Marine Mammals of the Pacific Region and Hawaii

Unit 23

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INTRODUCTION

The Pacific region has 65 stocks of at least 37 species of marine mammals. The U.S. Fish and Wildlife Service is responsible for managing two stocks of sea otters (central California and Washington), while the National Marine Fisheries Service (NMFS) has management authority for the cetacean and pinniped stocks. According to the criteria provided in the 1994 Amendments to the Marine Mammal Protection Act (MMPA), these include 11 strategic stocks. In the eastern Pacific (i.e. waters of Washington, Oregon, California, and northern Mexico), the strategic stocks include: endangered sperm, humpback, blue, fin, and sei whales; short-finned pilot whales, mesoplodont beaked whales, and threatened Guadalupe fur seals. Strategic stocks in Hawaiian waters include endangered blue, fin, and sperm whales, and Hawaiian monk seals.

Table 23-1 summarizes the status of marine mammal stocks in the Pacific region. Important population parameters of the stocks and their status under the various protected species laws are included. Some selected stocks are discussed below.

HAWAIIAN MONK SEAL

Stock Definition and Geographic Range

Hawaiian monk seals are distributed throughout the Northwestern Hawaiian Islands (NWHI) in six main reproductive populations at French Frigate Shoals, Laysan Island, Lisianski Island, Pearl and Hermes Reef, Midway Atoll, and Kure Atoll. Additional populations, with limited reproduction and maintained by immigration, are found at Necker Island and Nihoa Island, and a small number of seals are distributed throughout the Main Hawaiian Islands.

Demographically, the different island populations have exhibited considerable independence. For example, abundance at French Frigate Shoals grew rapidly from the 1950's to the 1980's, while other populations declined rapidly. Current demographic variability among the island populations probably reflects a combination of different histories and varying environmental conditions. While management activities and research focus on single island and atoll populations, this species is managed as, and considered to be, a single stock.

In the last two centuries, this species has experienced two major declines which, presumably, have severely reduced its genetic variation. The tendency for genetic drift may have been (and may continue to be) relatively large, due to the small size of the different island and atoll populations. However, 10–15% of the seals migrate among the different populations and, at least to some degree, this movement should counter the development of separate genetic stocks.

Population Size

Abundance of the Hawaiian monk seal in 1997 was estimated by counts of individual seals, the relationship between beach counts and total population size for subpopulations at Necker and Nihoa Islands, and a "best guess" for the Main Hawaiian Islands. A total of 1,295 seals (including pups) were observed at the main reproductive populations in

Table 23-1

Status of marine mammal stocks of the Pacific region and Hawaii (Barlow et al., 1997).

