ova minute” (do NOT write “ovary granular”); likewise, if the oviduct is $< 1/2$ mm wide, then write “oviduct minute.” If no ova can be distinguished (i.e., ovary lacks granular appearance, as is often the case in juveniles), then write “ovary ## X ## mm – smooth.” Beware of the following: (1) a partially decomposed ovary may look “smooth”; (2) that juvenal ovaries can be translucent and therefore easily overlooked; and (3) adrenal glands or ovary-shaped fat deposits in the vicinity of the gonads are frequently misidentified by the inexperienced preparator as ovaries in both juvenile females AND MALES. *For adult females in active breeding condition*, also record diameters of the three largest ova, and be alert for the presence of shelled or unshelled ova in the oviduct, ruptured or regressing follicles in the ovary, possible presence of a right ovary (mainly Falconiformes), and presence of an incubation/brood patch.

If you’re not 100% sure of the sex, DO NOT GUESS; mis-sexed birds are obviously highly undesirable, and you need not be ashamed if the sex cannot be determined. Don’t be timid about asking more experienced people to sex a bird in question. Be sure to open the body cavity for sexing birds as soon as possible (and before extracting tissue samples) if the bird has been frozen, shot in the back or belly, or has been sitting around for a while; every minute counts and unsexed specimens are of greatly reduced value. Getting to the gonads quickly is especially important for juveniles, the gonads of which are characteristically minute and delicate. Adequate illumination and magnification is VERY IMPORTANT for detecting gonads. If gonads can’t be found initially, then it may help to gently flush the abdominal cavity with water and re-examine. If the bird cannot be sexed, then you can write “gonads rotted,” or “gonads destroyed by shot,” or “no gonads found” to indicate that you didn’t forget to look. For specimens prepped in the lab, it’s worth refrigerating or re-freezing carcasses of unsexed individuals and getting opinions from other experienced preparators.

BURSA OF FABRICIUS: This dorsal out-pocketing of the cloaca is present in many young birds; it disappears as the bird matures. Consult frequently with experienced preparators until you know what to look for. Measure bursa length and width as you would a testis, e.g., “bursa 7 x 4mm.” If you are positive that there is no bursa, then write “no bursa;” otherwise, leave blank (e.g., “bursa not found” or “no bursa found” are ambiguous).

BODY WEIGHT (MASS): Abbreviate grams as “g” (NOT g., gr., gr, gm, or gms, etc.). Do not waste space with “wt. = # g.” In the field, use a scale that will allow maximum resolution (i.e., don’t use a 300 g scale to weigh a hummingbird) and calibrate it with something of known weight, because many Pesola scales are slightly “off” (they can be disassembled and tared). In the lab, use a triple beam balance or digital scale; again, make sure that you know how to read

the scale and that it is tared. Weigh birds as soon as possible after death, preferably before or immediately after freezing; dehydration begins to affect body weight within a couple of hours; if the bird is kept alive in captivity for more than a couple of hours before it is weighed (say, for a tissue sample), then indicate next to the body weight how many hours it was kept captive; better yet, weigh the bird when captured. If a specimen has been frozen for more than 3 months before weighing, then indicate this next to the weight, e.g., "53 g, after frozen 5 months," or "27 g on 8 April 2011." If the specimen was not in a sealed plastic bag, then give the number of months (or weeks) frozen even if under 3 months. Do not weigh birds that are substantially wet, muddy, or found dead (unless extent of eye dehydration indicates that the specimen was very fresh). If your scale weighs only to the nearest gram, don't put a decimal point and "0" after weight (e.g., "87.0" g) because that indicates that you measured it to the nearest 0.1 g; be sure to include the decimal point and zero for those birds that weighed exactly at gram increments. Don't be afraid to estimate weights to the nearest 0.1 g on a scale that has only gram or half-gram increments. If you estimate in 0.5 g increments, then write a "1/2" after the gram weight (not "0.5"). For certain individuals, it may be appropriate to add comments such as "emaciated, sunken pectoral muscles."

