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Book Review

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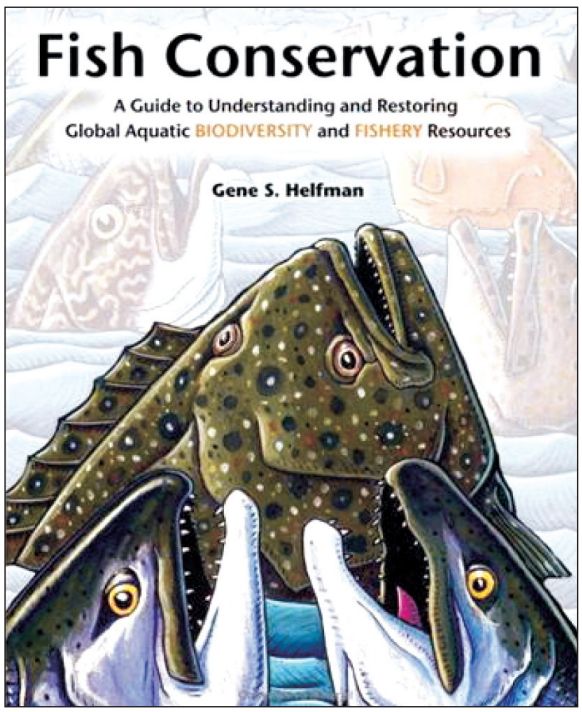
FISH CONSERVATION: A Guide to Understanding and Restoring Global Aquatic Biodiversity and Fishery Resources. By Gene S. Helfman.

Island Press, Washington, Covelo, London, 2007, pp. i -xi, 1-584. ISBN 13: 978-1-55963-596-7; Hard-cover Price: $ 170.00, Paperback $ 85.00.

Fishes, unlike terrestrial plants and animals are "unseen" renewable resources, which until the sixties and early seventies of the 20th Century were considered inexhaustible, especially in the marine realm. Conservation and management of fish diversity, protection and restoration of imperiled species, habitats and ecosystems were not matters



of grave concern. In marine fisheries, globally estimates of potential yield of several hundred million tons were projected, which led to a frenzy of building overcapacity of fishing crafts, sophisticated gears and the development of more efficient fish detecting devises which have led to over fishing , decline and collapse of major fisheries world wide. Fishing down the food-web has resulted in large predatory species such as sharks, tunas, sword fish, marlins and so on and important ground fish occupying the apex of the food chain being decimated or commercially extinct and replaced by low value fish. The natural aquatic ecosystems of streams, rivers, estuaries, lakes, lagoons, coastal seas and even the abyssal depths are under stress from unsustainable anthropogenic actions. Add to these, climate change, global warming, and phenomena such as El Nino, the impact of which on aquatic organisms and ecosystems are immeasurable. It is obvious that management of 'unseen aquatic resources", their habitats and ecosystems for conservation, restoration and judicial management are quite different from those being adopted for terrestrial biota.

Dr. Helfman's book entitled **FISH CONSERVATION** should be viewed as a positive achievement in filling a void that has existed in our understanding the impact of natural and anthropogenic actions on fish and fishery resources, aquatic habitats, ecosystems and strategies for restoring global aquatic biodiversity. The book is thought provoking on conceptually a wide spectrum of relevant subject areas impregnated with an abundance of information and in short, an indispensable compendium. Helfman is a practicing behavioural ecologist who has spent over three decades carrying out, in his words, "under water bird-watching" and the result of this effort embodied in this book is his way of "give something back to the fishes".

The book encompasses sixteen chapters in V Parts. Part I highlights aspects of fish diversity including genetic diversity within species; the role of sub-species and the unique genetic characteristics linked to evolution of species: imperilment and vulnerability of species and the significance of population genetics for understanding the same.

Part II has three chapters on taxonomic perspective; geopolitical perspective and characteristics of vulnerable species and correlates of imperilments. Answers to questions and problems such as the services that fish render to the ecosystem; the importance of Regional Traditional Ecological Knowledge (TEK) to understand the status of the species; qualitative and quantitative aspects of vulnerability of fresh water fishes; size vulnerability of reef fishes; application of knowledge of trends and traits of vulnerable biota and habitats for conservation, are some of the highlights.

Part III has five chapters which takes us through habitat modifications and loss; impact of dams, impoundments and other hydrological alterations; degradation of water quality and corrective measures such as bioremediation; impact of alien and invasive species, their threats to natural fish populations and other aquatic biota and the habitats, and the steps that could be taken to mitigate the problems. The deleterious effects of sea bed trawling which is compared to clear felling of forests is discussed at length, drawing attention to the replacement of specialist species by low value fish; damages to

benthic communities; and the need for allowing biogenic substrates to recover. These are critical and sensitive issues relevant to our country as well. The author also suggests solutions for the protection and restoration of protected areas and habitats which should be of interest to us.

Construction of large dams and barrages are considered monumental achievements. However, to the ecologist, these reflect human shortsightedness as they are "killing fields for native aquatic species." Construction of dams is a sensitive issue for us and the author has cited the report of the "World Commission of Dams (2002). "India has 4,290 dams over 15 meters high or impounding more than 15 million cubic meters of water out of a total of 39,000 to 45,000 world-wide. An interesting information is the decommissioning and removal of dams to form waterways in some countries.

The author has highlighted dangers of homogenization through alien introductions in vogue in some countries leading to loss of biodiversity of fish and other aquatic biota and this information should come as a warning signal to those involved with aquaculture, or ranching alien species for the purpose of enhancing production.

Part IV with five chapters, like-wise, deal with issues on over-fishing; importance of understanding the behaviour, life-history, evolution and ecosystems; exploitation of fragile ecosystems such as coral reefs; trade in live fishes and the promise aquaculture has thrown open. Pertinent questions are posed, such as "Why and how fisheries management has failed?"; why are coral reefs and their fishes so vulnerable?; the importance of ecotourism as an alternative to extractive exploitation and so on. The stress is on ecosystem based management of fisheries. The author has given a thought provoking critiques on "Misapplication of Agricultural Analogy" when speaking of Aquaculture versus Capture Fisheries which should be of interest to the reader.

Part V in two chapters on "Ethics of Exploitation and Intervention, Do we have the right?" and "Future Perspective: Beyond Gloom and Doom?" pose hard questions and seeks answers to challenging ethical problems such as avoidance of techno-arrogance; reduction and regulation of extractive activities; involvement of community based support; and adoption of an approach of reconciliation and restoration in an ecosystem based management perspective. The last said theme pervades throughout the book and the author concurs with and persuades the reader to subscribe to the dictum of Aldo Leopold (1949) that a thing is right "When it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise." The book contains an Appendix, listing the probable fish extinctions globally; a useful Glossary and a Reference Section listing over 2000 publications.

Dr. Gene S. Helfman has put in a tremendous life-time effort in bringing out this monumental and unique publication, a first on "Fish Conservation" combined with global aquatic biodiversity and fishery resources. It is easy to read and captivates the mind of the reader who will find many of the issues, problems and plausible answers towards judiciously developing and managing our freshwater, estuarine, marine and contiguous terrestrial ecosystems and the biota therein. Being a storehouse of information, I strongly recommend that this book should find a prominent place in libraries to be useful to teachers and students of fish taxonomy, fishery science and aquaculture, fish farmers, environmental ecologists, marine biologists, aquatic resource managers, policy planners and conservationists as it is once in a life time that such a magnum opus is delivered.