

Anthropology 4372/6372
Spring Semester 2018

2:00 – 5:00 PM Monday
Stewart 117 (back lab)

Zooarchaeology

Professor: Jack M. Broughton (jack.broughton@anthro.utah.edu) TA: Isaac A. Hart (ikeosaurus@gmail.com)
Office: 218 Stewart Building (Phone: 581-8869)
Drop by anytime! (or by appointment)

Course Description and Goals

Anth 4372/6372 (4 credit hours; no pre- or co-requisites). Analyses of archaeological vertebrate remains can address problems that range from past human subsistence strategies and paleoecology to paleoclimatic reconstruction. Addressing such issues requires the identification of vertebrate bones and teeth from archaeological contexts. This hands-on, laboratory-based course provides an introduction to the identification and analysis of fragmentary vertebrate osteological material from archaeological and paleontological settings. Students will gain competence in the identification of fragmentary remains of fishes, amphibians, reptiles, birds, and mammals, focusing on taxa native to western North America and the Great Basin. More specialized expertise will be gained through individual projects where students will develop and address a research problem through the analysis of a specific set of archaeological or paleontological vertebrate materials.

Course Objectives

After taking this course, you will be able to identify and analyze fragmentary vertebrate remains from archaeological and paleontological contexts from western North America. You will also gain skills in developing and writing problem-oriented scientific research papers involving those remains, and presenting the results of that work orally. Finally, you will gain experience in the preparation and curation of vertebrate skeletal specimens for an osteological comparative collection.

Readings

Required Text:

Broughton, Jack. M., and Miller, Shawn. 2016. *Zooarchaeology and Field Ecology: A Photographic Atlas*. University of Utah Press: Salt Lake City.

Additional required readings are posted on Canvas.

Dissecting kit

A dissecting kit (including scalpel, scissors, forceps) is required for the vertebrate skeletal preparations; they are available at the University Bookstore. These need to be brought to class for each of the three prep labs. Tetanus shots within the last 7 years are highly recommended for students prior to participating in the skeletal preparations.

Evaluation

The semester grade will be determined from the composite scores attained on four laboratory practical exams, a written take-home exam on the lecture/reading materials, attendance/punctuality, the preparation of three vertebrate specimens, a written research proposal, a written research report, and a 15-minute class presentation of that report. The weight of these requirements is as follows:

Attendance/punctuality (each tardy/absence –10)	30 points
Fish lab exam (Feb 5)	50 points
Research proposal (due Feb 12)	20 points
Mammal lab exam (March 5)	50 points
Lecture/Articles exam (due April 2)	50 points
Bird/Herp lab exam (April 9)	50 points
Research report (due April 16; see below)	100 points
Presentations (April 23)	50 points
Final lab exam (April 30)	100 points
Skeletal preparations; lab etiquette	<u>50 points</u>
Total	550 points

Note: There will be no makeup exams or skeletal preparation labs.

Class Schedule

Week/Date	Topics	Readings
1. Jan 8	Introduction; History of American Zooarchaeology; Zoological Nomenclature; Anatomical Orientations; General Osteology of Bony Fishes	Atlas pp. xiii-31, Steele 2015, Broughton 2015
2. Jan 15	No Class—Martin Luther King Jr. Day (study fish!)	
3. Jan 22	Modern Goals of Zooarchaeology; Taxonomy and Osteological Variation of Western Fishes	Atlas pp. 32-43, Driver 1992
4. Jan 29	A Model of Assemblage Variability; Fish Prep Lab	Marean /Assefa 1999, Wolverton 2012
5. Feb 5	Fish Lab Exam ; Criteria for Identifications; Quantification of Taxonomic Abundances; General Osteology of Mammals	Grayson 1979 (pp.199-218), Atlas pp.72-94
6. Feb 12	Quantification of Skeletal Part Abundances; Utility Indices; Taxonomy and Osteological Variation of Western Mammals (<i>Research proposal due</i>)	Atlas pp. 95-126, Madrigal & Z. 2002
7. Feb 19	No Class—President's Day (study mammals!)	

8. Feb 26 Case Study: Faunal Resource Depression in California
Faunal Data Recording; Taphonomy Lab Broughton et al. 2010,
Schmitt 1995,
Atlas pp. 169-179
9. Mar 5 **Mammal Lab Exam; Mammal Skeleton Preparation** Butler and
Schroeder 1998
10. Mar 12 Specimen, Collection, Preparation, and Curation;
Paleoenvironmental Reconstruction; General Osteology of Birds Atlas pp.127-143,
Grayson 2006,
Hart et al. 2015,
Lyman 2017
11. Mar 19 No Class— Spring Break (work on projects!)
12. Mar 26 Taxonomy and Osteological Variation of Western Birds;
Bird Skeleton Preparation Broughton et al. 2008,
Lecture/Articles Take-Home Exam (**due April 2**) Atlas pp. 144-168
13. April 2 General Osteology and Taxonomy of Amphibians and Reptiles;
Case Study: Artiodactyls and Climatic Seasonality. Atlas pp. 44-71,
Thurs-Sun (**TBA**) **Field Trip:** Bonneville Basin caves Crabtree 1990,
(roadkill collecting, owl pellets, field identifications) Lyman 1996
14. April 9 **Bird and Herp Lab Exam;** Applied Zooarchaeology;
Research Report Structure and Organization
15. April 16 **Research Report Due; Field Trip:** Great Salt Lake
(field identifications).
16. April 23 **Research Report Presentations**
17. April 30 Finals week: **Comprehensive Lab Final Exam**
(Monday, April 30: 2-5 PM); **Final Research Report Due May 4.**

