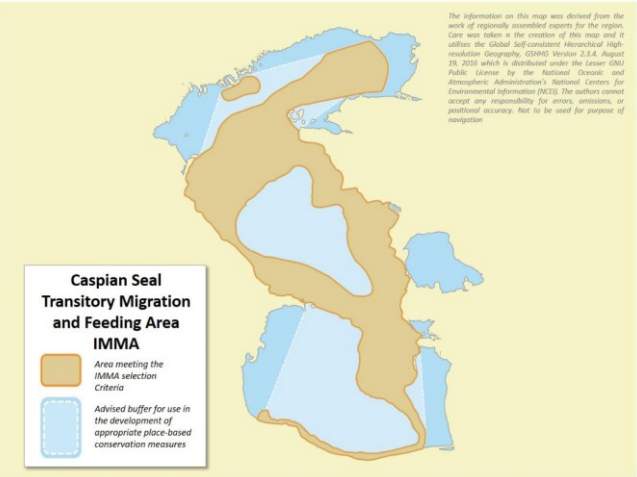

Area Size

164,136 km^2

Qualifying Species and Criteria

Caspian Seal – *Pusa (Phoca) caspica*

Criteria A, C(2, 3b)

Summary

This IMMA encompasses the primary feeding areas and migration corridors of the Caspian seal (*Pusa caspica*). It connects areas used for haul-out and moulting in the northern Caspian and the winter breeding area, with routes taken by seals to enter into the mid and southern Caspian basins. The areas in the northern basin are primarily very shallow, with an average depth of less than 5m. The landward margins of this area, which are composed of sandbanks and extensive reed beds are sensitive to fluctuations in sea level. The migration corridors in the mid-basin extend from the coast to 200m bathymetric contour. The southern section runs from the Kazakh-Turkmen border in the east, and the Absheron Peninsula in Azerbaijan in the west, following an area of steeply sloping bathymetry extending south to the Iranian coast, comprising both shallow nearshore waters as well as areas deeper than 400m and more than 150 km from the nearest shore. Seals use the whole area throughout the year, but there are seasonal increases in foraging activity in the mid and southern basins during the spring, summer and autumn.

Caspian Seal Transitory Migration and Feeding Area IMMA

Description

The area encompasses most of the northern Caspian basin including territorial waters of Kazakhstan and Russia. It also extends along the western and eastern coasts of the Caspian encompassing the Caspian basin from the coastline to the 200m isobath, reaching the Absheron Peninsula in Azerbaijan in the west and the Turkmen border in the east. From the Kazakh-Turkmen border the easterly portion of the IMMA follows an area of steeply sloping bathymetry extending south to the Iranian coast. Overall, the area comprises both shallow nearshore waters as well as areas deeper than 400m and more than 150 km from the nearest shore. It includes the primary feeding areas and migration corridors of the Caspian seal (*Pusa caspica*) throughout the Caspian Sea. There is seal presence across the whole area throughout the year, but the intensity of usage of different areas varies seasonally (Krylov, 1990; Dmitrieva, 2013; Dmitrieva et al., 2016).

The northern basin is very shallow, with an average depth of less than 5m. The landward margins of this area, which are composed of sandbanks, mudflats and extensive reed beds are sensitive to fluctuations in sea level, and can show extensive regression and advancement of water over short timescales (days/weeks). The area intersects with the Ural and Volga river deltas, which are the major inflows of fresh water into the Caspian Sea (Fendereski et al., 2014). These northern areas are important for other biodiversity including native fish species, and resident and migratory birds, and include a number of EBSAs (CBD 2018), and other areas nominally listed as protected areas under the littoral States' national legislation.

