

## **Relationships Among Body Mass, Fat, Wing Chord, Age, and Sex for 170 Species of Birds Banded at Powdermill Nature Reserve**

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Source: The Condor, 107(3) : 729

Published By: American Ornithological Society

URL: [https://doi.org/10.1650/0010-5422\(2005\)107\[0729:BR\]2.0.CO;2](https://doi.org/10.1650/0010-5422(2005)107[0729:BR]2.0.CO;2)

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## BOOK REVIEWS

EDITED BY DAVID L. SWANSON

*The Condor* 107:726–729  
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**In search of the Ivory-billed Woodpecker.**—Jerome A. Jackson. 2004. Smithsonian Books, Washington, DC. 294 pp. ISBN 1-58834-132-1. \$24.95 (cloth).

Professor J. A. Jackson has been in search of the Ivory-billed Woodpecker (*Campephilus principalis*) from 1965 up to the present. During this period he made intermittent searches throughout the southeastern United States' range of the species, with more intensive fieldwork undertaken in the late 1980s funded by a grant from the U. S. Fish and Wildlife Service. In addition, he visited Cuba three times. These efforts resulted in two glimpses by Jackson of possible Ivory-billed Woodpeckers in flight, one in Alabama in 1973 and the other in Cuba in 1988. The current book is the first detailed report of Jackson's search efforts. In addition, the book provides results from studies of museum specimens, an overview of what is known about the ecology of the Ivory-billed Woodpecker, a discussion of the causes for its decline, biographies of naturalists who collected or studied Ivory-billed Woodpeckers, a state-by-state overview of presence of potential habitat for the species in the United States, and a record of possible sightings of the species during recent decades.

The section on the ecology of the Ivory-billed Woodpecker is, by necessity, largely a repetition of the monumental study by Tanner (1942). The studies by Jackson of museum specimens yielded interesting new findings. Notably, male Ivory-billed Woodpeckers appear to have a white spot at the base of the red crest, which is normally concealed and probably functions as a display character when the crest is fully erected. It is noted for the first time that the tail of the Ivory-billed Woodpecker is strongly curved, and Jackson proposes that the curved tail may function as an uncoiling spring that yields extra thrust to tapping, drumming, or climbing. This interesting possibility should be explored in more detail by a comparative study of tail curvature in other woodpeckers and by measuring the size and direction of the force exerted by the uncurling of the Ivory-billed Woodpecker tail.

In other sections of the book, more comparative data on other woodpecker species—especially congeners—would have been welcome. Jackson dismisses reports of drumming Ivory-billed Woodpeckers as unlikely and expects that the Ivory-billed Woodpecker uses only a double rap as method of drum communication. Although it is true that double raps are diagnostic for the genus *Campephilus*, several *Campephilus* species also perform drum series in addition to double raps. Drum series of between five and eight beats are common in Crimson-crested Woodpecker (*C. melanoleucos*), Crimson-bellied Woodpecker (*C. haematogaster*), and Guayaquil Woodpecker (*C. gayeri*), and may actually be used more frequently than double raps in some species (Mayer 2000, Krabbe and Nilsson 2003). Therefore, it is not impossible that Ivory-billed Woodpeckers also use short drumming series, as reported by early observers. Jackson argues that the Ivory-billed Woodpecker is a social, group-living species based on an interpretation of several historical sources. I agree with this interpretation, but the argument could have been strengthened by pointing out the social tendencies in Magellanic Woodpeckers (*C. magellanicus*) and Imperial Woodpeckers (*C. imperialis*). The estimate by Tanner (1942) of a breeding period of 20 days for Ivory-billed Woodpecker is judged as improbably long by Jackson, but a breeding period of 18 to 21 days has also been found in the congeneric Magellanic Woodpecker (Ojeda 2004).

