

SHELLFISH AT RISK: A GLOBAL STUDY

Coastal waters around the world support an impressive array of marine life as well as human livelihoods and well being. Habitats such as estuarine seagrass meadows, oyster reefs, salt marshes, and mangrove forests are the nurseries for much of the marine life along the world's coasts and provide many other services as well from water filtration to shoreline protection. **But the health of these habitats, estuaries and bays is declining around the globe.** Major threats include habitat loss, nutrient and toxic pollution, altered freshwater flows, exotic invasive species, overfishing, rising sea levels, and wetland loss.

Shellfish reefs and beds are one of the most globally impacted of all ecosystems. The once extensive oyster reefs of Chesapeake Bay and other estuaries have been dramatically reduced. Native shellfish fisheries have collapsed across Europe, the US and Australia. With the loss of these and other shellfish reefs and beds, we have also lost habitat for a diverse array of fish and crustaceans, the protection of shorelines from reefs that once served as natural breakwaters, and the natural capacity of shellfish to filter and clean the surrounding waters. A comprehensive program of conserving and restoring shellfish ecosystems is a critical step in saving our coastal bays and estuaries and the many forms of life that depend on them.

Scientists and managers almost always look at shellfish ecosystems on a bay-by-bay basis and rarely attempt to synthesize a general view of their alarming decline. Indeed no non-governmental organizations (NGOs) or public agencies have a global focus on important ecosystems such as seagrasses, salt marshes, or oyster reefs particularly in temperate regions. Most shellfish conservation and restoration is very

localized, and few scientists, public agencies, or conservation organizations address the problems of coastal waters and shellfish ecosystems on a regional, national, or global scale.

Efforts to conserve shellfish ecosystems tend to be conducted piecemeal rather than as part of a broader strategy. While many scientists, conservation groups, and public agencies have cooperated in recent years to assess and address the declining health of tropical marine systems, especially coral reefs, no similarly broad-based efforts have yet been undertaken for shellfish ecosystems in temperate waters. A 1998 global study of tropical coral reefs, Reefs at Risk, analyzed the condition of coral reefs and threats to their survival. This study has been very effective in galvanizing support for further research and improved conservation and management of tropical reefs around the world. No such study exists of the world's temperate marine ecosystems in general and shellfish ecosystems in particular.

To fill this gap, The Nature Conservancy is initiating, with partners, a project to identify the state, condition, and action needed to conserve shellfish ecosystems. Over the next two years, TNC will work with internationally-recognized experts



to synthesize available data on the distribution of key native shellfish species (primarily oysters and mussels), develop a method of analyzing and rating the condition of shellfish ecosystems, developing quantitative models of the conditions of and threats to shellfish ecosystems, and extending our findings to wider geographic areas.

In the first phase of the global study, we are compiling initial data sets; assembling a small advisory board of outside experts; and recruiting the additional expertise needed to complete the study. Tangible outcomes of the first year of work will include a global data set containing (1) most of the readily available distribution data for key shellfish species and (2) spatial information describing recognized threats to shellfish populations (such as industrial or municipal wastewater discharges and channel-dredging operations).

In the second phase, we will analyze the spatial threats data assembled in the first phase and, using those data, develop and test models that predict the condition of shellfish populations around the world. The ultimate product of this study will be a comprehensive Shellfish at Risk report describing our working group's findings and recommendations for long-term conservation and restoration of global shellfish populations.

The principal products of this global assessment will be (1) a Shellfish at Risk report that identifies shellfish ecosystems around the world and rates their risk of ecological extinction as low, medium or high; (2) an accompanying global database of the distribution of bivalve shellfish in temperate waters; and (3) a model of the factors that, taken together, describe the conditions of these ecosystems and the threats to them. The Nature Conservancy and partners will publicize and distribute these products widely to the environmental community, researchers, governments, and other appropriate parties.



Intertidal oyster reef at TNC's Virginia Coast Reserve. (c) Barry Truitt, TNC

We expect this report and database to help build a broader constituency and stimulate increased efforts for shellfish conservation and restoration at scales ranging from local to global. With this information in hand, scientists, non-governmental conservation groups, and public agencies will be able to make better-informed decisions on how to conserve, manage, and restore shellfish ecosystems. Ultimately, we hope that TNC and partners will be able to galvanize greater science, conservation and management of these ecosystems that are critical to the functioning of bays and estuaries globally.

We need your help: *TNC is currently seeking any leads on data (particularly spatial) on the distribution of native bivalve shellfish species around the globe.*

If you can provide data to help advance this study or suggest potential sources, please contact Rob Brumbaugh (rbrumbaugh@tnc.org) or Mike Beck (mbeck@tnc.org).

*This assessment is supported by
The Kabcenell Foundation*