



BOOK REVIEW

Biology and management of dogfish sharks

Edited by V. F. Gallucci, G. A. McFarlane and G. G. Bargmann

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This book comprises 34 chapters (35 including the initial keynote paper), each written as a stand-alone scientific paper, that are grouped in functional categories. The keynote paper is followed by 11 papers addressing Distribution and Abundance, 6 papers on Age, Growth and Reproduction, 6 papers on Ecology and Physiology, and 10 papers on Fisheries, Assessment and Management, and Conservation. Some of the papers are based upon presentations that were given at the First International Symposium on the Management and Biology of Dogfish Sharks, held in Seattle, WA in 2005.

Even though the book is titled 'Biology and Management of Dogfish Sharks', most papers deal exclusively with the spiny dogfish, *Squalus acanthias* Linnaeus, 1758. Traditionally, the spiny dogfish has been the most fished, impacted upon and studied of all squaloid sharks (dogfishes). In fact it is one of the most fished and studied of all sharks. While the studies in this book addressing a vulnerable and impacted species are most welcome, it would have been nice to see greater breadth by devoting a larger portion of the volume to less well-studied but more threatened deepwater squaloids. Only two papers in the book deal with squaliform sharks as a group, specifically papers addressing fossil records and the origin of Squaliformes (chapter 2) and molecular approaches to the study of dogfishes (chapter 20). The only other paper that focuses on another dogfish species is chapter 12, which describes the distribution and abundance of both *Squalus acanthias* and *Squalus blainville* (Risso, 1827) in the Mediterranean.

Most papers presented are based on studies of NE Pacific spiny dogfish populations in Canada and the United States, which may actually represent a distinct species, *Squalus suckleyi* (Girard, 1855) (see Ward et al. 2007 for a discrimination of the genus *Squalus* based on DNA barcoding), with only a few works dealing with other geographically disparate populations. The current IUCN Red List assesses the spiny

dogfish as globally 'Vulnerable' (Fordham et al. 2006), with the Atlantic and the Mediterranean populations probably representing the areas of highest concern. The Mediterranean and the NW Atlantic populations are currently assessed as 'Endangered' and the NE Atlantic population is assessed as 'Critically Endangered', while the NE Pacific population is listed as 'Vulnerable'. Therefore, it is a bit disappointing that the volume has so few papers addressing populations and regions where spiny dogfish populations are in more urgent need of better management and protection.

The keynote paper presents an excellent review of the spiny dogfish fishery in Canadian Pacific waters with descriptions of the various fisheries that have impacted the species since the nineteenth century and a summary of the species' life history traits in the region. The 'Distribution and Abundance' section begins with a fine study on the fossil record and origin of Squaliformes sharks, and is followed by six papers that deal in detail with the distribution, abundance, movements and population trends of spiny dogfish in the Strait of Georgia and Puget Sound. The last four papers of this section deal with populations of spiny dogfish occurring elsewhere, with one paper focusing on the distribution and abundance in Alaskan waters, one paper describing the captures off the Northern Kuril Islands and the southeastern Kamchatka Peninsula (Pacific Russian waters), one paper focusing on spiny dogfish overwintering aggregations in North Carolina (Atlantic US waters), and the last paper describing Mediterranean Sea biomass estimates of *Squalus acanthias* and *S. blainville* derived from fishery-independent trawl data.

The second section of the book links six papers dealing with life history under the heading, 'Age, Growth and Reproduction'. Of particular note is the age validation of the Puget Sound population based on oxytetracycline-injected specimens that lived in the wild for up to 20 years. Other chapters document age, growth and reproduction in the NE Pacific and the NW Atlantic, and reproduction in the population off Patagonia, Argentina.

The 'Ecology and Physiology' section covers a wide range of subjects, starting with an interesting study on the physiological responses of spiny dogfish to the stress subsequent to being caught by otter trawl. An overview of the contribution of molecular genetics to the study of dogfishes, including phylogenetics, evolution, population structure and

paternity, follows. Other papers in this section focus on the determination of the gastric evacuation rates of juveniles, the use of stable isotopes (C and N) to determine ontogenic changes and regional differences in feeding behaviour, and predator interactions between spiny dogfish and the sixgill shark, *Hexanchus griseus* (Bonnaterre, 1788).

The final section deals with 'Fisheries, Assessment and Management, and Conservation'. This section presents papers dealing with both commercial and recreational fisheries and summarizes historical and recent information available for management, as well as recent trends in populations and the evolution of management of spiny dogfish for the NE and NW Pacific and the NE and NW Atlantic. A final chapter provides an overview of the conservation efforts of the spiny dogfish over the last 15 years, and the timing of both this chapter (and the book in general) seems to have been particularly appropriate. The spiny dogfish has again been proposed to be listed under Appendix II of CITES (the Convention on International Trade in Endangered Species of Flora and Fauna), and the next meeting of the Conference of the Parties, where the proposals for amendments are voted, will take place in March 2010.

Biology and management of dogfish sharks is an excellent book that presents state of the art research on the spiny dogfish, *Squalus acanthias* (and possibly the closely related *S. suckleyi*). While the emphasis is primarily on populations inhabiting NE Pacific waters, there also are nice contributions from other

regions in the world. This is an essential book for researchers working with squaloid sharks and an important reference for researchers, managers and conservationists working with elasmobranch fishes in general.

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Rui Coelho
Florida Program for Shark Research
Florida Museum of Natural History,
University of Florida
Gainesville, Florida, USA
 and
Center of Marine Sciences
University of Algarve
Faro, Portugal
 E-mail: rcoelho@flmnh.ufl.edu
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