An ice sheet forms across the northern Caspian basin, usually from late December until mid-March, which is a breeding substrate for Caspian seals (Krylov 1990; Wilson et al., 2017a). The ice sheet is at the southern latitudinal boundary for sea ice formation in the

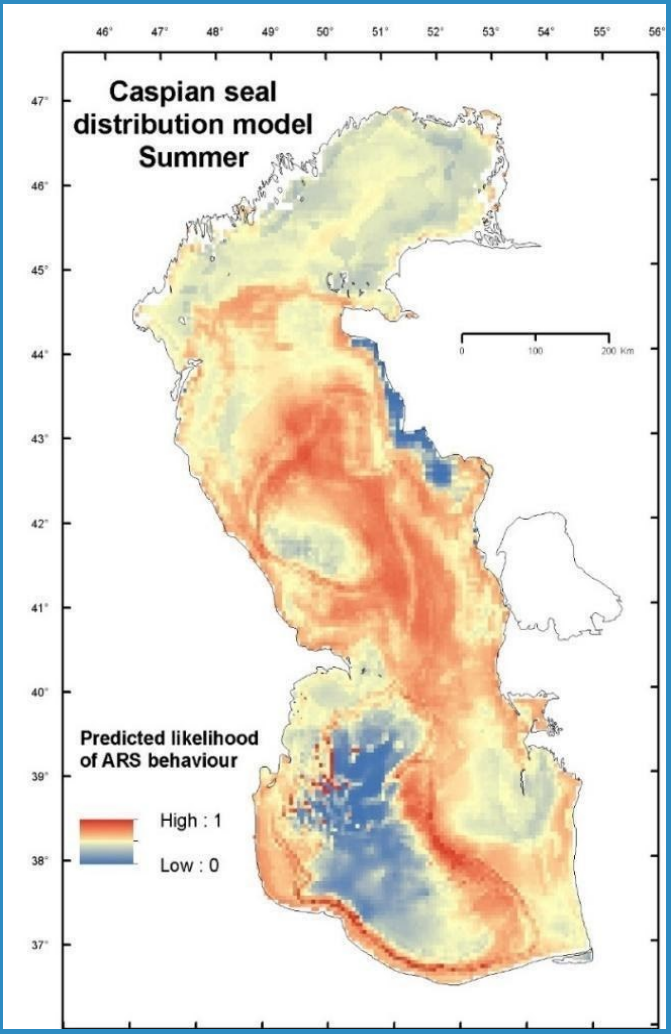

Figure 1: Predicted summer (May-September) foraging behaviour (2011), inferred from Area Restricted Search (ARS) telemetry locations determined from state space modelling of satellite track data. Predictions were derived from a General Additive Model fitting ARS locations with environmental covariates From: Dmitrieva, 2013 and Dmitrieva et al., unpublished data

northern hemisphere and is therefore sensitive to climate warming (Goodman & Dmitrieva 2016). Due to the large inflow of freshwater into the northern basin, it has reduced salinity compared to the mid and southern basins.

The mid-basin extends from the Mangyshlak Peninsula in Kazakhstan to the Absheron Peninsula in Azerbaijan and reaches a maximum depth of nearly 800m. Some coastal sea ice may occur locally during cold winter weather, but there is no extensive ice cover compared to the north. The mid-basin has important haul-out sites for seals in the Kenderli Bay, and around Kara-Bogaz-Gol in the border region between Kazakhstan and Turkmenistan (Krylov 1990; Wilson and Goodman, 2012).

The northern and mid- Caspian basins have high levels of human activity, including legal and illegal fisheries, shipping and offshore oil and gas extraction and transport (Lattuada, Albrecht and Wilke 2019; Wilson et al., 2017b). The northern basin in particular is the site of some of the world's largest hydrocarbon fields that have been developed outside of Saudi Arabia in recent decades, such as the Kashagan field in Kazakhstan (Wilson et al., 2017b).

The southern basin experiences warm subtropical temperatures and maintains high primary productivity throughout the year, in contrast to the north where productivity declines significantly during the cold winter months (Fendereski et al., 2014). The Turkmen coast is arid, and mostly sparsely populated. It is characterised by a few rocky islets close to the Kazakh border, and a mix of sandy spits, islets and large sand islands (e.g. Ogurjaly (Ogurchinskiy) Island) further south, which are documented as historical or current haul out locations for Caspian seals (Krylov 1990; Kucheruk 1995; Wilson and Goodman 2012). The waters between Baku and Turkmenbashi contain a high concentration of offshore oil and gas installations (Lattuada et al., 2019). A number of sites along the Azeri, Iranian, and Turkmen coasts have recently been designated EBSAs (CBD 2018), which cover some of the identified current and historical seal haul out locations, along with other existing coastal terrestrial protected areas.

