

HEAVY METALS IN GREENLAND SEABIRDS. By CHRISTIAN OVERGAARDNIELSEN and RUNE DIETZ. Meddelelser om Grønland, Bioscience 29. Copenhagen: The Commission for Scientific Research in Greenland, 1989. 26 p., 1 fig., 8 tables, 7 appendices, refs. Softbound. DKK 35,50 excl. VAT and postage.

This book is written in the style of a scientific article. It presents original data obtained as part of a research project initiated in 1985 on heavy metals in the Greenland marine environment. As explained in the introduction, *Heavy Metals in Greenland Seabirds* is the first of a series of papers, each dealing with a particular section of Greenland's marine ecosystem.

The book reports the concentrations of zinc, cadmium, mercury and selenium in muscle, liver and kidney of 14 species of seabirds collected from six Greenland districts. The initial table lists the species by common and scientific names and abbreviated species codes. Thereafter, only the scientific name is used in the text, and the abbreviated species code is used in the tables and appendices. This makes it difficult for a reader not familiar with the scientific names to follow along easily.

The table of contents is very useful in directing the reader to the different analytical treatments of the data. These treatments include inter-organ correlation of element concentrations, intra-organ association of elements, age dependence and sex dependence of element concentrations, geographical variation in element concentrations within Greenland and within the Arctic, and a comparison of arctic and temperate regions. The abstract is concise and summarizes the results very well. Concentrations were found to vary widely within species and to increase with age. No significant differences between sexes were found. Muscle, liver and kidney concentrations were found to correlate positively for cadmium, mercury and selenium, whereas only liver and kidney concentrations correlated mutually for zinc. The three organs analyzed for all species showed a large excess of selenium over mercury, and the intra-organ association of elements was strongest for zinc and cadmium in liver and kidney and for mercury and selenium generally. All four elements showed consistently higher concentrations in birds from north-western and northeastern Greenland than in those from southern Greenland.

In addition to the concentration data, the authors have included information on body and tissue weights and dry weight percentage of the tissues in the appendices. This information is a welcome addition to any scientific paper reporting contaminant data in that it broadens the potential usefulness of the data base.

The opening paragraph of the introduction of the book focuses on the role of marine animals, particularly fish and marine mammals, in the native diet. The birds are described as contributing "... a welcome variation in the diet." The rationale for including seabirds in the study, however, is not presented until the last paragraph of the introduction. When they are finally introduced, seabirds are described as "... a side line in the marine ecosystem... only worthy of... some interest to compare the level of metals... with that of other consumers exploiting the same food resource." I find this somewhat of a slight with regard to the importance of seabirds in the marine ecosystem and their potential value as indicators of environmental contamination.

The study birds were bought from local hunters, thus providing "... a representative sample bagged for local consumption." The theme of marine animals as part of the native diet is developed quite strongly in the introduction and carried through the materials and methods section. This theme is not reflected in the title of the book or in the abstract or discussion of results. I suspect that it was meant as more of an introduction to the series of papers than this particular one dealing with seabirds. This should have been made clear at the outset, since the role of seabirds in native diet is never mentioned again in the paper after the materials and

methods section. This is actually quite a shame, since it would have made an interesting discussion point.

The discussion includes some comparisons of metal levels found in the literature for seabirds from both temperate and arctic regions. There is no discussion, however, of possible sources of the metals found in the birds or of the influence of the annual cycles (i.e., migration, egg-laying, moult) or feeding habits of the various seabird species on the metal levels found.

Overall, this book contains a substantial amount of useful data, but is somewhat lacking in interpretation and discussion of the results. Due to the analytical nature of the presentation of the material, the book would be mainly of interest to the scientific community as an additional arctic contaminants data base.

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BIRDS OF THE SEWARD PENINSULA, ALASKA: THEIR BIOGEOGRAPHY, SEASONALITY, AND NATURAL HISTORY.

