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BOOK REVIEW

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**Manual for ageing and sexing the landbirds of Bosque Fray Jorge National Park and north-central Chile, with notes on occurrence and breeding seasonality.** Peter Pyle, Andrew Engilis Jr & Douglas A. Kelt (2015) Special Publication of the Occasional Papers of the Museum of Natural Science. Louisiana State University, 119 Foster Hall, Baton Rouge, LA 70803, USA. PDF version, 155 pp, 158 color illustrations, 3 black and white illustrations, 1 color map, 1 flowchart. Print-ISBN-978-1-4951-3624-5. No costs, available online: https://sites01.lsu.edu/wp/mnspapers/files/2015/02/Manual-for-Ageing-and-Sexing-Birds-at-Fray-Jorge-National-Park-Pyle-et-al-2Feb-2015.pdf.

Fray Jorge National Park is a Biosphere Reserve, located in the Coquimbo Region on the coast of north-central Chile. The ecological dynamics of this region are very particular since it is where the hyperarid Southern Atacama Desert and the Northern Chilean Mediterranean region meet and major transition happens, leading to conditions for high species diversity (Kelt et al. 2016). The reserve hosts 26.2% of the 469 bird species in Chile (Jamarillo & Barros 2013).

Written by Peter Pyle, one of the leading authorities on molt studies in the continent, Andrew Engilis, and Douglas Kelt, both distinguished and recognized zoologists, the manual is an excellent by-product of what originally was planned only as an avian productivity monitoring study that commenced in 2008. Part of a major project devoted to analyse abiotic effects on productivity of organisms in the matorral habitat of the reserve since 1989. It gathers information on the 29 most common species in the reserve, many of which are widespread in Chile and South America. It contains information mainly on age and sex characteristics but it is not limited to this two aspects, since it also provides valuable descriptions on geographic variation, range and breeding seasonality.

**What kind of book it is?** This is a reference book, a manual conceived to be helpful primarily for people conducting bird studies that include age and sex variables, not exclusively for researchers but also for bird banders, field technicians and volunteers pursuing this same objective. Devoid of an engaging prose for those not familiar and interested in the topic, it takes the reader straight to the promised subject, clearly stated on the title. It is the first banding manual for Chile and one of few that cover South American resident species.

**General contents.** Most of manual contents are novel. All structural measurements, molt, age, and sex information presented are original and unpublished. The rest is a compilation of previously published information on concepts and techniques (first part of the book) and newly attained and previously published information on geographic variation, and very specific range and breeding seasonality details, collected in the field and from museum collections.

The *Sex* determination section is brief, and easy to read and understand, it mainly focuses on color and morphological differences, clarifying if measurements presented in the prior section are reliable for sexing or not. As for the *Molt* section, just like with other Pyle guides, the reader must be familiarized with molt concepts and nomenclature to understand it. A similar caveat applies to the *Aging* section, which is extensive. The book covers in its first pages all necessary concepts in a clear and summarized manner, for those new to the subject. Particularly the molt-cycle-based ageing system (Wolfe-Ryder-Pyle "WRP" system) nomenclature is explained in detail given that it is recent, and of potential broad use for aging birds in the entire American continent, making it unnecessary to look for information in a different source prior to use the manual to age and sex birds.

**Book structure and contents.** To the unfamiliar eye, content on concepts and techniques might seem a repetition of some of the information available in other molt publications, such as other Pyle guides (Pyle 1997, 2008), or even on landbird monitoring manuals, such as that of Ralph et al. (1993). However, feathers and tracts definitions, code explanations, etc. are quite handy when thinking of the target users: field technicians or researchers who will need all this information summarized in the same book.

Each of the 29 species comes with very detailed information, that centers on molt and age determination. The *Molt* section comes with an explanation on the assumptions the authors made on molt timing and strategies. For example, when they suggest that a species does not molt at the reserve, they explain that these conclusions are based on lack of evidence of active molt in the study site and also based on breeding timing and information from collection specimens from other regions. In the *Aging* section, I found particularly useful that

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authors indicate which of the 20 WRP codes are correctly applicable to age the species. Far from limiting the bander when trying to accurately age the bird, it focusses attention and avoids incorrect coding that makes no sense in field data sheets, and prevents collecting information that is never useful for analysis.

