

by making local keys where fewer species are involved or expanding on such observations as longspine thorny-heads have "branchiostegals usually with scales" – how frequent is usually? The compilation of countable characters is simply a list of pectoral, anal and dorsal fin rays, gill rakers, lateral line pores, and vertebrae. It might be possible to analyse these as a combination of characters that can be used to key out fish or at least unequivocally narrow the choices where species diversity is high.

Most books of serious scientific bent are devoid of humour, rightly so in the judgment of some. This book is eccentric in that its strong scientific and highly technical content is interspersed with humorous asides. These will not be to the taste of all but certainly enliven the book. We learn on page 1 that the genus of rockfishes, *Sebastes* meaning "magnificent", was coined by Baron Cuvier who was blessed with a whole series of Christian names and then adopted his late brother's name but, being "ordered, austere, disciplined, and pompous" was unlikely to have been called "Georgie", "Nikky" or "Cuvie" by his contemporaries (this is merely silly); on page 10 Theodore Gill is captioned as "grouchy and sowed confusion in his wake" in respect of rockfish taxonomy (too harsh?); Figure 7.4 on declining annual recruitment of juvenile bocaccio is a line graph in the best scientific tradition but has the young rockfish spilling out of a baby carriage

(drives the point home but quaint); the gap between the two cultures of science and art is no better illustrated than on page 46 where a painting of a man with a rockfish swallowing/biting the top of his head is captioned "Fish Head" (no explanation for the poor scientist); and on the last page the blurb about the senior author states that he is "A quick-tempered man of huge ego, we would not cross him if we were you" (a joke by his co-authors or a cause for concern to reviewers?).

This book is an essential, if quirky in parts, guide for anyone interested in rockfishes or their biology in the northeastern Pacific.

Literature Cited

- Coad, B. W., with H. Waszczuk, and I. Labignan. 1995. Encyclopedia of Canadian Fishes. Canadian Museum of Nature, Ottawa and Canadian Sportfishing Productions, Waterdown, Ontario. viii + 928 pages, 128 colour plates.
- Hart, J. L. 1973. Pacific Fishes of Canada. Bulletin of the Fisheries Research Board of Canada, 180: ix + 740 pages.

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Caviar: The Strange History and Uncertain Future of the World's Most Coveted Delicacy

By Inga Saffron. 2002. Broadway Books, New York. xv + 270 pp. U.S.\$ 35.95.

There has been a recent trend to popular books on individual fish species, such as cod and shad, and now we have reached the *reductio ad absurdum* of a book on fish eggs. But these eggs form caviar, an economically important and status-rich commodity whose bearers are now facing extinction from overfishing, habitat loss, and pollution. True caviar comes from members of the sturgeon family Acipenseridae and this book details the biology and fisheries of these giant fishes in North America and, after the collapse of fisheries there, in the Caspian Sea. An idea of the value of caviar can be gained from the cost of beluga caviar in Heathrow Airport where it climbed from £76 for a 50 g tin in December 1993 to £208 in November 2000 (personal observations). A single sturgeon has produced 360 kg of caviar worth, on the above prices \$3.74 million today, although such monster fish are never seen now and caviar weights are well under 100 kg and mostly less than 50 kg.

The author is a journalist who was in Russia at the time when concern over the loss of the Caspian Sea sturgeons became a popular item in newspapers and

magazines although it had long been known by biologists that their survival was threatened. Her lack of biological knowledge is apparent in the text and a few examples can be cited here. She considers that "According to all the usual rules of evolution, the sturgeon should be extinct already" because of their long reproductive cycle (the differences between r- and k-selection are not understood). She also has the powerful tail swooshing food towards its mouth on page 31, refers on page 32 to the *Acipenser* order (rather than genus), has the beluga (*Huso huso*) listed as *Husa husa* and the Kura River as the Kuro on the only map, has sturgeons hatching in one day on page 36, has baited hooks for sturgeons as useless on page 50 (for an interesting read on catching Canadian sturgeons on hook-and-line see Glavin (1994)), and has the sturgeon's front fins enabling the fish to speed through the water (rather than used for steering).