FAT: Record amount of subcutaneous fat using the following scale (modified from McCabe, 1943, Auk 60: 550-558):

"no fat" = no fat found

"trace fat" = hardly more than a trace in a dorsal tract or around the pygostyle

"light fat" = a substantial depth, perhaps 1 mm or so in a 20 g bird, in the dorsal tract; some fat in the furcula area.

"moderate fat" = quite heavy in the tracts, with small plates elsewhere on the skin; crotch of furcula fairly well-filled.

"heavy fat" = considerable amounts of fat removable from many parts of the skin; fat in the abdominal cavity. In this and the next category, it may be appropriate to add measurements of depth of the fat layer.

"extremely heavy fat" = deep sheets of fat everywhere between skin and muscle, even over the back; intestines solidly embedded and overlaid, hardly visible.

MOLT: Describe as thoroughly as reasonably possible, which will depend on your knowledge of molt, and on label space constraints. Although researchers interested in molt will prefer to personally examine specimens, notations made during preparation are still helpful, and it is usually easier to assess molt (especially wing and contour plumage) during preparation than

after the specimen has dried. Minimally, molting contour feathers, as detected by examination of feather tracts from inside the skin, should be noted, with some qualitative statement as to location and extent, e.g., “light molt on head and neck” or, for a bird in peak molt, “heavy head, body, wing, and tail molt.” If no molt is detected, then be sure to write “no body, wing, or tail molt” (vs. “no molt,” which would be ambiguous as to body region). Add “skin-inside” after all comments on body molt to indicate if your determination was made by internal rather than external examination. Note wing and tail molt by recording which feathers are being replaced, e.g., “primary #6 growing in.” To save space, it’s permissible to abbreviate primary as “P,” secondary as “S,” and rectrix as “R.” If space permits, then go into more detail, noting which remiges/retrices are “new” vs. “old,” e.g., “P1-4 new, P5 sheathed, P6 missing, P7-10 old” etc. If any rectrices or remiges were already missing when the bird was collected or were accidentally broken off or pulled out during collection or preparation, then note this. For skeletal specimens, describe plumage type, e.g., “Juvenal,” “First Basic,” “Definitive Basic,” “molting from Definitive Basic to Definitive Alternate,” etc. If space does not permit elaborate molt descriptions, then give a brief summary and refer to more detailed info in your personal catalog entry.

SOFT PART COLORS: Generally, DO NOT record colors of specimens that have been frozen or that are found dead (because they’ve almost certainly changed). Record color of iris (and orbital or facial skin if applicable), bill (maxilla and mandible if colored differently), gape (if different from bill, as on many juvenal birds), mouth-lining (at least for groups in which this is an important character, e.g., *Empidonax*, *Myiarchus*), tarsi and toes. Because iris color fades quickly after death, note this color as soon as the specimen is obtained. In species with complex facial or bill patterns, it may be preferable to make a separate drawing on a second label or to refer to a photo to be deposited in the LSUMNS Photo File. For series of same species with same soft part colors, reference subsequent specimens to the first one, e.g., “soft parts same as SWC 3555.” Do not abbreviate colors. If you use Smithe’s color guide, then capitalize his color names.

HABITAT & HOW OBTAINED: Be as specific as possible, e.g., “shot from mixed-species flock in mid-story of humid subtropical forest” or “shot singing (female nearby) 25 m up in canopy of humid tropical forest.” Statements such as “shot on fencepost” are useless unless expanded to reflect general habitat, e.g., “shot on fencepost along road through desert grassland.” Be sure to record HOW the specimen was obtained (e.g., “shot,” “netted,” “found dead,” “road kill,” “window kill,” etc.). This is important for compiling samples of birds obtained by similar collecting methods and often has unforeseen relevance to the subsequent data analyses. Do not give time of day of collection unless this has direct relevance for a specific research project.

STOMACH/CROP CONTENTS: Even a general statement such as “insects” or “plant material” is better than nothing, especially for poorly known species or species with seasonal diet shifts. Raptor stomach contents are especially important. If stomach/crop contents are saved, then note this on the label. Be sure to look for crop contents (e.g., raptors, columbids, hummingbirds, emberizids, icterids, etc.) as these are typically more intact than are stomach contents.

TISSUES SAVED: If tissues have been preserved, write “Tissues B-####” across the end of the label, using LSUMNS Tissue Catalogue number for cross-referencing purposes.

