

MUSKOX: LIFE HISTORY AND CURRENT STATUS OF MUSKOXEN IN THE N.W.T. By D.R. URQUHART. Yellowknife: N.W.T. Department of Renewable Resources, Wildlife Service, 1982. 40 p. incl. maps, illus. Softcover. Cdn\$5.00. (Order from Supervisor, Conservation Education, Department of Renewable Resources, Government of the N.W.T., Box 2668, Yellowknife, N.W.T., Canada X1A 2R1.)

Muskox (*Ovibos moschatus*) populations were exterminated or greatly depleted throughout much of the circumpolar range of the species during the 19th century. Through legal protection and reintroductions to historical ranges the species has made a remarkable recovery worldwide and populations are in most cases experiencing high productivity. Range extensions into habitats unoccupied since before 1900 are occurring in mainland areas of Alaska and Canada. This publication on the muskox in the N.W.T. provides the first updating on the status of the species in Canada since Tener's monograph in 1965. The entire Canadian population of muskoxen is contained in the N.W.T., with the exception of a few individuals recently released from a captive herd at Old Fort Chimo in northern Québec and occasional animals moving into northern Yukon from adjacent herds in Alaska.

The report will be a useful reference on muskox populations and their distribution for wildlife managers and others interested in Canada's north. It is well illustrated with maps and notes on muskox population status. Coverage of muskox life history is disappointing. Very little is added beyond what is available in Tener (1965) and this is surprising in view of several recent references cited but rather sketchily summarized. The effort to include a review of industrial activity, past, present, and planned, for each area reported on is well intended, but appears too superficial to be of much value.

I found a few points of contention throughout the text which appear to stem from an incomplete review of literature. In the introduction, Sweden should be included in the list of countries where muskox populations occur. A group of Norwegian muskoxen crossed into Sweden and established themselves there several years ago. In the section on taxonomy the author states that "Recent serological tests indicate that this animal is most closely aligned with goats", and goes on to conclude: "Consequently, it is classified as a separate tribe *Ovibosini* [*sic* *Ovibovini*] in the subfamily Caprinae of the family Bovidae (Tener 1965)". It is not clear whether reference to "recent serological tests" is from Tener where Moody (1959) is cited as a reference on serological studies. The classification indicated in Tener is that of Simpson (1945), made without reference to serological studies. Investigation of chromosome number in muskoxen (Tietz and Teal, 1967) has failed to substantiate a close relationship to goats and the question of evolutionary relationships to other Bovidae remains unanswered.

The statement under population dynamics and densities, that "Large parts of the Canadian tundra are devoid of suitable forage and could never support this species" calls to mind the words "never say never" accompanying a recently popular musical score. In view of the wide diversity of plant species present in the diet of muskoxen throughout their distribution and evidence from winter observations, it appears that characteristics of the snow cover, rather than forage types *per se*, are more important in limiting distribution.

The author states that "experiments with muskox domestication began in Vermont in 1954", failing to note that during 1930-1935 muskox domestication experiments were carried out at the U.S. Biological Survey Experiment Station at College, Alaska (Palmer and Rouse, 1946). He goes on to state that a "domesticated herd has also been maintained since 1964 by the University of Alaska" whereas the herd in question was maintained by the Institute of Northern Agricultural Research at the University of Alaska during 1964-1976, and from 1976 at Unalakleet, quite independent of the University of Alaska.

In discussion of the population status of muskoxen on Banks Island the author states: "Historical evidence indicates that the Thomsen River area could be a refugium for muskoxen on Banks Island", but no reference is cited. The reader is left wondering whether this is based on the extensive archaeological literature on muskox-hunting cultures that were present there or stems from reports of early explorers in the area.

The art work and quality of paper in the publication is impressive, but one is also struck by the inefficient use of paper with large blank spaces on most pages, and maps with virtually no detail blown up to full-page size. The result is a publication of 40 numbered pages when it could readily have been shortened by nearly half that number with no reduction in content.

In spite of its shortcomings, the publication will serve as a valuable reference source on muskox populations in Canada's Arctic, providing baseline information against which future population changes can be compared.

