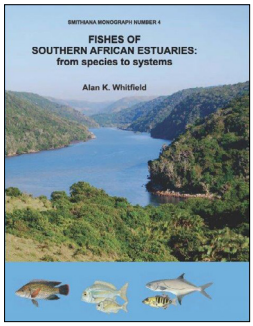
BOOK TITLE:
Fishes of southern African estuaries: From species to systems



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ISBN:
9780869106397 (softcover, 495 pp)

PUBLISHER:
South African Institute for Aquatic Biodiversity, Makhanda; ZAR900 (open access ebook)

PUBLISHED:
2019

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HOW TO CITE:
Moyle PB. Estuaries and fishes in southern Africa: A legacy of knowledge. S Afr J Sci. 2020;116(3/4), Art. #7654, 1 page. https://doi.org/10.17159/sajs.2020/7654

ARTICLE INCLUDES:
☐ Peer review
☐ Supplementary material

PUBLISHED:
26 March 2020

Estuaries and fishes in southern Africa: A legacy of knowledge

As species and habitats around the world decline, the information about them expands, and is squirrelled away in an infinity of websites and obscure reports, even when collected in the interest of conservation. Yet such information, while useful, is not knowledge, which requires synthesis and understanding. Only from such knowledge, can we find better ways to understand and consequently sustain the diversity of habitats and species that make up the natural world on a broad scale. Disseminating knowledge is why books like Whitfield's are both rare and important. Whitfield has devoted much of his life to studying the biology of fishes of south African estuaries. Over 50 years he has created a rich legacy of scientific papers on the fishes, enough to satisfy most scientists. Instead, he has written a book which pulls together this diverse information in a readable fashion, the glue being his personal observations from long experience of being out on the estuaries of southern Africa sampling fish. This book allows others to tap into Whitfield's vast knowledge of estuaries and their fishes and I regard it as a model for other senior scientists to follow.

So why would anyone choose a career studying estuaries? Whitfield describes estuaries as '…regions where marine and fresh waters meet, where environmental gradients are steep, and where exceptionally high levels of production are often recorded' (p.41). Estuaries occupy very limited areas at the end of coastal rivers, where conditions vary greatly with tides, season, and freshwater inflow, making them difficult to study. Yet they are also very distinctive habitats, often important as nurseries for marine fishes and for fisheries, and their dynamic nature makes their natural history fascinating. The fishes are a mixture of marine and freshwater species that can tolerate variable salinity and temperature, with very few adapted specifically to live in estuaries. Moreover, the assemblage of fishes present at any given place is likely to change from year to year. But Whitfield makes it clear that these challenging aspects of estuaries are also what makes them so fascinating: there is always something new to learn. Not surprisingly, his book also reveals a scientist who simply loves being out sampling fish in estuaries.

But all is not well with the estuaries of southern Africa – reflecting a global problem. They are highly vulnerable to degradation by human actions and highly vulnerable to the effects of climate change (e.g. sea level rise), which adds urgency to their study. While there are an estimated 280 estuaries in southern Africa, Whitfield calculates that 133 of them are degraded, including some of the larger ones. While there are many and multiple causes of degradation, the removal of water from inflowing rivers and alteration of catchments for farming and urban use generally lead the list. Given the short memories of people for how conditions have changed (the 'shifting baselines' phenomenon), this book makes a determined effort to compare the estuaries of today with what they were like in the past.

To increase the reader's appreciation of the fishes and estuaries, Whitfield has generated illustrations and distribution maps of 99 fish species, while 273 figures are a mixture of colour photographs and diagrams, along with 31 summary tables. The diagrams are especially attractive from my perspective (as one who also studies estuarine fishes), because many of them are accessible 'conceptual models' that present Whitfield's understanding of various aspects of the natural history of the fishes in estuaries. Figure 242, for example, shows, in colour, the existing fish community of an estuary next to a similar diagram that shows what the more diverse fish community of a healthy estuary would be like. *Anyone l*ooking at the figure can grasp what it shows, which belies Whitfield's immense knowledge behind it. The text associated with the figure provides details and references that a biologist or manager might need, especially for rating how degraded an estuary has become and what remediation measures are required. All these illustrations make the book a dream for people, like me, who like to browse through books at first acquaintance. Virtually every page has something eye-catching on it, including colour photos of the diverse estuaries of the region, which provide an outsider (also like me) an opportunity to grasp how similar (or different) the estuaries are to those in other parts of the world.

My first browse of the book revealed commonalities with the many small coastal estuaries of California, which also has a Mediterranean climate with strong seasonality of stream flows, a rich marine fish fauna, and a limited selection of freshwater fishes. This results in many similarities in how estuaries are used by diverse fishes with similar life histories. Endemic fishes can be in trouble in both places: California's delta smelt and South Africa's estuarine pipefish are both threatened with extinction because of great alterations of their estuaries. But Californian estuaries lack sea-run eels while South African estuaries lack salmon and other anadromous fishes.

The 'gee whiz' factor is high for browsers. I was struck by the photo of seven very similar species of mullet caught in the same net, which all feed on organic matter (detritus). The species apparently reduce competition by feeding in different places in the estuary because the average size of sand grains in their stomachs differs. Such observations are integrated into a larger picture to explain how the fishes use diverse estuaries, noting the roles of biological, physical and chemical processes in determining fish distribution and abundance. The result is an extraordinarily thorough exploration of estuarine ecology over a large region, which leaves as many questions as it answers – a mark of good science. Whitfield's book is a benchmark work, against which to measure the effects of global change on estuaries and fishes in southern Africa, as well as to compare these estuaries and their fishes with other estuaries around the world. Estuarine ecologists and natural historians worldwide are therefore fortunate that the book is available online at no cost.