

PACIFIC WHITE-SIDED DOLPHIN (*Lagenorhynchus obliquidens*): North Pacific Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

The Pacific white-sided dolphin is found throughout the temperate North Pacific Ocean, north of the coasts of Japan and Baja California, Mexico. In the eastern North Pacific, the species occurs from the southern Gulf of California, north to the Gulf of Alaska, west to Amchitka in the Aleutian Islands, and is sometimes encountered in the southern Bering Sea. The species is common both on the high seas and along the continental margins, and animals are known to enter the inshore passes of Alaska, British Columbia, and Washington (Ferrero and Walker 1996).

The following information was considered in classifying Pacific white-sided dolphin stock structure based on the Dizon et al. (1992) phylogeographic approach: 1) Distributional data: geographic distribution is continuous; 2) Population response data: unknown; 3) Phenotypic data: two morphological forms are recognized (Walker et al. 1986, Chivers et al. 1993); and 4) Genotypic data: preliminary genetic analyses on 116 Pacific white-sided dolphins collected in four areas (Baja California, the U.S. west coast, British Columbia/Southeast Alaska, and offshore) do not support phylogeographic partitioning, although they are sufficiently differentiated to be treated as separate management units (Lux et al. 1997). This limited information is not sufficient to define stock structure throughout the North Pacific beyond the generalization that a northern form occurs north of about 33°N from southern California along the coast to Alaska and a southern form ranges from about 36°N southward along the coasts of California and Baja California, while the core of the population ranges across the North Pacific to Japan at latitudes south of 45°N. Data are lacking to determine whether this latter group might include animals from one or both of the coastal forms. Although the genetic data are unclear, management issues support the designation of two stocks; because the California and Oregon thresher shark/swordfish drift gillnet fishery (operating between 33°N and approximately 47°N) and, to a lesser extent, the groundfish and salmon fisheries in Alaska are known to interact with Pacific white-sided dolphins, two management stocks are recognized: 1) the California/Oregon/Washington stock, and 2) the North Pacific stock (Fig. 1). The California/Oregon/Washington stock is reported in the Stock Assessment Reports for the U.S. Pacific Region.

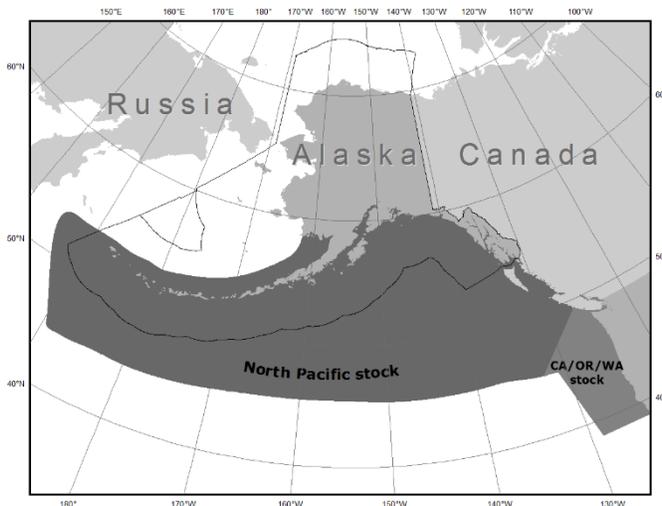


Figure 1. Approximate distribution of Pacific white-sided dolphins in the eastern North Pacific (dark shaded areas). The U.S. Exclusive Economic Zone is delineated by the solid black line.

POPULATION SIZE

The most complete population abundance estimate for Pacific white-sided dolphins was calculated from line-transect analyses applied to the 1987-1990 marine mammal sighting survey data across the North Pacific from 25°N and into the Bering Sea (Buckland et al. 1993). The Buckland et al. (1993) abundance estimate, 931,000 dolphins (CV = 0.90), more closely reflects a range-wide estimate rather than one that can be applied to either of the two management stocks off the west coast of North America. Furthermore, Buckland et al. (1993) suggested that Pacific white-sided dolphins show strong vessel attraction but that a correction factor was not available to apply to the estimate. While the Buckland et al. (1993) abundance estimate is not considered appropriate to apply to the management stock in Alaska waters, the portion of the estimate derived from sightings north of 45°N in the Gulf of Alaska can be used as the population estimate for this area (26,880). For comparison, Hobbs and Lerczak (1993) estimated 15,200 Pacific white-sided dolphins (95% CI: 868-265,000) in the Gulf of Alaska. This estimate is based

on a single sighting of 20 animals and so should not be used as an abundance estimate. Small cetacean aerial surveys in the Gulf of Alaska during 1997 sighted one group of 164 Pacific white-sided dolphins off Dixon entrance, while similar surveys in Bristol Bay in 1999 made 18 sightings (188 individuals with possible repeat sightings) off Port Moller (MML, unpubl. data).

