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HARBOR PORPOISE (*Phocoena phocoena*): Southeast Alaska Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

In the eastern North Pacific Ocean, the harbor porpoise ranges from Point Barrow, along the Alaska coast, and down the west coast of North America to Point Conception, California (Gaskin 1984). The harbor porpoise primarily frequents coastal waters and in the Gulf of Alaska and Southeast Alaska, they occur most frequently in waters less than 100 m in depth (Hobbs and Waite in review). The average density of harbor porpoise in Alaska appears to be less than that reported off the west coast of the continental U.S., although areas of high densities do occur in Glacier Bay, Yakutat Bay, Copper River Delta, and Sitkalidak Strait (Dahlheim et al. 2000, Hobbs and Waite in review). Stock discreteness in the eastern North Pacific was analyzed using mitochondrial DNA from samples collected along the West Coast (Rosel 1992) and is summarized in Osmek et al. (1994). Two distinct mitochondrial DNA groupings or clades exist. One clade is present in California, Washington, British Columbia and Alaska (no samples were available from Oregon), while the other is found only in California and Washington. Although these two clades are not geographically distinct by latitude, the results may indicate a low mixing rate for harbor porpoise along the west coast of North America. Investigation of pollutant loads in harbor porpoise ranging from California to the Canadian border also suggests restricted harbor porpoise movements (Calambokidis and Barlow 1991). Further genetic testing of the same data mentioned above along with additional samples found significant genetic differences for 4 of the 6 pair-wise comparisons between the four areas investigated: California, Washington, British Columbia, and Alaska (Rosel et al. 1995). These results demonstrate that harbor porpoise along the west coast of North America are not panmictic or migratory, and that movement is sufficiently restricted to evolve genetic differences. This is consistent with low movement suggested by genetic analysis of harbor porpoise specimens from the North Atlantic. Numerous stocks have been delineated with clinal differences over areas as small as the waters surrounding the British Isles. Unfortunately, no conclusions can be drawn about the genetic structure of harbor porpoise within Alaska because of insufficient samples. Only 19 samples are available from Alaska porpoise and 12 of these come from a single area (Copper River Delta). Accordingly, harbor porpoise stock structure in Alaska remains unknown at this time.

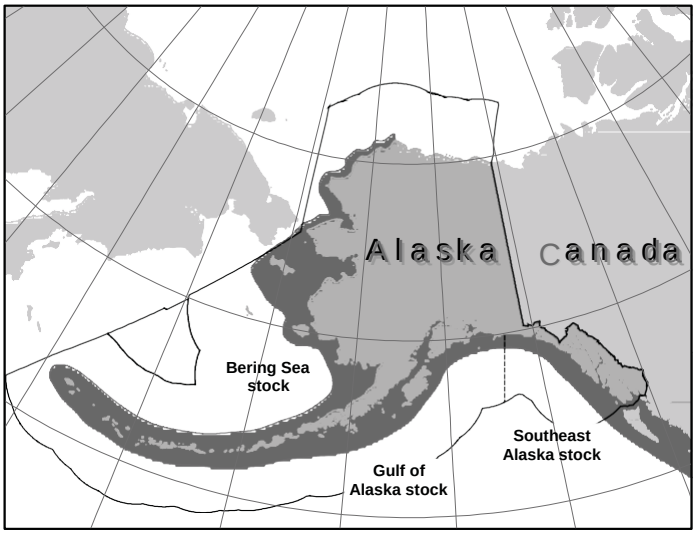

Figure 27. Approximate distribution of harbor porpoise in Alaska waters (shaded area).

Although it is difficult to determine the true stock structure of harbor porpoise populations in the northeast Pacific, from a management standpoint, it would be prudent to assume that regional populations exist and that they should be managed independently (Rosel et al. 1995, Taylor et al. 1996). The Alaska Scientific Review Group (SRG) concurred that while the available data were insufficient to justify recognizing three biological stocks of harbor porpoise in Alaska, it did not recommend against the establishment of three management units in Alaska (DeMaster 1996, 1997). Accordingly, from the above information, three separate harbor porpoise stocks in Alaska are recommended, recognizing that the boundaries were set arbitrarily: 1) the Southeast Alaska stock - occurring from the northern border of British Columbia border to Cape Suckling, Alaska, 2) the Gulf of Alaska stock - occurring from Cape Suckling to Unimak Pass, and 3) the Bering Sea stock - occurring throughout the Aleutian Islands and all waters north of Unimak Pass (Fig. 27). Information concerning the 4 harbor porpoise stocks occurring along the west coast of the continental United States (Central California, Northern California, Oregon/Washington Coast, and Inland Washington) is in the Stock Assessment Reports for the Pacific Region.

