Biologie und Bedrohung:

Pusa caspica

English– Caspian Seal

Synonym(s):

Phoca caspica Gmelin, 1788

The Caspian Seal belongs to the Phocina group of northern seals, which includes the ringed seals (Pusa), the harbour and largha seals (Phoca) and the grey seal (Halichoerus). The radiation of the Phocina group is now believed to have started in the northern seas of the late Pliocene, 2-3 MY ago, and was accompanied by invasion of the continental basins, though the paleogeography in this period is not clear (Palo and Väinöla).

The taxonomic relationships between the seals of the continental lakes and those of the open ocean remain unclear, and the placement of the Caspian Seal has varied between the genera Pusa (Gmelin 1788) and Phoca. Following Wozencraft (2005): "Burns and Fay (1970), Rice (1977), McDermid and Bonner (1975), Gromov and Baranova (1981), King (1983), and Wyss (1988) considered Phoca, Pusa, Histriophoca, and Pagophilus a monophyletic group. Cladistic analysis based on morphology and mtDNA revealed two clades,

Pagophilus+Histriophoca and the Phocina group, Phoca+Pusa+Halichoerus (Muizon 1982, Mouchaty et al. 1995, Perry et al. 1995, Carr and Perry 1997, Rice 1998, Bininda-Emonds et al. 2007). In the most recent phylogenetic studies using large mtDNA datasets, Palo and Väinöla (2006) consider Pusa to be basal to the Phocina, but suggest that the Caspian Seal is most closely related to Phoca and Halichoerus, while Arnason et al. (2006) suggest the Caspian Seal to be most closely related to the Gray Seal, with the Baikal Seal forming a sister taxon, and Phoca, Ringed Seals being basal to this group.

Assessment Information [top]

Red List Category & Criteria: Endangered A2abd+3bd+4abd ver 3.1

Year Published: 2008

Date Assessed: 2008-06-30

Assessor(s): Härkönen, T. (IUCN SSC Pinniped Specialist Group)

Reviewer(s): Kovacs, K. & Lowry, L. (Pinniped Red List Authority)

Geographic Range [top]

Range Description: Caspian seals are confined to the Caspian Sea. They range throughout the sea with seasonal migration between the southern, middle and northern basins. Almost all breeding takes place on ice, which covers the shallow northern parts of the Caspian Sea in winter. Occasional observations of low numbers (tens) have been made at islets off Turkmenistan.

Countries occurrence:

Native:

Azerbaijan; Iran, Islamic Republic of; Kazakhstan; Russian Federation; Turkmenistan

Population: Historically, the population of Caspian seals was estimated to have exceeded one million (Krylov 1990, Härkönen et al. 2005). However, the most recent abundance estimate of the total population is in the region of 111,000 in 2005. This estimate was based on an estimate of pup production that year of about 21,000 pups (95% confidence intervals 19 329 to 22 797), derived from counts made during aerial transects across the winter ice conducted in late February 2005 (Härkönen et al. 2005, 2008).

The population decline throughout the 20th century has been reconstructed by a demographic model using hunting statistics (Härkönen et al. 2005). By the 1950s–1960s, the population was estimated from this model to have been reduced to between 400,000-

500,000 seals (Härkönen et al. 2005), while an estimate based on a harvest of 86,000 pups in 1966, believed to be most pups born that year, also produced an estimate of 500,000 seals for that year (Badamsin 1969, cited by Krylov 1990). Aerial surveys conducted in 1976 and 1980 suggested an estimate of 450 000 animals (Krylov 1984, cited by Krylov 1990), although the hind-casting analysis suggests a population of only about 200,000 seals remaining at that time (Härkönen et al. 2005). Surveys in 1987 and 1989 resulted in an estimate of approximately 360,000-400,000 (Krylov 1990), but again the hind-casting analysis suggests this might again have been an over-estimate, with perhaps only about 148,000 seals remaining by the late 1980s. The hind-casting analysis suggests an ongoing population reduction averaging about 3-4% per year since 1960 and an 83% reduction in the size of the breeding female population since 1955 (approximately 3 generations, with one generation being 16.5-20 years , Härkönen et al. 2005).

