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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, Shelden et al. 2005). Although whaling records initially indicated that right whales ranged across the entire North Pacific north of 35EN and occasionally as far south as 20EN (Scarff 1986, 1991; Fig. 42), recent analysis shows a pronounced longitudinally bimodal distribution (Josephson et al. 2008a). Before right whales in the North Pacific were heavily exploited by commercial whalers, concentrations were found in the Gulf of Alaska, eastern Aleutian Islands, south-central Bering Sea, Sea of Okhotsk, and Sea of Japan (Braham and Rice 1984). An analysis conducted on the North Pacific right whale fishery by Josephson et al. (2008b) showed that within the course of a decade (1840's), right whale abundance was severely depleted, particularly in the eastern portion of their range. During 1965-99, following large illegal catches by the U.S.S.R., 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).

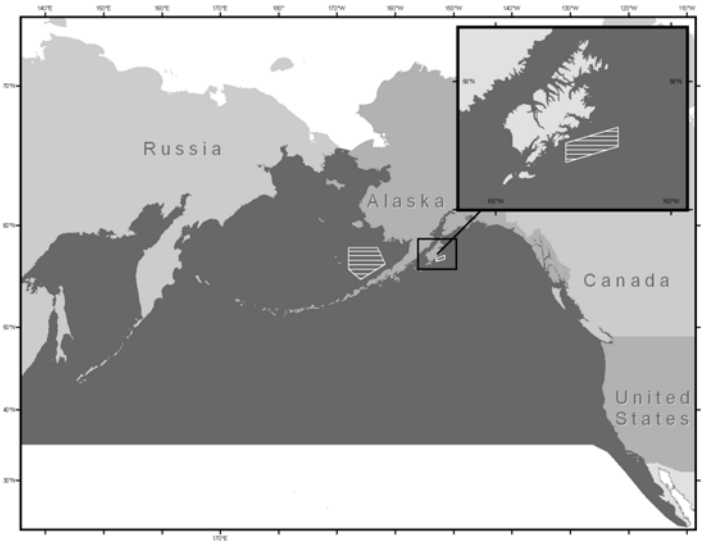

Figure 42. Approximate historical distribution of North Pacific right whales in the eastern North Pacific (shaded area). Striped areas indicate northern right whale critical habitat (71 FR 38277, 6 July 2006).

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 been identified (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, Scarff 1986, 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. 42) where right whales have been observed most summers 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, 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). Analysis of the data from the recorders indicates that right whales remain in the southeastern Bering Sea from May through December with peak call detection in September (Munger and Hildebrand 2004). Use of this habitat may intensify in mid-summer through early fall based on higher monthly and daily call detection rates. Rates of detection on the middle shelf (<100 m depth) suggests that right whales pass

through intermittently and typically do no remain longer than a few days (Munger and Hildebrand 2004, Munger et al. 2008). Right whale calls were rarely detected in the northwestern Gulf of Alaska in the late summer (Mellinger et al. 2004). 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 use of satellite telemetry has been implemented to provide information about habitat use and population size. In 2004, a right whale was successfully tagged with a satellite-monitored transmitter for 40 days, during which time the animal moved over a large part of the southeastern Bering Sea including the outer shelf area (Wade et al. 2006). In September 2004, information from the tag was used together with acoustic detections to find the largest aggregation of right whales observed in the eastern North Pacific since Soviet whaling. A minimum of 17 individuals were identified by photo-id and by genotyping from skin biopsies. During a NMFS survey in 2008, a second right whale, last sighted in 2002, was satellite-tagged (Phil Clapham, AFSC-NMML, pers. comm., 29 October 2008). The animal remained inside the Bering Sea critical habitat providing further indication of this area's importance as foraging habitat for eastern North Pacific right whales.

There are fewer recent sightings of right whales in the Gulf of Alaska than in the Bering Sea (Brownell et al. 2001), although little survey effort has been conducted in this region. 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 four right whales at the mouth of Yakutat Bay in 1979 could be positively confirmed (Waite et al. 2003). Sightings of a single right whale off eastern Kodiak Island occurred in July 1998 during an aerial survey (Waite et al. 2003), and additional lone animals were observed off Kodiak Island in the Barnabas Canyon area from NOAA surveys in August 2004, 2005, and 2006 (available Alex Zerbini, NOAA, AFSC, NMML, 7600 Sand Point Way, Seattle, WA; unpublished data). Acoustic monitoring at seven sites in the Gulf of Alaska has detected right whale calls at only two: one off eastern Kodiak (detection distance 20-50 km) and the other in deep water south of the Alaska Peninsula (detection distance 10s of kilometers) (Mellinger et al. 2004).

Many of the illegal Soviet catches of right whales occurred across a large area to the south of Kodiak, where right whales were found in tight feeding concentrations (primarily in 1963 and 1964, Doroshenko 2000). Whether this region remains an important habitat for this species, or whether cultural memory of its existence has been lost, is currently unknown.

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 Western North Pacific and an Eastern North Pacific stock (Rosenbaum et al. 2000, Brownell et al. 2001). The former is believed to feed primarily in the Sea of Okhotsk.

