

Case study

Haliotis kamtschatkana

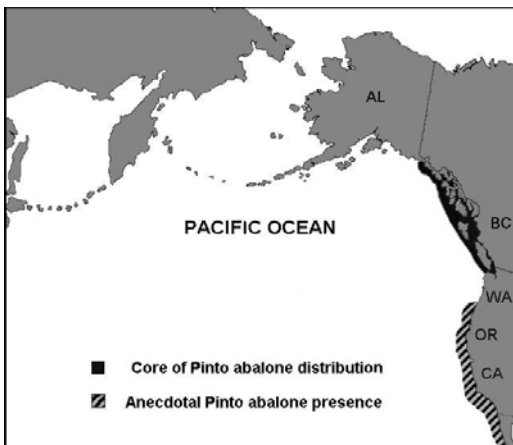
Species:	<i>Haliotis kamtschatkana</i> (Jonas, 1845)
Common Name:	Pinto Abalone
Class:	GASTROPODA
Order:	ARCHAEOGASTROPODA
Family:	HALIOTIDAE



Photo © Andy Murch [www.elasmodiver.com]

Range:

The Pinto Abalone is predominantly a North American species. Its range extends from Sitka Island, Alaska in the north, along the coast of British Columbia, and to Turtle Bay, Baja California in the south. In central California, the subspecies *H. kamtschatkana assimilis* (threaded abalone) occupies the southern part of the range. Very little is known about populations in this part of the range, with apparently low presence of threaded abalone relative to other abalone species of the south.



Map of pinto abalone distribution. Black shading represents core distribution and the hatched area represents the anecdotal range.

Population:

Alaska and British Columbia are the only two regions where targeted commercial fisheries for pinto abalone ever existed. Although the percentage of the global population occurring in these areas is not known, the core range for the species is believed to be Alaska, British Columbia, and Washington. There seem to be no significant populations of pinto abalone south of San Juan, Orcas and Lopez Islands in Washington State.

Alaskan fishery CPUE data from 1979 to the close of the fishery in 1996 indicates a decline in CPUE of 89.7% over this period. This is the only measure of pinto abalone numbers in Alaska. With the closure of the fishery in 1996, there is no way to determine the current status of Alaskan stocks of pinto abalone.

In British Columbia, fisheries-dependent catch and CPUE data exist from 1977 to 1990 when the fishery closed.

Fisheries-independent data consist of abalone densities at survey sites along the coastline. Fishery data show a 41.4% decline in CPUE between 1977 and 1990. The difference in decline rates in CPUE between Alaska and British Columbia is likely a result of different approaches in fisheries management. However, site surveys in British Columbia demonstrate a much steeper decline than do the CPUE data: there was an 88.6% decline in abalone density between 1979/1980 and 2001 in the central coast of British Columbia, and an 85.5% decline in densities recorded in 1978 and the average densities recorded in 1990, 1994, 1998, and 2002 in the Queen Charlotte Islands. There has been no significant increase or decrease in densities observed in that area since 1990.

Although the above figures indicate extreme population declines in the core range area, it should also be noted that the disappearance of one of the abalone's main natural predators, the sea otter *Enhydra lutris*, in the 19th century resulted in pinto abalone numbers increasing immediately prior to the period of heaviest fishing pressure on the species. If this natural predator had remained within the abalone's range, the decline in natural population size caused by fishing pressures would likely be 50-80% since the 1970s.

Habitat & Ecology:

Pinto abalone are sessile gastropods that exist in patchy distributions. Their preferred habitat is rocky-shore coastline. The species is an intertidal zone herbivore and is targeted by a diverse range of predators, depending on the water depth in which they occur. In subtidal waters, predators include asteroids, crabs, fish, octopi, and sea otters. In intertidal waters, birds, sea otters and mink are the major predators. The eradication of the sea otter during the 19th century led to the increased co-occurrence of sea urchins and abalone. Sea urchins out compete pinto abalone for food resources, which has resulted in "sea urchin barrens" — large areas with high sea urchin populations, no macroalgae and little or no abalone. Nevertheless, sea urchins may also provide some enhancement by maintaining encrusting coralline algae cover and by affording shelter under their spine canopy to small abalone.

Generation time for the species is estimated at about 10 years.

Threats:

Poaching of pinto abalone is a lucrative enterprise and is likely placing continued stress on the remaining abalone populations. Illegal harvest of pinto abalone is likely to continue to pose a threat to the recovery of the species. The large and mostly uninhabited coastline is a hindrance to enforcement efforts, and the high value of pinto abalone makes poaching a very lucrative enterprise. The removal of large numbers of mature individuals drastically threatens the reproductive potential of an already depressed population.

There is evidence to suggest that abalone are susceptible to recruitment failure at reduced densities. This renders the population highly susceptible to recruitment over-fishing. Abalone harvesters tend to remove all available individuals from each site visited, and the resulting reduced local populations are at risk of experiencing recruitment failure.

Sea otters are effective natural predators of abalone. Historically, the sea otter's range encompassed the entire range of the pinto abalone. Over-exploitation at the end of the 18th century led to the extirpation of the sea otter throughout most of this range. Following major conservation efforts (translocations and reintroductions) in the 1970s, the sea otter is rapidly re-establishing itself. They currently overlap with pinto abalone only in the northernmost reaches of the pinto distribution and it is doubtful that sea otters are responsible for the observed decline in abalone populations over the last few decades. Nevertheless, sea otter numbers are increasing. A study investigating the impact of sea otters on red abalone *H. rufescens* in California reported that the effects of predators on abalone abundance were greater than the effects of recreational harvesting.

Pinto abalone populations are very susceptible to development and habitat destruction.

The large and continuing decline of black abalone *H. cracherodii* in California is partly a result of Withering Syndrome, and has raised concerns that other species of abalone may also be in danger from contagious pathogens. Laboratory studies of the bacterium responsible for Withering Syndrome, *Candidatus xenohaliotis californiensis*, indicate that it is capable of infecting other species of abalone. However to date there have been no recorded instances of Withering Syndrome in pinto abalone.

Conservation Measures:

Several conservation actions are currently underway on behalf of the pinto abalone. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessed the pinto abalone as a threatened species in 1999. This has resulted in development of a National Recovery Action Plan (NRAP), with various recommendations including actions for curtailing illegal harvest; a communications campaign aimed at increasing public awareness of the decline of the species and ongoing efforts to engineer its recovery; and recommendations for research aimed at determining the best methods for abalone rebuilding projects, and many aspects of the biology, physiology and ecology of the species that currently are unknown. The NRAP also encourages ongoing monitoring projects.

In 1994, the Washington Department of Fish and Wildlife closed the pinto abalone fishery but did not initiate any conservation efforts. In 2004, the National Marine Fisheries Service listed the pinto abalone as a Candidate Species in the state of Washington for protection under the Endangered Species Act. This designation, however, does not confer any procedural protections under the Endangered Species Act.

In California, after a series of closures of the various targeted abalone fisheries (of which pinto abalone did not play a significant role), fisheries managers enforced a moratorium on the taking, possessing and landing of all abalone species for commercial or recreational purposes south of San Francisco. The same bill mandated the creation of an Abalone Recovery Management Plan (ARMP). Pinto abalone are included in the ARMP only indirectly, as they are insufficient in numbers to support any form of targeted management or harvest.

Sources:

McDougall, P.T., Ploss, J. & Tuthill, J. 2005. *Haliotis kamtschatkana*. In: IUCN 2006. 2006 IUCN Red List of Threatened Species. <www.iucnredlist.org>. Downloaded on 14 June 2007