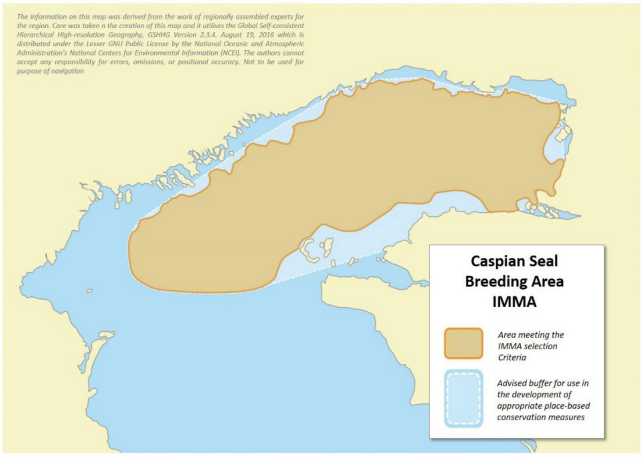

Area Size

164,136 km²

Qualifying Species and Criteria

Caspian Seal – *Pusa caspica*
Criteria A, B2, C1

Marine Mammal Diversity

Pusa caspica

Summary

The winter ice field in the northern Caspian Sea is the only breeding site for the entire population of the Caspian seal (*Pusa caspica*). Current population estimates are approximately 168,000 with a maximum annual pup production of around 34,000. Pups are born and nursed on the ice surface (Fig. 1) until weaning, while mating takes place in the water. Stable pack ice in rubble fields is optimum habitat for pupping. The main birthing period is from the end of January, peaking in the first week of February and continuing through the end of February, while mating takes place closer to the weaning of the pup or immediately after lactation. The location of the main breeding aggregations depends on the pattern of ice formation and the extent of the stable ice in any one year. Imminent threats to the ice-breeding habitat include a diminishing ice field, water depth loss, and the expansion of industrial shipping.

Figure 1: A Caspian seal pup . Photo: Nataliya Shumeyko

Caspian Seal Breeding Area IMMA

Description

The winter ice field in the northern Caspian Sea is the only breeding site for the entire population of Caspian seal (*Pusa caspica*). (Härkönen et al., 2008; Dmitrieva et al., 2015; Wilson et al., 2017a) (Fig. 3). The breeding season extends from late January to early March (Wilson et al., 2017a). There is no multi-year ice in the Caspian Sea. The winter ice field forms anew over the shallow water in the northeast Caspian, usually from late December each year. It extends from the northeast Caspian coast (including the river Ural and delta region) towards the southern border of the shallow northern basin. In mild winters, the Caspian seal breeds entirely in the Kazak sector (i.e. the northeastern Caspian Sea), since ice formation begins from east to west (Härkönen et al., 2008; Dmitrieva et al., 2015; Ivkina et al., 2017). In severe and very severe winters, the boundaries of the breeding haul-out sites shift to the west (Fig. 2) and are mainly located in the Russian sector (i.e., in the northwestern part of the Caspian Sea) (Härkönen et al., 2008; Melentyev et al., 2012; Kuznetsov, 2015: Dmitrieva et al., 2015; Ivkina et al., 2017).

The region and amount of the ice sheet occupied by breeding seals each year varies depending on how much of the ice field is accessible to the seals. As the ice begins to form, the seals foraging beneath the surface start to create breathing/access holes in the thin ice. As the ice thickens, the seals enlarge these holes and use them to haul out on to the ice surface. Thus, when the ice forms gradually, the seals have considerable access to the interior of the ice sheet. In years when the ice forms very rapidly, such gradual colonisation of the ice is prevented (as in 2006; Härkönen et al., 2008), and seal distribution may be limited to the ice edge area. In recent years, the seals have gained access to the centre of the ice field using shipping channels created by icebreakers servicing the Kashagan oil field (Härkönen et al., 2008). Unfortunately, pups born at the edge of the shipping channels are especially vulnerable to being struck by vessels (Wilson et al., 2017b).

