



Photo credit: California Department of Fish and Game.

#### KEY INFORMATION

##### Area of Concern

Sitka, Alaska, to Pt. Conception, CA.  
Predominantly Washington, British Columbia, and Alaska.

**Year Identified as “Species of Concern”**  
2004

##### Factors for Decline

- Overharvest
- Illegal, unregulated, unreported harvest
- Predation by recovering sea otters
- Disease

##### Conservation Designations

IUCN: Endangered

#### Brief Species Description:

Pinto abalone are found in kelp beds along outer well-exposed coasts from Sitka, Alaska to Point Conception, California (Figure 1); typically in low intertidal zone to 30 feet (9 m) depth, but they can be found to 330 feet (100 m) depth. The shell is generally green-brown but can have white or blue coloration and has a somewhat scalloped edge. The epipodium is lacy and green-brown in color. Three to six open flush pores (respiratory pores) can be found on the left side of the shell and spiral growth lines are evident on the posterior. Tentacles surrounding the foot and extending out of the shell sense food and predators. They are herbivorous. They reach a maximum length of about 5.5 inches (14 cm) and maximum age is 15 years. They broadcast spawn from April to June. Minimum density for successful fertilization is approximately 1.4 to 3.6 per square foot (about 0.13 to 0.33 individuals per m<sup>2</sup>).

#### Rationale for “Species of Concern” Listing:

##### **Demographic and Genetic Diversity Concerns:**

There was a 60 to 90% reduction of legal-size abalone by 1978 (Sloan and Breen 1988). Limited larval dispersal seems to make abalone species in general difficult to manage (Jamieson 1999). There may be an unusual genetic form in the Puget Sound/Strait of Georgia region.

##### **Factors for Decline:**

Overharvest, suspected illegal harvest, predation by reintroduced and recovering sea otter (*Enhydra lutris*), and disease (the protozoan *Labryinthuloides haliotidis*, only observed in mariculture juveniles) have impacted the status of this species.

California: Pinto abalone were never a major component of the commercial or recreational catch. There was however nearly 10-fold decline in abundance in northern California (156,000 in 1971 to 18,000 in 1999-2001).

Alaska: Peak harvest was between 1978 and 1981 (260,000 lbs); average harvest declined to 50,000 lbs in 1994. The commercial fishery was closed in 1996; recreational free-diving fishery remains.



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Washington: There was no historical commercial fishing; the recreational fishery closed in 1994 due to declines in abundance. Recent surveys in the San Juan Islands (Figure 2 and Table 1 below) indicate a decline in density at many sites. Densities at all but one site are below or within the minimum range for successful fertilization. Abalone size has increased between 1996 and 2006, but abundance has not increased (D. Rothaus WFDW, personal communication).