Criterion A: Species or Population Vulnerability

The Caspian seal is listed as Endangered by IUCN (Goodman and Dmitrieva, 2016), and in the Red lists of all 5 littoral states (Azerbaijan, Iran, Kazakhstan, Russia and Turkmenistan). Since it is landlocked within the Caspian Sea it cannot migrate to alternate areas, and therefore is entirely dependent on the Caspian environment. The IMMA encompasses the primary areas used by Caspian seals for feeding and seasonal migration throughout the Caspian Sea basin, connecting key areas used for breeding, moulting, hauling out and foraging.

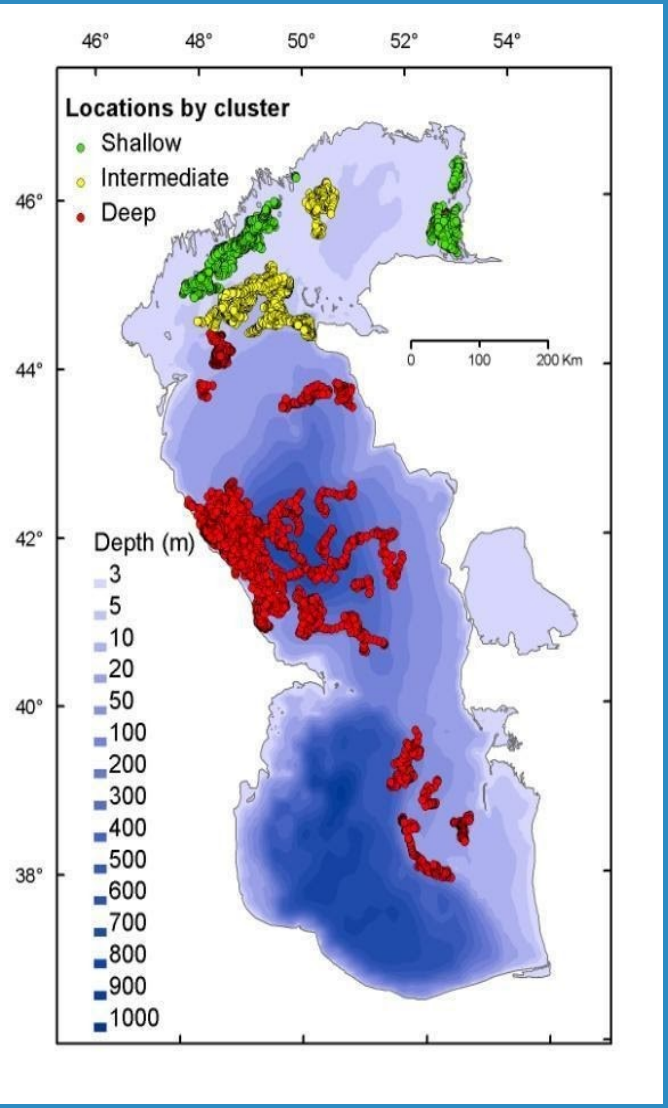

Figure 2: Foraging locations of tagged Caspian seals by dive profile type ("Shallow", "Intermediate", and "Deep" divers). From: Dmitrieva et al., 2016

Criterion C: Key Life Cycle Attributes
Sub-criterion C2: Feeding Areas

Spatial modelling of satellite tag data (2009-2018) demonstrates consistent foraging activity throughout the IMMA (Fig. 1) (Dmitrieva, 2013; Dmitrieva et al., 2016; Dmitrieva et al., unpublished data). Areas which show seasonally increased rates of foraging activity from spring through autumn in the north and mid-Caspian basins include the mouth of the Volga delta, an area of steeply sloping bathymetry on an arc between the Mangyshlak Peninsula (Kazakhstan) and Chechen Island (Dagestan, Russia), offshore from the city of Derbent (Dagestan Russia), and waters north of the Absheron Peninsula (Azerbaijan).