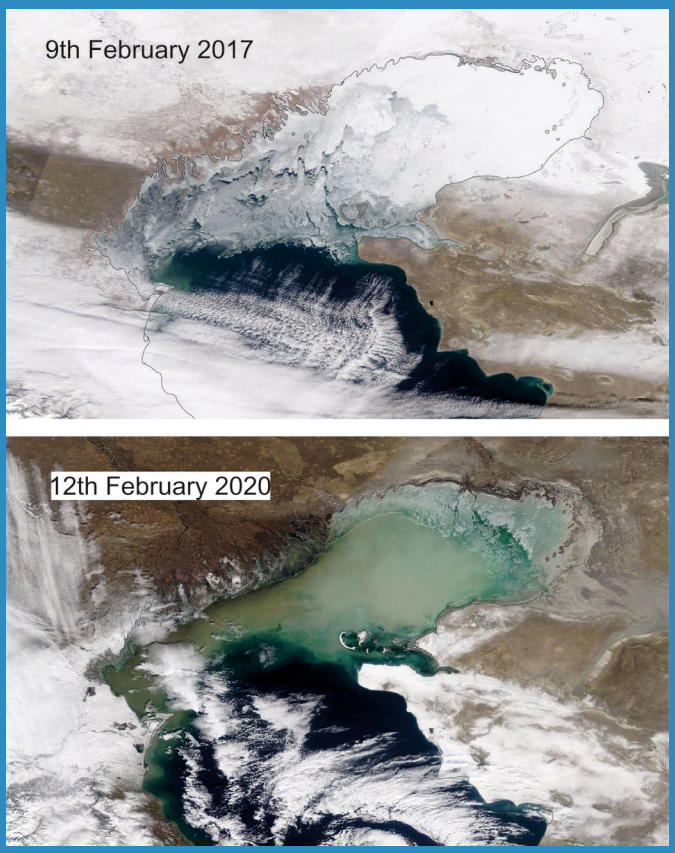

Figure 2: Contrast between a typical good ice year (2008) and the very poor ice year of 2020 in early and late February (Ice images from NASA Worldview).

Females give birth on the surface of the ice. Records of pupping between 2006 and 2012 indicated that 70% of newborn pups have been recorded between Jan 25th and mid-February, with the peak of pupping during the first week of February. A small number of "late" births occur through the end of February (Wilson et al., 2017a). Optimum habitat is ice which provides a stable platform from birth to weaning, at approximately 3–5 weeks. Parturient females are seen gathering on the ice in groups and then give birth usually at least ~2m apart (Wilson et al., 2017a). Nursery sites may be on a flat ice sheet or in a rubble field, the latter is considered optimal, with the ice ridges of the rubble field providing a degree of shelter for the pup from the wind and from predators (eagles, wolves). A typical nursery site incorporates an ice ridge and at least one water access hole. Once the pup is born, it is usually sedentary until weaning. It does not normally enter the water until it has acquired a substantial blubber layer and at least begun to moult the lanugo (Wilson et al., 2017a).

Since the late 1990s, industrial shipping through the seal breeding area of the ice field has developed to service the Kashagan oil field. This shipping causes serious disturbance to mothers and pups (Wilson et al., 2017b), likely affecting up to 10% of pups born (Wilson et al., 2020). With future increases in oil development and shipping anticipated, this disturbance level may rise. The combination of increased shipping and more frequent warmer weather is likely to have a detrimental effect on the pupping habitat (Prange et al., 2020).

Criterion A: Species or Population Vulnerability

The Caspian seal is endemic to the Caspian Sea and is listed as Endangered by IUCN (Goodman & Dmitrieva, 2016), and in the Red List of all 5 littoral states (Azerbaijan, Iran, Kazakhstan, Russia and Turkmenistan). Since it is landlocked within the Caspian Sea it has no possibility to migrate to alternate areas, and therefore is entirely dependent on the Caspian environment.

The IMMA encompasses the winter ice field of the north Caspian Sea, which is used by the entire breeding population of Caspian seals to give birth, raise pups to weaning and to mate. The winter ice field is therefore crucial to the survival of the species. Unsustainable hunting of adults (mainly females) and pups on the ice field from the 19th century to the 1990s resulted in collapse of the species population (Badamnshin, 1961), estimated at 1–1.6 million in the mid-19th century, to around 100,000 individuals by 2005 (Härkönen et al., 2012; Goodman & Dmitrieva, 2016). This decline, 90% since the mid-19th century, demonstrates the extreme vulnerability of the species. The species' long-term viability depends on the physical characteristics of the northern ice field and on the breeding seals being free from hunting, shipping, or other forms of anthropogenic disturbance.