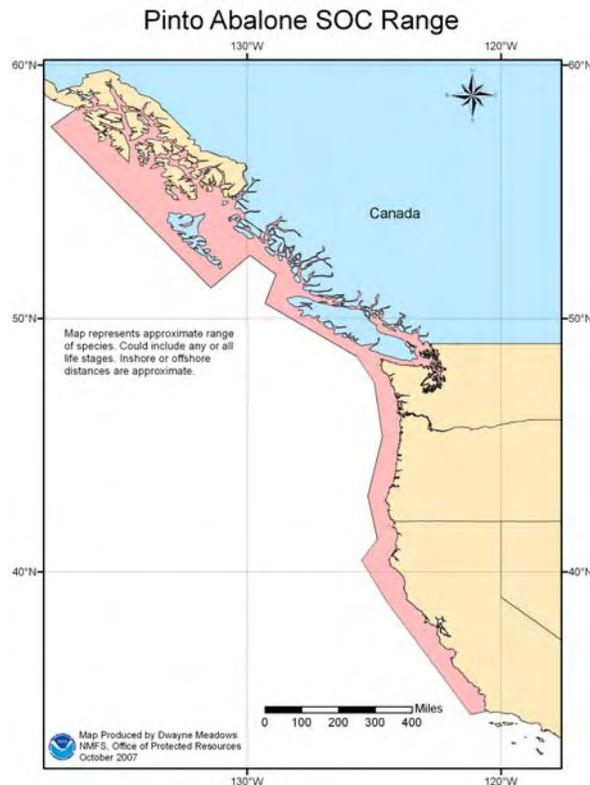
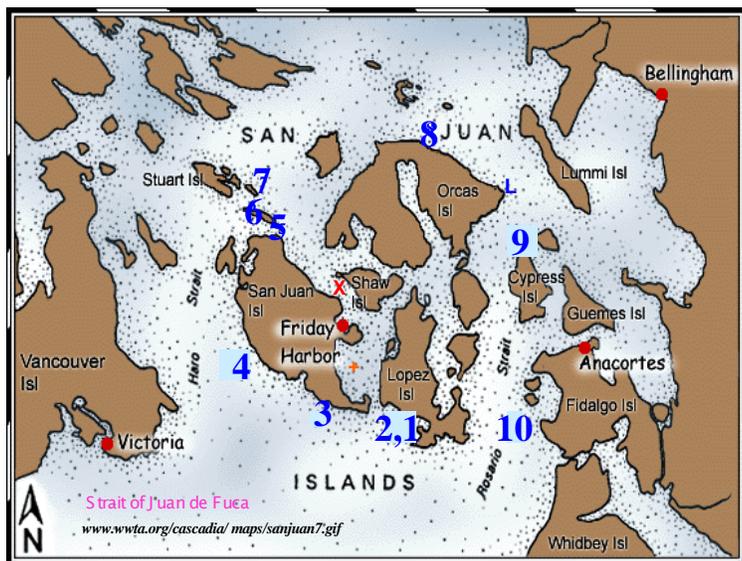


Figure 2. Map of established WFDW study sites in the San Juan Island Archipelago. Study sites are numerically indicated (1-10).

Table 1. Density and numbers of northern abalone at 10 index stations within the San Juan Island Archipelago. Note: most stations show a trend of decline between 1992 and 1996 (**bold**). Stations/dates in **red** are those for which the observed density is below the minimum threshold range for successful fertilization. Those in **blue** are those for which densities are within the minimum threshold range. Only the density observed at Big Cactus Island in 1996 is above the minimum threshold range. (Bradbury et al. 1998, WFDW)

| Index Site Name<br>(# on map) | 1992 Density<br>(n)            | 1994 Density<br>(n)            | 1996 Density<br>(n)            |
|-------------------------------|--------------------------------|--------------------------------|--------------------------------|
| <b>Cypress Island (#9)</b>    | <b>0.15/m<sup>2</sup> (46)</b> | <b>0.06/m<sup>2</sup> (21)</b> | <b>0.03/m<sup>2</sup> (8)</b>  |
| Deadman's Bay (#4)            | 0.12/m <sup>2</sup> (22)       | 0.13/m <sup>2</sup> (24)       | 0.16/m <sup>2</sup> (31)       |
| Long Island East (#1)         | 0.04/m <sup>2</sup> (17)       | 0.07/m <sup>2</sup> (26)       | 0.08/m <sup>2</sup> (30)       |
| <b>Long Island West (#2)</b>  | <b>0.31/m<sup>2</sup> (48)</b> | <b>0.28/m<sup>2</sup> (44)</b> | <b>0.23/m<sup>2</sup> (36)</b> |
| <b>Old Eagle Point (#3)</b>   | <b>0.09/m<sup>2</sup> (22)</b> | <b>0.13/m<sup>2</sup> (29)</b> | <b>0.06/m<sup>2</sup> (14)</b> |
| <b>Parker Reef (#8)</b>       | <b>0.12/m<sup>2</sup> (45)</b> | <b>0.05/m<sup>2</sup> (19)</b> | <b>0.05/m<sup>2</sup> (19)</b> |
| <b>Ripple Island (#7)</b>     | <b>0.30/m<sup>2</sup> (41)</b> | <b>0.25/m<sup>2</sup> (34)</b> | <b>0.17/m<sup>2</sup> (23)</b> |
| <b>Spieden Island (#5)</b>    | <b>0.26/m<sup>2</sup> (49)</b> | <b>0.09/m<sup>2</sup> (16)</b> | <b>0.16/m<sup>2</sup> (30)</b> |
| Williamson Rocks (#10)        | 0.08/m <sup>2</sup> (20)       | 0.13/m <sup>2</sup> (34)       | 0.12/m <sup>2</sup> (32)       |
| <b>Subtotal</b>               | <b>N=310</b>                   | <b>N=247</b>                   | <b>N=223</b>                   |
| Big Cactus Island (#6)        | 0.27/m <sup>2</sup> (41)       | 0.27/m <sup>2</sup> (41)       | 0.49/m <sup>2</sup> (74)       |
| Total                         | (351)                          | (288)                          | (297)                          |