Species	Stock area	Minimum population estimate (N_{min})[1]	Potential biological removal level (PBR)[2]	Annual human-caused mortality[3]	Strategic status[4]	ESA status[5]
California sea lion	United States	111,339	6,680	974	N	
Harbor seal	California	27,962	1,678	243	N	
Harbor seal	Oregon/Washington coast	25,665	1,540	15	N	
Harbor seal	Washington inland waters	15,349	921	36	N	
Northern elephant seal	California breeding	51,625	2,142	145	N	
Guadalupe fur seal	Mexico to California	3,028	104	0.0	Y	T
Northern fur seal	San Miguel Island, California	5,018	216	0.0	N	
Hawaiian monk seal	Hawaii	1,431	4.3	N/A	Y	E
Harbor porpoise	Central California	3,431	33	14	N	
Harbor porpoise	Northern California	7,640	76	0.0	N	
Harbor porpoise	Oregon/Washington coast	22,046	212	13	N	
Harbor porpoise	Inland Washington	2,681	21	15	N	
Dall's porpoise	California/Oregon/Washington	34,393	330	22	N	
Pacific white-sided dolphin	California/Oregon/Washington	82,939	796	22	N	
Risso's dolphin	California/Oregon/Washington	22,388	224	37	N	
Bottlenose dolphin	California coastal	134	1.3	0.0	N	
Bottlenose dolphin	Calif./Oreg./Wash. offshore	1,904	15	4.4	N	
Striped dolphin	California/Oregon/Washington	19,248	154	1.2	N	
Common dolphin, short-beaked	California/Oregon/Washington	309,717	3,097	272	N	
Common dolphin, long-beaked	California	5,504	53	14	N	
Northern right whale dolphin	California/Oregon/Washington	15,080	151	47	N	
Killer whale	California/Oregon/Washington	436	3.5	1.2	N	
Killer whale	Southern Resident Stock	96	1.9	0.0	N	
Pilot whale, short-finned	California/Oregon/Washington	741	5.9	13	Y	
Baird's beaked whale	California/Oregon/Washington	252	2.0	1.2	N	
Mesoplodont beaked whales	California/Oregon/Washington	1,169	11	9.2–13	N	
Cuvier's beaked whale	California/Oregon/Washington	6,070	61	28	N	
Pygmy sperm whale	California/Oregon/Washington	2,059	19	2.8	N	
Dwarf sperm whale	California/Oregon/Washington	N/A	N/A	0.0	N	
Sperm whale	California/Oregon/Washington	896	1.8	4.5	Y	E
Humpback whale	Calif./Oreg./Wash.–Mexico	563	0.5	1.8	Y	E
Blue whale	California/Mexico	1,463	1.5	0.2	Y	E
Fin whale	California/Oregon/Washington	747	1.5	<1	Y	E
Bryde's whale	Eastern Tropical Pacific	11,163	0.2	0.0	N	
Sei whale	Eastern North Pacific	N/A	N/A	0.0	Y	E
Minke whale	California/Oregon/Washington	122	1.0	1.2	N	
Rough-toothed dolphin	Hawaii	N/A	N/A	N/A	N	
Risso's dolphin	Hawaii	N/A	N/A	N/A	N	
Bottlenose dolphin	Hawaii	N/A	N/A	N/A	N	
Pantropical spotted dolphin	Hawaii	N/A	N/A	N/A	N	
Spinner dolphin	Hawaii	677	6.8	N/A	N	
Striped dolphin	Hawaii	N/A	N/A	N/A	N	
Melon-headed whale	Hawaii	N/A	N/A	N/A	N	
Pygmy killer whale	Hawaii	N/A	N/A	N/A	N	
False killer whale	Hawaii	N/A	N/A	N/A	N	
Killer whale	Hawaii	N/A	N/A	N/A	N	
Pilot whale, short-finned	Hawaii	N/A	N/A	N/A	N	
Blainville's beaked whale	Hawaii	N/A	N/A	N/A	N	
Cuvier's beaked whale	Hawaii	N/A	N/A	N/A	N	
Pygmy sperm whale	Hawaii	N/A	N/A	N/A	N	
Dwarf sperm whale	Hawaii	N/A	N/A	N/A	N	
Sperm whale	Hawaii	N/A	N/A	N/A	Y	E

1997. Estimates for Necker and Nihoa Islands (± standard deviation) are 65 (±15.1) and 56 (±21.1), respectively. Finally, sporadic reports indicate that abundance on the Main Hawaiian Islands may be as high as 40 seals.

By applying NMFS guidelines for assessing marine mammal stocks, which account for uncertainty in our abundance estimates, the minimum size for the entire Hawaiian monk seal population in 1997 was 1,423 seals.

Current Population Trend

Between 1958 and 1993, average beach counts at the main reproductive population sites declined by 60%. From 1985 to 1993, the total of the average site count declined by about 5% annually. From 1993 to 1997, the total remained relatively stable (Figure 23-1). In the near future the trend will likely be determined by the extent to which expected growth at Kure Atoll and Pearl and Hermes Reef will offset the expected further decline at French Frigate Shoals.

Human-induced mortality has caused two major declines of the Hawaiian monk seal, and it may continue to be an important factor impeding its recovery. In the 1800's, this species was decimated by sealers, surviving sailors of wrecked ships, and guano and feather hunters. A 1958 survey indicated at least partial recovery of the species in the first half of this century; however, subsequent surveys documented a second major decline beginning in 1958 (or earlier), during which several populations (Kure Atoll, Midway Atoll, and Pearl and Hermes Reef) decreased by 80–100%. Population trends at Kure Atoll, Midway Atoll, and French Frigate Shoals appear to have been determined by the pattern of human disturbance. Such

