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Identification Guide to North American Birds, Part II.—Peter Pyle. 2008. Slate Creek Press, Point Reyes Station, CA. xi + 836 pp., 556 text figures, 71 text tables, 289 bar graphs. ISBN 9780961894047. \$62.99 (paper).

At the outset, I must stress that this is *not a field guide* in the sense of a guide to the identification of species of North American birds. In the main, it is not a field guide at all; it is the second and final part of a comprehensive collation of technical material to be applied primarily to birds in the hand. Thus the primary audience consists of bird banders (there is a successful coordination of data in the book with the data required of U.S. and Canadian bird banders by the joint North American Bird Banding Laboratory) or museum workers and others using reference collections for research. The girl scout seeking material for her Bird Study merit badge or the beginning birder interested in, for example, the changing plumages of the American Golden-Plover (*Pluvialis dominica*) might start to read the molt section on p. 513 and puzzle over “Molt—CAS. PF complete (Oct–Mar/May in HY/SYs), DPB complete (Jul–Mar in AHY/ASYs). . . .” Yet Pyle is aware of the problems involved in describing concisely for each

species the characteristics that separate it from similar species in the hand, and with the advent of superb optics and modern digital photography, an understanding of the molt sequence of any one species, with reference to the complete species account, may add considerably to the inquiring field birder's knowledge and appreciation of a well-studied individual bird at reasonable ranges. Thus we discerning viewers of online digital bird images should also be included as potential buyers of this book.

This final volume (Part II) completes the monumental task started in Part I (Pyle 1997), which covered 392 species and 856 subspecies of North American landbirds. In this volume, Pyle summarizes tersely geographic variation, molt, age, sex, hybrids reported, and references for 310 species and 276 subspecies of nonpasserine birds (waterfowl through alcids). Accordingly, a careful reading of the first 46 pages before the species accounts is obligatory. To keep the book at a transportable size (15.5 × 23.5 cm), extensive abbreviation has been employed, and the most frequent "abbreviations and interpretations" are printed inside the front and back covers for more rapid reference. Because published information on molts and plumages by age is less for the species in Part II than for those in Part I, Pyle has relied more heavily on field work and specimen examination, making 93 visits to reference collections over the 6.5 years of writing. He presents this work (rather too modestly in my opinion) with "a primary objective ... to call attention to unsolved problems" (p. 1) and asks for the inevitable new research, suggestions, corrections, and updates to be coordinated at the website www.Slate-CreekPress.com in the future. The phrase "more study needed" occurs frequently in species accounts. We should all try harder.

An early heading within the introduction is "Bird Topography," which standardizes feather nomenclature to follow the widely used approach summarized in Sibley (2000). The primary, secondary, or rectrix feathers are numbered in the order in which they are molted in the majority of species (primaries proximal to distal, secondaries usually distal to proximal, and rectrices centrifugally). After sections similarly standardizing measurement techniques, an extremely important section deals with molt. Following Humphrey and Parkes (1959), a molt (e.g., prealternate) is named for the plumage (e.g. alternate, usually breeding) that results from it. Pyle also follows Howell et al. (2003) by recognizing additional inserted molts such as the preformative molt, which may follow the first prebasic and precede the first prealternate. This sequence is abbreviated to save space and would be represented as PBI, PF, PA1 (see Complex Alternate Strategy F, fig. 10, p. 14). In large, long-winged birds such as cormorants (family Phalacrocoracidae) that need to maintain the ability to fly while molting, primary and secondary wing feathers follow a strategy termed *Staffelmauser* (Stresemann and Stresemann 1966). Here "simultaneous waves" of molt may create differences in wear and coloration, as does arrested molt in any tract, leading to visible molt limits in a plumage. Thus, an understanding of molt leads to plumages, which lead to age and sex determination in as precise a manner as possible. When combined with characters of brood patch and cloacal development the age and sex are then coded according to the calendar-year-based system of the Bird Banding Laboratory (BBL). Most active bird banders have already discovered that moistening the skin over the skull and attempting to see through to the pneumatization development beneath is far more difficult in nonpasserine birds. Pyle summarizes the literature to suggest that "most to all nonpasserines do not complete pneumatization" that can be seen through the skin of the living bird. This will be a welcome relief to all who have struggled and failed.

