Biology And Conservation Of The New Zealand Sea Lion (Phocarctos Hookeri)

Introduction

Phocarctos hookeri, commonly referred to as the New Zealand sea lion; from the family Otariidae and are one of the largest animals in New Zealand (see figure 1). The Otariidae family consists of three groupings of Pinnipeds (seals), one of which being the Phocarctos hookeri (King, 1960). They are the only identified species of the genus Phocarctos, and have a lifespan of 23 years. It mainly breeds on New Zealand's subantarctic islands; Auckland, Stewart and Campbell, and around the south coast of the mainland (Maloney et al. 2012). The Phocarctos hookeri's population numbers are around 10,000, making it the world's rarest sea lion species (Geschke and Chilvers 2009).

Figure 1: Phocarctos hookeri. The IUCN Red List of Threatened Species 2015 (Chilvers, B.L. 2015)

This paper discusses distinct physical features of the Phocarctos hookeri, its geographical distribution, behaviour, diet, reproduction, population. Specifically, it will discuss key threats towards the mammals, and will examine the conservation status of the Phocarctos hookeri.

Physical Description

The Phocarctos hookeri is a large marine mammal (pinniped); distinguished from other New Zealand ortalids by their blunt nose and short whiskers. The taxonomy of the Phocarctos hookeri can be seen in the figure 2.

Taxonomy

- Kingdom Animalia
- Phylum Chordata
- Class Mammalia
- Order Carnivora
- Family Otariidae
- Genus Phocarctos

Species Phocarctos hookeri

Figure 2: Taxonomy of Phocarctos hookeri (King, 1960)

They have small ear-flaps on the side of their head, with a thick layer of fur and fat that allows them to keep warm in the subantarctic seas of New Zealand. Through turning their hind flippers forwards they are able to move on land, up to surprisingly fast speeds. Males and females are sexually dimorphic (differ in sizes), with males being considerably larger than females (Geschke and Chilvers 2009). Male sea lions have a mane on their shoulders, typically a dark brown or

black colour and reach between 2.4 and 3.5m in length, weighing between 200 and 400kg (Geschke and Chilvers 2009).

Females typically have a lighter grey or yellow colour, with colours around the flippers changing to a darker grey (Chilvers et al. 2005). The average female length is smaller than that of the male, reaching a maximum of 2m in length and only weighing up to 160kg (Chilvers et al. 2005). Immature males tend to look like females until they have fully matured, with a typical brown colour covering all young pups (Chilvers et al. 2005). Maturation of pups occurs anywhere from 3-5 years, typically weighing 8-10kg, with a length of 70-100cm (Chilvers et al. 2006a).

With an extremely short and blunt head, this species has a length to width ratio of 2:1, typically fur seals have a length to width ratio of 3:1 (Clark, 1873). At first glance, Phocarctos hookeri's typically get confused with the Australian Sea Lion, but clear differences can be seen, differing them from the Australian Sea Lion as well as other species of sea lion. This includes an overall larger body shape, as well as darker toned colours with an increased amount of fur.

Geographical distribution, behaviour and diet

Phocarctos hookeri is endemic to New Zealand, with a primary habitat of New Zealand's south islands and surrounding waters, although small colonies have been found on Stewart Island along the southeast coast of Otago (see figure 3).

Figure 3: Phocarctos hookeri Geographic Range: The IUCN Red List of Threatened Species. (Louise Chilvers 2015)

This is typically a highly restricted distribution for a marine mammal, with the main breeding colony found at the Auckland Islands as well as Campbell Island. Before Human occupation (both Maori and European), fossil records have displayed that the Phocarctos hookeri's had a more extensive range, appearing to have inhabited most of the mainland and subantarctic islands (Childerhouse and Gales 1998). Pup and adult bones have also been found as far up as the top of the North Island.

Phocarctos hookeri's are a social species, but are not migratory. Studies have been conducted that involve tracking females and displayed that they do not travel between the breeding sites in the Auckland and Campbell Islands (Robertson et al. 2006). Their only movement is between specific beaches and birthing beaches, with the males taking full control of their movements. Male Phocarctos hookeri have social hierarchies, with the dominant territorial male having breeding rights leaving juvenile and bachelor males excluded from mating. When on land Phocarctos hookeri's typically gather in large groups, consisting of mothers and their pups, increasing the chance of protecting them (Meynier, L 2009).

The Phocarctos hookeri are carnivorous (piscivore, molluscivorous) and are referred to as 'opportunistic' in regards to feeding, as they will not think twice about consuming something (Bell, B, 2008). This bravery has a direct correlation to their already low population numbers, as death by fishing nets and debris is forever increasing. Arrow squids, red cods, opal fishes, small local fishes, octopus, rays and sharks are seen as the typical diet. They collect this food through diving under the water, with most dives lasting four to five minutes and generally less then 200m deep (Chilvers et al. 2006b). Immature sea lions feed on the same type and size of prey as

adults. It is also common for New Zealand Fur Seal pups and penguins to be taken by adult male Sea Lions (Chilvers et al. 2006b).