A large part of the book is devoted to the sadly failed attempts during World War II to save the mature bottomland forests in the Singer Tract of Louisiana, where J. T. Tanner had studied a small population of Ivory-billed Woodpeckers. Although the demise of the Singer Tract is lamentable, the events are not unexpected under the historic circumstances and in view of a conservation movement that was only nascent in that period. In contrast, it is incomprehensible why in 1986, after the discovery of Ivory-billed Woodpeckers in Ojito de Agua in Cuba, no floodgates of international funding and research support opened. By then, conservation organizations had unprecedented funding resources and political influence. However, despite plans to girdle trees to increase food supplies for Ivory-billed Woodpeckers, employ wardens, and establish a research station, none of these initiatives materialized. Only a three-week expedition was organized by the National Geographic Society in 1988, in which Jackson participated as scientist. Unfortunately, Jackson reveals nothing about the commercial or political interests that may have prevented conservation organizations from starting a full-scale recovery program for the emblematic bird. It was not until five to seven years after the rediscovery that privately funded individuals devoted serious fieldwork time in Ojito de Agua and other Cuban sites, only to come up empty-handed with regard to evidence of the continued presence of the species in Cuba. Jackson is in a key position to deliver an inside perspective on the riddle of the conservation failure in Ojito de Agua but does not provide any information on the subject.

The listing of potential habitat for the Ivory-billed Woodpecker in the United States makes it clear that in fact large tracts of potentially suitable habitat exist and that much of this habitat remains woefully under-

explored for the species. By documenting the extent of potential habitat available, and summarizing the long list of possible sightings throughout the decades after the last confirmed sighting of the bird, Jackson illustrates that the species might still exist in the United States and that devoted searches are direly needed. The main merit of this book is to lend an academic voice to the view that the Ivory-billed Woodpecker might have slipped through the population bottleneck resulting from habitat alteration during the peak in logging activities in the swamp forests of the southern US in the early 20<sup>th</sup> century. As a tool for guiding dedicated searches, however, the book is not entirely satisfactory. It lacks maps showing areas of potential habitat and locations of reports or tables with characteristics of target search areas. Information is ordered in an alphabetic list of states rather than regions, which often transcend several state boundaries. Errors in the names and years of reports and search efforts are numerous, and often frustratingly little detail is provided about reports communicated privately to the author.

The recent sightings and video evidence of an Ivory-billed Woodpecker in Arkansas (Fitzpatrick et al. 2005) show that Jackson's optimism is justified about the possibility of the Ivory-billed Woodpecker persisting in the United States. Undoubtedly the Arkansas developments will pique the interest of many to search for Ivory-billed Woodpeckers in various areas in the United States. This book by Jackson is the best available, but not optimal, tool to help identify promising search areas.—MARTJAN LAMMERTINK, Institute for Biodiversity and Ecosystems Dynamics and the Zoological Museum, Mauritskade 61, 1092 AD Amsterdam, Netherlands. E-mail: lammertink@science.uva.nl

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- More Than Kin and Less Than Kind: The Evolution of Family Conflict.**—Douglas W. Mock. 2004. The Belknap Press of Harvard University Press, Cambridge, MA, and London, England. ISBN 0-674-01285-2. \$27.95 (cloth).

This book is a fascinating read, using evolutionary theory to explain why family members behave towards each other as they do. The author is a long-time student of family relationships, particularly in egrets and herons, and particularly when the feathered familial relations go sour. Given his background and the substantial academic contributions he has made in the field, Mock is well placed to expound on the subject of how genetic relationships affect cooperation and competition between relatives.

The main thread of the book weaves a well-integrated and logical path through various subtopics. The text is cogently written, and complex arguments are carefully and clearly outlined. The reader is often referred to the historical context in which important theoretical or conceptual advances were made, which provides an interesting backdrop. Egrets and herons dominate as the case studies used to illustrate the theoretical arguments, but the book is also generously peppered with a smorgasbord of taxonomically diverse empirical examples. In addition, Mock sidesteps regularly with delightful biological and personal tangents that provide lighter and often amusing moments, yet without interrupting the flow of the book.