MISCELLANEOUS: If the bird was a territorial, singing bird, note this on the label. If members of a pair or family were collected, then indicate this on the label, e.g., “apparently mated to SWC 3220.” Any indication of breeding activity, such as carrying food or nest material or if flushed from nest, should also be noted. If the bird was voice-recorded, then note this on the label. Be on the lookout for parasites, physical deformities, disease symptoms, old injuries and other unusual observations and make appropriate notations on the label. If other material is saved from the specimen, then note this on the label also, e.g., partial skeleton, spread-wing, nest or eggs, parasites, gut tract, etc.

APPENDIX 3. Preparation of Specimens Obtained from Wild Bird Rehabilitation Centers or Donated as Salvage.

Hundreds of birds that died from gunshot wounds, hitting vehicles, wires or windows, disease, starvation, domestic cat predation, etc. are donated annually to wildlife rehabilitation centers or brought to LSUMNS by private citizens. Most such specimens are accompanied by reasonably reliable date and locality data and are prepared and labeled the same way as other specimens- with the following deviations.

1. Because of the number of specimens received, most are skeletonized or pickled. Specimens of rare species should be skinned. Other specimens that are in good shape, that were brought in dead, or were not in captivity for more than 1-2 days may also be skinned. Condition of specimens received frozen is often difficult to determine until thawed. Specimens of common species that lack date or specific locality data, that are rotted and cannot be sexed, or that have badly damaged skulls should be discarded. If in doubt, then consult with the Curator, Collections Manager, or Preparator.
2. “Locality” = where the specimen was found/captured; DO NOT use the name of the Rehab center. Street addresses should be included as part of the locality.
3. The “date” is the date that the specimen was FOUND in the wild. If that is not available (and the specimen is valuable enough to keep), then use another date in the following

priority: date RECEIVED at the Rehab center or Museum (indicate circumstances on back of label); date of DEATH (preceded by "Died:"); date of PREPARATION (preceded by "Prep:").

4. Depending on how long the bird was kept in captivity, how it died, and how much it was "tainted" during any attempts to keep it alive, data on the back side of the label may need to be modified as follows:
 - a. Molt activity may have been altered if the bird was held in captivity for more than a few weeks.
 - b. Body weight SHOULD NOT be recorded for specimens kept in captivity for more than 2 days, or for those that were necropsied, had parts amputated, had other major surgery or are badly soiled or dehydrated.
 - c. Fat SHOULD NOT be recorded on birds kept in captivity for more than 2 days.
 - d. Stomach contents should be described only for birds found dead.
 - e. Soft part colors should not be described unless recorded at the time of death.
5. For Rehab specimens, record on the back side of the label the name of the Rehab center and their specimen reference number and give date and ultimate-proximate causes of death (if known).
6. The person that found/donated the specimen (if known), should be noted as the "collector" ("coll. by") on the front of the label.

APPENDIX 4. Preparation of Aviary Specimens.

Specimens obtained from zoos or private aviaries are prepared the same way that other specimens are with the following exceptions:

1. The "locality" is written in the REVERSE sequence of that for normal specimens, e.g., "HOUSTON ZOO: Houston, Texas." This prevents any confusion between aviary and wild birds with respect to locality.
2. The "date" is the date that the specimen died. If that is not available, then use the date of preparation. In either case, the date is preceded by "Died:" or "Prep:" to avoid any confusion with non-aviary specimens.
3. The data on the back side of the label are greatly reduced. The only data we believe to be valuable for aviary birds are:
 - a. Gonad data (just to convince the researcher that the bird was correctly sexed).
 - b. Skull ossification & bursa of Fabricius.
 - c. For rare species, body weight and fat (to provide a general idea of size).