Reproduction

Male Phocarctos hookeri become sexually mature at the age of five, with females maturing sexually at 3-4 years (Chilvers et al. 2010). The estimated reproductive rate of adult female Phocarctos hookeri's is 65% per year. Contrasty, pup mortality was 30-55% for the Auckland Islands and rose to 55% in the first 6 weeks after birth (Chilvers et al. 2010). Adult males have an average lifespan of 23 years, with females extending to 26 years (Chilvers et al. 2010).

The breeding season typically begins late November, but only when adult males have established themselves on territories through vocalizing and fighting. Adult females arrive early December and give birth to their pup from the previous year ?2.1 days after returning to the rookery (Chilvers et al. 2006b). Competition amongst adult males is always evident, with newly changing and arriving neighbours.

Approximately 10 days after the female gives birth, oestrous occurs, prior to this females are continuously attending their newborn pup (Chilvers et al. 2005). After mating it is common for females begin short trips on the hunt for food, followed by pup attendance, this is typical of many otariids. These trips last an average of 2.7 days followed by 1.5 days of pup attendance and feeding ashore (Chilvers et al. 2005). When mothers are away, pups gather into groups to gain protection. The primary causes of pup deaths within the first two months of life are listed below (figure 4):

Figure 4: Cause of pup deaths in the first two months of life: The IUCN Red List of Threatened Species (Castinel et al. 2007a)

Population numbers

The Phocarctos hookeri is the world's most threatened sea lion species with fewer than 10,000 sea lions remaining. Counts of pups is a way of recognising the abundance of pinniped populations; pup numbers have declined by more than 50% since 1998 (Meynier, L 2009). Phocarctos hookeri pups are estimated to account for ?65% of the total number of mature females (Meynier, L 2009). In 2008-2009 the Phocarctos hookeri population was approximately 9,880 (Meynier, L 2009).

Both Maori and early European settlers hunted the Phocarctos hookeri for their fur and meat, but populations dropped dramatically when commercial hunters became aware of the large populations at the Subantarctic islands in the 1800's (Childerhouse and Gales 1998). Sealing effectively stopped because of this huge decrease in population, as it wasn't financially viable for them to make the long and sometimes dangerous boat trips. It was until the 1880's when legislation came in, to protect the sea lions (Childerhouse and Gales 1998). Now almost 200 years later the Phocarctos hookeri is at risk of being lost again. It is thought that pup mortality has increased due to a bacterial infection Klebsiella pneumoniae (Castinel et al. 2007b). It is unclear as to whether this disease has been present in the population for long periods of time or whether it is a sudden issue.

In the Southern Ocean the Phocarctos hookeri's foraging territory overlaps with the Southern Arrow Squid; hence sea lions were being caught in trawl nets (Bell, B, 2008). As sea lions are mammals they drown when caught in a net, as a result of this, in 1993 the New Zealand Government created a limit for the number of sea lions that can be killed before the squid fishery is closed for the season. As the Southern Arrow Squid is such an important food for the Phocarctos hookeri, these fisheries are likely impacting the amount of food available for the sea lions, furthering resulting to their declining population (Chilvers et al. 2005).

Females give birth to their offspring from the previous season within a few days of arriving at the breeding ground. Then within 10 days later they will again breed. Within the first 3 weeks of life, the pup stays on land only consuming its mother's milk, whilst gaining basic hunting skills (Louise, 2007). If males feel threatened by any pup they will injure or kill them, which heavily affects the mortality rate of this species, with an already low 23 year lifespan and dropping population numbers.

Threats and conservation

The Phocarctos hookeri are in trouble, without protection they are faced with possible extinction. As the numbers of sea lion pups has declined by half since 1998, the Phocarctos hookeri could be functionally extinct in 23 years (Meynier, L 2009). There are many factors that are influencing this decline, some of which are listed below (figure 5):

Figure 5: Factors resulting in sea lion deaths (Roberts and Doonan 2014)

According to the New Zealand Department of Conservation, Phocarctos hookeri are listed as critical, while IUCN lists the species as vulnerable (Roberts and Doonan 2014). Governments, scientists and conservationists recognise that the Phocarctos hookeri are under severe threat from a range of resources, both natural and influenced by humans (Roberts and Doonan 2014). They need more protection, not less, if humans want to halt their decline towards extinction.

The World Wildlife Fund (WWF) want the native New Zealand mammals population to recover and for this to happen intense government action is needed, to take precautionary measures to limit the impact of fishing (Mckenzie, E et al. 2012). On June 2016 the government released a Threat Management Plan for the Phocarctos hookeri, following that in August 2016 the WWF-New Zealand made a submission to the government providing deep analysis and robust scientific research to address the human caused threats from fishing (Mckenzie, E et al. 2012).

'Sea lions don't have a voice, but humans do, speak out to save the sea lions'

Conclusion

In conclusion, the Phocarctos hookeri is the rarest sea lion species in the world and is the most threatened due to their declining numbers. It is struggling to establish population sizes, as it is susceptible to a numerous number of threats influencing their decline. Their reproduction rates are low, which is typical of a declining species, which emphasises the importance of managing what numbers are left. It is imperative that appropriate government policies are in place in order to save the Phocarctos hookeri from extinction.

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