

estuaries, have also been reported as sites for calving.

Dugongs do not appear to be well adapted to activity in rough seas, where the necessity to surface frequently to breathe may impose heavy energy costs (Anderson and Birtles 1978). Food requirements and energy demands combine to force dugongs to use inshore areas frequently, where they may be taken by hunters with even the smallest watercraft. It has been reported that animals subject to hunting pressure frequent deeper waters during the daytime (Brownell *et al.* 1981) and move toward the shore to feed at night. However, Nishiwaki and Marsh (1985) found that there is diurnal (daytime) inshore feeding in some areas.

Dugongs are long-lived, with a low reproductive rate, long generation time, and a high investment in each offspring. Marsh (2002) has suggested that females do not bear their first calf until they are at least 10 and up to 17 years old. The gestation period is 13–15 months, and the litter size is usually one. The calf suckles for 14–18 months, and periods between successive calving range from 2.4 to 7 years (Nowak 1991). Population simulations by Marsh (1995, 1999) have revealed that, even with the most optimistic combinations of life-history parameters (low natural mortality and no human-induced mortality), a dugong population is unlikely to increase more than 5 percent per year.

In the Micronesian area, dugongs occur only in Palau, except for occasional sightings around Yap and Guam (Nishiwaki *et al.* 1979, as cited in Marsh *et al.* 1995). It is believed that Palauan waters support one of the most isolated populations of dugong in the world. The closest dugong populations are found in Papua Barat, 800 km to the south, and in the Philippines, 850 km to the west. In both of these areas, dugongs are under threat from human exploitation, and it is unlikely that the Palauan population is supplemented by recruitment from either of these areas (Marsh *et al.* 1995). The dugong's close ties to the shore increase its chances of local extinction and may limit the chances of long-distance dispersal and recolonization or recruitment through immigration (Brownell *et al.* 1981).

Full aerial surveys have been conducted in these waters around Palau in 1977–1978, 1983, and 1991. One survey was partially completed in 1998, but was halted because of the loss of the aircraft (The Nature Conservancy 2002). The numbers of individuals observed were 15 in 1977 and 34 in 1978 (Brownell *et al.* 1981). Of these numbers, 13 percent of the specimens seen in 1977 were calves, whereas 24

percent were calves in 1978, indicating an apparent increase in the reproductive rate (Eldredge 1991). The population in Palau was resurveyed in 1983 by Rathbun *et al.* (1988), with the total number of individuals observed being 38, including three calves. A survey conducted in 1991 by Marsh *et al.* (1992) covered 55 percent of the waters inside the barrier reefs. Twenty-six dugongs were sighted, including four calves. This is a minimum count because some dugongs on the surface are missed by observers and others are not seen because they are too far below the water surface (Marsh and Lawler 1998). The number of dugongs sighted in the 1991 survey suggests a reduction in the number of dugongs in Palauan waters over the earlier estimates from the 1980s. After the 1991 survey, the total dugong population for Palau was considered to be a few hundred animals at most (The Nature Conservancy 2002). While incomplete, the 1998 survey yielded more adults with calves than did the 1991 survey, indicating that the population was, at a minimum, still reproductively viable (*ibid.*). The latest survey in this area was completed in March 2003. Although the final report is not yet complete, results from the overflight are 20 adults and 7 calves (Chris Swenson, Service, pers. com. 2003).

#### Previous Federal Action

The dugong is currently listed under the Act as endangered throughout its entire range, except in the Republic of Palau. Prior to the enactment of the Act, species were afforded protection through the Endangered Species Conservation Act of 1969. Under this 1969 Act, the Service prepared two lists: a “Native” list and a “Foreign” list. Originally, the dugong was included in the “Foreign” list of protected species and was listed on December 2, 1970 (35 FR 18320). When the Act became effective in 1973, it supplanted the Endangered Species Conservation Act of 1969. The “Foreign” and “Native” lists were combined to create one list of endangered and threatened species (39 FR 1171; January 4, 1974). On this list, the dugong was listed as endangered throughout its entire range.

When the lists were combined, the United Nations Trust Territory of the Pacific Islands (Republic of Palau) was under the jurisdiction of the United States (U.S.). Section 4(b)(5) of the Act requires that notice of proposed regulations be given to affected States in which the species occurs. The U.S. population of dugong was included on the list without prior notice to the Republic of Palau. Therefore, in 1988,

the Service amended the Code of Federal Regulations to exclude the U.S. population from the listing. The Republic of Palau was then formally notified, and on August 5, 1993, we published a proposal to extend the endangered classification to the dugong population in Palau (58 FR 41688) and opened a 60-day public comment period.

The proposal was not finalized, however, because of budget limitations and subsequent litigation-driven listing priorities. Additionally, after three decades as part of the UN Trust Territory of the Pacific under U.S. administration, this westernmost cluster of the Caroline Islands opted for independence in 1978 rather than joining the Federated States of Micronesia. A Compact of Free Association with the United States was approved in 1986, but not ratified until 1993. It entered into force the following year when the islands gained independence (Central Intelligence Agency 2002). Finally, on December 2, 2002 (67 FR 71529), we published a notice to reopen the comment period on our proposal to list the dugong as endangered in the Republic of Palau for 90 days to allow all interested parties to submit additional information and written comments for our consideration.

All populations of the dugong are also listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In addition, dugong are also listed as vulnerable to extinction in the IUCN Red List (The World Conservation Union [IUCN] 2002).

#### Summary of Comments and Recommendations

In the August 5, 1993, proposed rule (58 FR 41688), we requested all interested parties to submit factual reports or information that might contribute to the development of a final listing decision. We contacted appropriate Federal agencies, State agencies, county governments, scientific organizations, and other interested parties to request information and comments. We published a legal notice in the *Pacific Daily News* on August 16, 1993. The first public comment period was open for 60 days and closed on October 4, 1993. We re-opened a second comment period on December 2, 2002, for an additional 90 days, closing on March 3, 2003 (67 FR 71529). During this time, we contacted the government in the Republic of Palau for comment. The Ministry of State responded positively, indicating that Palau was fully committed to coordinating its efforts with the United States and other