So while the biology in this book must be taken with a pinch of salt, just like caviar, the politics of the resource and the human failings around its management are the core of the book and a fascinating and salutary read. Perhaps one of the most curious conclusions of this book is that state-controlled fisheries in such diverse systems as those of the Soviets and the

Islamic Republic of Iran best conserved the sturgeon stocks while laissez-faire capitalism in America and in post-Communist Russia completely failed these fishes. Most sturgeons are now considered in imminent danger of extinction and some are probably only maintained by hatchery stock.

The caviar industry in former Soviet waters of the Caspian Sea is detailed along with modern skullduggery. The caviar industry in Iran is less well covered and the historical mischief there has not been investigated by the author. Apparently the fisheries in Iran were first granted by the government to Stepan Martinovitch Lianozoff, an Armenian subject of Czarist Russia in the 1870s, regularly renewed. In 1896 the lease was renewed at an annual cost of 450,000 gold francs. In one version of events, Martin (the grandson of Stepan) disappeared in 1923, kidnapped while meeting two ravishing Armenian sisters, leaving only a letter ceding his rights in the caviar fishery to the Soviets. Another version simply has Martin selling his rights to the Soviet Government.

There is a longish review of the origin of the word caviar, based apparently on one man's quest to prove it is Greek. However the word caviar may come from the Farsi "chav-jar" meaning "a cake of strength or power" or "bread of lovers" in allusion to its reputed aphrodisiac qualities; havyar in Turkish means "fish eggs" but this may be of more recent derivation.

The procedures for catching sturgeons, for extracting and processing their eggs as caviar is well des-

cribed. The bodies were often simply discarded, but some sturgeons have also been utilised for their flesh and the author waxes lyrical on her personal experience of the taste. Simply cooked stellate sturgeon, however, can be execrable (at Bandar Shah on the Iranian shore from my experience).

Perhaps the most disappointing aspect of this book is its lack of illustrations. Sturgeon, their fisheries and habitats, caviar, and the caviar-processing factories are all good photographic subjects and are readily available. The author paints some excellent word pictures, for example in her depiction of the now lost town of Caviar, USA, but it is always fascinating to compare the word and the figure.

The book is a compelling read for anyone interested in the loss of a great and renewable natural resource and an instructive guide to the failings and successes of political systems when attempting to manage species of great value.

Literature Cited

Glavin, T. 1994. *A Ghost in the Water*. New Star Books, Vancouver. 78 pages.

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Resource Selection by Animals

By B. J. Manly, L. L. McDonald, D. L. Thomas, T. L. McDonald, and W. P. Erickson. 2002. Kluwer Academic Publishers, Dordrecht. 221 pp. U.S. \$78.00.

This second book of papers recently presented at the First International Conference on Resource Selection by Animals in Laramie, Wyoming is truly a bible for wildlife researchers. The authors present Resource Selection Functions (RSF) as a unified theory for the study of resource selections and how to quantify them.

The focus of this book is the statistical aspects of resource selection as relevant for any Wildlife and Fisheries Biologists. This key publication defines "resources" as food and habitat. Much confusion exists in the wildlife literature about use, selection and preference of habitat and food, but the authors provide brilliant clarification: "Selection is the process in which an animal chooses a resource, and preference is the likelihood that a resource will be selected if offered on an equal basis with others (Johnson 1980)". Addressing habitat preferences is the key to managing wildlife habitats efficiently. Obviously, one can only derive preference when resource availability is known; a topic

of debate. "However, if we learn there is selection for or against a resource then this is a starting point for further in depth study". This is a drawback for spatial applications of RSFs since they deal mostly with pure abundances; e.g., presence/absence or densities. Although a first step to knowing resource preferences, a pure abundance view can be misleading and, as the authors note, it can only be a basis for more in-depth studies. RSFs likely should also address fitness and relevant ecological processes; topics of future research.

The general RSF concept is actually quite old, and its first application dates back as early as the 1920s by A. Scott. The first edition of this book was published in 1993, but the updated second edition also includes such advanced topics such as AIC, GIS, Risk Assessment, Alternative Modelling Methods, Discrete Choice Models and spatial species predictions. Personally, I find that this new version is much more readable than the previous one.

All important RSF sampling design issues are addressed: Sampling Protocols A, B and C, and Design I (Populations), II (Individuals) or III (each Animal). Also, all assumptions for using RSFs successfully are