# Marine Mammals of the Alaska Region

Unit 22

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## INTRODUCTION

The Alaska region has 39 stocks of 24 species of marine mammals. Three of these species (sea otter, polar bear, and walrus) are managed by the U.S. Fish and Wildlife Service, and the remaining cetaceans and pinnipeds are managed by the National Marine Fisheries Service (NMFS). According to the criteria provided in the 1994 Amendments to the Marine Mammal Protection Act (MMPA), these include 10 strategic stocks: the northern fur seal (which is depleted under the MMPA); the sperm whale, the western North Pacific and central North Pacific humpback whales, the fin whale, the North Pacific right whale, and the bowhead whale (listed as endangered under the Endangered Species Act (ESA)); the Cook Inlet stock of beluga (annual takes exceeding the potential biological removal (PBR) level); and the western U.S. Pacific stock of Steller sea lions (listed as endangered under the ESA) as well as the eastern Pacific stock of this species (listed as threatened under the ESA). Of the 39 stocks, nine are believed to be increasing, five are stable, three are declining, and the population status of the remaining 22 are unknown.

Eight stocks, the western U.S. Pacific stock of the Steller sea lion, the northern fur seal, the Gulf of Alaska harbor seal and all stocks of beluga whales, are subject to subsistence harvests. While most marine mammal stocks are assessed under the authority of Section 117 of the MMPA, the NMFS determined that management of the stocks subject to subsistence harvests that do not have significant commercial takes should be developed through the comanagement process described in Section 119 of the Act. The process should also include a sound research and management program to identify and address uncertainties concerning the stocks.

Table 22-1 presents a summary of the status of stocks for the marine mammals in the Alaska region. Important population parameters for the stocks and their status under the various protected species laws are included. These include: stock identification, $N_{min}$ (a conservative estimate of abundance used to estimate the PBR, which is the maximum allowed level of human-related removal in a given year), estimates of current human-related mortality, population status, and current population trend. A narrative for some selected stocks follows:

## STELLER SEA LION: EASTERN AND U.S. WESTERN NORTH PACIFIC STOCKS

### Stock Definition and Geographic Range

Steller sea lions range along the North Pacific rim from northern Japan to California, with historic centers of abundance and distribution in the Gulf of Alaska and Aleutian Islands, respectively. The species is not known to migrate, but individuals disperse widely outside of the breeding season (late May–early July), thus potentially intermixing with animals from other areas. Two separate stocks of Steller sea lions are recognized within U.S. waters: an eastern Pacific stock, which includes animals east of Cape Suckling, Alaska (144°W), and a western U.S. Pacific stock, which

**Table 22-1**

Status of marine mammal stocks in the Alaska Region.