Habitat and Ecology: During late spring, summer, and early autumn, Caspian seals are distributed throughout the Caspian Sea. They feed throughout the sea, exploiting both the shallow basin in the north and the deep middle and southern basins. After the ice melts, the seals use sandy islands and reefs as haulout sites, preferring the tips of peninsulas and sand bars in many areas, although large concentrations of seals in reed-bed areas of islands also occur. In late autumn the breeding adults gather in the northeast, hauling out on sandy islands and reefs in increasing numbers until sea ice begins to form (Krylov 1990). When the surface freezes over, females form aggregations on the ice to give birth to their pups, tending to gather along cracks in the ice giving them ready access to the water, although they also construct and maintain holes in the ice for water access (Heptner 1996, Härkönen et al. 2008).

Pups are generally born from mid-January to late February on the ice and nursed for 4-5 weeks. Females do not usually construct lairs (Frost and Lowry 1981), possibly because sufficient amounts of snow overlying the ice is normally lacking. Pupping on the ice has allowed direct counts of pups to be made in the recent aerial surveys (Härkönen et al. 2008). Pups do not enter the water until the ice melts in mid to late March.

The first documented observations of small numbers of seals breeding in other parts of the Caspian were made in 1982, with females reported pupping on small sand islands in the southern part of the Caspian Sea, although it is likely this behaviour was not new (Krylov 1990).

Large numbers of mostly nonbreeding seals spend the winter in the middle and southern Caspian, with one estimate of 15,000 seals along the Turkmenistan coast (Krylov 1990). A post-breeding moult occurs from April to May, during which the seals first use the ice and then islands and reefs for hauling out (Krylov 1990).

Both sexes become sexually mature at around 6 years of age, with most breeding females (74% in a 1974 sample) aged between 8 and 17 years (Popov 1982). The pregnancy rate for females older than 9 is reported to be as low as 0.2-0.33 (Watanabe et al. 1999, Miyazaki 2002), and Krylov (1990) reports a similar low rate of 0.34 for females aged 10-14 years. Härkönen et al. (2005), acknowledge that the reproductive rate is low in females >20 years old, but suggest that the reproductive rate is >0.5 for females et al. (1999) and Härkönen et al. (2005) attribute the lower reproductive rates of older females to the effect of long term exposure to organochlorine contaminants in the older animals.

Caspian seals feed on a variety of fish species. During the summer and autumn, seals move to and congregate where prey are abundant, particularly Caspian kilka (Clupeonella sp.), Caspian silverside (Atherina mochon), and Caspian gobies (Gobidae) (Krylov 1990), with Clupeonella species historically making up a major proportion of their total annual diet (Kosarev and Yablonskaya 1994). A report on fish found in the stomachs of seals in the northern Caspian in 1986-1987 (Piletskii and Krylov 1990) suggested that fish eaten in order of frequency were roach (Rutilus rutilus), zander (Lucioperca lucioperca), gobies (Knipowitschia sp., Neogobius kessleri and Benthophilus sp.), and bream Blicca bjoerkna and Abramis brama), followed by Clupeonella deliculata and other species. A preliminary study from faecal samples on the Apsheron Peninsula in June 2001 and March 2002 suggested that gobies, silverside and shrimp were important constituents of the diet of seals hauled out at that time (Eybatov et al. 2002). New studies of diet in Caspian seals are urgently required in order to get an accurate picture of current prey in different areas of the Caspian in light of potential changes to the abundance of fish species due to recent ecological changes occurring in the Caspian Sea.

Systems: Terrestrial; Freshwater

Major Threat(s): Caspian seals have been commercially exploited on an intensive basis since the early 1800s. Harvests averaged 119,000-174,000 per year throughout the 19th century, with peaks of 300,000 having been recorded. In the 20th century, harvest levels peaked in the 1930s with an average annual harvest of 164,000 and a maximum single year take of 227,600. The numbers of seals taken fell during World War II to an average of 60,800 per year, and subsequently ranged between a low of 41,400 and a high of 108,300 for the period 1951-1975 (Krylov 1990). Commercial harvesting was temporarily halted in 1996 after a much-reduced estimated take of 14,000 seals. Commercial and scientific hunting in the region of 3,000-4,000 seals a year – mainly pups - has continued at least since 2004, and is currently ongoing. The hunting quota, set by the Caspian Bioresources Commission for 2007, was 18,000 seals which exceeded the estimated annual pup production for that year (Harkonen et al. 2008).

