Revised 1/9/05

NORTH PACIFIC RIGHT WHALE (*Eubalaena japonica*): Eastern North Pacific Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

A comprehensive review of all 20th century sighting, catches, and strandings of North Pacific right whales was conducted by Brownell et al. (2001). Data from this review were subsequently combined with historical whaling records to map the known distribution of the species (Clapham et al. 2004). Whaling records indicate that right whales in the North Pacific ranged across the entire North Pacific north of 35(N and occasionally as far south as 20(N (Rosenbaum et al. 2000; Fig. 42). Before right whales in the North Pacific were heavily exploited by commercial whalers, concentrations were found in the Gulf of Alaska, eastern Aleutian Islands, southcentral Bering Sea, Sea of Okhotsk, and Sea of Japan (Braham and Rice 1984). During 1965-99, following illegal catches by the USSR, there were only 82 sightings of right whales in the entire eastern North Pacific, with the majority of these occurring in the Bering Sea and adjacent areas of the Aleutian Islands (Brownell et al. 2001). Sightings have been reported as far south as central Baja California in the eastern North Pacific, as far south as Hawaii in the central North Pacific, and as far north as the sub-Arctic waters of the Bering Sea and Sea of Okhotsk in the summer (Herman et al. 1980, Berzin and Doroshenko 1982, Brownell et al. 2001).

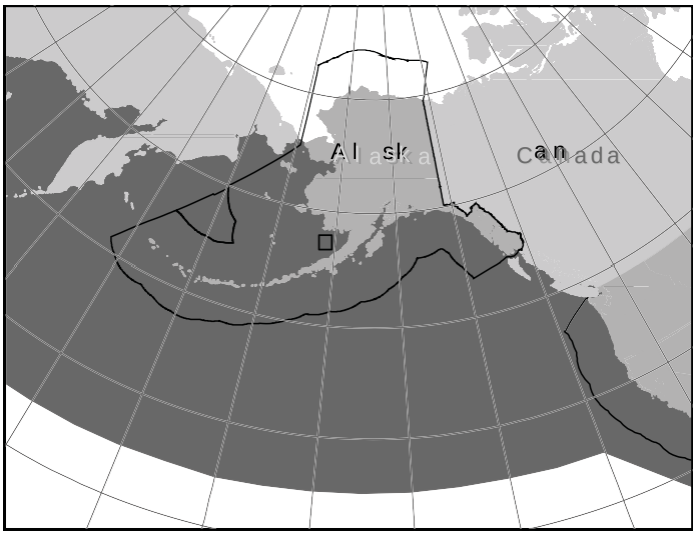

Figure 42. Approximate historical distribution of North Pacific right whales in the eastern North Pacific (shaded area). The box outlines the area in Bristol Bay where intensive aerial and vessel surveys for right whales have occurred from 1999 to 2004.

North Atlantic (*E. glacialis*) and Southern Hemisphere (*E. australis*) right whales calve in coastal waters during the winter months. However, in the eastern North Pacific no such calving grounds have ever been found (Scarff 1986). Migratory patterns of the North Pacific stock are unknown, although it is thought the whales migrate from high-latitude feeding grounds in summer to more temperate waters during the winter, possibly offshore (Braham and Rice 1984, Clapham et al. 2004).

Information on the current seasonal distribution of right whales is available from dedicated vessel and aerial surveys, bottom-mounted acoustic recorders, and vessel surveys for fisheries ecology and management which have also included dedicated marine mammal observers. Aerial and vessel surveys for right whales have occurred in recent years in a portion of the southeastern Bering Sea (Fig. 41) where right whales have been observed each summer since 1996 (Goddard and Rugh 1998). North Pacific right whales are observed consistently in this area, although it is clear from historical and Japanese sighting survey data that right whales often range outside this area and occur elsewhere in the Bering Sea (Clapham et al. 2004; Tynan 1999; LeDuc et al. 2001; Moore et al. 2000; Moore et al. 2002; NMFS unpublished data). Bottom-mounted acoustic recorders were deployed in the southeastern Bering Sea and the northern Gulf of Alaska starting in 1999 to document the seasonal distribution of right whale calls (Mellinger et al. 2004). Preliminary analysis of the data from the recorders indicates that right whales remain in the southeastern Bering Sea at least through November (Munger et al. 2003). Right whales have not been observed outside the localized area in the southeastern Bering Sea during surveys conducted for fishery management purposes which covered a broader area of Bristol Bay and the Bering Sea (Moore et al. 2000, 2002; see Fig. 40 for locations of tracklines for these surveys).