By BRINA KESSEL. Fairbanks: University of Alaska Press, 1989. 330 p., 17 tables, 21 figs., 11 illus., maps, index, bib. Hardbound. US\$34.95.

Long awaited by boreal ornithologists, *The Birds of the Seward Peninsula, Alaska* fills one of the many gaps in regional comprehensive references concerning arctic birds. Covering an area that truly provides a bridge linking Palearctic and Nearctic avifaunas, information provided in this publication will be of interest not only to devotees of northern ornithology but also students of biogeography, ecology, wildlife management and even devout North American birders. The author not only relies on her own extensive field studies spanning the past 23 years, but incorporates observations from a long list of biologists, associated field scientists, birders and local residents to provide a complete picture of the avian assemblage in this unique region.

The introductory chapters set the stage by orienting the reader to the often harsh climate and rugged terrain of the peninsula, with discussions of the physiographic features encountered, the overall climate of the region and the predominant vegetation. A chapter on avian habitats describes all of the habitats found in the region based on Dr. Kessel's own habitat classification scheme for Alaska published previously (Kessel, B. 1979. Avian habitat classification for Alaska. *Murrelet* 60:86-94). Black-and-white photographs of some of these habitats are indispensable in helping the reader visualize the habitats available to birds in the study area. A chapter on avian species abundance lists species of birds in order of abundance based on the author's many miles of terrain walked, driven or boated over a ten-year period.

Although many disclaimers appear in the preceding paragraphs, I cannot help but expect those not familiar with more standard avian census techniques to place too great an import on the data presented, particularly because habitats were not censused and data not presented in relation to the amount of habitats available on the peninsula. Nonetheless I found the tables of interest, and if used for the comparative purposes intended, they do provide some understanding of the general picture of avian abundances one would expect to encounter upon visiting a range of habitats on the Seward Peninsula. A chapter on distribution patterns provides an interesting overview of the zoogeographic affinities of the present species assemblage and helps explain why the Seward Peninsula is a particularly diverse region, given its northerly latitude. The final introductory chapter on seasonal

activity patterns additionally sets the time frame for visualizing the conditions faced during any given year form a "bird's-eye view."

The bulk of the book is organized into species accounts, each of which covers a species' abundance status, use of the peninsula and surrounding islands and waters (i.e., resident, breeder, migrant or visitant); describes specific observations on local population levels and distribution patterns, timing of use, natural history, and for some species their biogeographic affinities and recent taxonomic status. Throughout each account, information presented is meticulously and quite consistently referenced to the original observer or literature source. Written in a very readable style, the accounts provide plenty of specifics for the serious ornithologist, but remain at a manageable level of detail to be of interest for even the average bird enthusiast. The use of subtitles within each account (e.g., "status," "spring migration," "breeding," "fall migration," etc.) would have aided the reader seeking specific information on a particular life phase of a given species. Accounts are, however, subdivided by paragraphs, each of which often (although not consistently) begins with an introductory phrase such as "Commencement of nesting . . ." and "Fall movement begins . . .," which can assist the reference seeker in locating the appropriate section of interest at a glance.

The great care taken in review of literature and scrutiny of records submitted by a variety of observers sometimes not personally known to the author is evident throughout the species discussions. For example, records for the Long-toed Stint and Siberian Tit are (appropriately) placed in brackets and, as explained, the single observer sightings are not altogether convincing enough to place them on the confirmed list of Seward Peninsula birds. Although sometimes maddening to enthusiastic observers, this system of careful scrutiny of all avian records accepted by the University of Alaska Museum ensures a trusted reference work will result from the accepted records. Similarly, the seeming lack of observations for some probably common but confusing species (e.g., Glaucous-winged Gull, Thayer's Gull) reflects the caution with which the records are accepted. Few obvious omissions or mistakes can be found in the text. The discussion of the probable breeding of Marbled Murrelets north of Nome seems to need clarification as to whether the adult birds apparently collected with the egg are still available for examination, thereby lending additional support for possible breeding, since they were said to have been taken "on rocky land." The discussions of taxonomy for some confusing species such as the Redpoll may be more helpful if placed toward the beginning of the accounts to clarify later discussions, such as was done with the Lesser Golden-Plover. All species seem to have received treatment in proportion to their abundance on the peninsula. The Ruby-throated Hummingbird identified from Nome, however, does not receive its own account but is lumped under "Hummingbirds" with a sighting of another unidentified hummingbird and other extralimital sightings. The use of extralimital sightings has been appropriately kept to a minimum and they appear only when necessary to place the pattern of sightings in a regional perspective.