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- TENER, J.S. 1965. Muskoxen in Canada. A Biological and Taxonomic Review. Ottawa: Queen's Printer. 166 p.
- TIETZ, W.J. and TEAL, J.J. 1967. Chromosome number of the muskox (*Ovibos moschatus*). Canadian Journal of Zoology 45:235-237.

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DIE SEETAUCHER. By E.O. HÖHN. Die Neue Brehm Buecherei. A. Ziemsen Verlag, Wittenberg Lutherstadt, German Democratic Republic, 1982. 96 p. + 9 tables, 17 illus., 32 photos. Softcover. M8.20. (In German.)

In this first edition the author describes the morphology, distribution, natural history, and ecology of the four species of loon which inhabit northern environments of the Old and New Worlds. The aim of this work was to provide an updated alternative to earlier discussions by other authors of the biology of the four members of the Order Gaviiformes, Family Gaviidae. The author did not attempt to review exhaustively the literature of the Soviet Union and refers to other authors for a complete discussion of plumage variation and molt.

After diverging from an ancestral type, already identifiable in the 130-million-year-old deposits of the Cretaceous, the modern-day loons have become highly specialized divers. Their normal diving bouts may last as long as two minutes and take them to a depth of 11 m. Loons have especially long uncinate processes which extend laterally from one rib over several others, affording extra strength and preventing the rib cage from collapsing during a dive. Their heavy bones, unlike those of most other birds, lack hollows for air sacs (the cervical and interclavicular air sacs are missing altogether) and facilitate diving by reducing buoyancy. Muscles acting on the feather shafts press the contour feathers closely against the body, reducing air spaces between feathers and causing the bird to submerge. The thigh bones are rigidly connected to the rump, and muscles which allow other birds to walk erect are used by loons to increase their propelling force in water. The cost for this specialization for an aquatic existence is paid for by a poor ability to walk on land. As a result, loon nests are rarely more than a few metres from water.

Loons are carnivorous, feeding on fish and aquatic invertebrates. They pursue their prey under water, made possible by excellent eyesight both in air and in water. A specially adapted "window", situated in the center of the nictitating membrane, acts as an additional structure for refracting light rays when this third eyelid covers the eye during a dive. It is not clear whether the wings are used by loons during a dive. Their wings are small in comparison to their body weight and loons therefore need to run on water to take flight. They gain height only slowly and for this reason avoid landing on small lakes, particularly in forested regions.

The eerie calls of loons carry up to 8 km in their northern habitats. The Yellow-billed, Arctic, and Red-throated loons are circumpolar in their distribution but the Common Loon breeds in North America, Greenland, and Iceland only. The Yellow-billed Loon characteristically breeds north of the treeline whereas the others also inhabit lakes in forested regions. The Red-throated Loon is the smallest of the four species and the only one able to take flight from land. Because of their greater maneuverability in flight, Red-throated Loons are able to feed and nest on small ponds, and if these are surrounded by trees, they fly in circles to gain height.

Fish comprise approximately 80% of the loons' diet, invertebrate animals are second in importance, and ducklings are killed occasionally. Since marine fish, as opposed to marine invertebrates, have a low salt content, and since loons obtain most of their water from their fish diet when at sea, they rely less on their salt glands for salt excretion than do other birds feeding on marine invertebrates. Parent loons feed their one to two young for approximately 70 days.

The book is well written and well organized, treating the general biology of the four species in the first chapter, discussing each species separately in the following four chapters, and including a summary. It is unfortunate that the

literature of the Soviet Union is sparsely represented. Of 95 references cited, 39 studies were published in North America and 55 in Europe, of which only one study reports on research in the USSR. This book is useful to naturalists and biologists interested in the general biology and natural history of loons.

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NORTHERN DEVELOPMENT, NORTHERN SECURITY. By NILS ORVIK. Kingston, Ontario: The Centre for International Relations (Queen's University, Kingston, Ontario, Canada K7L 3N6), 1983. ISBN 0-919827-51-9. 196 p. Cdn\$12.00.