The following information was considered in classifying stock structure according to the Dizon et al. (1992) phylogeographic approach: 1) Distributional data: distinct geographic distribution; 2) Population response data: unknown; 3) Phenotypic data: unknown; and 4) Genotypic data: unknown. Based on this limited information,

two stocks of North Pacific right whales are currently recognized: a Sea of Okhotsk stock and an Eastern North Pacific stock (Rosenbaum et al. 2000, Brownell et al. 2001).

POPULATION SIZE

Based on sighting data, Wada (1973) estimated a total population of 100-200 in the North Pacific. Rice (1974) stated that only a few individuals remained in the Eastern North Pacific stock, and that for all practical purposes the stock was extinct because no sightings of a cow with calf had been confirmed since 1900 (D. Rice, AFSC-NMML-ret., pers. comm.). Brownell et al. (2001) suggested from a review of sighting records that the abundance of this species in the western North Pacific was likely in the "low hundreds". A reliable estimate of abundance for the North Pacific right whale stock is currently not available.

There were several sightings of North Pacific right whales in the mid-1990s which renewed interest in conducting dedicated surveys for this species. In April 1996 a right whale was sighted off of Maui (Salden and Mickelsen 1999). This was the first documented sighting of a right whale in Hawaiian waters since 1979 (Herman et al. 1980, Rowntree et al. 1980). A group of 3-4 right whales was sighted in western Bristol Bay, southeastern Bering Sea, in July 1996 which may have included a juvenile animal (Goddard and Rugh 1998). During July 1997, a group of 4-5 individuals was encountered one evening in Bristol Bay, followed by a second sighting of 4-5 whales the following morning in approximately the same location (Tynan 1999). During dedicated surveys in July 1998, July 1999, and July 2000, 5, 6, and 13 right whales, were again found in the same general region of the southeastern Bering Sea (Leduc et al. 2001). Biopsy samples of right whales encountered in the southeastern Bering Sea were taken in 1997 and 1999. Genetics analyses identified 3 individuals in 1997 and 4 individuals in 1999; of the animals identified, one was identified in both years, resulting in a total genetic count of 6 individuals (LeDuc et al. 2001). Genetic analyses on samples from all 6 whales sampled in 1999 determined that the animals were male (LeDuc et al. 2001). Two right whales were observed during a vessel-based survey in the central Bering Sea in July 1999 (Moore et al. 2000).

Aerial photogrammetric analyses indicated that one of the animals was seen in 1997, 1998, and 1999 (LeDuc et al. 2001). Body lengths of 12 animals ranged from 14.7 to 17.6m (LeDuc et al. 2001); since body length at sexual maturity has been estimated at about 15 m, LeDuc et al. (2001) hypothesize that all measured animals may have been sexually mature.

Preliminary information from the Bristol Bay survey in 2002 indicates that there were seven sightings of right whales; it is not yet known how many of these animals were seen in previous years (NMFS, unpublished data). One of the sightings in 2002 included a right whale calf; this is the first confirmed sighting of a calf in decades (a possible calf or juvenile sighting was also reported in Goddard and Rugh 1998). It is notable that all recent right whale sightings in the Bering Sea have occurred in the small area depicted on the distribution map (Fig. 42), despite substantially increased aerial and vessel survey effort in other parts of the Bering Sea in recent years.