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 mature female with a calf had been confirmed since 1900. However, confirmed sightings in 2004 in the Bering Sea have invalidated this view (Wade et al. 2006). 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 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), although there is no reason to believe that either Hawaii or tropical Mexico have ever been anything except extra-limital habitats for this species (Brownell et al. 2001). 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. Genetic analyses identified three individuals in 1997 and four individuals in 1999; of the animals identified, one was identified in both years,

resulting in a total genetic count of six individuals (LeDuc et al. 2001). Genetic analyses on samples from all six 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). Most recently in 2008, 9-12 right whales were sighted during NMFS vessel and aerial surveys of the southeastern Bering Sea and North Aleutian Basin (Amy Kennedy, AFSC-NMML, pers. comm. 13 November 2008).

Right whales can be individually identified by photographs of the unique callosity patterns on their heads. Aerial photogrammetric analyses indicated that the same individual was seen in 1997, 1998, and 1999 (LeDuc et al. 2001). Body lengths of 12 animals ranged from 14.7 to 17.6 m (LeDuc et al. 2001); since body length at sexual maturity has been estimated at about 15 m, LeDuc et al. (2001) suggest that all measured animals may have been sexually mature.

During the Bering Sea survey in 2002, there were seven sightings of right whales (LeDuc 2004). 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). The concentration of right whales found in the summer of 2004 (above) included a minimum of 17 individuals, as determined by both photo-identification and genotyping from skin biopsies. Among these, at least one male had been previously photographed and four animals biopsied in other years; the latter included the only female seen prior to this encounter (Wade et al. 2006). This concentration also included two probable calves.

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, of 13 individual animals photographed during aerial surveys in 1998, 1999, and 2000, two have been re-photographed (LeDuc et al. 2001). This photographic recapture rate is consistent with a very small population size. This conclusion is supported by a preliminary genotype-based comparison of the 17 individuals biopsied in the Bering Sea in the summer of 2004 which also revealed at least four matches to animals biopsied in previous years (Wade et al. 2006).

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, given the small apparent size and low observed calving rate of this population, this rate may be unrealistically high.

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: $PBR = N_{MIN} \times 0.5R_{MAX} \times F_R$. 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. Vessel collisions are considered the primary source of human-caused mortality of right whales in the Atlantic (Cole et al. 2005). 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). An analysis of right whale photographs to estimate entanglement rate from scarring data is currently under way.

There are no records of fisheries mortalities of eastern North Pacific right whales. Thus, the estimated annual mortality rate incidental to U. S. 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 whales which tend to congregate in coastal areas. Their thick layer of blubber causes them to float when killed. These attributes made them an easy and profitable species for early (pre-modern) whalers. By the time the modern whale fishery (harpoon cannons and steam powered catcher boats) began in the late 1800s, right whales were rarely encountered (Braham and Rice 1984). Best (1987) estimated that between 1835 and 1909 15,374 right whales were taken from the North Pacific by American-registered whaling vessels, with most of those animals taken prior to 1875. Scarff (2001) updated that analysis with adjustments for struck-and-lost whales and whaling conducted by citizens of countries other than the U.S.; he estimated that 26,500-37,000 right whales were killed during the period 1839-1909, with the great majority taken in the single decade of 1840-49. 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 U.S.S.R. 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 this source 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. In 2008, NMFS relisted the North Pacific right whale as “endangered” as a separate species (*Eubalaena japonica*) from the North Atlantic species, *E. glacialis* (73 FR 12024, 06 March 2008). 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". Biologists working aboard the Soviet factory ships which killed right whales in the eastern North Pacific in the 1960s considered that the fleets had caught close to 100% of the animals they encountered (N.V. Doroshenko, pers. comm.); accordingly, it is quite possible that the Soviets wiped out the great majority of the animals in the population at that time. 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), which is arguably the most endangered stock of large whales in the world.

HABITAT CONCERNS

NMFS conducted an analysis of right whale distribution in historic times and in recent years, and stated that the habitat requirements for right whales were the dense concentrations of prey (Clapham et al. 2006), and on this basis proposed two areas of critical habitat: one in the southeastern Bering Sea and another south of Kodiak Island (70 FR 66332, 2 November 2005). In 2006, NMFS issued a final rule designating these two areas as northern right whale critical habitat, one in the Gulf of Alaska and one in the Bering Sea (71 FR 38277, 6 July 2006; Fig. 42). In 2008, NMFS redesignated the same two areas as eastern North Pacific right whale critical habitat under the newly recognized species name, *E. japonica*.

There are no known current threats to the habitat of this population, although this partly reflects a lack of information about the current distribution and habitat requirements of right whales in the eastern North Pacific, as well as about the location and nature of any potential threats to the animal or its environment. However, there has been recent interest in oil/gas exploration with possible development in the “North Aleutian Basin” area, which occurs in Bristol Bay and overlaps and extends beyond designated North Pacific right whale critical habitat. The

Mineral Management Service is supporting a series of surveys from 2007-2009 to better understand right whale distribution in this area so that potential impacts and mitigation measures can be better assessed.

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