The prologue introduces the content and aim of the book well—to use the logic of natural selection to explain family relationships. It also sets up the tone and style of the text, and the promise of an entertaining and interesting read encourages one to settle more deeply into a comfy chair and to get ready for a prolonged session!

The first four chapters explain some important foundation concepts that underpin the rest of the book. In particular, Mock explains how the theory of kin selection provides the template for determining the limits of both 'cooperative' as well as 'selfish' behavior within families, as well as why the 'rules' of kin selection mean that family members may have vested interests in the outcome of interactions between other relatives, even if they do not involve the focal family member directly. The most obvious example of this is that parents may have an interest in how conflict is resolved between two offspring if it affects their own lifetime reproductive success. Hamilton's Rule, how to calculate the coefficient of relatedness between individuals, and what sex does to genes, and thus relatedness, are all clearly explained. Chapter Three also introduces the idea of the 'nursery'—a confined arena in which family members (especially siblings) interact. This idea is important, because attributes of the nursery, especially its size, shape, and context, can partly determine the nature and the outcome of familial interactions. Chapter Three also presents one of the more dramatic examples of sibling rivalry in action, in the form of sand tiger sharks, where about 17 000 eggs develop inside the mother into embryos with teeth, and over the course of gestation the number is gradually whittled down through rather unfriendly sibling interactions to just one live-born young!

Chapter Four is particularly interesting. It encapsulates the history of major leaps in evolutionary theory (and includes some of the relevant historical context), such as the development of game theory (where the best thing for an individual to do depends critically on what the other individual does), parent-offspring conflict, and sex ratio theory (why the production of sons and daughters may have different genetic benefits for parents under some circumstances). This chapter also describes many of the various hypotheses that were generated as a direct result of these important conceptual advances. In particular, it runs through a number of examples such as kin facilitation and the insurance hypothesis, which implicitly share the idea that depending on the context, offspring may have nonequivalent values, and consequently that some offspring are more expendable than others.

This step in the thread of the book provides the link with the following six chapters, which parade through the spectrum of sibling interactions, from obligate mortality (with or without overt fighting, and which perplexed ecologists for so long), to facultative siblicide (where mortality is context or environmentally determined), to scramble competition. Throughout this parade, Mock explains the situation from the viewpoints of the parents, as well as from the perpetrating and victimized offspring. He successfully interweaves the concepts explained earlier in the book (of kin selection, parent-offspring conflict, etc.) with some new ideas such as the trade-off between offspring quantity and quality, the dichotomy between insurance versus resource-tracking hypotheses for brood reduction, the trade-off between the success of one breeding attempt versus that of lifetime reproductive success, the concept of parental gambling with respect to offspring production, and also the idea of marginal offspring.

Chapters Eleven and Twelve take a closer look at parent-offspring conflict, partly to elaborate on what seems to be one of the author's bugbears—he loves the theory but is still searching for a good example of it. He believes that although evolutionary conflict exists (that is, the parent and the offspring have different preferred outcomes), in practice there is no conflict, because the parent does exactly what it wants, sometimes at the offspring's expense. For instance, in the well-known example of mother-offspring squabbling over the termination of suckling in red deer, despite any protestations on the part of the calf, the mother always has the physical advantage and therefore the upper hand. I was a little unconvinced by his argument, as I do not see the need for a clear 'win' on the part of the offspring—surely modifying the parental behavior is enough. If the red deer calf was completely passive, and did not pester its mother continuously, it seems likely to me that suckling would terminate earlier. Of course, measuring the effect of offspring sulkiness on the outcome of many of these conflict situations is difficult. Despite his reservations, Mock describes some cases that he believes will be textbook examples of parent-offspring conflict, particularly the Queen-Worker conflict over the sex ratio (and reproduction) in Hymenopterans. In telling this story, he relates the quirky effects of haplodiploidy on the social

systems, sex ratios, and work roles in a clear and interesting way.

