

A PROCESS-ORIENTED FRAMEWORK FOR CONSIDERING ARTIFICIAL REEFS

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Artificial reefs are tools used to shift ecological processes toward attaining management objectives. Unfortunately, they have long been used without thoroughly understanding the ecological processes being manipulated or specifying the objectives to be attained. Recent experiments reveal how reefs function ecologically, and indicate that reef technology might be used strategically to alleviate limitations or bottlenecks affecting the abundance and productivity of some fish populations. But like any tool, they have potential for harm if misused.

In the United States, artificial reefs have been used to enhance recreational fishing, for mitigation, and as economic development projects. They are just now being considered as management tools for fisheries conservation. Elsewhere, they are used for seafood production, habitat protection, water quality improvement, and artisanal fisheries. How artificial reefs are viewed by individuals and used by society is a reflection of human values that range along a continuum of preservation, conservation and exploitation.

For fisheries applications, artificial reefs affect the spatial-temporal distributions of primary resources on which fish depend, i.e., food, shelter and mates. Thus, they can affect ecological processes such as habitat selection, coupling, predator-prey dynamics, bioenergetics, reproduction and recruitment. There is no single answer to the questions posed – Are artificial reefs good, bad or indifferent? Do they produce new biomass or increase primary productivity? – Truly objective answers will depend on the context and details of the application, and the management objectives specified for any given project.