- d. For rare species, soft part colors (obviously to be interpreted with caution because of possible effects of captive diets on soft part colors).
4. Many zoo specimens have been necropsied and may be missing gonads. In such cases, see if the zoo veterinarian recorded the sex on the zoo label. In veterinarian jargon, a “1.0” = male, and “0.1” = female. If sex is not indicated on the label, then determine if the species can be sexed by plumage or size. If not, search carefully for the remnants of gonads. If the bird has a zoo ID number band or if there is a number on the label, then record it on the back of the specimen label – it may eventually be possible to determine sex from zoo records.
5. Do not discard leg bands.
6. Do not assume that aviary birds are correctly identified on freezer labels – double check ID.
7. Specimens of well represented species (check inventories) that are badly necropsied, rotted, or unsexable should be discarded.
8. The majority of aviary specimens should be skeletonized. Some which are relatively fresh and in good shape can be pickled (although we question whether even these specimens are of value because of potential atrophy of muscles in captivity). Avoid pickling specimens that are badly necropsied, dehydrated or otherwise in poor condition (diseased, emaciated, etc.). Specimens in good plumage can be skinned if the taxon or plumage is not represented in the collection.

APPENDIX 5. Preparation of Spread-wing Specimens.

Fully feathered spread-wing specimens are useful for observing plumage patterns, molt patterns and shapes of wings – characteristics that cannot be fully assessed from standard study skins. Spread-wings are most commonly obtained from specimens that are to be skeletonized, although it is occasionally advisable to prepare a spread-wing from a study skin specimen. Guidelines for choosing and preparing spread-wing specimens are as follow

1. We recommend that preparators save spread-wings from as many skeletal specimens as possible.
2. Specimens that are potential spread-wing candidates must have both sets of wing bones intact or, if one wing has broken elements, then that should be the one to be removed as a spread-wing. Potential spread-wings should be in good condition, e.g., they should not be soiled, stained or have broken or accidentally removed feathers. Although wings in molt may not look “perfect,” they are especially valuable.

3. The chosen wing is completely severed from the body by clipping thru the base of the humerus. Try to cut through the skin so that the scapulars and axillars stay with the wing. For wings from large birds, it may be advisable to remove some of the larger muscle masses by splitting open the skin on the underside of the humerus and radius-ulna. Do not "skin-out" the wing to remove flesh, because this may alter wing shape and feather positions. Apply some borax powder to any remaining scraps of meat. For medium-sized wings, inject some 10% formalin into the wing muscles. Wings are then firmly pinned-out to dry in a standard, fully extended position; the leading edge of the wing and the outermost primary should more or less form a straight line. Carefully arrange the other flight feathers and scapulars so that they dry in a symmetrical pattern. Allow to dry for at least a few weeks.
4. The spread-wing label should be tied through the patagial skin on the leading edge of the wing. The front side of the label should include state or country, date, sex, preparator's name, and catalogue number. On the back side of the label, write the identification along the top edge in ink, indicate the age and plumage type, and reference the wing to associated skeleton or skin material.

APPENDIX 6. Format Instructions for Personal Catalog

[demo copies of JVR catalogue with notes in margins]

APPENDIX 7. Preservation of Bird Stomach Contents.

What to save: There are few set rules on which species' and how many individuals' stomach contents should be saved. Obviously, rarities and species of immediate interest to someone's project should have top priority. Also, individuals that have been shot are more desirable than those mist-netted, because the latter often show strong post-capture digestion of, or regurgitation of, stomach contents. Series of 10 or more from a single locality are also valuable. On expeditions, the number of

stomach vials available will usually limit the number of samples that can be saved. For specimens prepared at LSUMNS, we usually save all stomachs that have potentially identifiable contents. Do NOT save the stomach contents of aviary birds or those of “rehab” or salvaged birds unless they were DOA’s of special interest.

How to save stomach contents:

1. Remove stomach as quickly as possible (contents decompose/digest rapidly if left sitting after body is opened).
2. Slit the stomach open by cutting carefully along stomach wall with scissors; cutting deeper may damage larger insect parts or seeds.
3. Place stomach in a vial, preferably our standard 20-ml glass (borosilicate) “Kimble” scintillation vial with white plastic-lined “polyseal” cap (do not buy “foil-lined” caps).
4. Fill vial at least ½ full with ethanol (or when contents themselves fill more than half the vial, fill until contents completely submerged). Stomachs of large (>300g) birds or vertebrate prey found in stomachs should be placed in 10% formalin for proper fixing and later transferred to ethanol. Intact vertebrate prey should be injected as you would any fluid-preserved specimen.
5. On a small piece of high-rag-content paper, write (in indelible ink) species’ name, preparator’s initials and catalogue number, and state or country abbreviation, and place this in the vial after the ink is dry. Record the same information with a “sharpie” pen on the top of the vial cap. Make certain that the cap is screwed on TIGHT.
6. Write “saved” after “stomach” on both your specimen label and in your catalogue.