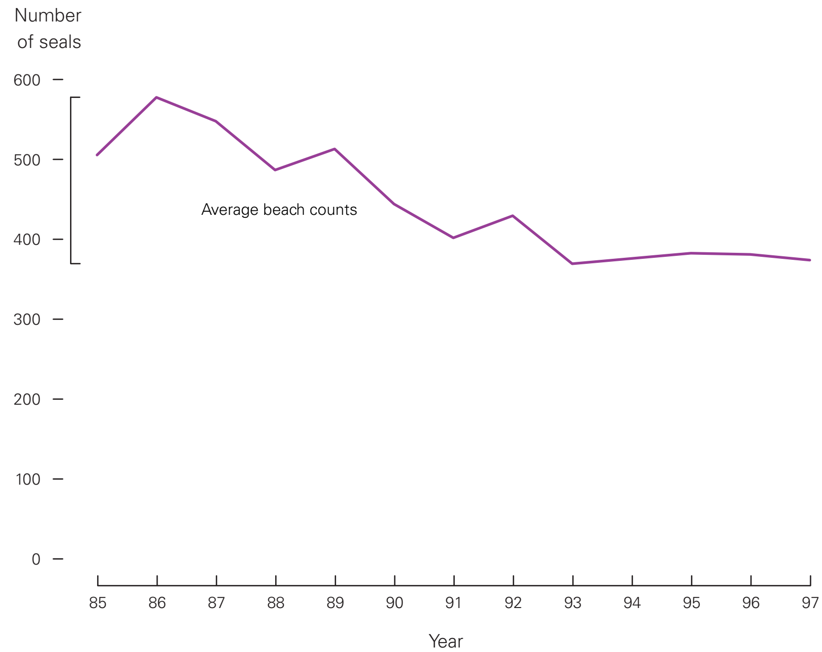

Figure 23-1
Average beach counts of Hawaiian monk seals (excluding Midway Island and pups).

Table 23-1
Continued from the previous page.

Species	Stock area	Minimum population estimate (N_{min})[1]	Potential biological removal level (PBR)[2]	Annual human-caused mortality[3]	Strategic status[4]	ESA status[5]
Blue whale	Hawaii	N/A	N/A	N/A	Y	E
Fin whale	Hawaii	N/A	N/A	N/A	Y	E
Bryde's whale	Hawaii	N/A	N/A	N/A	N	
Sea otter[6]	California	2,376	N/A	N/A	Y	T
Sea otter[6]	Washington	360	N/A	N/A	Y	T

[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. Calculations are from 1996. N/A = information is not available.
[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). Calculations are from 1996.
[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. Annual records for each species are not available. Estimated totals are based upon available records, which vary by species (Barlow et al., 1997).
[4]Strategic status: Y = yes, N = no.
[5]ESA status: E = listed as endangered, and T = listed as threatened under the Endangered Species Act.
[6]This species is under the jurisdiction of the U.S. Fish and Wildlife Service, and is not included in the stock-status tables of the National Overview.

disturbances caused pregnant females to abandon prime pupping habitat and nursing females to abandon their pups, thereby increasing juvenile mortality.

Since 1979, disturbance from human activities on land has generally declined and is currently a matter of concern at only Midway Island, where opportunities for ecotourism must be carefully monitored and controlled to prevent such disturbances. Development and expansion of fisheries during the 1970's in the NWHI has led to interactions detrimental to monk seals. The interactions fall into four categories: operations and gear conflict, potential entanglement in fisheries debris, seal consumption of potentially toxic discard, and competition for prey. Direct Hawaiian monk seal interactions have involved four fisheries: the NWHI lobster fishery, the NWHI bottomfish fishery, the pelagic longline fishery, and recreational fisheries in the Main Hawaiian Islands. Recent construction efforts and the establishment of a Protected Species Zone around the Northwestern Hawaiian Islands appear to have substantially reduced the potential for direct fisheries interactions. Possible indirect interactions with fisheries, such as competition for lobster or the degradation of foraging habitat associated with precious coral harvesting, require further investigation.

Status of Stock

In 1976, the Hawaiian monk seal was designated as endangered under the Endangered Species Act (ESA) and depleted under the MMPA. Under the methodology specified in the 1994 amendments to the MMPA (NMFS, 1996), and employing the values of N_{min} (a conservative estimate of the minimum population of the stock) and R_{max} (one-half the maximum theoretical or estimated net productivity rate of the stock at a small population size) or 1,423 monk seals and 0.07/yr, respectively, the calculated potential biological removal (PBR) is 5 seals. However, the ESA takes precedence in the management of this species and, under the ESA, the allowable take of monk seals is zero. The species is assumed to be well below its optimum sustainable population (OSP) and, therefore, is characterized as a strategic stock.