There are fewer recent sightings of right whales in the Gulf of Alaska than in the Bering Sea (Brownell et al. 2001). Waite et al. (2003) summarized sightings from the Platforms of Opportunity Program from 1959-97. Seven sightings of right whales were reported, but only one sighting of 4 right whales at the mouth of Yakutat Bay in 1979 could be positively confirmed (Waite et al. 2003). A sighting of a right whale off Kodiak Island in 1998 occurred during an aerial survey. This sighting prompted researchers to plan an acoustic monitoring study off Kodiak Island during 2000; results from recordings made between 26 May and 11 September include one series of calls in early September that may have been from a right whale (Waite et al. 2003). Research efforts in 2004 led to the placement of satellite tags on two North Pacific right whales in the Bering Sea (P. Wade, AFSC-NMML, pers. comm.). A few weeks later, the locations of these whales was provided to staff on a Southwest Fisheries Science Center vessel cruise in the southern Bering Sea; although the tagged animals could not be relocated, other right whales in the area were observed. Data on the number of animals in this group are not yet available (W. Perryman, NMFS-SWFSC, pers. comm.).

Minimum Population Estimate

At this time, it is not possible to produce a reliable estimate of minimum abundance for this stock, as a current estimate of abundance is not available. However, it is worth noting that of 13 individual animals photographed during aerial surveys in 1998, 1999, and 2000, two have already been rephotographed (LeDuc et al. 2001). This “mark-recapture” success rate is consistent with a very small population size.

Current Population Trend

A reliable estimate of trend in abundance is currently not available.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Due to insufficient information, it is recommended that the default cetacean maximum net productivity rate (R_{MAX}) of 4% be employed for this stock (Wade and Angliss 1997). However, this default rate is likely an underestimate based on the work reported by Best (1993).

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: $PBR = N_{MIN} + 0.5R_{MAX} + F_R$. The recovery factor ($F_R$) for this stock is 0.1, the recommended value for cetacean stocks which are listed as endangered (Wade and Angliss 1997). A reliable estimate of minimum abundance is not available for this stock but it is certainly very small. The PBR level for this stock is considered zero.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Fisheries Information

Gillnets were implicated in the death of a right whale off the Kamchatka Peninsula (Russia) in October of 1989 (Kornev 1994). No other incidental takes of right whales are known to have occurred in the North Pacific. Any mortality incidental to commercial fisheries would be considered significant. Entanglement in fishing gear, including lobster pot and sink gillnet gear, is a significant source of mortality for the North Atlantic right whale stock (Waring et al. 2004).

Based on the available records, the estimated annual mortality rate incidental to commercial fisheries approaches zero whales per year from this stock. Therefore, the annual human-caused mortality level is considered to be insignificant and approaching a zero mortality and serious injury rate.

Subsistence/Native Harvest Information

Subsistence hunters in Alaska and Russia are not reported to take animals from this stock.

Other Mortality

Right whales are large, slow-swimming, tend to congregate in coastal areas, and have a thick layer of blubber which enables them to float when killed. These attributes made them an easy and profitable species for early (pre-modern) whalers. By the time the modern (harpoon cannons and steam powered catcher boats) whale fishery began in the late 1800s, right whales were rarely encountered (Braham and Rice 1984). Between 1835 and 1909, an estimated 15,374 right whales were taken from the North Pacific by American-registered whaling vessels, with most of those animals taken prior to 1875 (Best 1987, IWC 1986). From 1900 to 1999, a total of 742 right whales were killed by whaling; of those, 331 were killed in the western North Pacific and 411 in the eastern North Pacific (Brownell et al. 2001). The latter total includes 372 whales killed illegally by the USSR in the period 1963 67, primarily in the Gulf of Alaska and Bering Sea (Doroshenko 2000, Brownell et al. 2001).

Ship strikes are significant sources of mortality for the North Atlantic stock of right whales, and it is possible that right whales in the North Pacific are also vulnerable to these sources of mortality. However, due to their rare occurrence and scattered distribution it is impossible to assess the threat of ship strikes to the North Pacific stock of right whales at this time.

STATUS OF STOCK

The right whale is listed as “endangered” under the Endangered Species Act of 1973, and therefore designated as “depleted” under the MMPA. As a result, the stock is classified as a strategic stock. Reliable estimates of the minimum population size, population trends, and PBR are currently not available. Though reliable numbers are not known, the abundance of this stock is considered to represent only a small fraction of its precommercial whaling abundance (i.e., the stock is well below its Optimum Sustainable Population size). The estimated annual rate of human-caused mortality and serious injury seems minimal for this stock. The reason(s) for the apparent lack of recovery for this stock is (are) unknown. Brownell et al. (2001) noted the devastating impact of extensive illegal Soviet catches in the eastern North Pacific in the 1960s, and suggested that the prognosis for right whales in this area was "poor". In its review of the status of right whales worldwide, the International Whaling Commission expressed "considerable concern" over the status of this population (IWC 2001).

