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The Sea Among Us: The Amazing Strait of Georgia by Richard Beamish and Gordon McFarlane

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The Beauty of the Strait

The Sea Among Us: The Amazing Strait of Georgia by **RICHARD BEAMISH and GORDON McFARLANE**
Harbour, 2014 $39.95

Reviewed by **DEE HORNE**

An important book for the scientist and the layperson alike, *The Sea Among Us* offers an in-depth look at the beautiful and productive inland sea that is the Strait of Georgia. The book is divided into two sections. The first has a scientific emphasis and canvasses geology, biological oceanography, invertebrates, marine plants, fishes, marine mammals, and coastal birds. The second shifts focus toward people and their industries, including the pre-contact era, the zone of encounter, and the history of fisheries.

Every chapter is written by different authors, each a specialist in his or her field. The writing is not only well researched, but accessible. The photographs are stunning, and the charts, tables, and illustrations are comprehensive, informative, and integrated effectively into the narrative. The book will appeal to all who appreciate and care about the Strait of Georgia, as well as those who have yet to see it but wish to visit. The book will also engage anyone interested in our interrelationships with ecosystems. In addition to providing a thorough picture of the Strait's biodiversity, the authors discuss some of the challenges the strait faces, how these challenges have been addressed over time, and opportunities ahead.

Specifically, the authors consider present threats to biodiversity, such as habitat loss, pollution, overfishing, marine transport, and climate change. For example, scientists estimate a one to two meter rise in sea levels by the end of the 21st century and increases in salinity as well. These changes will affect what species can survive, and the authors consider how species might adapt and the potential consequences for the whole ecosystem.

There is enormous diversity in adaptation strategies. Some animals mimic their habitat. Others have commensal relationships, where one species benefits and the other is unaffected, while still others engage in mutualism, where both species benefit. Examples of mutualism include the symbiotic algae growing in anemones or the clever disguise of sponges on scallops, where the sponge benefits from the mobility of the scallop and the scallop benefits because its disguise protects it from predatory sea stars.

The authors also discuss management and recovery initiatives, what efforts are being made now, and what can be done in the future. For example, Paul Harrison and Dave Mackas consider harmful algal blooms and those elements that influence phytoplankton growth and their seasonal cycles, which have been documented by the sensors on BC Ferries from Tsawwassen to Nanaimo. Another suggestion for action includes citizen scientists who report unusual fish sightings to an organization that can record the information. Before knowing whether a species is increasing or decreasing in number, we must first be able to identify and count them. Equally important to collecting this information is sharing it through a common archive.

In examining habitats and the conditions that affect them, Rick Harbo notes that predicted increases in air and water temperatures and changes to freshwater runoff will impact the estuarine circulation, tidal mixing, and upwelling in the strait. Seasonal changes may be slow,

but at times a more drastic change might lead to mass die-offs in some species. Some animals might adapt by going to deeper depths—where they may find themselves easier prey. Carbon dioxide increases may also lead to oceanic acidification, which could have dire effects for those animals with calcium carbonate shells, such as clams, oysters, corals, and sea urchins. According to Andrew Trites, some resident killer whales are struggling to hunt enough Chinook salmon to meet their needs, while others suffer the effects of bioaccumulation, with high concentrations of chemical pollutants in their tissues that may hinder their immune systems. All of the above are indicators of the increasingly precarious state of the strait.

Beyond the threats to the strait, the authors also recognize its unique beauty and fascinating inhabitants. It is home to glass sponge reefs several kilometres long, giant Pacific octopi whose arms can spread over two metres, and some of the largest marine invertebrates in the world. The strait also contains ancient red sea urchins that can live over 150 years and Geoduck clams that can live up to 168 years. Equally fascinating are sequential hermaphrodites: oysters, spot prawns, and slipper shells, which start out male and then become female, while sponges and flatworms can be both male and female at the same time.

Then, there are the worst case scenarios for the disaster inclined reader: a storm surge and 9.0 earthquake and tsunami at high spring tide in the strait. Closer to home and more immediate is the fact that the southwest region of Vancouver Island is rising, while in the strait, geological processes are reducing the rate of sea level rise. For those living in the Fraser River delta area, loss of sedimentation due to river dredging and diking means that the sea level there is expected to rise at an accelerated rate, twice that of the global ocean. The authors also discuss deep water renewal and the effects of El Niño and La Niña on sea levels in the Salish Sea, such as the damaging surges associated with the former and the lower sea levels and less rainfall that correspond with the latter. Though some fluctuations are part of the normal ebb and flow of the ecosystem, others are influenced by human impacts. In the last twenty-five years, the ecosystem of the strait has been altered and it is considered one of the most at-risk natural environments in Canada.

It is commendable that the authors' royalties go to the Pacific Salmon Foundation, which supported this book project and will use the publication of this book to start the Salish Sea Marine Survival Project (2014-2018), which will tackle the challenge of restoring sustainable Chinook and coho fisheries within the strait. Readers can be reassured that by purchasing this book, they are contributing to the protection and restoration of its subject.

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