Significant population declines have been attributed to the high harvest levels (Härkönen et al. 2005). Another contributory cause to high pup mortality is natural predation by wolves (Canis lupus) and sea eagles (Haliaeetus spp.). Krylov (1990) estimated that wolves killed 17-40% of Caspian seal pups on “some breeding grounds from 1974 to 1976”, while eagles took less than 1% of pups. The reverse was found during a systematic survey by Harkonen et al. (2008). Few wolves were observed during this survey, but about 2,000 eagles were seen on the ice preying on pups in 2005-2006; they likely took approximately 10% of the annual estimated births of 20 000 pups.

By-catch of seals in fisheries and killing of seals by fishermen are threats that have not been adequately investigated, but are thought to be a significant source of mortality, particularly for juvenile seals (Härkönen et al. 2005). The Iranian commercial fishery is of conservation concern; it is likely responsible for the deaths of an estimated 500 seals annually (Eybatov et al. 2002). But, by-catch in legal and illegal fishing activity in the northern Caspian is likely to exceed this number substantially. This by-catch may amount to several thousand animals per year, with local fishermen in the Mangistau region of Kazakhstan citing catches exceeding 200 seals per 5 km of nets set (Goodman, Wilson and Dmitrieva unpublished data based on interviews November 2007).

Mass mortality events in 1997 and 2000-01, killing several thousand seals each time, have been attributed to a morbillivirus, canine distemper virus (CDV). Presence of a hitherto unknown strain of this virus was confirmed in one dead seal in 1997 (Forsyth et al. 1998), and the same strain was confirmed as the primary cause of death in seals dying in 2000 in Kazakhstan and Azerbaijan (Kennedy 2000, Kuiken 2006). The cause of a further mass mortality in 2001 was less clear (Eybatov et al. 2002). Examination of archive stranding records in Azerbaijan since 1971, show an increased mortality every few years, suggesting the possibility of previous outbreaks of CDV. A serology study of archived samples indicated that CDV was present in Caspian seals in 1993, 1997 and 1998 (Ohashi et al. 2001).

Degradation of the Caspian Sea ecosystem and overexploitation of primary food resources are also threats to Caspian seals (Reijnders 1993). An invasive of comb jellyfish, Mnemiopsis leidyi, arrived in the Caspian Sea via ship ballast water in the Volga-Don Canal in1999 (Ivanov et al. 1999). Mnemiopsis consumes zooplankton rapidly, leading indirectly to a reduction in fish stocks and a substantial impact on local fisheries. A 70% reduction in commercial landings of three species of Kilka (Clupeonella spp.) was recorded within 3 years of the comb jellyfish invasion (Kideys et al. 2005). Kilka are thought to be important prey for Caspian seals in the central and southern parts of the sea, and the invasion of Mnemiopsis is considered a threat to the seals (Ivanov 1999, Eybatov et al. 2002).

The Caspian Sea has no outlet and receives most of its input from the Volga, Ural and other rivers. Contamination of the Volga with lead, copper, zinc, and cadmium has increased dramatically since the mid-1980s, but levels in seals appear not be elevated, with the exception of zinc in some diseased animals, which may have suffered homeostatic disturbance of trace metal levels (Anan et al. 2002). Organochlorine levels in Caspian seals dying in the 2000-01 epizootic were high when compared to other marine mammal species suffering from epizootic disease outbreaks. The most significant organochlorine contaminant in Caspian seals was found to be DDT (Hall et al. 1998, Kajiwara et al. 2002). Environmental contaminants, particularly organochlorines, may affect the overall Caspian seal population health by causing decreased reproductive rates, particularly in older females (Krylov 1990, Eybatov et al. 2002, Härkönen et al. 2005). Decreased immune function has also been suggested as a contributory cause of the CDV epizootic in 2000 (Kajiwara et al. 2002), and the deaths in 2001, although scrutiny of organochlorine levels in seals dying in this outbreak did not provide supporting evidence for this (Kuiken et al. 2006, Eybatov et al. 2002).

Total juvenile mortality from continued hunting, natural predation and fisheries by-catch is believed to be unsustainable. Overall mortality in the first year of life from all sources is likely to be in the region of 50% (Härkönen et al. 2008). The high rate of juvenile mortality has been singled out as the primary reason for the continuing decline in the Caspian seal, with lowered fertility due to organochlorine contamination being a relatively minor factor (Härkönen et al. 2005).