From here, Mock moves onto conflict between mates over reproductive investment, and then the idea of Progeny Choice, before finishing in Chapter Fifteen with an assortment of what he calls 'complex and weird' examples of different manifestations of familial interactions, including black storks, pigs, burying beetles, lions, spadefoot toads, and Laughing Kookaburras, which are especially interesting as they show extremes of both cooperative behaviour (offspring delay dispersal and breeding to help their parents raise more young), as well as selfish behavior (given the right circumstances, the chicks are seriously murderous towards siblings).

By explaining complex theory in a clear and accessible way, and by using an entertaining range of examples and anecdotes, this book will be of interest to a wide audience, from university undergraduates to interested naturalists. Its synthesis of several strands of theory with a wide-ranging review of empirical studies also makes it a useful and enjoyable read for professional ecologists, including those involved in the fields of sibling rivalry and parent-offspring conflict. I strongly recommend this book—you'll enjoy it!—SARAH LEGGE, Senior Scientist, Australian Wildlife Conservancy, Mornington Wildlife Sanctuary, PMB 925, Derby, WA 6728, Australia. E-mail: sarah@australianwildlife.org

**Seabirds: A Natural History.**—Anthony J. Gaston. 2004. Yale University Press, New Haven, CT. 224 pp. ISBN: 0-300-10406-5. \$45.00 (cloth).

With the discriminating insight of a seasoned naturalist, a dash of philosopher and the panache of a journalist, Tony Gaston has crafted an engaging and easily readable book about seabirds and their natural history. In doing so, he bared some of the many motivations that rouse people to study marine birds.

Ten chapters guide the reader through the varied qualities of seabirds. Contrasting comparisons with terrestrial birds help in clarifying the essence and diversity of marine species. Gaston overviews their taxonomy, diversity, and plumage, their adaptations and constraints, their feeding behavior, distributions, and assemblages. These treatments bring home the pervasive influences of geography and oceanography in shaping seabird lives and life histories.

Large-scale oceanographic patterns bring home the inter-relatedness of these sea creatures and their ocean environment. Eastern boundary currents and the forage fishes therein that drive their food webs are clearly globally important areas for seabirds and other marine organisms. The relative absence of pursuit-diving seabirds in tropical waters is associated with an inverse relationship between water temperature and the burst or escape speeds of fishes that the birds might prey upon. The tropical oceans in turn, create marine barriers to pursuit-divers at high latitudes in both the southern and northern hemispheres. Fossil auks have not been found in the southern hemisphere, or fossil penguins in the northern one.

Considerations of seabird foraging and migratory behavior, including the transequatorial feats of the



shearwaters, exemplify that while being bird-brained or more likely because of it, seabirds are spatial geniuses. In human analogy, they are Olympian players one and all. Gaston rounds out the book with chapters on coloniality and its consequence and population regulation. His closing plea to practitioners is for more incisive theoretical tests of empirical data. These efforts are needed to advance synthesis and to integrate behavioral tactics and evolutionary strategies within the context of a pervasive, dynamic, and unforgiving ocean environment. Non-Olympians are quickly cut from the gene pool by Mother Nature, a beneficent but not particularly indulgent coach.

Some topics are given rather cursory treatment (e.g., mating systems), but are informatively dealt with. When one is striving for the big picture as Gaston is, some things of necessity have to fall to the wayside or an encyclopedic mode ensues and bogs progression.

Besides his knowledge, thoughts, and challenging (but user friendly) conjectures about seabird biology, Gaston also treats the reader with some stories of his personal experiences. One I especially enjoyed was a self-deprecating account about seeing a gadfly petrel in a rock video while working out at health club and the consequences that followed therefrom.

*Seabirds: A Natural History* is a comfortable, well-produced book for which Yale University Press is to be commended. The photographs by the author, John Chardine, and Tim Lash are striking and give a real vibrancy to the lives of marine birds. In this era of modern publishing, however, it would improve the relevance, impact, and flow of the text to intersperse the stunning color photographs throughout the text where most relevant rather than to bulk 16 pages of them between pages 64 and 65.

