

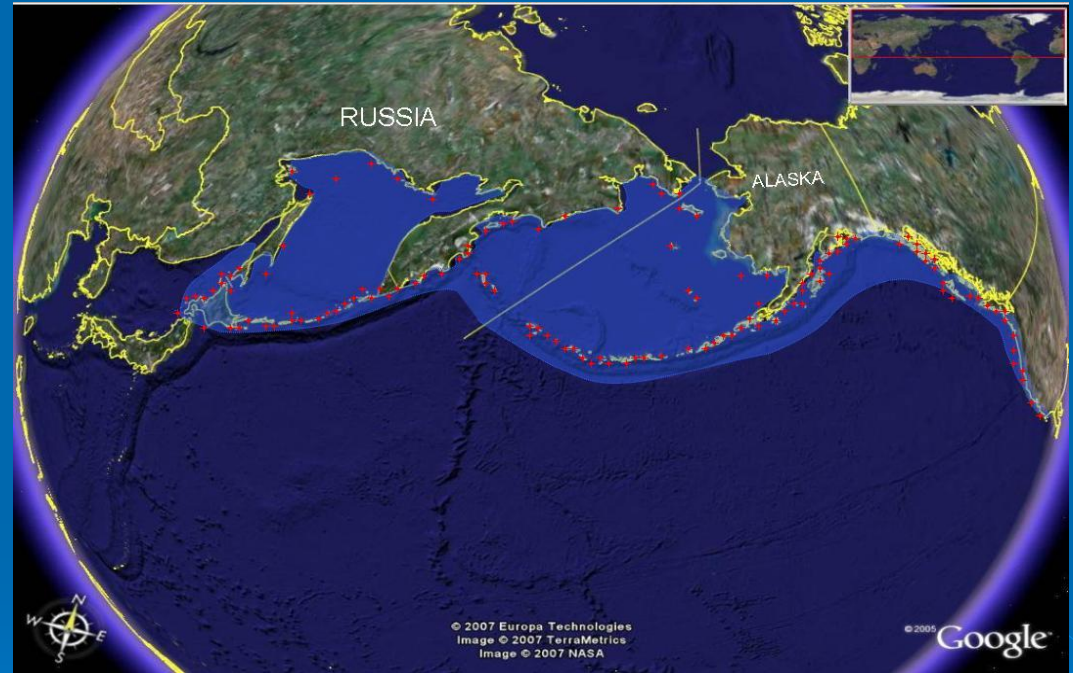
Ecological Role of Sea Lions as Predators, Competitors, and Prey



- **Sea Lion Species**
 - California Sea Lions (not listed) - increasing
 - Steller Sea Lions eDPS (threatened) – increasing (delisting review under way, June 2010)
 - Steller Sea Lions wDPS (endangered) - decreasing
- **Predators** – varied diet: fish, cephalopods, crustaceans
- **Competitors** – commercially-targeted longline and trawl species; ESA-listed salmon ESUs
- **Prey** – killer whales, some sharks

Population Size (2011 MM Stock Assessments, NMFS)

- California Sea Lion – 296,750; 153,337 minimum – CA, Mexico
- Steller Sea Lion, eDPS – 58,334-72,223 – CA, OR, WA, SE AK
- Steller Sea Lion.



Sea Lions as Predators

- Primarily Piscivorous
- Wide Variety of Prey
- Diet Varies Seasonally, by Age Group, by Sex, by Geographic Location
- Can Specialize
 - Eulachon in SE Alaska (eSSL)
 - Atka mackerel in Aleutians (wSSL)
 - Now salmon, sturgeon, lamprey in Columbia (eSSL)

SSL Sub-Region	Fishery Management Area	RCA	Primary Prey (% FO)	
			Summer	Winter
wAI	543	1		1.Atka mackerel (55)
cAI	542	2	1.Atka mackerel (96)	2.P. Cod (26)
		3	2.Salmon (17)	3.Irish Lord (23)
	541	4	3.Cephalopods (13)	4.Cephalopods (18)
eAI	610	5	4.Pollock (7)	5.Pollock (12)
		6	5.P. Cod (6)	6.Snailfish (12)
wGOA	620	7	1.Pollock (46)	1.Pollock (53)
		8	2.Salmon (38)	2.Atka mackerel (43)
cGOA	630	9	3.Herring (35)	3.P. Cod (39)
			4.Sand Lance (34)	4.Irish Lord (35)
eGOA	640	10	5.Atka mackerel (32)	5.Sandlance (28)
			6.Rock Sole (19)	6.Salmon (25)
cGOA	630	9	7.P. Cod (18)	7.Arrowtooth (21)
			1.Sandlance (65)	1.Pollock (93)
eGOA	640	10	2.Salmon (57)	2. P. Cod (31)
			3.Pollock (53)	3.Salmon (17)
cGOA	630	9	4.P. Cod (36)	4.Sandlance (17)
			5.Atka mackerel (21)	5.Arrowtooth (7)
eGOA	640	10	6.Arrowtooth (14)	1.Pollock (44)
			1.Salmon (56)	2.P. Cod (43)
cGOA	630	9	2.Pollock (46)	3.Sand Lance (38)
			3. Arrowtooth (45)	4. Arrowtooth (31)
eGOA	640	10	4.Sandlance (16)	5.Salmon (29)
			5.Capelin (13)	6.Irish Lord (17)
cGOA	630	9	6.Herring (12)	
			1.Salmon (84)	
eGOA	640	10	2.Sand Lance (39)	
			3.Herring (24)	
cGOA	630	9	4.Capelin (13)	
			5.Pollock (8)	
eGOA	640	10	6.P. Cod (5)	
			7.Arrowtooth (5)	not available

Sea Lions as Competitors

- With Commercial Fisheries; With Personal Use Fisheries; With Other Piscivores; With ESA Management Goals
- Seasonal Competition (e.g. salmon gillnet or seine fisheries; blackcod longline fisheries)
- Geographically Abundant or Locally Aggregated Competition (e.g. Atka mackerel in AI; herring in SE AK and GOA in spring; salmon in AI in summer; salmon at Bonneville)
- Year Round Competition (pollock, Pacific cod)

Sea Lions as Prey

- Killer Whales
- Sharks
- Human Harvest (Primarily AK, Russia)
 - SSL eDPS – 10/yr
 - SSL wDPS – 198/yr
- Fishery Interaction (Gear entanglement, Injury, Intentional)
 - CASL – 337/yr
 - SSL eDPS – 0.8/yr
 - SSL wDPS – 28.53/yr

Killer Whale Predation on Sea Lions

- 3 Ecotypes of Killer Whale
- Transient Ecotype Preys on Marine Mammals
 - E No. Pacific GOA, AI, BS Transient (552)
 - AT1 (PWS AK) (7)
 - West Coast Transient (BC, WA, OR, CA)(354)
- Other Ecotypes: Resident, Offshore
- Recent LHX Tag Studies, eGOA
 - 36 tagged wSSL, 16 mortalities
 - 14 of 16 killed by predator (transient KW or shark)
 - Horning and Mellish 2012: predation may impede recovery of wSSL in eGOA
- Killer Whales in the Columbia?
 - Pod in Hood Canal learned to specialize on harbor seals