APPENDIX 8. Preparation of Fluid-preserved Bird Specimens.

GENERAL

Birds to be “pickled” should be fixed as soon as possible after death; never leave overnight. Avoid shot birds for anatomical specimens unless no others are available. If you know in advance that a shot bird will be pickled, then do not stuff cotton down the throat, because this may cause damage and dehydrate the feeding apparatus. If possible, pickle frozen birds within two weeks.

Fill out the label of a fluid-preserved specimen as you would a skin label except record the name of the species in ink along the upper edge of the back side of the label. Indicate sex

when this can be determined from plumage; otherwise, leave sex blank (do not write “sex?”). Do not neglect to record body weight, soft part colors, molt, habitat and whether bird was shot, netted, etc. Let ink dry on label for several minutes before washing or placing in formalin. Give some indication of how long specimen was stored in the freezer.

Preparation

Wash the specimen gently in alcohol or soapy water to destroy water repellent properties of feathers to allow formalin to penetrate the plumage to the skin. Avoid fixing the specimen in a contorted position. If birds are to be stored in plastic bags, then wrap the claws and bill in cotton to prevent puncturing.

A 10% formaldehyde (formalin) solution is the standard embalming/fixing agent. “Full strength” formalin is about 38% concentration in a saturated solution. So, a 10% solution of full strength formalin is actually about a 3-4% absolute concentration.

For birds smaller than a *Turdus*, inject body cavity with 10% buffered formalin until the specimen is turgid or fluid runs out of the nostrils. For birds Cardinal-sized and larger, also inject major muscle masses, toe pads, and tarsal skin. For birds weighing over 500 g, re-inject every 24 hours or so for 3-4 days. If no syringe is available and for extremely large birds, then make a shallow cut through abdominal skin from sternum to cloaca to allow formalin into body cavity.

Storage

Birds Robin-sized or smaller should remain in a 10% formalin solution for 3- weeks; larger birds should remain in formalin for at least 6 weeks. Afterwards, rinse specimens in water for at least 24 hours to leach out formalin and then transfer specimens to a solution of 70% ethyl alcohol. Specimens remaining too long in formalin will decalcify. This can be counteracted to some extent by adding a buffering agent like marble chips or limestone.

When traveling, a formaldehyde equivalent (paraformaldehyde) available in powdered form is convenient for saving weight and space. To convert paraformaldehyde to a solution equivalent to 10% formalin, add 32 g paraformaldehyde to 1 qt. water (128 g to 1 gal., 34 g to 1 L). If possible, buffer this solution with NaOH (4 pellets per qt. or L), marble chips, or limestone.

APPENDIX 9. Preparation of Skeletal Bird Specimens

General

Avoid skeletonizing badly shot birds or road-kills, especially those with damage to the head area. If you know in advance that a particular shot bird will be skeletonized, then do not stuff cotton down the throat because this may damage delicate hyoid bones and seriously interfere with proper preparation. For species whose identification is not certain, refer the skeleton to a skin of the same species. Do not skeletonize birds of uncertain identification for which there is no reference skin. Do not save trunk skeletons from birds prepared as skins unless the species is rare or poorly represented in the LSU skeletal collection; "ROM's" (complete skeleton minus one wing and leg, + skin) are preferable in such situations. Trunk skeletons are almost never used, yet they take the same amount of time to process and take up the same amount of space in the collection as complete skeletons. If both sets of wing bones are intact, it may be advisable to save one, fully feathered wing for the spread-wing collection; preparators should routinely consult the inventory of the spread-wing collection to fill gaps in species and plumages (see guidelines for preparation of spread-wings). Trunk skeletons (or complete skels. from ROM's) and spread wings must be labeled with the same catalog number as the skin from that specimen; on the labels, cross-reference skin and associated skeletal or spread-wing material.