On 4 October 2000, NMFS received a petition from the Center for Biological Diversity to designate critical habitat for this stock. Petitioners asserted that the southeast Bering Sea shelf from 55-60(N latitude should be considered critical habitat. On 1 June 2001, NMFS found the petition to have merit (66 FR 29773). On 20 February 2002, NMFS announced a decision to not designate critical habitat for North Pacific right whales (67 FR 7660) at this time. NMFS concluded that the information available did not indicate that the physical or biological features essential to the conservation of the species exist throughout the petitioned area, and that a smaller area may contain essential physical and biological features, but the boundary of this smaller area could not yet be defined. Thus, NMFS determined that critical habitat was undeterminable at this time. However, NMFS will be evaluating new information collected during recent field studies and may propose to designate critical habitat at that time if the new information indicates that certain areas are critical for the conservation of the species and require special management considerations.

CITATIONS

Berzin, A. A., and N. V. Doroshenko. 1982. Distribution and abundance of right whales in the North Pacific. Rep. Int. Whal. Comm. 32:381-383.

Best, P. B. 1993. Increase rates in severely depleted stocks of baleen whales. ICES J. Mar. Sci 50:169-86.

Best, P. B. 1987. Estimates of the landed catch of right whale (and other whalebone) whales in the American fishery. Fish. Bull., U.S. 85(3):403-418.

Braham, H. W., and D. W. Rice. 1984. The right whale, *Balaena glacialis*. Mar. Fish. Rev. 46(4):38-44.

Brownell, R. L., P. J. Clapham, T. Miyashita, T. Kasuya. 2001. Conservation status of North Pacific right whales. J. Cetacean Res. Manage. (Special Issue). 2:269-86.

Clapham, P. J. , C. Good, S. E. Quinn, R. R. Reeves, J. E. Scarff, and R. L. Brownell, Jr. 2004. Distribution of North Pacific right whales (*Eubalaena japonica*) as shown by 19th and 20th century whaling catch and sighting records. J. Cetacean Res. Manage. 6(1): 1-6.

Dizon, A. E., C. Lockyer, W. F. Perrin, D. P. DeMaster, and J. Sisson. 1992. Rethinking the stock concept: a phylogeographic approach. Conserv. Biol. 6:24-36.

Doroshenko, N. V. 2000. Soviet whaling for blue, gray, bowhead and right whales in the North Pacific Ocean, 1961-1979. Pp. 96-103 *In* Soviet whaling data (1949-1979). Eds: Yablokov, A. V. and Zemsky, V. A. Center for Russian Environmental Policy, Marine Mammal Council, Moscow.

Goddard, P. C., and D. J. Rugh. 1998. A group of right whales seen in the Bering Sea in July 1996. Mar. Mammal Sci. 14(2):344-349.

Herman, L. M., C. S. Baker, P. H. Forestell, and R. C. Antinoja. 1980. Right whale, *Balaena glacialis*, sightings near Hawaii: a clue to the wintering grounds? Mar. Ecol. Prog. Ser. 2:271-275.

International Whaling Commission. 1986. Report of the workshop on the status of right whales. Rep. Int. Whal. Comm. (Special Issue 10):1-33.

International Whaling Commission. 2001. Report of the workshop on the comprehensive assessment of right whales: a worldwide comparison. J. Cetacean Res. Manage. (Special Issue 2):1-60.

Kornev, S. I. 1994. A note on the death of a right whale (*Eubalaena glacialis*) off Cape Lopakta (Kamchatka). Rep. Int. Whal. Comm. (Special Issue 15):443-444.

LeDuc, R. G., W. L. Perryman, J. W. Gilpatrick, Jr., J. Hyde, C. Stinchcomb, J. V. Carretta, R. L. Brownell, Jr. 2001. A note on recent surveys for right whales in the southeastern Bering Sea. J. Cetacean Res. Manage. (Special Issue 2):287-289.