HARBOR PORPOISE: CENTRAL CALIFORNIA STOCK

Stock Definition and Geographic Range

In the Pacific, harbor porpoise are found in coastal and inland waters from Point Conception, California, to Alaska and across to Kamchatka and Japan. Harbor porpoise appear to have more restricted movements along the west coast of the continental United States than along the U.S. east coast. Regional differences in pollutant residues from harbor porpoise tissue samples indicate that the species does not mix freely between California, Oregon, and Washington (Calambokidis and Barlow, 1991). The study also showed some regional differences within California (although the sample size was small). This pattern stands in sharp contrast to the east coast of the United States and Canada where harbor porpoises are believed to migrate seasonally from as far south as the Carolinas to the Gulf of Maine and Bay of Fundy. Early genetic analyses did not show any significant differences between samples from California and Washington, but more recent analyses with larger sample sizes do show significant differences. These studies show that porpoises on the west coast are not freely mixing or migratory, and movement is sufficiently restricted that genetic differences have evolved.

In its harbor porpoise assessment (Barlow and Hanan, 1995), the NMFS and the California Department of Fish and Game recommended that the animals inhabiting the central California coast (from Point Conception to the Russian River) be treated as a separate stock. The justifications for this were: 1) fishery mortality of harbor porpoise is limited to central California, 2) movement of individual animals appeared to be restricted within California, and consequently 3) fishery mortality could cause the local depletion of harbor porpoise if the central California coast stock was not managed separately. Because the recent genetic studies have confirmed that movement on the west coast is limited, harbor porpoise in central California is considered to be a separate stock. Other Pacific coast stocks of harbor porpoise include: 1) a northern California stock, 2) an Oregon/Washington coastal stock, 3) a Washington inland-waters stock, and 4) an Alaska stock.

Population Size

A 1994 review (Barlow and Forney, 1994) of previous estimates of harbor porpoise abundance along central California resulted in a new estimate of 4,120 animals (CV = 0.22)[1] based on a series of aerial surveys from 1988 to 1993. This recent estimate is not significantly different from the previous estimate of 3,274 animals (CV = 0.31) but is more precise (owing to the greater number of kilometers surveyed). Both of these estimates only include the region between the coast and the 91 m (50 fathom) isobath. In California, the vast majority of harbor porpoises are sighted within this depth range; however, 24% of the harbor porpoises seen during aerial surveys of Oregon and Washington were between the 100 m and 200 m isobaths (55–109 fathoms). Thus, these abundance estimates are likely underestimates of the total abundance by a non-trivial amount. The current minimum population estimate of 3,431 animals in central California is based on aerial surveys conducted between 1988 and 1993 (Barlow and Forney, 1994).

Current Population Trend

An analysis of a 1986–95 time series of aerial surveys was conducted to examine trends in harbor porpoise abundance in central California (Forney, 1996). After controlling for the effects of sea state, cloud cover, and area on sighting rates, a negative trend in population size was evident. The trend was not statistically significant, but statistical power to detect trends remains low. Indications of a decline were most evident in the southern part of central California, between Point Conception and Monterey Bay. A real population decline would be somewhat surprising since fishery mortality has been declining during this same time period. Harbor porpoise abundance appears to be correlated with changes in sea surface temperature, and apparent trends could be caused by changing oceanographic conditions.

Status of Stock

The estimated PBR of 33 animals for this stock is calculated as the product of one half of the minimum population estimate (3,431), one-half the default maximum net growth rate for cetaceans (4%), and a recovery factor of 0.48 (for a species of unknown status with a mortality rate coefficient of variation equal to 0.44).

The harbor porpoise in California is not listed as threatened or endangered under the ESA nor as depleted under the MMPA. Calculation of harbor porpoise status relative to historic carrying capacity suggests that the central California population could have been reduced to between 30% and 97% of its carrying capacity by incidental fishing mortality. Present information is insufficient to narrow the range of this estimate, and the status of harbor porpoise relative to their OSP levels in central California is unknown. The average mortality rate of 14 animals over the past 3 years is less than the calculated PBR (33 animals) for central California harbor porpoise; thus, the central California harbor porpoise population is not considered a strategic stock under the MMPA. The Pacific Scientific Review Group (established by the MMPA) recommended, however, that this stock be considered strategic because it appears to be in decline and may be listed as threatened under the Endangered Species Act unless this trend is stopped. Because fishery mortality has been reduced over the past 10 years and because there is some indication that the decline in animals may be due to natural causes, the NMFS does not believe that a strategic status is justified at this time. Research will continue to monitor this population size and to investigate the possible causes of its decline.

[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.