Research Report: Guidelines

The problem-oriented research report will be the culmination of your analysis of an archaeological or paleontological vertebrate assemblage. Each student will consult with me in detail on the nature of the research project to be undertaken. You will write the paper in scientific format, using the style of the *Journal of Taphonomy*. Further details and examples are included in the *Journal of Taphonomy* "Guide to Authors" at <http://www.journaltaphonomy.com/>. Note that there are many differences between scientific papers and the typical "term paper" for, say, an English class. Everything is to be double-spaced and word-processed, and the pages numbered. The paper must have the following components in this order:

1. Title page. This page gives the title and your name and affiliation.
2. Abstract. This is a self-contained paragraph that encapsulates the entire study: goals, methods, results, and conclusions. It is normally no more than one double-spaced page and is separated from the Introduction. While the abstract appears first, it is invariably best to write it last.
3. Introduction. This section provides a brief background to the problem and takes the reader by the hand to what will be done in the paper and why it is important. Therefore, it is not the place for an exhaustive literature review but should indicate why the study was conducted and cite pertinent work by others. Introductions typically end with a paragraph more or less as follows: "To test the hypothesis that..., I analyzed x assemblages from x location." (Note: The introduction may be followed by a separate more detailed theoretical exposition.)
4. Materials and Methods: In the zooarchaeological context, this section is often called something like "The Site X Vertebrate Fauna". Here, the site or sites that provided the vertebrate materials are described, including pertinent background information such as the environmental setting, recovery methods, dating issues, etc. Specific taxonomic identification issues are also included in this section. Maps indicating the location of the site or sites are standard in this section.
5. Results: What happened? In this section the data are presented, summarized and synthesized. A table including the numbers of identified specimens per taxon is standard and usually is presented first. What are the patterns in the faunal data relevant to the research problem? Graphs or other figures illustrating key trends in the data are presented here. You may not have had a course in statistics, but if you have this is the place to use what you learned. (Note: There may actually be several subheadings within the general Results section.)
6. Discussion/Conclusion. This section begins with a concise wrap-up of the salient results and whether or not they support the hypothesis outlined in the introduction. Start with the simplest, most sound conclusions from the analysis. Do not whine about the small sample sizes or make other excuses for shortcomings in the analysis. Be positive and sell the major impact this work has for our knowledge of the topic that was studied. A good closing paragraph states that your test is strong but also identifies additional lines of evidence that would provide stronger tests of the hypothesis.

7. Acknowledgments. This includes a set of “Thanks You’s” for people who helped you in the course of your analysis.

8. References. All papers cited in the text, figures or tables must be referenced and no paper should be referenced that is not cited in the paper. Failure to adhere to this indicates careless preparation. Note the way papers in the *Journal of Taphonomy* are referenced and follow their examples ***precisely***. References in the text should be by name and date (Broughton 2002). A References Cited section should be included directly after the main text. References should be listed alphabetically as follows:

Books, monographs and doctoral theses:

Haynes, G. (1991). *Mammoths, Mastodons and Elephants. Biology, Behavior and the Fossil Record*. Cambridge University Press, Cambridge.

Articles:

Lupo, K. D. (1994). Butchery marks and carcass acquisition strategies: distinguishing hunting from scavenging in archaeological contexts. *Journal of Archaeological Science*, 21: 827-837.

Book chapters:

Behrensmeyer, A. K. (1990). Transport-hydrodynamics: bones. In (Briggs, D. E. G. & Crowther, P.R., eds.) *Paleobiology: A Synthesis*. Oxford: Blackwell Scientific Publications, pp.232-235.

9. Figures. Tables and figures are not interspersed throughout the paper but are included at the end. The “Figure Captions” page comes after the references and are all typed on the same page. For example:

Figure Captions

Figure 1. Map of the San Francisco Bay indicating location of the Patterson Shellmound.

Figure 2. The distribution of the lagomorph index by stratum at Sudden Shelter.

Figure 3. The relationship between the artiodactyl index and the numbers of identified specimens at the Evans Mound.

10. Each figure (graphs, maps, photographs, etc) should then (following the figure captions page) be placed on its own page in the order in which it appears in the text. Do not use color, only black and white. A computer should generate graphs. No captions are required here. (I usually indicate the figure number in pencil at the bottom so I [they] don’t get them mixed up.)

10. Tables. Each table is on its own page and has a self-explanatory caption. This means that one should be able to decipher the table without reading the text. Do not include gridlines on tables.

Again, see examples of published papers in the *Journal of Taphonomy* at:
<http://www.journaltaphonomy.com/>.

Report Evaluations. We will follow as closely as possible the evaluation process as if you had submitted your paper to a journal for publication. Normally, when you submit a paper to a journal, it is first sent out to “external referees,” experts in the field that will critically evaluate the paper and recommend whether or not it should be published and how it could be improved. The “editor” of the journal solicits the external reviews and evaluates both the paper itself as well as the comments made by the referees. The editor then notifies the author about the outcome. If the editor does not “reject” the paper he/she will normally recommend specific issues that the author must address before submitting a revised version.

I will act as both external referee and the editor in the context of this class. Papers need to be submitted by **April 16**. I will review them for you to pick up by April 23. Based on the reviews, you will then revise your manuscript and re-submit it by **May 4**.