

Broughton, Jack M., and Shawn D. Miller
2016 *Zooarchaeology & Field Ecology: A
Photographic Atlas*. Salt Lake City: The
University of Utah Press. xvii, 201 p. ISBN
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Abstract: *This copiously-illustrated book provides guidance on identifying bones from animals found in the western United States and Canada.*

Broughton and Miller present a well-illustrated guide to basic animal identification focused on species found in the western United States and Canada (more specifically, non-marine vertebrate species found west of the Rocky Mountains). The introduction provides basic information on taxonomy, bone biology, and terminology. The last chapter discusses taphonomy and the types of marks that can be produced on bone by different agents, including stone tools, carnivore teeth, roots, and burning. The five chapters that comprise most of the book cover the bones of fish, amphibians, reptiles, mammals, and birds. The black and white photographs and text guide students in identifying bones down to the genus level. There is a 16 page insert of color illustrations, but these are photographs of living animals, not of bones. Finally, there is both a list of references and suggestions for further reading, the latter subdivided by animal class.

Each of the five middle chapters is subdivided into an overview of the general osteological characteristics of the (traditionally defined) animal class, and more detailed description of the families within that class found in the western U.S. Each overview includes multiple photos of the bones of a representative specimen. There are 13 photos of Common Carp (*Cyprinus carpio*), an Asian fish that has only appeared in the U.S. in historic times, seven photos of

Northern Leopard Frog (*Lithobates pipiens*) for amphibians, four photos of various reptiles, 20 photos of mammals, primarily bobcat (*Lynx rufus*), and 13 photos of birds including domestic chicken (*Gallus gallus*), Great Sage-grouse (*Centrocercus urophasianus*), and Dusky Grouse (*Dendragapus obscurus*). Osteological landmarks on each bone are labeled. Curiously, none of the photos have a scale, but the images themselves are clear and show many osteological details.

The second section of each chapter goes into details on the different types of animals within each class. For example, the chapter on birds includes summaries of 18 orders, including Galliformes (grouse, turkey, and similar species), Gaviiformes (Loons), and Piciformes (woodpeckers). Several of these orders are represented by a single family, and in some cases, a single species, in western North America. In general, the text describes the animals within each subgroup and their basic ecology, while the photos (which do have scale bars) and their figure captions point out differences among groups of animals and distinctive osteological features that help in bone identification, such as the difference between the haemal spines on vertebrae of crotalid and colubrid snakes. Many of the admittedly numerous and confusing anatomical terms are defined in Chapter 1, but some, like “fusiform” and “edentulous” are dropped into the text without explanation.

The book also includes bones from species that are rarely depicted in other guides, including a lamprey mouth and a hummingbird skull and sternum. Most of the mammal families are only represented by photos of skulls, which are commonly found in other guides, while the bird photographs contain the skull and at least one other skeletal element. The amphibians chapter,

in contrast, includes an image of the cranium, pectoral girdle, and os coxa (pelvis) for each of the four families of Anura (Bufonidae, Hylidae, Ranidae, and Scaphiopodidae).

Overall, the book is a strong contender as a textbook for an introductory zooarchaeology class, especially if the geographic focus matches the class. The quality of the photos and figure captions, which are the real stars of the book, also make it a useful reference to keep in a zooarchaeology or paleontology laboratory.

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