HUMPBACK WHALE: CALIFORNIA/ OREGON/WASHINGTON–MEXICO STOCK

Stock Definition and Geographic Range

Four relatively separate migratory populations of humpback whales have been identified in the North Pacific based on sightings of distinctively marked individuals. These are the coastal California/Oregon/Washington–Mexico stock, the Mexico offshore island stock (feeding destination unknown), the central North Pacific stock (Hawaii/Alaska), and the western North Pacific stock (Japan/feeding destination probably the Aleutian Islands). The California/Oregon/Washington–Mexico stock ranges from Costa Rica to southern British Columbia but is most common in coastal waters of California (in summer and fall) and Mexico (in winter and spring).

Significant levels of genetic differences exist between the California and Alaska feeding groups based on analyses of mitochondrial DNA and nuclear DNA. The genetic exchange rate between California and Alaska is estimated to be less than one female per generation. Genetic profiles from animal samples in the Hawaiian and coastal Mexican breeding areas showed fewer genetic differences than did the two feeding areas. These differences are substantiated by the observed movement of individually identified whales between Hawaii and Mexico. There have been no individual matches between 597 humpbacks photographed in California and 617 humpbacks photographed in Alaska. Few whales photographed in British Columbia have matched with a California photographic catalog, indicating that British Columbia is an approximate geographic boundary between feeding populations.

Population Size

Based on whaling statistics, the pre-1905 population of humpback whales in the North Pacific was estimated to be 15,000, but this population was reduced by commercial whaling to approximately 1,200 by 1966. The present North Pacific total almost certainly exceeds 3,000 humpback whales.

Population estimates for the California/Oregon/Washington–Mexico stock range from 338 (CV = 0.29) to 626 (CV = 0.41). The most precise and least biased estimate is likely to be a 1994 mark-recapture estimate of 597 (CV = 0.07) animals. The minimum population estimate for humpback whales in this stock from mark-recapture methods is approximately 563 humpback whales.

Current Population Trend

There is some indication that humpback whales have increased in abundance in California coastal waters between 1979–80 and 1991, but this trend is not significant. Mark-recapture population estimates have increased steadily from 1988–90 to 1992–93 at about 5% per year. Although the North Pacific population is expected to have grown since it was given protected status in 1966, the possible effects of continued unauthorized take, incidental ship strikes, and gillnet mortality make this uncertain.

Status of Stock

The PBR level is estimated as 1.1 whales; however, because this stock spends approximately half its time in Mexican waters, the PBR allocation for U.S. waters is one-half of the PBR estimate, or 0.5 whale/year.

Humpback whales in the North Pacific were estimated to have been reduced to 13% of carrying capacity by commercial whaling, and the population remains severely depleted. The population's initial abundance has never been estimated separately for the California/Oregon/Washington-Mexico stock, but this stock was also probably depleted by whaling. Humpback whales are formally listed as endangered under the ESA, and consequently the California/Oregon/Washington–Mexico stock is automatically considered as a depleted and strategic stock under the MMPA. Although the estimated annual mortality due to entanglement (1.2/yr) plus ship strikes (0.6/yr) in California is greater than the estimated PBR level allocation of 0.5 for this stock in U.S. waters, the California/Oregon/Washington–Mexico stock appears to be increasing in abundance.

Table 23-2
Mortality of dolphins in the eastern tropical Pacific due to the tuna fishery.

Stock	Abundance 1986–90	Minimum population estimate (N_{min}) 1986–90	Potential biological removal level (PBR[1]) 1986–90	Incidental Mortality in the eastern tropical Pacific tuna fishery		
				1994	1995[2]	1996[3]
Northeastern spotted[4]	730,000	648,900	6,489	934	952	818
West/South spotted	1,298,400	1,145,100	11,451	1,226	859	545
Coastal spotted	29,800	22,500	225	N/A	N/A	N/A
Eastern spinner[4]	631,800	518,500	5,185	743	654	450
Whitebelly spinner	1,019,300	872,000	8,720	619	445	447
Central American spinner	N/A	N/A	N/A	11	17	11
Northern common	476,300	353,100	3,531	101	9	77
Central common	406,100	297,400	2,974	151	192	51
Southern common	2,210,900	1,845,600	18,456	0	0	30
Striped	1,918,000	1,745,900	17,459	11	34	5

[1] Comparison of recent incidental mortality to potential biological removal levels (PBRs) calculated for stocks of eastern tropical Pacific dolphins. It should be noted that ETP dolphins are explicitly excluded from management under the PBR section of the Marine Mammal Protection Act. Nonetheless, the calculated PBRs still provide a useful guide for intepreting the significance of dolphin mortality. Abundance estimates are from Wade and Gerrodette (1992). PBRs were calculated using an assumed maximum net productivity rate of 0.04 and a recovery factor of 0.5 in each case.
[2] Hall and Lennert, 1997.
[3] Lennert and Hall, In press.
[4] Listed as depleted under the Marine Mammal Protection Act.