| Species | Stock area | Minimum population estimate ($N_{min}$)[1] | Potential biological removal level (PBR)[2] | Annual human-caused mortality[3] | Strategic status[4] | MMPA /ESA status[5] | Trend[6] |
|---|---|---|---|---|---|---|---|
| Steller sea lion | Western U.S. Pacific | 38,893 | 350 | 443 | Y | E | D |
| Steller sea lion | Eastern Pacific | 30,403 | 1,368 | 16 | Y | T | I |
| Northern fur seal | North Pacific | 848,539 | 18,244 | 1,722 | Y | D | S |
| Harbor seal | Southeast Alaska | 35,226 | 2,114 | 1,778 | | | I |
| Harbor seal | Gulf of Alaska | 27,917 | 868 | 824 | | | D |
| Harbor seal | Bering Sea | 12,648 | 379 | 26 | | | D |
| Spotted seal | Alaska | N/A | N/A | N/A | | | S |
| Bearded seal | Alaska | N/A | N/A | N/A | | | U |
| Ringed seal | Alaska | N/A | N/A | N/A | | | U |
| Ribbon seal | Alaska | N/A | N/A | N/A | | | U |
| Beluga | Beaufort Sea | 32,453 | 649 | 160 | | | S |
| Beluga | Eastern Chukchi Sea | 3,710 | 74 | 54 | | | U |
| Beluga | Eastern Bering Sea | 6,439 | 129 | 127 | | | S |
| Beluga | Bristol Bay | 1,316 | 26 | 20 | | | S |
| Beluga | Cook Inlet | 712 | 14 | 71 | Y | | U |
| Killer whale | Eastern North Pacific transient | 197 | 2.0 | 0.8 | | | U |
| Killer whale | Eastern North Pacific resident | 642 | 6.4 | 0.8 | | | U |
| Pacific white-sided dolphin | North Pacific | 486,719 | 4,867 | 4 | | | U |
| Harbor porpoise | Bering Sea | 8,549 | 86 | 2 | | | U |
| Harbor porpoise | Southeast Alaska | 8,156 | 82 | 4 | | | U |
| Harbor porpoise | Gulf of Alaska | 7,085 | 71 | 25 | | | U |
| Dall's porpoise | Alaska | 76,874 | 1,537 | 42 | | | U |
| Sperm whale | North Pacifc | N/A | N/A | N/A | Y | E | U |
| Baird's beaked whale | Alaska | N/A | N/A | 0 | | | U |
| Cuvier's beaked whale | Alaska | N/A | N/A | 0 | | | U |
| Stejneger's beaked whale | Alaska | N/A | N/A | 0 | | | U |
| Gray whale | Eastern North Pacific | 21,597 | 432 | 47 | | | I |
| Humpback whale | Western North Pacific | 367 | 0.7 | 0 | Y | E | U |
| Humpback whale | Central North Pacific | 3,698 | 7.4 | 1.0 | Y | E | I |
| Fin whale | Northeast Pacific | N/A | N/A | 0 | Y | E | U |
| Minke whale | Alaska | N/A | N/A | 0 | | | U |
| Northern right whale | North Pacific | N/A | 0 | 0 | Y | E | U |
| Bowhead whale | Western Arctic | 7,738 | 77 | 49 | Y | E | I |
| Sea otter[7] | South Central Alaska | 20,948 | 2,095 | 313 | | | I |
| Sea otter[7] | Southeast Alaska | 8,709 | 871 | 376 | | | I |
| Sea otter[7] | Southwest Alaska | 65,761 | 5,659 | 101 | | | U |
| Polar bear[7] | Alaska: Chukchi & Bering Seas | N/A | N/A | 55 | | | I |
| Polar bear[7] | Alaska: Southern Beaufort Sea | 1,611 | 73 | 34 | | | I |
| Walrus[7] | Alaska | 188,316 | 7,533 | 4,890 | | | U |

[1]Nmin is a conservative estimate of abundance used to estimate PBR and provides reasonable assurance that the stock size is equal to or greater than the estimate.

[2]PBR (potential biological removal) is the maximum number of animals, not including natural mortalities, that may be removed from a stock while allowing that stock to reach or stay at its optimum sustainable population level (50–100% of its carrying capacity).

[3]Annual human-caused mortality is an estimate of the total number of annual mortalities and serious injuries (likely to result in death) caused by humans.

[4]Strategic status: Y = yes, N/A = information is not available and N/D = estimated value has not been determined at this time.

[5]MMPA/ESA status: E = listed as endangered and T = listed as threatened under the Endangered species Act. D = listed as depleted under the Marine Mammal Protection Act.

[6]Trend: increasing (I), stable(S), decreasing (D), or unknown (U).

[7]These species are under the jurisdiction of the U.S. Fish and Wildlife Service, and are not included in the stock-status tables of the National Overview.

includes animals from Cape Suckling westward. Steller sea lions in Canada are part of the eastern Pacific stock.