It seems likely that warmer winters occurring in the near future may contribute to the further decline of Caspian seals if there is reduced ice cover in the northern Caspian. In 2007 the ice cover was limited to a narrow strip along the coastline of the north-east Caspian, and breeding was therefore concentrated along this strip of ice. The number of pups alive at the end of February, estimated from the aerial survey, was fewer than 7,000, i.e. fewer by half compared to the number counted in the previous two years (Härkönen et al. 2008). It has also been suggested that poor ice conditions may play a role in the epidemiology of CDV outbreaks due to seal crowding on limited haulout space and poor condition of weaned pups (Kuiken et al. 2006). However, there is no evidence for this at present.

Further threats to the seals on shore and on ice now come from increasing disturbance due to offshore and shoreline developments. One of the largest oil fields in the world is currently being developed in the Caspian, with the construction of numerous offshore oil drilling islands, pipelines, shipping access to these, and onshore logistics facilities. A recent study found that breeding seals are using shipping channels as artificial leads into the ice and are giving birth close to the edge of these channels. A significant proportion of the breeding population and pups may therefore experience disturbance by shipping traffic depending on the ice conditions (Härkönen et al. 2008). More research is required to quantify the likely impacts of this intensive oil development. The coasts of Azerbaijan and Iran have also seen increased development for domestic and leisure use in recent years, with many previously undisturbed stretches of coast now being developed.

Disturbance of island and reef haulout sites by illegal fishing activities and opportunistic seal hunting are another ongoing problem. Recent surveys have found that the Caspian seal has effectively disappeared from Azerbaijan, with the once important haulout sites of the Apsheron Peninsula and Archipelago abandoned. These sites were used by many thousands of seals until the 1930s, when they were heavily hunted (Krylov 1990). However, between 1997 and 2002 a few hundred seals were still counted regularly at these sites (e.g. Allchin et al.1997, S. Wilson, unpublished observations). Few live seals have been seen in this area since 2004 (T. Eybatov, S. Goodman, S. Wilson, unpublished observations). The overall Caspian seal population decline between 2002 and 2004 is unlikely to account for this total disappearance, which is most probably due in part to severe disturbance by illegal fishing and other coastal activities (T. Eybatov unpublished data). Similar declines in the regularity of seal occupancy have also been noted recently at other sites, such as South West Island near the Ural Delta and Osushnoy Island (Kazakhstan) and in Turkmenbashi Bay (Turkmenistan). The number of seals at Ogurchinsky Island (Turkmenistan) has also declined from several thousand in the 1980s to a few hundred (P. Erokhin, unpublished observations). The only previously recorded haulout site in Iran, at Ashoora Island, is no longer used by seals (H. Asadi, pers. com.). There is an urgent need to develop an inventory of all haulout sites throughout the Caspian together with archived and current records of seal occupancy.

Conservation Actions: Various prohibitions, quotas and protective measures have been taken to conserve the Caspian seal beginning in 1940 when seal nets were prohibited. The harvest of moulting seals in the spring was ended in 1946, and in 1952 the Apsheron Archipelago off Azerbaijan was closed to sealing. Female harvesting on the breeding grounds was stopped in 1966 and all take was prohibited on the "eastern islands of the northern Caspian in 1967." These last two changes led to a complete change in the commercial harvest in 1966 resulting in a switch to newborn and moulted pups. Quotas on harvest of pups, supposedly based on biological data, began in 1970 (Krylov 1990), although clearly these quotas were unsustainable. The Russian Federation continues to consider the Caspian seal to be a 'harvested' species and unsustainable quotas are continuing to be set through the Caspian Bioresources Commission (Härkönen et al. 2008), e.g. 18,000 pups in 2007.

A Seal Conservation Action and Management plan has been approved by the nations bordering the Caspian Sea, pursuant to the 2003 Framework Convention for the Protection of the Marine Environment of the Caspian Sea (see Harkonen et al. 2005; Caspian Environment Programme 2007), but this has as yet no legally binding action points. The cessation of all types of hunting, measures to reduce by-catch in legal and illegal fisheries, and the strategic creation of protected areas of sea, ice and shore would appear to be the only way forward in the conservation of this species.

Citation: Härkönen, T. (IUCN SSC Pinniped Specialist Group). 2008. Pusa caspica. The IUCN Red List of Threatened Species 2008: e.T41669A10532115. http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T41669A10532115.en. Downloaded on 25 March 2016.