"Species Accounts" (pp. 47–789) present a highly detailed summary of the above information (and much more) for all

species covered. In reading these I often find it essential to refer back to the abbreviation summaries inside the covers or to the introductory chapters, even after using most of this terminology since the publication of Part I in 1997. Each account gives the BBL's four-letter codes, species numbers, and suggested band size. Measurements or plumage characters distinguishing the bird from similar species are presented, and geographic variation is noted. Molts and their extent and timing are given, and then all the possible age categories are listed and described. This follows the BBL protocol in defining hatch year (HY) as the calendar year in which the bird was hatched. On the following 1 January the bird becomes second year (SY) for the next 12 months, etc. A bird in at least its second calendar year, but maybe older, is after hatch year (AHY). It then becomes after second year (ASY) on the next 1 January, if that plumage can be discerned. This somewhat confusing information is combined with any determination of sex in a summary bar graph for nearly all species. For each month, by all available age criteria, the percentage of birds of that age group that is likely to be successfully aged is indicated. The bars are patterned for the four likelihoods: >95%, 25–95%, 5–25%, and <5%. Symbols for male and female are added if sex can be determined in that month. The references at the end of each species account are invaluable and allow the user to check original publication of the described characters and also provide the basis for new discoveries, updates, or corrections. The publisher's website is provided with just this in mind for the future.

When I first saw the Pyle's (1997) system of summarizing all possible age and sex groupings under each species in North America it brought to mind a similar method used by Lars Svensson (1970) in his *Identification Guide to European Passerines*. The drawback to this method is that the user has to read the whole account and then assign the "best fit" age or sex category to the bird in hand. This system often requires a person unfamiliar with the species to have to choose the "best" character or perhaps be unsure and fail to make a more precise determination. Pyle tries to minimize this problem by presenting all the criteria, commenting on their reliability, then providing an estimate of what percentage of that species can be so determined in each month (the bar graph). The alternative is a form of binomial or multinomial key. This latter method has the advantage of leading the user from the most reliable characters down the key to the least reliable, while dropping out conclusions about the bird's age and sex category along the way. Some banders or biologists using skin collections may remember this method from unpublished draft keys from the BBL or *A Bird-Bander's Guide to the Determination of Age and Sex of Selected Species* (Wood 1969). For specific locations or smaller geographic areas, this may arguably still be the better method for training people unfamiliar with a species or plumage. For the more experienced, a Svensson/Pyle type of manual may be easier to use when only a single detail is to be confirmed. As a guide's geographic scope increases to an area the size of North America, many populations or subspecies will introduce variation and reduce the power of discrimination in a binary key. Reading of the acknowledgements from Pyle et al. (1987) informed me that Pyle had met Svensson in Sweden in 1981 and described conversations and birding trips with him as "the initial inspiration to someday create *Identification Guide to North American Passerines*." Now data for the rest of the nonpasserines have followed in the same Svensson style, with many, many refinements and improvements by Pyle and others. The author particularly thanks Steve Howell for initial drafts on gulls, terns, skuas, and jaegers, many comments, and 62 figures. Siobhan Ruck prepared many more figures and commented on diurnal raptors, while David DeSante published the series.

In summary, the sheer volume of detail, well referenced and presented in a standard format, makes this volume (Part II) and the original Part I essential for any serious ornithological reference library, museum, reference collection of bird skins, or bird-banding operation. Field ornithologists who wish to improve their basic knowledge of bird biology will find it informative and key to much more detailed observation, at least at closer ranges. The Internet is now providing all of us with better and better images, and this book will be useful in identifying many of these photographed birds to age or sex. The species accounts are not exactly readable in the normal sense. The necessary abbreviations are numerous and far from clear at first reading. But it is worth the effort to try to learn them, or at least keep looking them up. Standardization of terminology and measurement methods is always good, and bird banders will appreciate the standardization with BBL codes and the BBL's acceptance of age and sex categories, by month, used by Pyle. There will always be a place for well-written binary keys to age and sex for birds "up close." There is an equal place for the invaluable mass of data in the introduction, species accounts, and literature cited of Pyle's Part II.—TREVOR L. LLOYD-EVANS, Manomet Center for Conservation Sciences, P. O. Box 1770, Manomet, MA 02345-1770. E-mail: tlloyd-evans@manomet.org.

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