POPULATION SIZE

In June and July of 1997, an aerial survey covering the waters of the eastern Gulf of Alaska from Dixon Entrance to Cape Suckling and offshore to the 1,000 fathom depth contour resulted in an uncorrected abundance estimate of 3,698 (CV = 0.162) animals (Hobbs and Waite in review). Included were the inside waters of Southeast Alaska, Yakutat Bay, and Icy Bay were included in addition to the offshore waters. The total area surveyed across inside waters, was 106,087km^2. Only a fraction of the small bays and inlets (< 5.5 km wide) of Southeast Alaska were surveyed and included in this abundance estimate, although the areas omitted represent only a small fraction of the total survey area. The observed abundance estimate was multiplied by correction factors for availability bias (to correct for animals not available to be seen because they were diving and perception bias (to correct for animals not seen because they were missed) to obtain a corrected abundance estimate. Laake et al. (1997) estimated the availability bias for aerial surveys of harbor porpoise in Puget Sound to be 2.96 (CV = 0.180); the use of this correction factor is preferred to other published correction factors (e.g., Barlow et al. 1988; Calambokidis et al. 1993) because it is an empirical estimate of perception bias. A second independent observer was used to estimate the average availability bias as 1.56 (CV = 0.108). The estimated corrected abundance from this survey is 17,076 (3,698 H 2.96 H 1.56; CV = 0.265) harbor porpoise for Southeast Alaska.

Minimum Population Estimate

For the Southeast Alaska stock of harbor porpoise, the minimum population estimates (N_{MIN}) for the aerial and vessel surveys are calculated separately, using Equation 1 from the PBR Guidelines (Wade and Angliss 1997): $N_{MIN} = N/\exp(0.842*[\ln(1+[CV(N)]^2)]^{½})$. Using the population estimates (N) of 17,076 and its associated CV (0.265), N_{MIN} for this stock is 13,713.

Current Population Trend

The abundance of harbor porpoise in Southeast Alaska was estimated for 1993 and 1997. The 1993 estimate was 10,301 (Dahlheim et al. 2000). The 1997 estimate of 17,076 is higher than the 1993 estimate (Hobbs and Waite in review). However, these estimates are not directly comparable because the area surveyed in 1997 was larger than that in 1993, and because the 1997 abundance estimation involved direct calculation of perception bias, while the 1993 estimate used a correction factor based on some untested assumptions about observer behavior and visibility of harbor porpoise. Thus, while the estimates are not significantly different, there is no reliable information on trends in abundance for the Southeast Alaska stock of harbor porpoise.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

A reliable estimate of the maximum net productivity rate (R_{MAX}) is not currently available for the Southeast Alaska stock of harbor porpoise. Hence, until additional data become available, it is recommended that the cetacean maximum theoretical net productivity rate of 4% be employed (Wade and Angliss 1997).

POTENTIAL BIOLOGICAL REMOVAL

Under the 1994 reauthorized Marine Mammal Protection Act (MMPA), the 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: $PBR = N_{MIN} H 0.5R_{MAX} H F_R$. The recovery factor ($F_R$) for this stock is 0.5, the value for cetacean stocks with unknown population status (Wade and Angliss 1997). Thus, for the Southeast Alaska stock of harbor porpoise, PBR = 137 animals (13,713H 0.02 H 0.5).

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Fisheries Information

Until 2003, there were three different federally-regulated commercial fisheries in Alaska that could have interacted with the Southeast Alaska stock of harbor porpoise. As of 2003, changes in fishery definitions in the List of Fisheries resulted in separating the GOA groundfish fisheries into many fisheries (69 FR 70094, 2 December 2004). This change does not represent a change in fishing effort, but provides managers with better information on the component of each fishery that is responsible for the incidental serious injury or mortality of marine mammal stocks in Alaska. These fisheries (Pacific cod longline, Pacific halibut longline, rockfish longline, and sablefish longline) were monitored for incidental mortality by fishery observers from 2000 to 2004, although observer coverage has been very low in the offshore waters of Southeast Alaska. No mortalities from this stock of harbor porpoise incidental to commercial groundfish fisheries have been observed.

For this stock of harbor porpoise, the estimated minimum annual mortality rate incidental to commercial fisheries is 0. However, a reliable estimate of the mortality rate incidental to commercial fisheries is currently unavailable because of the absence of observer placements in Southeast Alaska fisheries. Therefore, it is unknown whether the kill rate is insignificant.

Subsistence/Native Harvest Information

Subsistence hunters in Alaska have not been reported to take from this stock of harbor porpoise.

Other mortality

There was an unconfirmed report of an entanglement of a harbor porpoise in a subsistence drift gillnet near Haines in 2001.

STATUS OF STOCK

Harbor porpoise are not listed as "depleted" under the MMPA or listed as "threatened" or "endangered" under the Endangered Species Act. At present, U.S. commercial fishery-related annual mortality levels less than 13.7 animals per year (i.e., 10% of PBR) can be considered insignificant and approaching zero mortality and serious injury rate. Based on the best scientific information available, the estimated level of human-caused mortality and serious injury (0) is not known to exceed the PBR (137). However, because the abundance estimates are quite old, long-term survey information suggests a decline in the Southeast Alaska population, and information on incidental harbor porpoise mortality in commercial fisheries is not well known, the Southeast Alaska stock of harbor porpoise is classified as a strategic stock. Population trends and status of this stock relative to OSP are currently unknown.

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