Caspian Seal Project

Caspian seal origin, life history, threats and conservation

The Caspian seal is the only marine mammal in the Caspian Sea, and is found no where else in the world. At the start of the 20th century there were around 1 million Caspian seals. It is an iconic animal for the region, and is a key indicator for the health of the Caspian Sea, upon which the livelihoods of thousands of people depend.

Today the population has fallen by more than 90% and continues to decline. The Caspian Sea faces many human pressures and ecological changes, so urgent conservation measures are needed to prevent the disappearance of this key component of the Caspian ecosystem.

Origins

The origins of the Caspian and Baikal seals are still debated by scientists. It used to be thought that the ringed seals isolated in Lakes Ladoga, Saimaa, Caspian and Baikal were populations of Arctic ringed seals ((Pusa hispida) which became landlocked in lakes when the ice of the last ice age retreated about 11 thousand years ago. This may, in fact, be the case for the Ladoga and Saimaa seals which are considered to be only subspecies of the Arctic ringed seal. However, recent analysis of mitochondrial DNA suggests that the origin of the Baikal and Caspian seals may be older. It is now thought that Caspian and Baikal seals may have had a common origin with all the seals in the Phocina group (which includes the present-day harbour and grey seals, as well as the ringed seal species), and may have migrated across the continent to the Caspian and Baikal lakes in the late Pliocene, i.e. about 2-3 million years ago. The Caspian seal may even be more closely related to the grey seal than to the Baikal and Arctic ringed seals. All of these species are ice-breeding in origin and have pups which have an infantile (lanugo) white coat (although present-day harbour seals no longer breed on ice, and the lanugo coat is generally shed just before birth).

The Caspian Sea is just under 400,000 square km, and is the largest inland sea in the world. It is weakly saline, with the shallow northern basin (fed by the Volga and Ural rivers) being almost fresh water, while the deeper middle and southern basins are about one third of oceanic salinity. The northern basin is no more than a few metres deep, and freezes in the winter, thus providing the seals with their ice-breeding habitat.

Life history

Almost all Caspian seals are born on the winter ice-field, which covers the shallow northern Caspian between January to March. Unlike other ringed seal species, the pups are rarely hidden in lairs, because there is usually not enough snow for lairs to be excavated. Most pups are therefore exposed on the surface of the ice, with their mothers close beside them. Newborn pups are protected from the cold by a long white ‘lanugo’ coat. If this coat gets waterlogged, pups may freeze to death on the exposed ice, so it is important that newborn Caspian pups should not enter the water.

The ice is usually about 20-30 cm thick, and mothers gnaw water access holes in the ice through which they enter and leave the water. However, the white-coated pups do not go into these holes.

Although almost all pups are born on the ice-field in the Northern Caspian, a few pups are born on sandy beaches of islands, most notably Ogurchinsky Island in Turkmenistan.

The pups do not normally enter the water until the lanugo coat is moulted at about 6 weeks of age. Some pups may still be with their mothers at this stage, but soon they will be weaned and will be independent of their mothers.

Adult males haul out close to mothers on the ice, so after the pups are weaned, the mothers are mated again. After mating, all the older seals start to moult their old fur for a new, shiny grey coat of dappled grey. This moulting process can take about a month.

When the ice melts the seals disperse to islands, where they continue their moult, during which period they prefer to spend much time ashore. It is at this time of year that the seals are at their thinnest, since they have had little chance to feed during the breeding season and moult. The newly-weaned pups do not moult again until the following year, however, so during this time they are able to swim, dive and start learning how to feed on small fish and shrimps.

From late spring to late autumn the seals probably spend most of their time at sea, feeding. However, they do sometimes haul out on islands, where they form dense groups, usually at the ends of peninsulas or sandbars. Here the 'personal space' between individuals seen on the ice-breeding grounds is much less evident, as the seals rest very closely together on the beach.

In the late autumn the adult seals once again start to converge on the northern Caspian, preparing for taking up their breeding positions as soon as the ice forms in January. The females start to give birth in late January.

Threats

At the turn of the 19th century there were probably at least a million Caspian seals (or about 2.5 seals per square km of the sea). Today the numbers are approximately one tenth of that.

