Book Review

Stock Assessment in Inland Fisheries

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Publisher: Fishing News Books, Blackwell science Ltd., Osney Mead, Oxford OX2 EL,. UK.

(1996. ISBN 0 85238 224 3, Hardcover, 528 p, Price: £ 59.5.)

Assessment of fish stocks, whether marine or inland, is an important aspect of intelligent fishery resource management. Due to the demanding pressures of social, political and economic environment, the subject of marine fisheies has acquired prominence in the growing literature on fish stock assessment. However, the fisheries of most of the inland water bodies, being subject to tremendous changes during the last few decades owing to various human activities, are also in a critical state. Therefore, it is imperative that rational policies are adopted for the sustainable management of the inland fisheries for which accurate assessment of fish stock is essential. It is in this context that this book 'Stock Assessment in Inland Fisheries' becomes more relevant.

The book is based on the International Symposium on Stock Assessment in Inland Fisheries organised and hosted by the International Fisheries Institute at the University of Hull, UK, during 11-15 April 1994. The book contains 39 selected papers, designated as chapters and grouped under seven sections, under which the various issues of fish stock assessment in inland waters of the temperate and tropics were discussed.

In the opening chapter of the first section dealing with Survey Methods, Hickley attempts a synthesis of the workshop's discussions on survey methods and recommends development of hydroacoustics, optimising the use of catch statistics, combination of complementary methods and improvement of interpretation of results for improving the fish stock assessment programmes. In the subsequent three chapters, assessment of riverine fish stocks using three different methods, namely electric fishing (Harvey and Cowx), resistivity fish counter (Aprahamian et al) and instream observation by Snorkel and SCUBA diving (Bird *et al*) are presented. Assessment of the deepwater trawl fishery in lake Malawi using exploratory fishing and catch data is the subject dealt in the paper by Banda et al. In the sixth chapter, Kubecka compares the species and size composition of Breder trap catch with the catches from qualitative shore seines in the Elbe Backwater and Klicava reservoir of Czech Republic. In the last chapter of this section, estimate of the migrant yellow eel stock in the river Meuse (Belgium), made using fish passes as a tool for discriminating resident and migrating eel is presented by Baras *et al.*

The second section on Catch and Effort Methods, opens with a paper by Steel *et al* presenting the preliminary results of the application of roving census technique combined with the a photographic method for estimating the fish stocks of rivers. In the next chapter, Evans describes the use of logbooks for gathering detailed information on catch and effort. The other three papers of this section deal with estimation of historical trends of migratory salmonids in UK rivers (small), interpretation of trends in salmon stock dynamics from rod catches in River Spey (Smith *et al.*).

The third section is devoted to Hydroacoustic Assessment and consists of five papers. Kubecka, in his paper on use of horizontal beam sonar for fish surveys in shallow waters, discusses the ways of tackling the problem of low signal-to-noise ratio and suggests a combination of mobile surveys of extensive areas and subsequent observations at fixed locations as a good strategy for routine surveys. Mouse and Kemper, based on their study in lake Ijsselmeer, do not recommend hydroacoustics as a tool for studying size-wise and spatial abundance of fish on a wide scale in shallow lakes but suggest its combination with other methods. In such an attempt in lake Malawi, a comparison of the results obtained from acoustic survey and predictions based on size spectrum models is made by Allison. Bean *et al.*, on the other hand, have attempted to estimate the stock of Arctic charr population in Loch Ness, UK, using a combination of quantitative echo-sounding and trawling.

The next section, Population Models, consisting of six chapters (18-23) begins with two papers based on the fishery of Lake Ijsselmeer, the first one by Dekker presenting a length-structured matrix model and its application on three fisheries of the lake and the second one by Buijse and Dekker assessing the uncertainity in fish stock assessment by trawl surveys in the lake using a Generalised Linear Model. In the 20th chapter, Hoggarth and Kirkwood discuss the implications of different exploitation strategies in three floodplain fisheries in Bangladesh, Thailand and Indonesia by using FAO's BEAM4 methodology. A contribution by Ward in this section discusses the population dynamics of steelhead trout in Keogh River, British Columbia. Mark-recapture method figures in two contributions of this section, the first one by Davidson *et al* presenting the results of estimation of run size of Atlantic salmon and sea trout using Mark-recapture and trap indices in the River Dee and the second one by Kristiansen discussing the Mark-recapture experiment in a sea trout ranching stream in Danish lowland.

In the first chapter of fifth section dealing with Case Studies on Lakes and Reservoirs, Allison examines the stock assessment considerations in large lakes and reservoirs. While stressing the need for improving stock assessment procedures and enhancing their predictive powers, he suggests that the presentation to the managers should also include an analysis of the effect of ignoring the advice. The other six contributions of this section deal with various aspects of stock assessment in lakes of Sri Lanka (Amarasinghe), lake Tanganyika (Marshall), inland fisheries of Zimbabwe (Mandima), Lake Taupo, New Zealand (Cryer), Lake Constance (Loffler) and lake Wolderwijd (Backx). The sixth section on Case Studies-Rivers, opens with Jackson's paper, Stock assessment considerations for riverine fisheries and five other contributions on different aspects of stock asessment in/of Sondu Miriu river, Kenya (Muli and Ojwang), Spanish mountain streams (Garcia De Jalon *et al*), European eel (Knights *et al.*), Danube delta Romania (Navodaru), Sanpedtro River Mexico (Noiset and Micha) also figure in this section.

Turner, in the opening chapter of the concluding section on Fisheries Management, discusses the issues of maximum yields from African lakes and suggests abolition of technical measures such as mesh size regulations for maximum yield. However, he mentions that the decision to manage African lakes either for maximising yield or maximising profit are made essentially on political grounds. The achievement of fisher communities of Malaysia in the sustainable management of their common property, narrated by Ali in the second chapter, is worth emulating in other parts of the world with suitable modifications. In the conclud-

ing chapter, Cowx discusses the strategic approach to stock assessment which meets the demands of both the managers and scientists, reviews the objectives of both the managers and scientists, and the objectives of fishery management and evaluates the level of precision of stock assessment procedures and compares the various techniques.

The book gives an overview of the stock assessment techniques and methods currently being applied in the inland water bodies world-wide and also provides the experts view on the advantages and disadvantages of the different techniques and management strategies. The references provided at the end of each chapter, the illustrations and comprehensive index at the end certainly add to the utility (an author index would have made it complete) of the book. The book is an unique single source of information on stock assessment in Inland fisheries and can be a standard reference for the scientists, managers and academicians who wish to keep abreast of the developments in the subject and constantly strive to refine their methods. Obviously this volume should certainly be available in the institutions and organisations concerned with the Inland fisheries.

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