Criterion B: Distribution and Abundance Sub-criterion B2: Aggregations

The Caspian Seal breeding population on the ice was surveyed annually from 2005 to 2012 (Härkönen et al., 2008; Dmitrieva et al., 2015). The minimum estimate for the number of pups born on the ice has ranged

from ~8,000–9,000 in years 2007–2008 and 2010 and between ~22,000 and 34,000 in years 2005–2006, 2009 and 2011–2012. These figures may be compared with estimates of pup production from the 1980s of 50,000–90,000 (Krylov, 1990), although the methodology for these earlier estimates is not clear (see Härkönen et al., 2012). The minimum estimate for the number of adults on the ice has ranged from ~14,000 in 2010, ~32,000 in 2008, ~40,000 in 2005–2006, 53,000 in 2011 to ~63,000–67,500 in 2005, 2009 and 2012 (Dmitrieva et al., 2015).

The boundaries of the IMMA were defined primarily on the maximum geographic extent of the distribution of breeding seals observed in transect-based aerial surveys conducted between 2005 and 2012 (Dmitrieva et al., 2015). The ice coverage in these survey years ranged from above average to very poor and so the extent can be taken as representative of the current ice regime. The southern boundary was extended beyond the distributions observed by Dmitirieva et al. (2015) to allow for ice extent greater than occurred in the 2005-2012 period, but which is known to occur occasionally from remote sensing data. The northeastern boundary was extended to the coast to allow years with minimal sea ice cover, during which seals are forced to pup on remnants of land-fast ice. Such years are likely to be more frequent under projected climate heating.

Criterion C: Key Life Cycle Activities
Sub-criterion C1: Reproductive Areas

The main area for reproduction is the north Caspian winter ice field (Härkönen et al., 2008; Dmitrieva et al., 2015). A core area in the general location known as "the Saddle" has been most often frequented by mother-pup pairs in years when stable ice has covered this sea area. In other years, females have given birth close to the ice edge or on ice floes (Wilson et al., 2017b).

Figure 3: Mother and large pup (still in lanugo) at a nursery site, showing ice ridge in the background and water access hole in the foreground.

Mating also takes place in the winter ice field from late lactation to the post-pupping period. Individual males have been observed approaching females accompanied on the ice by their well-grown young. Male-female pairs have also been observed on the edge of large polynias during the immediate post-pupping period (late February to early March). Mating appears to take place in the water, either beneath the ice or in polynias (Wilson et al., 2017b).

Supporting Information

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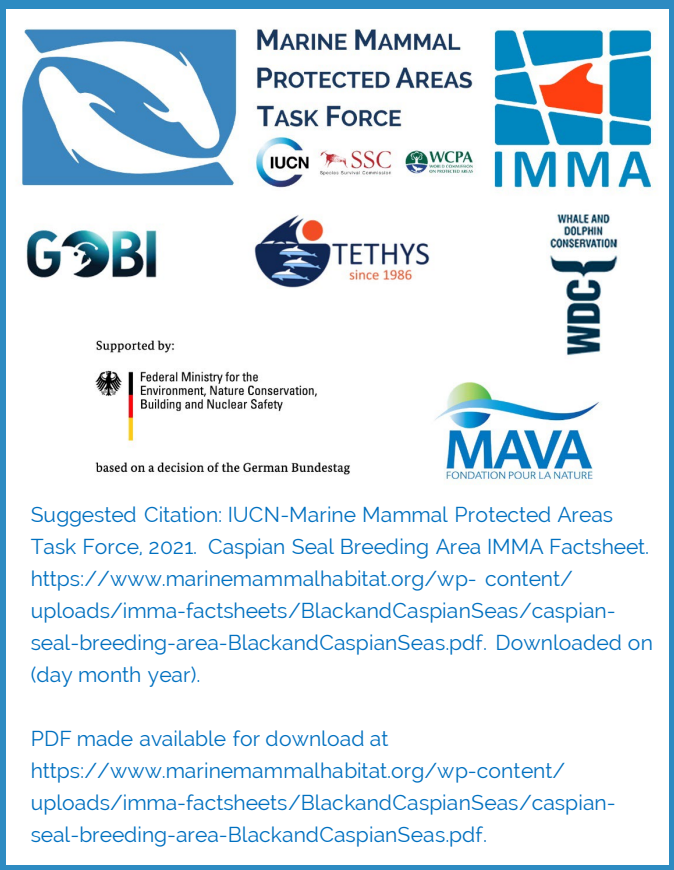

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