Historically, the principal reason for the decline was unsustainable commercial hunting throughout most of the 20th century. The Soviet Union - which included four of the five countries surrounding the Caspian (Russia, Kazakhstan, Turkmenistan and Azerbaijan) -

considered the Caspian seal to be a 'harvested species'. Hunting records show both pups and adult seals were killed in their tens of thousands every year on the ice-breeding grounds. Records from Azerbaijan in the 1930s indicate that 7–12 thousand seals a year were also killed on the Azeri islands. Through most of the history of the hunt seals were primarily hunted for their blubber, which was rendered into oil, and more recently for the fur of seal pups.

Since the demise of the Soviet Union, active commercial seal hunting stopped in Kazakhstan, and the former sealing ships become rusting ghosts of their past. However, Russia still considers the seal to be a 'harvested species' and continues to operate a commercial hunt of a few thousand seals, mostly pups, every year. Small-scale, opportunistic hunting continues also in other parts of the Caspian.

Other important threats to the Caspian seal include deliberate killing by fishermen around fishing operations, and accidental drowning (by-catch) in fishing nets, disease, organochlorine contamination of the food chain (particularly from DDT) can cause infertility in older females, disruption of the Caspian Sea food chain causing reduced prey availability for the Caspian for seals due to overfishing and invasion by the comb jelly Mnemiopsis leidyi, and loss of habitat. In the future climate change may also become important issue if this leads to reduction or instability of the winter ice fields used for breeding.

Fisheries by-catch is thought to kill about 500 seals a year along the Iranian coast every year, and probably accounts for many more deaths in other, less documented, parts of the Sea.

An epidemic of canine distemper virus (CDV) was diagnosed as the cause of the deaths of several thousand seals in 2000, and there are concerns that CDV outbreaks could recur and continue to threaten the population.

The levels of DDT in Caspian seal blubber have been relatively high, and are probably the cause of low fertility in Caspian seal females – which has been as low as 20-30% during the past decade.

The comb jelly Mnemiopsis leidyi, actually native to the north-west Atlantic, manages to invade new waters via ship's ballast. It is carnivorous, consuming zooplankton and thereby undermining the basis for the foodchain in non-native environments. By the 1990s it was already notorious for its devastating invasion of the Black Sea, and predictably reached the Caspian by the late 1990s, presumably via ships' ballast travelling through the Volga-Don canal. It is believed to be having the severest effects in the south Caspian, where it is combing with intensive fisheries to reduce the stoks of kilka (sprat) and other small pelagic fish.

Loss of habitat seems to be primarily due to human interference and disturbance, due either to coastal development for housing or industry or to frequent disturbance of a haul-out site by poachers or fishermen.

Conservation

The first and foremost conservation measure to be taken is to stop all deliberate killing of Caspian seals. At present, the only way of persuading the Russian authorities to stop the commercial hunt is to convince them of the actual current population size which is still declining, and cannot sustain even a modest commercial hunt. At present (2007) the annual hunting quotas set by the regional Bioresources Commission exceed the annual pup production figures obtained from surveys carried out by the international CISS team. The CISS team is therefore working with the Darwin project to have these figures recognised by the regional Governments. Regional scientists working with the Darwin team are already setting a 'zero kill' example to their colleagues in the region by replacing 'scientific' hunts by new methods of taking tissue samples from seals without the necessity of killing the animal: the animal is caught, tranquillised, sampled, treated with antibiotic and released unharmed. Other sampling is done on seals found already dead from interaction with fisheries or from natural causes.

In Iran, the serious problem of seal deaths in fishing operations is already being tackled through the Darwin project. Dr Hormoz Asadi and Leili Shamimi have organised workshops with local fishing associations and game wardens through which a new system has been put in place whereby fishermen who catch a seal in a net do not kill it as previously, but instead keep it in a holding tank until the Darwin team arrive to record data and take samples before releasing it unharmed. Fishing by-catch is also likely to be a serious problem through much of the rest of the Caspian in both legal and illegal fishing operations. It is an important research priority to quantify the by-catch rates.

An example of habitat loss has recently occurred in Azerbaijan. The tips of the peninsulas on Zhilhov Island and Shakhova Kosa on the Asheron Peninsula were still found to be regular haul-out sites for seals between 1996 and 2002, but as of now (2006-07) these sites are completely deserted by seals. The Darwin monitoring programme in Azerbaijan, led by Dr Tariel Eybatov, is now recording all seal activity in the Apsheron area to try and establish the facts behind this habitat loss in order that it might be reversed in the future.