### Population Size

An estimate of Steller sea lion abundance in Alaska is made possible using survey data collected in June and July of 1996, from California to the western Aleutian Islands. The surveys included counts of animals, excluding pups, at 95 "trend sites," where sea lions in the western U.S. Pacific stock have been monitored since the 1970's. Using correction factors derived from previous surveys, the 1996 surveys resulted in an estimated 39,500 Steller sea lions (33,700 nonpups and 8,800 pups) for the entire Gulf of Alaska, Aleutian Islands, and Bering Sea region that comprises the western U.S. Pacific stock. A comparable estimate for the eastern Pacific stock is not possible. However, counts from the southeast Alaska, British Columbia, California, and Oregon region indicate a population of at least 30,400 Steller sea lions.

### Minimum Population Estimate

Using the population estimate (N) of 39,500 and an associated CV[1] of 0.0184, $N_{min}$ for the western U.S. Pacific stock is calculated as 38,893 (Table 22-1). The population estimate for the eastern Pacific stock of 30,400 is used as a minimum because animals not seen in the surveys have not been taken into account.

### Current Population Trend

**Western U.S. Pacific Stock**—The first reported trend counts (an index of population size) of Steller sea lions in Alaska were made during 1956–60 which indicated that there were at least 140,000 sea lions in the Gulf of Alaska and Aleutian Islands. Subsequent surveys indicated a major population decrease, first detected in the eastern Aleutian Islands in the mid 1970's. The decline appeared to have spread eastward to the Kodiak Island area during the late 1970's and early 1980's, and then westward to the central and western Aleutian Islands during the early and mid 1980's. The greatest declines occurred in the eastern Aleutian Islands and western Gulf of Alaska, but declines also occurred in the central Gulf of Alaska and central Aleutian Islands. Uncorrected counts from 1976–79 indicated about 104,000 sea lions. The western U.S. Pacific stock decreased 37.4% from 1989 to 1994. The 1994 estimate was 42,536 animals, and the 1996 estimate was 39,500.

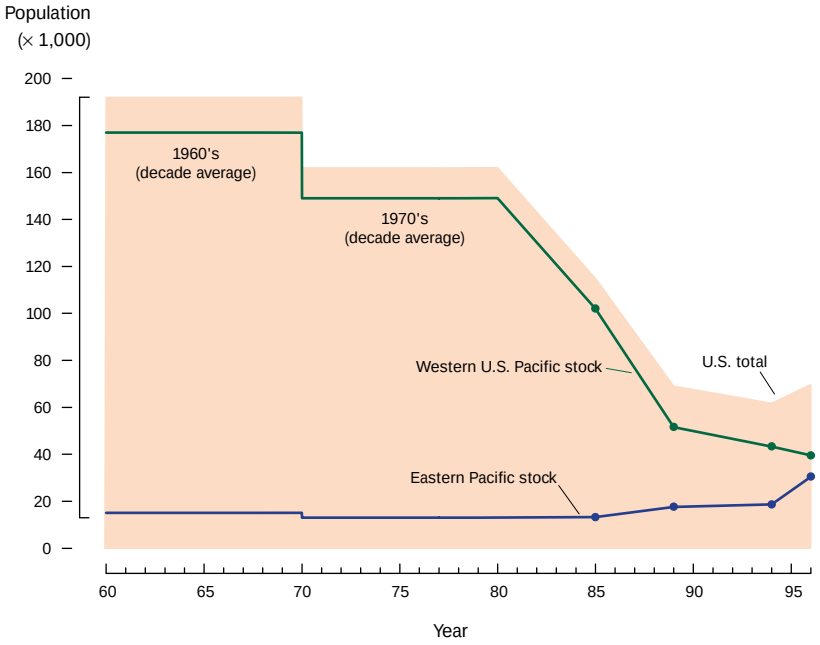


**Figure 22-1**
Estimated population size of Steller sea lions (adults, juveniles, and pups) of the two stocks off the United States and Canada.