This book, which is a compilation of essays, addresses the problems of northern development and the challenge confronting the people of the Canadian north in that respect. The basic assumption is that this development takes place within a "power triangle" where the federal government holds one corner, the developers (private corporations, investors, and industrialists) another, and those representing regional and local institutions a third. The hypothesis formulated is that the hunt for northern resources is equally important for all three groups and that none of them can hope for complete fulfillment of their goals and aspirations; it is the belief of the author that, due to the built-in checks and balances of the Canadian political system, the outcome is bound to be a compromise which, it is hoped, will give each actor enough incentive to stay in the game and to play it by the rules.

There can be no doubt that the power triangle will have a big say in influencing the course of developments in the north. Depending on time and circumstances the power base of the three actors may vary, but they are equal in the sense that they depend on each other and are directly involved and affected by the process. They are the main players. However, general experience and arctic developments in particular seem to suggest that two more corners should be added and the triangle converted into a "power pentagon". It is a common experience that the interests of other countries may influence, delay, or even hamper national aspirations and plans. This is so because the mutual interdependence of the world is on the increase, and the national community and the outside world reveal more and more points of contact. Problems are internationalized; increasingly the actions of one nation are the concern of others. Domestic policy has become more of an integral part of foreign policy and vice versa. The Arctic Pilot Project and the reactions it has caused in Nuuk and Copenhagen is but one example. The *Manhattan* incident is another. Seen in this perspective, the fourth corner belongs to what could be labelled foreign actors, meaning both other countries and international organisations. The fifth corner is held by opinion makers and what we could call activist organisations. These are interest groups acting on behalf of others, be it aboriginal people, animals, environment, or whatever. They are not themselves directly affected by what is going on, but want to preserve values of different kinds by invoking public conscience. Presently, these actors are not very active or vocal in arctic affairs, but it may prove a good bet to count them in if and when the development in the area "takes off". This line of reasoning points to the conclusion that the fate of the north most likely will be decided by and formed within the framework of an interacting "power pentagon" rather than within a power triangle. Professor Orvik is right, however, in pointing out that the momentum in this process is being maintained and preserved by a national "power triangle".

An interesting fact about the book is that the hypothesis for the moment is untestable — the reason being that it projects an outcome of a process in its very being. Only the future will tell if the "power geometry" of the north will result in a compromise with "equitable sharing of risks and costs as well as of gains and profits" among the actors involved.

The book is written at the intersection between a scientific analysis and a political engagement. The author tries both to clarify and to influence, to promote knowledge and insight and to form and shape politics. Given this mixed purpose, it is a major strength that most essays are factual and oriented towards the problems of the present and the immediate future. Statements are also well documented and the overall impression is that the author has succeeded in presenting a balanced account of some of the most vital problems facing northern Canada today and tomorrow. He should be credited for not throwing politically "hot potatoes" away, but trying to peel them irrespective of possible burning effects. I feel confident that he will find interested readers in both academic and political circles.

The main weakness of the book is that — in spite of dealing with security issues in the whole of part 2 — no mention is made about the possible security implications for Canada of Soviet deployment of strategic submarines beneath the ice of the Arctic Ocean. For years indications have been that a shift in the deployment of Soviet strategic submarines is under way, the core of this change being that the strategic centre of gravity in the Norwegian Sea tends to move towards the Arctic. This hypothesis gained weight in May 1983 when U.S. Admiral James D. Watkins, Chief of Naval Operations, disclosed that the U.S. Navy acknowledges the strong interests of the Soviets in hiding their submarines beneath the ice of the Arctic Ocean and that this development poses a threat to the North American continent to be counteracted. This change of strategy on the part of both superpowers may influence the preconditions of Canadian security and consequently of northern development in general. It is an integral part of the problems dealt with in the book and should have been part of it.

Despite this weakness, I do not hesitate to recommend the book to all — professionals and laymen — interested in arctic affairs. The questions raised are crucial and have to be dealt with in a serious manner by the power pentagon, for which this book is a *must*.

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