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ESTIMATING CETACEAN DENSITY AND ABUNDANCE IN THE CENTRAL AND WESTERN MEDITERRANEAN SEA THROUGH AERIAL SURVEYS: IMPLICATIONS FOR MANAGEMENT

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Abstract

Systematic, effective monitoring of animal population parameters underpins successful conservation strategy and wildlife management, but it is often neglected in many regions, including much of the Mediterranean Sea. Nonetheless, a series of systematic multispecies aerial surveys was carried out in the seas around Italy to gather important baseline information on cetacean occurrence, distribution and abundance. The monitored areas included the Pelagos Sanctuary, the Tyrrhenian Sea, portions of the Seas of Corsica and Sardinia, the Ionian Seas as well as the Gulf of Taranto. Overall, approximately 48,000 km were flown in either spring, summer and winter between 2009-2014, covering an area of 444,621 km^2. The most commonly observed species were the striped dolphin and the fin whale, with 975 and 83 recorded sightings, respectively. Other sighted cetacean species were the common bottlenose dolphin, the Risso's dolphin, the sperm whale, the pilot whale and the Cuvier's beaked whale. Uncorrected model- and design-based estimates of density and abundance for striped dolphins and fin whales were produced, resulting in a best estimate (model-based) of around 95,000 striped dolphins (CV=11.6%; 95% CI=92,900–120,300) occurring in the Pelagos Sanctuary, Central Tyrrhenian and Western Seas of Corsica and Sardinia combined area in summer 2010. Estimates were also obtained for each individual study region and year. An initial attempt to estimate perception bias for striped dolphins is also provided. The preferred summer 2010 uncorrected best estimate (design-based) for the same areas for fin whales was around 665 (CV=33.1%; 95% CI=350–1,260). Estimates are also provided for the individual study regions and years. The results represent baseline data to develop efficient, long-term, systematic monitoring programmes, essential to evaluate trends, as required by a number of national and international frameworks, and stress the need to ensure that surveys are undertaken regularly and at a sufficient spatial scale. The management implications of the results are discussed also in light of a possible decline of fin whales abundance over the period from the mid-1990s to the present. Further work to understand changes in distribution and to allow for improved spatial models is emphasized.

1. Introduction