**Eastern Pacific Stock**—Trend counts for the eastern Pacific stock have been relatively stable at about 2,000–3,000 animals (Fig. 22-1). The counts in Oregon have shown a gradual increase since 1976, as the adult and juvenile count for that year was 1,486 compared to 3,522 for 1994. This increase is likely due to a recovery from reduced numbers caused by mortality prior to 1972, as immigration from other areas has not been documented. Counts in California declined by over 50% from 5,000–7,000 between 1927 and 1947 to 2,000–

[1]Coefficient of variation (CV) is a statistical measure used to calculate confidence intervals (CI), which gauge the accuracy of population estimates. An accurate population estimate is characterized by a low CV and a narrow CI. CI is often given a percentage likelihood of being correct (e.g. 95% means that if the data were resampled and the CI were recalculated 100 times, then 95 times it would contain the true value.

2,500 between 1980 and 1990; limited information suggests that counts in northern California have increased from the late 1970's to the early 1990's. At Año Nuevo, California, a steady decline in ground counts started around 1970, resulting in a 85% reduction in the breeding population by 1987. Based on data from vertical photography taken between 1990 and 1993, pup numbers declined at a rate of 9.9%, while older individuals declined at a rate of 31.5%. Most recently, population estimates for Steller sea lions in the eastern Pacific stock increased 5.8% from 1989 (22,600) to 1994 (23,533) an increase that apparently is continuing.

### Stock Status

The PBR for the western U.S. Pacific stock of Steller sea lions has been estimated at 350 animals and for the eastern Pacific stock at 1,368. The estimated annual level of total human-caused mortality and serious injury was 443 animals for the western U.S. Pacific stock and 16 for the eastern Pacific stock. The mortalities for the western U.S. Pacific stock exceed this stock's estimated PBR. Both stocks of Steller sea lion are currently listed under the ESA; the western U.S. Pacific stock is listed as endangered, and the eastern Pacific stock is listed as threatened. Thus, both stocks of Steller sea lions are classified as strategic stocks. Management actions recently implemented to reduce interactions with human activities include no-entry buffer zones around rookeries, prohibition of groundfish trawling within 10–20 nautical miles of certain rookeries, and spatial and temporal allocation of Gulf of Alaska pollock catches.

## NORTHERN FUR SEAL: EASTERN PACIFIC STOCK

### Stock Definition and Geographic Range

Northern fur seals are found from southern California north to the Bering Sea and west to the Okhotsk Sea and Honshu Island, Japan. During the breeding season, approximately 74% of the worldwide population is found on the Pribilof Islands in the southern Bering Sea, with the remaining animals spread throughout the North Pacific. Of the seals in U.S. waters outside of the Pribilofs, approximately 1% of the population is found on Bogoslof Island in the southern Bering Sea and San Miguel Island off southern California. Fur seals may temporarily haul out onto land at other sites in Alaska, British Columbia, and on islets along the coast of the continental United States, but generally outside of the breeding season.

Adults usually are found on shore during the 6-month reproductive season (June–November), then migrate south and spend the next 6 months at sea. Adult females and pups from the Pribilof Islands migrate through the Aleutian Islands into the North Pacific, often to the Oregon and California offshore waters. Pups may remain at sea for 22 months before returning to their rookery of birth. Adult males generally migrate only as far south as the Gulf of Alaska and the Kamchatka coast. Two separate stocks of northern fur seals are recognized within U.S. waters: an eastern Pacific stock, and a San Miguel Island stock.

### Population Size

The population estimate for the eastern Pacific stock of fur seals is calculated as the estimated number of pups at rookeries multiplied by a series of different expansion factors determined from a life table analysis to estimate the number of yearlings, 2-year-olds, 3-year-olds, and animals at least 4 years old. The expansion factors are based on a sex and age distribution estimated after the harvest of juvenile males was terminated. The resulting population estimate is equal to the pup count multiplied by approximately 4.475. As the great majority of pups are born on the Pribilof Islands, pup estimates are concentrated on these islands, though additional counts are made on Bogoslof Island. A total population estimate for the northern Pacific stock based on recent pup counts was 1,002,516 seals.

### Minimum Population Estimate

Using the population estimate (N) of 1,002,516 and a CV of 0.2 to account for the correction factor, $N_{min}$ for the eastern Pacific stock of northern fur seals is 848,539 animals.