Fill out the skeleton label as you would a skin label except: (a) record the name of the species in ink along the upper edge of the back side of the label, and (b) on birds smaller than a Robin, confine writing to the right of the two label thread holes so that the narrow vertical margin to the left may be cut off; this allows the label to fit in our small skeleton boxes without bending. Do not neglect to record usual information on body weight, fat, gonad condition, soft part colors, stomach contents, molt, bursa of Fabricius, skull ossification (when possible), habitat, whether bird was shot, netted, etc., and tissue number on skeleton labels. Also, be sure to record plumage type, e.g., "juv.," "first-year," "red morph," etc., whenever this might be critical to subsequent analyses.

Preparation

Weigh specimen and check soft parts (probably unnecessary for species well represented by skins from the region in question), plumage type, and molt. Remove skin and feathers as quickly as possible by ripping large patches of skin away from the flesh. Plucking feathers first is a waste of time. Avoid losing or damaging delicate bones, especially those in distal portion of the wing. Rectrices should be stripped away from the pygostyle laterally. Wing feathers can be stripped away distally, except that the outer primaries and alula should be more carefully plucked. **DO NOT CLIP OFF FLIGHT FEATHERS, LEAVING QUILLS AND SKIN ON**

THE WING BECAUSE THIS GREATLY LENGTHENS SUBSEQUENT PROCESSING TIME. Sever breast muscles perpendicular to the muscle grain so that as they dry they will not buckle or warp the keel; on birds *Turdus*-sized and larger, remove major portion of the large muscle masses (this facilitates drying), taking care not to damage bones. Leave eyes in the specimen but puncture them carefully to allow fluids to dry; be careful not to damage the sclerotic ring. Remove uropygial gland (which contains potentially bone-staining oil), as well as fat deposits in furcular cleft and on lower back. Remove as much tarsal and toe skin as reasonably possible.

Sex the specimen and check for bursa of Fabricius, stomach contents, and parasites, being careful not to damage ribs. If gonads cannot be found, sex by plumage characters if possible and record sex on tag e.g., "by plumage." Then eviscerate as completely as possible. Be sure to peel lungs from rib cage (but be careful not to damage trachea) and kidneys from pelvic area. Remove any cotton or paper plugs from throat.

Any skeletal elements accidentally detached should be placed into the body cavity or otherwise anchored to the main skeleton. In the field, cross the legs behind the head and tie them together to make specimen more compact and tie remaining ends of label string around body to hold wings against body. Use extra string if needed to keep head, legs and wings against body (so that they don't break off during subsequent handling and transport), but use as little string as possible and do not wrap the specimen tightly (the specimen will dry faster, and will be more efficiently cleaned by dermestid beetles). With trunk skeletons, be sure to save neck, occipital region of head, sclerotic rings, and at least one humerus. Make every effort to avoid soaking or staining the label with blood or fat, because such labels are more susceptible to "bug" damage.

Storage

Dried specimens weigh much less than those stored in alcohol. So, if circumstances permit, try to dry skeletal specimens as thoroughly as possible. Sun or heat lamps in a drying box work best. Do not dry specimens over a campfire or using temperatures over 150 F; specimens dried over lanterns are easily scorched. Keep flies and ants off the specimens; a wooden-frame screen box or cheesecloth works well for this. Fly-blown specimens will not dry, will create odor problems, and are cleaned much more slowly by dermestids. If circumstances permit, a specimen suspected of harboring fly eggs should be frozen overnight to kill the flies. Of course, do not use insecticides, and avoid exposing carcasses to mothballs. If the skeletons cannot be dried fast enough to prevent insect or fungus damage, or rotting, then store them in ethanol. Do not allow paper or labels to stick to the carcass or carcasses to stick to each other. Once dried, make certain the specimen stays dry by keeping it well ventilated. If the specimen begins to rot or fungus appears, try to dry it out again. As a last resort, store it in alcohol. In humid regions, do not store specimens in closed containers until absolutely necessary because

this will promote fungus growth. Dried specimens stored in the field should be checked periodically for dermestid infestations. If possible, store dried specimens in a freezer until further processing.