All in all, a fine book and an engaging read. Buy one, you won't be disappointed, and if you have that certain mindset of the curious naturalist combined with the ever-enchanting lure of the sea, you may even be inspired.—W. A. MONTEVECCHI, Psychology Department, Memorial University of Newfoundland, St. John's, Newfoundland, A1B 3X9 Canada. E-mail: mont@mun.ca

**Relationships Among Body Mass, Fat, Wing Chord, Age, and Sex for 170 Species of Birds Banded at Powdermill Nature Reserve.**—Robert S. Mulvihill, Robert C. Leberman, and Adrienne J. Leppold. Carnegie Museum of Natural History, Powdermill Nature Reserve, Rector, PA. Eastern Bird Banding Association Monograph No. 1. 184 pp. ISBN 0-9749063-0-1. \$15.00 (spiral bound).

This monograph provides a wealth of data from birds banded at one of the longest-running bird-banding operations in the United States and is designed for use and reference by other researchers. The authors present data covering a wide variety of species, many having large sample sizes. Because this study comes from a region (the eastern United States) with many bird banders, it should prove useful as a reference manual for data on many 'eastern' species. Lastly, the authors encourage others with similarly extensive data

to follow suit by summarizing and analyzing their datasets for use and reference of other banders.

The book begins with 14 pages of text introducing the data and describing analytical techniques. The bulk of this volume consists of two main data sections. The 'Descriptive Statistics' section provides body mass and wing-length data by age, sex, and fat categories for all species with greater than 10 captures. For species with small sample sizes (10 or fewer captures), data for each individual are provided. The 'Graphs and Statistical Analysis' section presents analyses on the 100 species in this study with sample sizes greater than 100 for both body mass and wing length. Specifically, the authors examined the data for age and sex effects on both wing length and body mass. Additional analyses included linear regressions relating wing length and fat scores to body mass. From the fat score by body mass regressions, the authors derived data such as estimated lean body mass and an estimated payload mass (fat mass of birds with highest fat scores). Also, histograms of wing lengths (by sex when data are available) are provided for each species.

As an example of some applicable results from this volume, consider the data relating lean body mass (from birds with 0 fat) and wing length amassed for the 100 most common birds at the site. The  $R^2$  (proportion of variation in body mass that can be explained by wing length) for most species (both sexes combined) ranged from 0.02 to 0.40 and values seemed pretty dispersed throughout this range. However, four Icterids (Red-winged Blackbirds [*Agelaius phoeniceus*], Rusty Blackbirds [*Euphagus carolinus*], Brown-headed Cowbirds [*Molothrus ater*], and Common Grackles [*Quiscalus quiscula*]) showed  $R^2$  values between 0.64 and 0.85, suggesting a much tighter relationship between these variables for these species. In contrast, two species, White-eyed Vireos (*Vireo griseus*) and Yellow-breasted Chats (*Icteria virens*), exhibited no relationship between lean mass and wing length. These are the type of data many researchers draw on for a variety of reasons—including investigations of energetic condition or morphological studies. Thus, knowing how these relate for 100 species (or maybe just that one species of interest) should be valuable to many researchers.

Complementing the main sections are three appendices. Appendix 1 shows the seasonal composition of samples of birds used in this study. Appendix 2 summarizes results of all one-way ANOVAs for effects of age and sex on body mass and wing length. Appendix 3 provides wing-length cutoffs for sex classes (based on birds sexed by physical evidence) for 19 species.

In summary, this monograph is a very useful contribution to the ornithological literature. The book presents raw data and analyses for a diverse bird community—one that has much overlap with bird communities encountered by many other banders. Additionally, it provides an example of how to summarize, analyze, and present vast quantities of banding data, which often go unpublished. Thus, it should serve as a valuable reference for many ornithologists, including banders and those interested in comparative studies.—JAY D. CARLISLE, Idaho Bird Observatory, Boise, ID 83725 and University of South Dakota, Vermillion, SD 57069. E-mail: jcarlisl@usd.edu