### Current Population Trend

The Alaska population of northern fur seals recovered to approximately 1.25 million animals in 1974, after the killing of females was terminated in 1968. The population then began to decrease, with pup production declining at a rate of 6.5–7.8% per year into the 1980's; the total stock estimate in 1983 was 877,000. Annual pup production on St. Paul Island has remained relatively stable since 1981 (Figure 22-2), indicating that stock size has not changed much in recent years. The most recent stock estimates prior to 1996 were 984,000 in 1992, and 1.01 million in 1990. The northern fur seal was designated as depleted under the MMPA in 1988 because population levels had declined to less than 50% of levels observed in the late 1950's, and there was no compelling evidence that carrying capacity (K) had changed substantially since the late 1950's. Under the MMPA, this stock will remain listed as depleted until population levels reach at least the lower limit of its optimum sustainable population (60% of K).

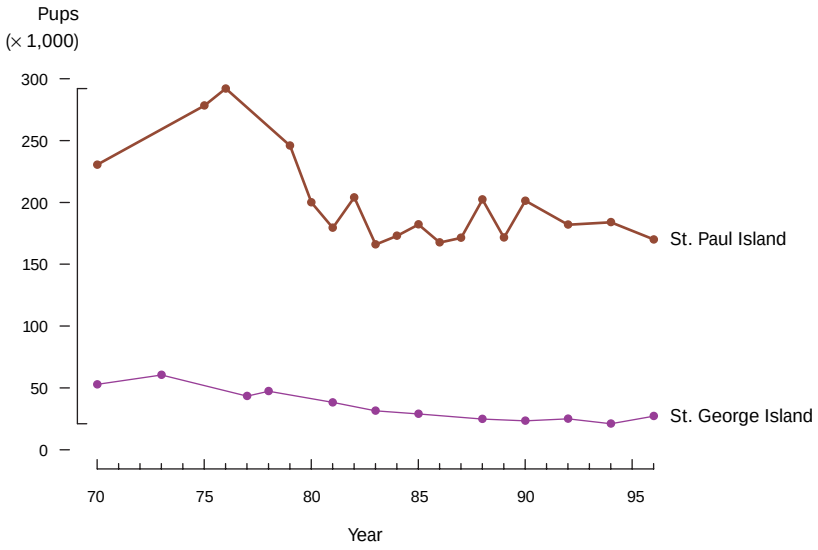


**Figure 22-2**
Northern fur seal pup counts from the Pribilof Islands, 1970–96.

### Status of Stock

The PBR for the eastern Pacific stock of northern fur seals is 18,244 animals. The estimated annual level of total human-caused mortality and serious injury is less than 2,000 seals, and thus does not exceed its PBR. The eastern Pacific stock of the northern fur seal is classified as a strategic stock because it is designated as depleted under the MMPA.

## BOWHEAD WHALE: WESTERN ARCTIC STOCK

### Stock Definition and Geographic Range

Bowhead whales are distributed in seasonally ice-covered waters of the Arctic and near-Arctic, generally north of 54°N and south of 75°N in the Western Arctic Basin. Small stocks occur in the Sea of Okhotsk, Davis Strait, Hudson Bay, and Spitsbergen, but only a few tens to a few hundreds are found in each of these stocks. The largest remnant population is the western Arctic stock which migrates from wintering areas (November to March) in the northern Bering Sea, through the Chukchi Sea in the spring (March through June), to the Beaufort Sea where they spend much of the summer (mid May through September) before returning to the Bering Sea in the autumn (September through November). The bowhead spring migration follows fractures in the sea ice around the coast of Alaska, generally in the shear zone between the shorefast ice and the mobile polar pack ice. There is evidence of whales following each other, even when their route does not take advantage of large ice-free areas. As the whales travel east past Point Barrow, Alaska, their migration is somewhat funneled between the shoreline and the polar pack ice, making for an optimal location from which to study this stock. Most of the year, bowhead whales are closely associated with sea ice. Only during the summer is this population in relatively ice-free waters in the southern Beaufort Sea, an area often exposed to industrial activity related to petroleum exploration.