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Canada: The fishery began in the early 1970's and the peak fishery was in 1977-1978 (400 t). Subsequently there was a population decline and quotas were instituted. As populations did not recover there were continuing quota reductions through 1989 (47.2 t) without population response (Jamieson 1999). The fishery was closed in 1990 to all user groups but there has been continued declines in abundance since closure. Current densities are  $<0.3$  individuals per  $m^2$  (1 ind/ $m^2$  is believed to be the threshold for successful fertilization). The only known locality with densities approaching historical levels is at a Victoria penitentiary where nearshore access has been prohibited (Jamieson 1999).

### Status Reviews/Research Underway:

The SOC program has funded an ongoing project entitled "Population structure of northern abalone (*Haliotis kamtschatkana*)" by Michael Ford (NWFSC) and Willie Swanson (U of Washington). The primary goals of this project are to examine patterns of variation in identified speciation loci of northern (= pinto) abalone (the VERL and lysin genes) sampled from throughout the species' range and to test for cryptic species or subspecies using phylogenetic and population genetic criteria.

### Data Deficiencies:

Extent of illegal harvest is unknown.

### Existing Protections and Conservation Actions:

The state of Washington never permitted commercial harvest and recreation take was outlawed in 1994. Alaska outlawed commercial harvest in 1996. Harvest has been illegal in Canada since 1990. The Committee On the Status of Endangered Wildlife In Canada (COSEWIC) has listed it as a threatened species. Abalone hatchery efforts have been initiated in Bamfield, B.C.

### For Further Information:

[http://www.pac.dfo-mpo.gc.ca/ops/fm/shellfish/Abalone/default\\_e.htm](http://www.pac.dfo-mpo.gc.ca/ops/fm/shellfish/Abalone/default_e.htm)

### References:

Jamieson, G.S. 1999. Review of status of Northern, or Pinto, abalone (*Haliotis kamtschatkana*). Canada DFO. <http://mehp.vetmed.ucdavis.edu/pdfs/jamieson.pdf>.

Rogers-Bennett, L. P.K. Haaker, T.O. Huff, and P.K. Dayton. 2002. Estimating historic abundances of abalone in California for restoration. CalCOFI Rep. 43:63-74.

Sloan, N.A. and P.A. Breen. 1988. Northern abalone, *Haliotis kamtschatkana*, in British Columbia: fisheries and synopsis of life history information. Can. Spec. Publ. Fish. Aquat. Sci. 103:46 pp.

### Point(s) of contact for questions or further information:

For further information on this Species of Concern, or on the Species of Concern Program in general, please contact NMFS, Office of Protected Resources, 1315 East West Highway, Silver Spring, MD 20910, (301) 713-1401, [soc.list@noaa.gov](mailto:soc.list@noaa.gov); <http://www.nmfs.noaa.gov/pr/species/concern/>, or Dr. Rick Gustafson, NMFS, Northwest Fisheries Science Center, 2725 Montlake Blvd. East, Seattle, WA 98112-2097, (206) 860-3372, [Rick.Gustafson@noaa.gov](mailto:Rick.Gustafson@noaa.gov); or Dr. Scott Rumsey, NMFS, Northwest Region, Protected Resources Division, 1201 NE Lloyd Blvd, #1100, Portland, OR 97232, (503) 872-2791, [Scott.Rumsey@noaa.gov](mailto:Scott.Rumsey@noaa.gov).