MEASURING ABALONE AND SEA URCHINS

Photo © Shannon Fitzgerald

Life history traits such as reproduction, growth, and survival in many marine species are based on animal size. For many marine invertebrates and fishes, larger animals have greater reproductive output, higher survival, and may continue growing slowly as they age. Size-specific life history data are needed to construct structured population models. Here Jennifer Stephenson collects size-specific data on red abalone in the cold waters off northern California.

Photo © Laura Rogers-Bennett

Large red abalone are susceptible to multiple sources of mortality, including fishing, predation, disease, wave dislodgement, and boring clams and sponges that compromise the integrity of the shell.

Photo © Shannon Fitzgerald

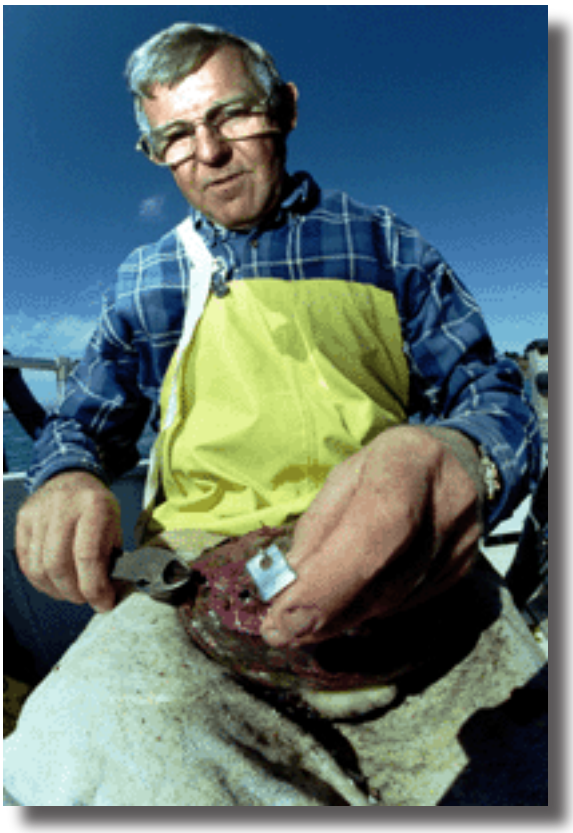

Photo © Laura Rogers-Bennett

Red abalone in shallow eelgrass beds in Horseshoe Cove, Bodega State Marine Reserve in northern California. This reserve is the oldest reserve in northern California where organisms are protected from fishing. There is an active recreational fishery for red abalone in northern California where shore pickers and free-divers collect abalone from shallow intertidal and subtidal habitats.

Tag and recapture studies are used to estimate growth and mortality rates. Data from a large-scale tagging program conducted by the California Department of Fish and Game was used to estimate growth and mortality for red abalone. Tags are made of stainless wire twisted through the open respiratory pores in the shell to hold numbered stainless washers. Abalone are tagged by Peter Haaker, California Department of Fish and Game, at Van Damme State Park in northern California.

Photo © Shannon Fitzgerald

Individuals tagged with stainless tags can be identified for years in the field. Tagged red abalone in the Bodega State Marine Reserve.

Photo © Shannon Fitzgerald

Red abalone inhabit coralline algae in the shallow nearshore communities.

Red abalone are dominant herbivores in subtidal rocky communities in northern California.

Look for the article by L. Rogers-Bennett and R. T. Leaf, "Elasticity analyses of size-based red and white abalone matrix models: Management and conservation in California," to be published in *Ecological Applications* **16**(1), February 2006