### Population Size

All stocks of bowhead whales were severely depleted during intense commercial whaling prior to the 20th century, starting in the early 16th century near Labrador and spreading to the Bering Sea in the mid 19th century. Prior to commercial

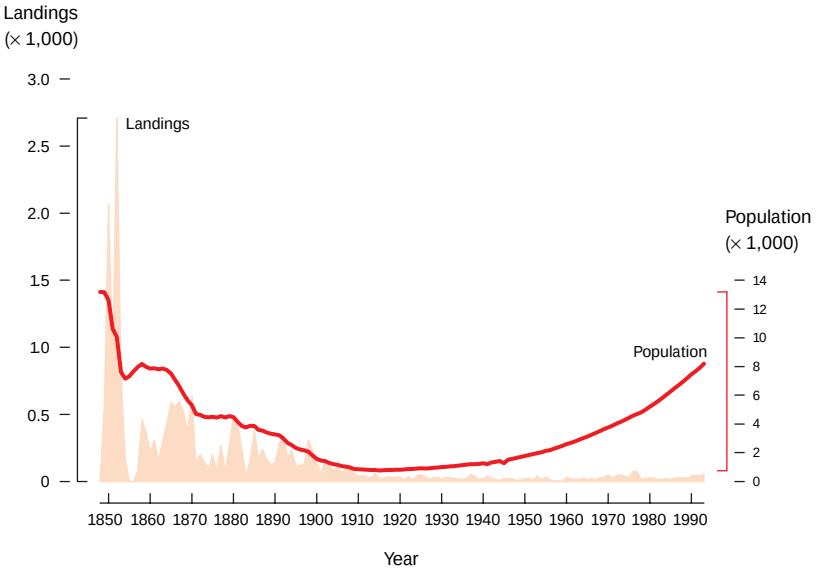


**Figure 22-3**
Bowhead whale population trend and catch history, 1848–1993.

whaling, the minimum world wide population estimate was 50,000 animals, with 10,400–23,000 in the western Arctic stock. This population dropped to less than 3,000 when commercial whaling on this stock ceased at the end of the 19th century (Fig. 22-3).

Since 1978, bowhead whales have been counted from sites on sea ice north of Point Barrow during the whales' spring migration. These counts have been corrected for whales missed due to distance offshore (through acoustical locators), whales missed when no watch was in effect (based on sighting rates), and whales missed during a watch (estimated as a function of visibility, number of observers, and distance offshore). However, in some years a small proportion of the population may not migrate past Point Barrow in the spring, therefore the estimate could be negatively biased. In 1993, unusually good counting conditions resulted in what is considered to be the most accurate population estimate to date for this stock: 8,200 bowhead whales (CV = 0.069), with a 95% confidence interval from 7,200 to 9,400.

### Minimum Population Estimate

Using the population estimate (N) of 8,200 and its associated CV of 0.069, $N_{min}$ for the western Arctic stock of bowhead whales is 7,738.

### Current Population Trend

The western Arctic stock increased at a rate of 3.1% (95% CI = 1.4–4.7%) from 1978 to 1993, when abundance increased from approximately 5,000 to 8,000 whales. This rate of increase takes into account whales that passed beyond the viewing range of the observers.

### Status of Stock

The PBR for this stock is 77 whales. The International Whaling Commission (IWC) independently established a quota for the number of bowhead whales to be taken by subsistence hunters, such that the number of whales struck could not exceed 68 in 1995, 67 in 1996, 66 in 1997, and 65 in 1998. The IWC determination takes precedence over the U.S. PBR estimate for the purpose of managing the Alaska native subsistence harvest. The level of human-caused mortality and serious injury averaged over the past five years (49) does not exceed the PBR (77) nor the IWC quota for 1998 (66). Bowhead whales of the western Arctic stock are listed as endangered under the ESA and further classified as a strategic stock.