For animals migrating into the southern basin during summer months, most foraging activity is concentrated around areas of steeply sloping bathymetry, particularly to the west of Ogurjaly (Ogurchinskiy) Island (Turkmenistan), but there is large individual variation, and seals were observed to use a wide range of water depths, and distances from shore. Smaller numbers of tagged seals were observed to use waters along the Iranian coast, however, habitat use models based on environmental variables predict a high probability of seal foraging in this area. This is supported by numerous reports of seal presence in the area throughout the year from visual sightings, and regular entanglements of seals in gear from nearshore fisheries in Iran (e.g. Sanaee et al., 2020). The seal presence observed in the south during the winter may reflect non-breeding animals remaining to exploit the higher productivity waters in colder months. The telemetry studies primarily targeted breeding adult animals, and therefore juveniles and other non-breeding individuals may be underrepresented in the telemetry data.

There is high individual variation in foraging behaviour, but Dmitrieva et al., (2016; unpublished data) identified 3 classes of behaviour that may reflect foraging specialisations for different types of habitat or prey (Fig. 2). 'Shallow diving seals' only exhibited dives to depths less than 10m, 'intermediate divers' did not dive deeper than 25m, while 'deep divers' dived to depths of up to 200m and greater. Seals specializing in these classes of behaviour were spatially segregated, with shallow divers (approximately 40% of tagged animals) remaining in the north Caspian (particularly around the Volga delta) throughout the summer, intermediate divers favouring the transition areas between the north and mid basins, and deep divers migrating into the mid and southern basins. In the mid-basin, elevated rates of foraging activity were often associated with steeply sloping bathymetry and occurred in waters around and west of Kendirli Bay. During the winter breeding season tagged seals were observed to make return foraging trips from the ice field to more than 400km south, and these trips could last up to a month. This may reflect low prey availability due to seasonally decreased primary productivity in the north. The small body size of Caspian seals means

Figure 3: A Caspian seal peeking out of its breathing hole. Photo: Nataliya Shumeyko.

that blubber reserves accumulated during the summer are not sufficient to sustain individuals throughout the whole breeding period without supplementary feeding.

Criterion C: Key Life Cycle Attributes

Sub-criterion C3: Migration Routes

C3b – Migration / Movement Area

More than 99% of the Caspian seal population breeds on the ice field which forms in the shallow northern basin from December to March (Fig. 3). The seals then moult on sand banks and areas of reeds in the north after the spring ice melt. From early April to mid-May, moulted seals disperse to summer foraging areas in the northern, mid and southern basins which is the habitat included in this IMMA. Telemetry data show that around 60% of tagged seals migrated into the mid and southern basins, mainly following routes along the east and west coasts of the mid Caspian basin between the coast and 200m isobath (Dmitrieva et al., 2016; Dmitrieva et al., unpublished data). However, multiple satellite tracks were also observed for animals taking direct lines of movement across the deep basins.

Supporting Information

Convention on Biological Diversity. 2018. Report of the regional workshop to facilitate the description of ecologically or biologically significant marine areas in the Black Sea and Caspian Seas. https://www.cbd.int/doc/c/50f9/bd6d/21c043b0408fd80e5d2bbb96/ebsa-ws-2017-01-04-en.pdf.

Dmitrieva, L. 2013. The abundance, habitat use and conservation of Caspian seals (*Pusa caspica*). PhD Thesis. University of Leeds.

Dmitrieva, L., Jüssi, M., Jüssi, I., Kasymbekov, Y., Verevkin, M., Baimukanov, M., Wilson, S., & Goodman, S. J. 2016 Individual variation in seasonal movements and foraging strategies of a land-locked, ice-breeding pinniped. Marine Ecology Progress Series, 554:241-256. doi: 10.3354/meps11804.