Mellinger, D. K., K. M. Stafford, S. E. Moore, L. Munger, and C. G. Fox. 2004. Detection of North Pacific right whale (*Eubalaena japonica*) calls in the Gulf of Alaska. Mar. Mammal Sci. 20: 872-879.

Moore, S. E., J. M. Waite, L. L. Mazzuca, and R. C. Hobbs. 2000. Provisional estimates of mysticete whale abundance on the central Bering Sea shelf. J. Cetacean Res. Manage. 2(3):227-234.

Moore, S. E., J. M. Waite, N. A. Friday and T. Honkalehto. 2002. Distribution and comparative estimates of cetacean abundance on the central and south-eastern Bering Sea shelf with observations on bathymetric and prey associations. Progr. Oceanogr. 55(1-2):249-262.

Munger, L., S. Moore, J. Hildebrand, S. Wiggins, and M. McDonald. 2003. Calls of North Pacific right whales recorded in the southeast Bering Sea. Abstract in the proceedings of the 2003 Annual Symposium Marine Science for the Northeast Pacific: Science for Resource Dependent Communities, Anchorage, AK, January 2002.

Rice, D. W. 1974. Whales and whale research in the eastern North Pacific. Pp. 170-195 *In* W. E. Schevill (ed.), The whale problem: A status report. Harvard Press, Cambridge, MA.

Rosenbaum, H.C., R.L. Brownell, M.W. Brown, C. Schaeff, V. Portway, B.N. White, S. Malik, L.A. Pastene, N.J. Patenaude, C.S. Baker, M.Goto, P.B. Best, P.J. Clapham, P. Hamilton, M. Moore, R. Payne, V. Rowntree, C.T. Tynan, J.L. Bannister, and R. DeSalle. 2000. World-wide genetic differentiation of *Eubalaena*: questioning the number of right whale species. Molec. Ecol. 9 (11): 1793-1802.

Rowntree, V., J. Darling, G. Silber, and M. Ferrari. 1980. Rare sighting of a right whale (*Eubalaena glacialis*) in Hawaii. Can. J. Zool. 58:308-312.

Salden, D. R. and J. Mickelsen. 1999. Rare sightings of a North Pacific right whale (*Eubalaena glacialis*) in Hawaii. Pac. Sci. 53:341-345.

Scarff, J. E. 1986. Historic and present distribution of the right whale, *Eubalaena glacialis*, in the eastern North Pacific south of 50°N and east of 180°W. Rep. Int. Whal. Comm. (Special Issue 10):43-63.

Scarff, J. E. 1991. Historic distribution and abundance of the right whale, *Eubalaena glacialis*, in the North Pacific, Bering Sea, Sea of Okhotsk and Sea of Japan from the Maury Whale Charts. Rep. Int. Whal. Comm. 41:467-487.

Tynan, C. 1999. Redistribution of cetaceans in the southeast Bering Sea relative to anomalous oceanographic conditions during the 1997 El Niño. *In* Proceedings of the 1998 science board symposium on the impacts of the 1997/98 El Niño event on the North Pacific Ocean and its marginal seas. (Eds: Freeland, H. J., Peterson, W. T., Tyler, A.) (PICES Scientific Report No. 10) North Pacific Marine Science Organization (PICES), Sydney, BC, Canada, 115-117.

Wada, S. 1973. The ninth memorandum on the stock assessment of whales in the North Pacific. Rep. Int. Whal. Comm. 23:164-169.

Wade, P. R., and R. Angliss. 1997. Guidelines for assessing marine mammal stocks: report of the GAMMS workshop April 3-5, 1996, Seattle, Washington. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-OPR 12, 93 pp.

Waite, J. M., K. Wynne, and D. K. Mellinger. 2003. Documented sighting of a North Pacific right whale in the Gulf of Alaska and post-sighting acoustic monitoring. Northwest. Nat. 84:38-43.

Waring, G. T., P. M. Richard, J. M. Quinta, C. P. Fairfield, and K. Maze-Foley. (Eds.) 2004. U. S. Atlantic and Gulf of Mexico marine mammal stock assessments - 2003. U.S. Dep. Commer., NOAA Tech. Memo. NMFS NE-182, 300 pp.