## BELUGA WHALE: BEAUFORT SEA, EASTERN CHUKCHI SEA, EASTERN BERING SEA, COOK INLET, AND BRISTOL BAY STOCKS

### Stock Definition and Geographic Range

Beluga whales are distributed throughout seasonally ice-covered Arctic and subarctic waters of the Northern Hemisphere, and are closely associated with open leads and polynya in ice-covered regions. Depending on season and region, beluga whales in the western Arctic may occur in both offshore and coastal waters, with concentrations in Cook Inlet, Bristol Bay, Norton Sound, Kasegaluk Lagoon, and the Mackenzie Delta. It is assumed that most beluga whales from these summering areas overwinter in the Bering Sea. Seasonal distribution is affected by ice cover, tidal conditions, access to prey, temperature, and human interaction. During winter, beluga whales

occur in offshore waters associated with pack ice. In the spring, they migrate to warmer coastal estuaries, bays, and rivers for molting and calving. Annual migrations may cover thousands of kilometers.

Five putative stocks of beluga whales are recognized within U.S. waters: Cook Inlet, Bristol Bay, Eastern Bering Sea, Eastern Chukchi Sea, and Beaufort Sea.

### Population Size

The sources of information to estimate abundance of belugas have included both opportunistic and systematic observations. The most recent survey conducted in 1992 for the Beaufort Sea stock resulted in an estimate of approximately 20,805 whales. A correction factor of 2 has been recommended for the Beaufort Sea stock, resulting in a current population estimate of 39,258. The estimated minimum size of the Eastern Chukchi stock of belugas is 1,200 based on counts of animals from aerial surveys conducted during 1989–91. If this count is corrected for the proportion of animals that were diving and thus not visible at the surface, and for the proportion of newborns and yearlings not observed due to small size and dark coloration, the total corrected estimate for the Eastern Chukchi Sea is 3,710. The 1994 population estimate for Bristol Bay was 1,555. For Cook Inlet, the 1997 population estimate was 834 ($N_{min}$ = 712, Table 22-1); however, the estimate for 1998 was less than 500. The current population estimate for the eastern Bering Sea stock is 7,986 based on surveys in 1992, 1993, and 1994.

### Minimum Population Estimate

The minimum population estimates for Alaska beluga whale stocks are: 32,453 for the Beaufort Sea stock; 3,710 for the eastern Chukchi sea stock; 6,439 for the eastern Bering Sea stock; and 1,316 for the Bristol Bay stock. The minimum estimate of abundance for Cook Inlet beluga whales is currently being revised, but will likely be less than 400 animals.

### Current Population Trend

The Beaufort Sea stock of beluga whales is believed to be stable or increasing; the eastern Chukchi Sea and Bristol Bay stocks are believed to be stable. The population trend for the Eastern Bering Sea stock is uncertain at this time. The Cook Inlet stock is likely declining.

### Status of Stock

The PBR for Alaska beluga stocks are: 649 for the Beaufort Sea stock, 74 for the eastern Chukchi Sea stock, 26 for the Bristol Bay stock, 129 for the eastern Bering Sea stock, and 14 for the Cook Inlet stock. This latter PBR will likely be reduced as NMFS recently solicited information from the public regarding the need to classify this stock as endangered or threatened under the ESA or depleted under the MMPA. The levels of human-caused mortality and serious injury for these stocks averaged over the past 5 years are: 160 for the Beaufort Sea stock, 54 for the eastern Chukchi Sea stock, 127 for the eastern Bering Sea stock, 26 for the Bristol Bay stock, and 71 for the Cook Inlet stock. At this time, only the Cook Inlet stock of beluga whales has been classified as a strategic stock under the MMPA.

### FOR FURTHER READING

Hill, P. S., and D. P. DeMaster. In press. Alaska marine mammal stock assessments: 1998. NOAA Technical Memorandum NMFS-AFSC-97, 150 p.

Hill, P. S., D. P. DeMaster, and R. J. Small. 1997. Alaska marine mammal stock assessments, 1996. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-AFSC-78, 150 p.