An overall plan for Caspian seal conservation (SCAMP, or Caspian Seal Conservation Action and Management Plan) has been developed by the Darwin team. This plan was loosely based on similar multilateral plans in the Baltic (HELCOM) and the Wadden Sea agreement, and was accepted in late 2006 as a working plan by Government representatives in the region.

Assessment of Caspian Seal By-Catch in an Illegal Fishery Using an Interview-Based Approach

Abstract

The Caspian seal (Pusa caspica) has declined by more than 90% since 1900 and is listed as endangered by IUCN. We made the first quantitative assessment of Caspian seal by-catch mortality in fisheries in the north Caspian Sea by conducting semi-structured interviews in fishing communities along the coasts of Russia (Kalmykia, Dagestan), Kazakhstan and Turkmenistan. We recorded a documented minimum by-catch of 1,215 seals in the survey sample, for the 2008–2009 fishing season, 93% of which occurred in illegal sturgeon fisheries. Due to the illegal nature of the fishery, accurately quantifying total fishing effort is problematic and the survey sample could reflect less than 10% of poaching activity in the north Caspian Sea. Therefore total annual by-catch may be significantly greater than the minimum documented by the survey. The presence of high by-catch rates was supported independently by evidence of net entanglement from seal carcasses, during a mass stranding on the Kazakh coast in May 2009, where 30 of 312 carcasses were entangled in large mesh sturgeon net remnants. The documented minimum by-catch may account for 5 to 19% of annual pup production. Sturgeon poaching therefore not only represents a serious threat to Caspian sturgeon populations, but may also be having broader impacts on the Caspian Sea ecosystem by contributing to a decline in one of the ecosystem's key predators. This study demonstrates the utility of interview-based approaches in providing rapid assessments of by-catch in illegal small-scale fisheries, which are not amenable to study by other methods.

Publications

This page gives references to academic publications on Caspian seal studies by the CISS (Caspian International Seal Survey) team, the Ecotox and Darwin project teams and their colleagues. The references are given in approximate chronological order, starting with the most recent. Some of these papers may be downloaded directly from the attachments below. We would like to acknowledge with special thanks all our colleagues who have contributed to this ongoing project. Special thanks are due to our Japanese colleagues at Ehime University who worked with us throughout the Ecotox project 2000-02 and to the Japan Trust Fund, which supported the Ecotox project via the World Bank. In more recent years we would like to thank The Caspian Environment Programme, The UK Darwin foundation, Agip KCO and NCPOC for their support for the po;ulation surveys and study of seal by-catch in fishing nets.

Wilson SC, Eybatov TM, Amano M, Jepson PD and Goodman SJ. 2014. The role of canine distemper virus and persistent organic pollutants in mortality patterns of Caspian seals (Pusa caspica). PLoS ONE 9(7): e99265. doi:10.1371/journal.pone.0099265. This paper integrates Caspian seal mortality data spanning 1971-2008 with data on age, body condition, pathology and toxicology for carcases stranded in the mass mortalities between 1997 and 2002. We concluded that organochlorine contaminant levels did not contribute significantly to CDV (canine distemper virus) mortality in the epizootics. We also provided growth curves for both male and female seals, based on the age and body length of stranded carcases.

Dmitrieva L, Kondakov AA, Oleynikov E, Kydyrmanov A, Karamendin K, Kasimbekov Y, Baimukanov M, Wilson S and Goodman SJ. 2013. Assessment of Caspian seal by-catch in an illegal fishery using an interview-based approach. PLoS ONE 8(6): e67074. doi:10.1371/journal.pone.0067074. This study was based on interviews with fishermen. A minimum by-catch figure of 1,215 seals for the 2008-09 season was estimated, which could reflect less than 10% of poaching in the N. Caspian, and may include 5-19% of annual births.

Härkönen T, Harding KC, Wilson S, Baimukanov M, Dmitrieva L, Svensson CJ and Goodman SJ. 2012. Collapse of a marine mammal species driven by human impacts. PLoS ONE 7(9): e43130. doi:10.1371/journalpone.0043130.This paper reconstructs the decline in the Caspian seal population from the mid-19th century to the present day. The reason for the decline is attributed primarily to unsustainable levels of hunting. The prospects for population recovery in the present-day perturbed Caspian ecosystem are discussed.

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Youtube:

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Petition:

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