The *Molt*, *Aging* and *Sex* sections are complete and contain sufficient information to collect data from birds in the hand while in the field. But the book is not limited to these three subjects, there are five other sections, *Geographic variation*, *Structure and Measurements, Range and Breeding seasonality*, *Further Study* and *Notes* that also provide further information on the species. In the *Geographic variation* section, the reader will find descriptions of known subspecies differences and very specific color descriptions of subspecies or population variation. In the *Structure and Measurement* section there is information on how many primaries, secondaries, and rectrices species have, and wing chord and tail measurements separated by sex in all cases, along with specific measurements by WRP age code in a few cases such as for the Great Shrike-Tyrant (*Agriornis lividus*). Sample size is indicated in all cases.

In the *Breeding and Range* information the reader will find information gathered from past literature and data that comes straight from Fray Jorge National Park biologists, which I believe is most valuable since it has not been previously published and is information that otherwise very rarely makes it into print. The *Further Study* section gives a clear idea of the knowledge gaps for the species. This is helpful for those in the field who observe characteristics that differ from what they would expect to find in general patterns. This section could encourage field technicians to take extra notes on the matter.

The *Notes* section make this manual distinct from other more arid molt guides, since for all species, relevant characteristics are portrayed in photos such as the shape variation in the outer primary of the Great Shrike-Tyrant, that varies with age, going from blunt to highly notched. Photographs of full body comparisons of plumage from both collection specimens and live birds in the hand are very useful. This section contains information such as that usually shared in "day highlights" in bird banding blogs, addressed to field techs and scientists willing to learn more on molt details and exceptions. This book makes comparative pictures accessible, even pointing with arrows specific traits that the reader should look for. Authors placed individuals of different ages and WRP codes right next to each other. Allowing the reader to easily spot overall differences in plumage, that no matter how well described in the text, are hard to visualize without an image. Pictures like the ones shown for Austral Thrush (*Turdus falcklandii*) and Chilean Mockingbird (*Mimus thenca*) are a good reference when looking for key differences among feather generations, such as the contrast of newly replaced greater coverts next to formative outer most greater coverts, a commonly used trait to age birds; or the subtle differences among feather tracts as those present in Rufous Collared Sparrow (*Zonotrichia capensis*). This shows new banders that some molt limits are quite hard to see and that proper recognition of these is only possible through experience. The level of detail showed on photos and descriptions are reminiscent of the detailed information found in Froehlich's (2003) *Photographic companion to age North American land birds*.

**What contribution does the book make to the field?** The manual sheds light on molt, a subject broadly neglected in the past in central and South America. To understand the relevance of its content we must consider that in the 1980's, North America (the most studied region in the American Continent) had a lag of 30 years, compared to Europe, in the study of molt and its use to age birds (Pyle et al. 1987). In the present time, American molt studies have not yet reached European bird knowledge from past decades, and South American molt knowledge was way behind before this book. The little information on molt of South American species is scattered in journals of limited access and thus not available to all potential users. Moreover, most of the information was generated decades ago, with several references to the 1960's and 1970's, the time when aging and sexing interest rose in North America.

One advantage of this manual is that it makes aging data attainable for those capturing birds for other aims, but still have the time and interest to gather further meaningful data. The level of detail allows the more dedicate and interested to explore its abilities to find molt limits and determine age and sex adding relevant variables to their projects.

**Who should buy this book?** This book is best suited for beginners on molt studies but also constitutes a great reference for experienced banders. It differs from books that use more elegant and detailed schemes but that are less practical for those that do not have some experience scoring plumage (Guallar et al. 2009) or books that have a more elegant presentation and photos but much general information (Howell 2010). The book is not one you get to read from start to finish. It is a reference book that will most likely be used repeatedly to look up for answers for the same species and traits.

The book is only available in a digital form (PDF), which I find is a disadvantage since in the field a hard copy may come in more handy. In my personal opinion, we have not gotten to the point where electronics are totally reliable and practical in the field. Since the manual is 158 pages long, I would see no problem in carrying it around. On the other hand, online availability means that it is accessible to all and field copies can be printed. I would encourage users to print the PDF in smaller than letter format (to make it easier to carry) and in color, since images included in the notes section are very clear and a

great reference to spot key plumage traits. The authors made a clever decision by making it available in Spanish (translation by Paulina González-Gómez), since most users will be Spanish speakers working on South American species.

In sum, this book is a must-have guide for scientists working on bird population not only in Fray Jorge National Park or this Chilean region, but elsewhere in South America where the species portrayed in this book are found.

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