The impressive amount of literature review undertaken by the author in preparation for the book is clearly indicated in the literature review section. Similarly, the number of observers who have contributed information on birds (all painstakingly listed with page references in the index) is a tribute to the unequalled data base assembled at the University of Alaska Museum. The level of organization of information on Alaskan avian abundance and distribution apparent at this institution should become a model for those compiling similar regional data bases.

The only criticism concerning the black-and-white illustrations by John C. Pitcher is that there should be more of them. This artist has already established himself as one of the premier illustrators

of birds on the continent today and his renditions in this volume provide an enticing taste of his abilities. Other figures, including the two maps on the inside covers, are clearly drawn and useful for reference. The only map I found missing is a relief map or topographic map useful in orienting the reader to major mountain regions and important wetland basins.

More than just another compiled regional ornithological reference, *The Birds of the Seward Peninsula, Alaska* provides an abundance of original data of significance. Examples include breeding range extensions for many species, habitat affinities not nearly so thoroughly explored by previous field biologists and many interesting behavioral and natural history notes worthy of separate publications on their own. This book exemplifies the extremely careful and well-thought-out writing style and thorough record-keeping abilities for which the author is well known; its readable style and clean organization lift it above the level of a stuffy reference text to that of a truly well-rounded and scholarly treatise indispensable for anyone desiring information on the birds of this fascinating region.

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GATHERING STRENGTH. By FRANCES ABEL. Calgary: The Arctic Institute of North America, 1989. Komatik Series, No. 1. 257 p., 1 map, 14 black-and-white photos, 12 graphs, 6 cartoons, 3 appendices, bib., index. Softbound. Cdn \$20.00.

The degree of success of the northern economy, self-government and the settlement of Native claims will depend heavily upon the performance by Native people in managerial and other roles that are being created. Frances Abele's book on training for employment in the Northwest Territories is therefore a timely addition to the literature on vocational education as it concerns Native people, particularly those of the North. The book is a study of various training programs for Native workers conducted in the Northwest Territories during the 1980s. Seven programs, each implemented by a separate agency, were studied over a period of six years, and during the central two years a small group of young Native people were trained on the job with the research team.

Gathering Strength begins with a summary of itself, followed by a brief preface. These two sections define the premises and convictions that guided the study. In summary, these are: 1) trainees and the people of their communities should identify what training is needed; 2) training should meet these needs; and 3) the study and future training should blend economic, social and political considerations and should bridge the gap between Native and non-Native value systems.

The preface is followed by several pages of facts about the Native Employment Training Study, including mention of one case study (of a Transport Canada training project) that did not contribute directly to this book.

A comprehensive list of acknowledgements is next, followed by a map showing the communities of the Northwest Territories, with a key containing names in English, Inuktitut and the appropriate Indian languages. Chapter one is an introduction, with some historical background, an outline of what the ensuing chapters will say, and comments on what has been omitted from the book. This chapter makes the important observation that each of the three present generations of Native people in the Territories has its distinct history and characteristics.

Chapter two deals with the legacy of colonization, the movement towards self-government, and the problem of designing training to accommodate regional characteristics. Chapter three sums up the history and current status of vocational training for