Longline fisheries and their possible effect on Steller sea lions in the Russian side of the Bering Sea

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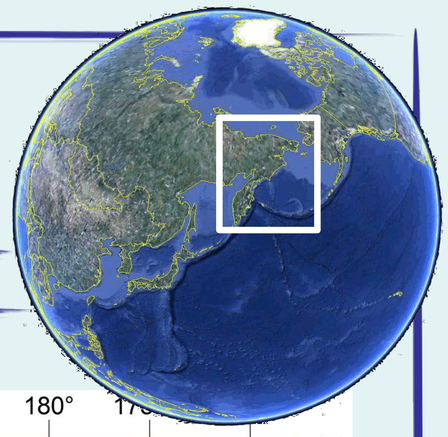


Introduction

Steller sea lions (SSL) have declined by 99% in the western part of the Bering Sea in the late 20th century and fisheries effects are one possible reason for this decline. We investigated the possible effect of longline fisheries on SSL mortality by interviewing fishermen and observing SSL-fishery interactions while working on fishing boats.

Methods

Fishermen were interviewed to investigate whether they observed SSL interactions with longline fisheries. Also, direct observations from longline fishing vessels were conducted in 2003, 2005, 2008, 2010 and 2013 while we worked as scientific observers during 1-4 months every year on fishing boats (Table 1). We collected various fishery related information and recorded presence-absence, and activity of SSLs near fishing vessels.

Results

Only 12 fishermen from a total of 112 that were interviewed participated in longline fisheries and all of them (100%) confirmed that SSL sometimes depredated in longline fishery. To protect the catch from SSL depredation ten respondents (83%) used guns and firecrackers as a deterrent. Observers were present during the fishery for a total of 199 days in the Western Bering Sea in 2003-2004 (November-January), 2008 (July-October), 2010 (July -October) and 2013 (July-August) (Table 1). SSLs were observed near the fishing vessels only 9 times: 7 in Karaginsky Gulf (one encounter in 2004 and six encounters in 2008) and 2 near Cape Navarin (Fig,1).

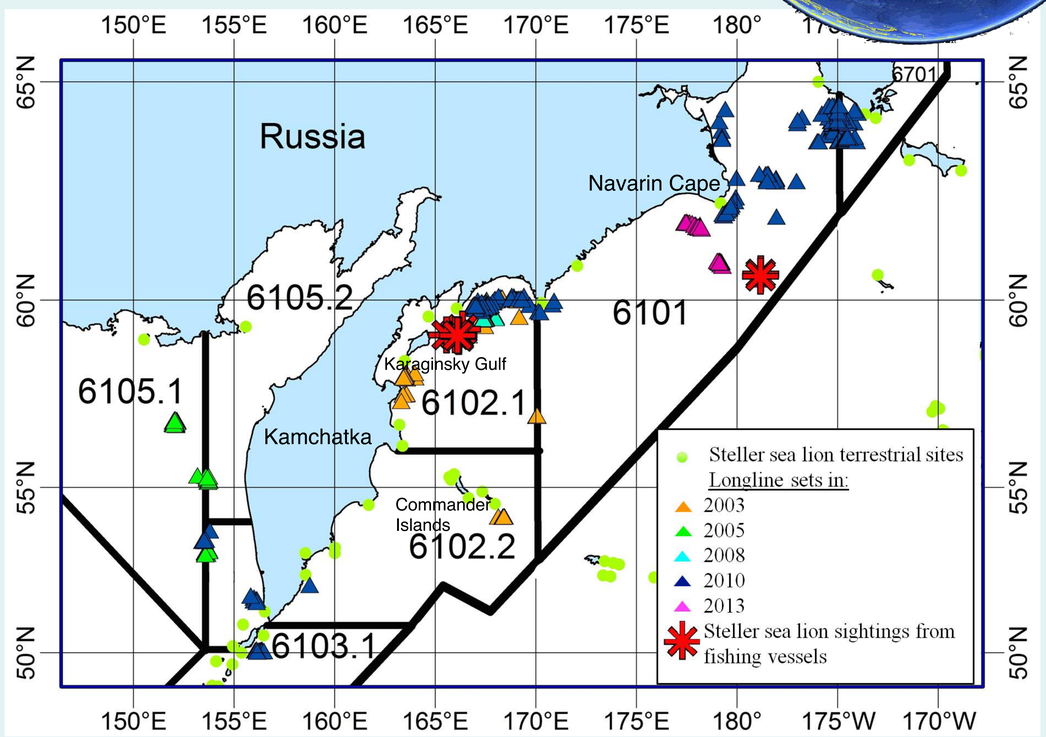


Fig.1.Locations of longline fishing sets and SSL sightings in our study.

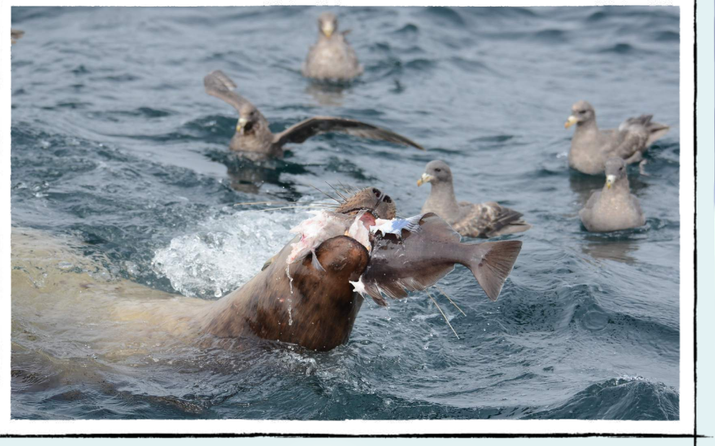
Total catch of groundfish species by longline fisheries in the western Bering Sea, eastern Kamchatka and eastern Okhotsk Sea in November-January 2003, April 2005, February-April 2008, July-October 2010 and July-August 2013 was 38,817 mt. The total catch of groundfish when the observers were on board was about 929 mt, which is 2.4% of the total catch. The minimum number of longline fishing vessels operating in the groundfish fisheries was 25 in 2003 and the maximum was 44 in 2010.

SSLs were seen in late fall and winter in Karaginsky Gulf in groups of up to 10 animals and two single individuals in summer 2013 near Navarin Cape. SSLs were consuming fish from the longline or foraged on fishery waste near vessels for a time period that ranged from 5 minutes to 2 hours. In 2013 the fisheries crew tried to haze SSLs using a gun, but SSLs moved farther from the vessel and continued foraging. The direct observation of longline fisheries in the western Bering Sea demonstrates that SSLs rarely approach the longline vessels.

Table.1. Summary of longline fisheries activity and SSL sightings.

Year	Season	Total num. of lonline fishing vessels	Total catch by longlines (mt)	Target fish	Effort, sets.	Catch (mt)	SSL sightings, times. num.	Total SSL seen, ind.
2003	November-January	25	2,987	Cod	120	106	1	2
2005	April	38	1,734	Halibut	61	32	0	0
2008	February-April	31	3,277	Cod, halibut, pollock	162	131	7	24
2010	July-October	44	2,2616	Cod	220	531	0	0
2013	July-August	39	8,203	Cod, halibut	114	129	2	2

Probably, the SSL - longline fishery interactions occurs more often in Karaginsky Gulf, where the fishery occurred mostly in winter. The number of injured and killed SSLs during the longline fishery in the western Bering Sea is probably low.



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