

Population size and density distribution of the Caspian seal (*Phoca caspica*) on the winter ice field in Kazakh waters 2005

A report on the findings of a fixed wing aerial population survey conducted February-March 2005, by Caspian International Seal Survey (CISS) for the Caspian Environment Programme, with recommendations for the development of a Caspian seal conservation action and management plan

EXECUTIVE SUMMARY

1. An aerial survey of Caspian seals was carried out over the winter ice-field in Kazakhstan in February 23–27, 2005. The purpose of the survey was to obtain an accurate estimate of pup production, number of adult seals and their distribution.
2. A L410 fixed-wing aircraft, flying at 250 km/h and 90 m altitude, was used to fly transects along longitudinal strips at intervals of six longitudinal minutes within Kazakhstan territory. Each strip was 800 m wide (a 400 m strip on each side of the aircraft) and thus 11% of the total ice-field in Kazakhstan was covered by the survey. Seals, eagles and wolves were counted within the strip by two observers on each side of the aircraft and 782 photographs were taken of larger groups of seals. The total number of each category of animals was divided by 11% to obtain an estimate for the total number on the ice-field.
3. The final estimates were: 19,452 seal pups (coefficient of variation, CV, 12.4), 17,720 seal mothers (CV 10.9), 14,722 other seals (CV 12.7), 2,209 eagles (CV 7.7) and 18 wolves. Eagles were often seen feeding on seal pup carcasses.
4. The survey had to exclude Russian territory and the southern Caspian because of funding limitations. Nevertheless, the survey will have included at least 90% of the breeding seal population. The total female population (including juveniles) was estimated at 55,498. This gives a total population of Caspian seals at present of about 111,000 seals.
5. In order to obtain a chart of the distribution of the seals, each strip was divided into 5 km segments. The resulting charts indicated a considerable area of adult seals and pups at low densities (0.1–3 adults and pups per km²) over a wide area of the ice-field with a much smaller number of hot spots (with up to 22 adult seals or 12 pups per km²). The eagle hot spots did not correspond well with the seal pup hot spots, however.
6. A hind cast for the Caspian seal population from 2005 to 1900 was carried out using this year's survey data and past hunting records. The pup production (or size of the fertile female population) has fallen from approximately 263,000 in 1900 to approximately 20,000 in 2005 (92% decline).
7. The mean annual decrease since 1960 in the total population was estimated at 3%, while the number of fertile females has fallen by about 4% per annum during the same period. Assessment of the current state of decline or recovery will require several more years of detailed survey and analyses.

8. A number of factors are known to cause the decline, including excessive juvenile mortality and persistent organic pollutant (POP) contamination of seal tissues leading to reduced fertility. However, an elasticity analysis (a mathematical population modelling technique) indicates that the principal driver of the decline is excessive juvenile mortality, with low fertility playing a relatively minor role.
9. The contributory causes of mortality, particularly of juveniles, are reviewed. These include commercial and 'scientific' hunting, seal-fisheries interactions, canine distemper virus (CDV) and other pathogens, as well as 'natural' neonatal mortality and loss to natural predators.
10. The IUCN Red listing of the Caspian seal as 'vulnerable' is briefly reviewed here and a preliminary suggestion is made that the seal presently seems to meet the criteria for the 'endangered' category, since it has experienced a decline in the region of 83% over the past three generations (about 50 years). The status of the Caspian seal is due to be reviewed in 2006.
11. It is concluded that all deliberate and avoidable killing of seals should be stopped, by multilateral agreement, to allow the seal population to begin to recover.
12. It is suggested that a Seal conservation action and management plan (SCAMP) be drawn up under a legal agreement between the five littoral States. The Agreement should be developed as a protocol, or part of a protocol, to the 2003 Framework Convention. A draft Agreement and SCAMP is appended to this report (Appendix 3).