Minimum Population Estimate

Historically, the minimum population estimate (N_{MIN}) for this stock was 26,880 dolphins, based on the sum of abundance estimates for four separate $5^\circ \times 5^\circ$ blocks north of 45°N ($1,970 + 6,427 + 6,101 + 12,382 = 26,880$) from surveys conducted during 1987-1990, reported in Buckland et al. (1993). This was considered a minimum estimate because the abundance of animals in a fifth $5^\circ \times 5^\circ$ block (53,885), which straddled the boundary of the two coastal management stocks, was not included in the estimate for the North Pacific stock and because much of the potential habitat for this stock was not surveyed between 1987 and 1990. However, because the abundance estimate is more than 8 years old, N_{MIN} is considered unknown.

Current Population Trend

There is no reliable information on trends in abundance for this stock of Pacific white-sided dolphins.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

A reliable estimate of the maximum net productivity rate (R_{MAX}) is not available for the North Pacific stock of Pacific white-sided dolphins. Life-history analyses by Ferrero and Walker (1996) suggest a reproductive strategy consistent with the delphinid pattern on which the 4% cetacean maximum theoretical net productivity rate was based. Thus, the cetacean maximum theoretical net productivity rate of 4% will be used for this stock (Wade and Angliss 1997).

POTENTIAL BIOLOGICAL REMOVAL

Potential biological removal (PBR) is defined as the product of the minimum population estimate, one-half the maximum theoretical net productivity rate, and a recovery factor: $\text{PBR} = N_{\text{MIN}} \times 0.5R_{\text{MAX}} \times F_{\text{R}}$. The recovery factor (F_{R}) for this stock is 0.5, the value for cetacean stocks of unknown status (Wade and Angliss 1997). However, the 2016 guidelines for preparing Stock Assessment Reports (NMFS 2016) state that abundance estimates older than 8 years should not be used to calculate PBR due to a decline in confidence in the reliability of an aged abundance estimate. In addition, there is no corroborating evidence from recent surveys in Alaska that provide abundance estimates for a portion of the stock's range or any indication of the current status of this stock. Therefore, the PBR for this stock is considered undetermined.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Information for each human-caused mortality, serious injury, and non-serious injury reported for NMFS-managed Alaska marine mammals in 2012-2016 is listed, by marine mammal stock, in Helker et al. (in press); however, only the mortality and serious injury data are included in the Stock Assessment Reports. The total estimated annual level of human-caused mortality and serious injury for the North Pacific stock of Pacific white-sided dolphins in 2012-2016 is zero; however, this estimate is considered a minimum because not all of the salmon and herring fisheries operating within the range of this stock have been observed. Potential threats most likely to result in direct human-caused mortality or serious injury of this stock include entanglement in fishing gear.

Fisheries Information

Between 1978 and 1991, mortality and serious injury of thousands of Pacific white-sided dolphins occurred annually incidental to high-seas fisheries for salmon and squid. However, these fisheries were closed in 1991 and no other large-scale fisheries have operated in the central North Pacific since 1991.

Information (including observer programs, observer coverage, and observed incidental takes of marine mammals) for federally-managed and state-managed U.S. commercial fisheries in Alaska waters is presented in Appendices 3-6 of the Alaska Stock Assessment Reports.

No mortality or serious injury of Pacific white-sided dolphins was observed incidental to U.S. federal commercial fisheries in Alaska in 2012-2016 (Breiwick 2013; MML, unpubl. data). However, a complete estimate of the total mortality and serious injury incidental to U.S. commercial fisheries is unavailable for this stock because not all of the salmon and herring fisheries operating within the range of this stock have been observed.

Alaska Native Subsistence/Harvest Information

There are no reports of subsistence takes of Pacific white-sided dolphins in Alaska.

Other Mortality

From 2012 to 2016, no human-caused mortality or serious injury of Pacific white-sided dolphins was reported to the NMFS Alaska Region stranding network (Helker et al. in press).

STATUS OF STOCK

Pacific white-sided dolphins are not designated as depleted under the Marine Mammal Protection Act or listed as threatened or endangered under the Endangered Species Act. The North Pacific stock of Pacific white-sided dolphins is not classified as a strategic stock. The abundance estimate for this stock is unknown because the existing estimate is more than 8 years old and so the PBR level is considered undetermined. Because the PBR is undetermined and fisheries observer coverage is limited, it is unknown if the minimum estimate of the mean annual mortality and serious injury rate (zero) in U.S. commercial fisheries can be considered insignificant and approaching zero mortality and serious injury rate. Population trends and status of this stock relative to its Optimum Sustainable Population are unknown.

There are key uncertainties in the assessment of the North Pacific stock of Pacific white-sided dolphins. The most recent surveys were more than 8 years ago and, given the lack of information on population trend, the abundance estimates are not used to calculate an N_{MIN} and the PBR level is undetermined. Several commercial fisheries overlap with the range of this stock and are not observed or have not been observed in a long time; thus, the estimate of commercial fishery mortality and serious injury is expected to be a minimum estimate.

HABITAT CONCERNS

While the majority of Pacific white-sided dolphins are found throughout the North Pacific, there are also significant numbers found in shelf break and deeper nearshore areas. Thus, they are subject to a variety of habitat impacts. Of particular concern are nearshore areas, bays, channels, and inlets where some Pacific white-sided dolphins are vulnerable to physical modifications of nearshore habitats, resulting from urban and industrial development (including waste management and nonpoint source runoff), and noise (Linnenschmidt et al. 2013, Waite and Shelden 2018).

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