Fendereski, F., Vogt, M., Payne, M. R., Lachkar, Z., Gruber, N., Salmanmahiny, A., Hosseini, S. A. 2014. Biogeographic classification of the Caspian Sea. Biogeosciences, 11: 6451–6470, doi:10.5194/bg-11-6451-2014.

Goodman, S. & Dmitrieva, L. 2016. Pusa caspica. The IUCN Red List of Threatened Species 2016: e.T41669A45230700. https://dx.doi.org/10.2305

Krylov, V. I. 1990. Ecology of the Caspian seal. Finnish Game Research, 47: 32-36.

Kucheruk, V. V., editor. 1995. Mammals of Turkmenistan, Volume 1. Predators, Pinnipeds, Ungulates. Ashgabat, Ylym.

Lattuada, M., Albrecht, C. Wilke, T. 2019. Differential impact of anthropogenic pressures on Caspian Sea ecoregions. Marine Pollution Bulletin, 142: 274-281 DOI: 10.1016/j.marpolbul.2019.03.046

Sanaee, S., Omidzahir, S. H., Sayad Shirazi, A, Akhoundian, M. 2020. Seasonal distribution and some biological parameters of the Caspian seal *(Pusa caspica)* in the southeastern region of the Caspian Sea. Iranian Journal of Fisheries Sciences 19: 2464-2474. doi: 0.22092/ijfs.2020.122454

Strukova, E., Guchgeldiyev, O., Evans, A., Katunin, D., Khodorevskaya, R., Kim, Y., Akhundov, M., et al. 2016. Exploitation of the Caspian Sea Bioresources (with Focus on Economics of Bioresources Utilization). In. Environment and Bioresources of the Caspian Sea Ecosystem, Edited by V. Velikova. DOI: 10.1007/698_2015_452. The Handbook of Environmental Chemistry series. Springer, Berlin, Germany.

Wilson, S. C. and Goodman, S. J. 2012. Inception Plan for Establishment of a Coastal Protected Area for Seal Conservation along Kazakhstan's Caspian Coastline. Final Report to GEF-UNDP CaspEco Project. University of Leeds.

Wilson, S. C., Dolgova, E., Trukhanova, I., Dmitrieva, L., Crawford, I., Baimukanov, M., Goodman, S. J. 2017a. Breeding behavior and pup development of the Caspian seal, *Pusa caspica*. Journal of Mammalogy 98: 143-153. http://dx.doi.org/10.1093/jmammal/gyw176.

Wilson, S. C., Trukhanova, I., Dmitrieva, L., Dolgova, E., Crawford, I., Baimukanov, M., Baimukanov, T., Ismagambetov, B., Pazylbekov, M., Jussi, M., Goodman, S. J. 2017b. Assessment of impacts and potential mitigation for icebreaking vessels transiting pupping areas of an ice-breeding seal. Biological Conservation, 214: 213-222. http://dx.doi.org/10.1016/j.biocon.2017.05.028.

Acknowledgements

We would like to thank the participants of the 2021 IMMA Regional Expert Workshop for the identification of IMMAs in the Black Sea, Turkish Straits System and Caspian Sea. Funding for the identification of this IMMA was provided by the Global Ocean Biodiversity Initiative funded by the German government's International Climate Initiative (IKI) and the Tethys Research Institute, through a contribution from the MAVA Foundation. Support was also provided by Whale and Dolphin Conservation.

Suggested Citation: IUCN-Marine Mammal Protected Areas Task Force, 2021. Caspian Seal Transitory Migration and Feeding Area IMMA Factsheet. https://www.marinemammalhabitat.org/wp- content/uploads/imma-factsheets/BlackandCaspianSeas/caspian-seal-transitory-migration-and feeding-area-BlackandCaspianSeas.pdf. Downloaded on (day month year).

PDF made available for download at https://www.marinemammalhabitat.org/wp-content/uploads/imma-factsheets/ BlackandCaspianSeas/caspian-seal-transitory-migration-feeding—area-BlackandCaspianSeas.pdf.