

Table 21.—Factors possibly influencing the recovery of sperm whale stocks under the ESA (1973) §4(a)(1)1992 Amend.

Factor	North Pacific	North Atlantic	Gulf of Mexico	Indian Ocean	Southern Hemisphere
1. Present or threatened destruction or modification of habitat	Pollution	Pollution (e.g. plastics, heavy metals)	Oil and gas development (e.g. noise disturbance, oil spills)	Pollution	Pollution
2. Overutilization for commercial, recreational, scientific, or educational purposes	Unknown	Whale watching and associated vessel traffic	Scientific research and associated vessel traffic	Unknown	Whale watching, scientific research, photography, and associated vessel traffic
3. Disease or predation	Papilloma and calcivirus; <i>Orcinus</i> attacks	Papilloma and calcivirus	Papilloma and calcivirus; <i>Orcinus</i> , <i>Pseudorca</i> , and <i>Globicephala</i> attacks	Papilloma and calcivirus	<i>Orcinus</i> and <i>Pseudorca</i> attacks
4. Other natural or man-made factors	Entanglement in fishing gear (e.g. longline, drift gillnets)	Entanglement in fishing gear (e.g. drift gillnets)	Unknown	Unknown	Entanglement in fishing gear (e.g. longline)

Chile) where sperm whales have become entangled in longline gear, have been observed feeding on fish caught in the gear, and have been reported following longline vessels for days (CCAMLR, 1994; Ashford et al., 1996; Capdeville, 1997). These observations, combined with anecdotal reports suggest that interactions between sperm whales and longline operations may be widespread in the waters off South America (Hill and Mitchell⁹⁶).

Noise Disturbance

In recent years, many studies on the effect of noise on the behavior of whales have been done (Richardson et al., 1995). A resident population of sperm whales occurs in the northern Gulf of Mexico, an area of intensive oil and gas exploration and development activities. Oil production platforms and their associated vessels have unknown effects on sperm whales (Odell, 1992). Studies of whale reactions to seismic surveys in the Gulf of Mexico indicated that sperm whales reacted to seismic pulses by moving away 50 km or more (Mate et al., 1994). In the southern Indian Ocean, most sperm whales stopped vocalizing when exposed to seismic pulses as much as 300 km away (Bowles et al., 1994). Sperm whales have also been observed exhibiting startle responses to a closely approaching vessel (Whitehead et al., 1990). Observed reactions of sperm whales in the presence of vessels include more erratic surface movements, reduced surface time, fewer blows per surfacing, shorter intervals between successive blows, and increased frequency of dives without raised flukes (Cawthorn, 1992; Gordon

et al., 1992). It is unknown whether anthropogenic noise has biological significance for sperm whales.

Pollution

Relatively high mercury levels have been found in breeding females captured off southern Australia. It is unclear whether these mercury levels affect the whale's health (Cannella and Kitchener, 1992). Plastic debris is probably ingested quite frequently by sperm whales at sea. For example, a 15 m male sperm whale captured in nearshore waters off Iceland had a 3-gal plastic bucket lodged in his intestinal tract (Lambertsen and Kohn, 1987).

Classification Status

The sperm whale was listed as endangered under the ESA in 1973 and is protected under the MMPA. Endangered status is applied to all sperm whale stocks utilizing U.S. waters (Anonymous, 1994b). The western North Pacific stock is the only sperm whale stock designated as a "Protected Stock" by the IWC. Under this designation, the IWC recognizes that these whales are 10% or more below their maximum sustainable yield (MSY) level, or 54% of carrying capacity (*K*) (IWC, 1995b). Although without trend data or information on status relative to *K* for this stock, the validity of this designation is questionable.

Since Braham's 1991 status review³, there has been little new information to improve the accuracy of population estimates or stock identity. One of the major difficulties in identifying distinct sperm whale stocks is their heterog-

enous and widespread distribution, which is apparently gender- and age-related. Table 21 summarizes information on potential threats affecting the status of sperm whales. Therefore, any reevaluation of sperm whale classification status awaits the collection of more reliable information on distribution, migration patterns, abundance, and trends in abundance on a stock-specific basis, as well as the development of objective delisting criteria. Nonetheless, if the accuracy of abundance estimates and stock determinations for North Atlantic and North Pacific sperm whale populations can be made more reliable with additional survey data, and if human-related sources of mortality and serious injury remain low, some stocks might be candidates for downlisting.

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