EASTERN TROPICAL PACIFIC DOLPHINS

Approximately nine species of dolphins are incidentally taken in the international purse-seine fishery for yellowfin tuna in the eastern tropical Pacific (ETP) waters off Mexico and Central America. Only four species (representing 10 stocks) have experienced significant mortality associated with the tuna fishery. Since these four species also occur in U.S. waters and are impacted by U.S. fishing boats in the fleet, the NMFS Southwest Fisheries Science Center has routinely assessed these dolphin populations.

The greatest dolphin mortality occurred in the 1960's and 1970's and led to dramatic declines in abundance of the northeastern spotted dolphin and eastern spinner dolphin stocks to one-fourth of their pre-exploitation level in 1959. Additionally, trend data collected since 1975 indicate both stocks are still significantly below the levels of 1975. In 1993, the NMFS listed both the northeastern offshore spotted and the eastern spinner stocks as depleted under the MMPA because they were below their optimum sustainable populations.

Although the greatest mortality occurred in the 1960's and 1970's, incidental mortality of ETP dolphins was still fairly high as recently as 1986 when 133,174 dolphins were estimated killed, and, out of eight stocks for which a PBR level can now be calculated, seven had incidental mortalities that exceeded their PBR's. In 1991, mortality in the three stocks of greatest concern (northeastern spotted, eastern spinner, central common) still exceeded their PBR's. These comparisons are illustrative only, as the MMPA specifically manages ETP dolphins by quotas, not calculated PBRs. Incidental mortality of northeastern spotted dolphins increased in 1986 to 7% of their abundance estimate, a level that is not likely to be sustainable, and this apparently led to another significant decline in the stock between 1985 and 1994. The data also indicate that the central stock of common dolphins is still significantly below its 1975 level.

Mortality of ETP dolphins has been declining since 1986 and has decreased dramatically since 1991 (Table 23-2). A 1992 international agreement to manage the incidental mortality of ETP dolphins, which included individual vessel quotas, has led to a decrease in the total mortality (2,914 dolphins of all species) in 1997. Since 1992, the incidental mortality has been less than the estimated PBR for all stocks, and the annual incidental mortality of each stock is now less than 0.2% of their estimated abundance. Such low mortality rates should be sustainable and should, if continued, allow the northeastern spotted dolphin and the eastern spinner dolphin populations to increase and eventually recover.

There are still some uncertainties and concerns about the status of two small populations of endemic subspecies that are found in the ETP, the coastal spotted dolphin and the Central American spinner dolphin. An abundance estimate, only available for the coastal spotted stock, indicates that mortality of more than 225 animals per year may not be sustainable. No coastal spotted dolphins were reported killed in 1993 and 1994 (with near 100% observer coverage), although they were reported killed in previous years. Additionally, 41 and 237 unidentified dolphins were reported killed in 1993 and 1994, respectively, which may have included some of these subspecies. Only 18 and 11 Central American spinner dolphins were reported killed in 1993 and 1994, respectively. Monitoring of both of these coastal distributed stocks remains important, particularly if much fishing effort occurs close to the coast.

In 1995, another international agreement set dolphin mortality limits by stock, provided for an end to U.S. embargoes of ETP tuna, and proposed a new definition of "dolphin-safe" tuna. U.S. legislation (the International Dolphin Conservation Program Act) signed into law in 1997 implemented provisions of this agreement and mandated new research to determine whether or not encirclement of dolphins during tuna purse-seine fishing has a significant adverse impact on dolphin stocks. If it is found that encirclement does have a significant adverse effect, the current definition of "dolphin-safe" (no dolphins were chased or encircled while catching the tuna) will be retained; otherwise, the definition will be changed to mean that no dolphins were killed or seriously injured in that particular set even if dolphins were chased and encircled. The Secretary of Commerce must make a preliminary determination on this matter by March 1999 and a final determination by December 2002.

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ERRATUM

In *Our Living Oceans 1995*, the section of Unit 23 on the harbor porpoise stock off central California contained a figure showing population counts (Figure 23-2). This figure was in error, and actually showed harbor seal counts.