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Appendix C Estimated Marine Mammal and  
Sea Turtle Impacts from Exposure to Acoustic  
and Explosive Stressors Under Navy Training  
Activities



**Gulf of Alaska Navy Training Activities  
Draft Supplemental Environmental Impact Statement/  
Overseas Environmental Impact Statement**

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## **Appendix C      Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training Activities**

Navy training activities would result in the incidental takes of marine mammals and sea turtles within the Study Area. The following appendix provides the estimated number of marine mammal and sea turtle impacts. Specifically, estimated impacts are derived from the quantitative analysis for activities under Alternative 1 that involve the use of acoustic or explosive stressors. The quantitative analysis takes into account Navy activities, marine species density layers, acoustic modeling, and other environmental parameters. A detailed explanation of the quantitative analysis is provided in the technical report *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing* (U.S. Department of the Navy, 2018). It is important to note that *impacts*, as discussed in this appendix, represent the estimated instances of take of marine mammals or sea turtles, not necessarily the number of individuals impacted (i.e., some marine mammals or sea turtles could be impacted several times, while others would not experience any impact).

The tables below represent the maximum estimated impacts under Alternative 1 for any given year. In addition, estimated impacts are provided over the duration of the Marine Mammal Protection Act (MMPA) Regulations and Letters of Authorization, which would be valid for a seven-year period. The No Action Alternative would not result in any impacts because the Proposed Action would not occur.

### **C.1      Estimated Marine Mammal Impacts from Sonar and Other Transducers Under Navy Training Activities**

Table C-1 provides a summary of the estimated number of marine mammal impacts by species stock from exposure to sonar and other transducers used during Navy training activities under Alternative 1 over the course of a year (annual maximum usage) and seven years.

Table C-1: Estimated Marine Mammals Impacts from Sonar Training Activities

Species	Stock	Alternative 1 – Annual			Alternative 1 – 7 Year		
		Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS
<b>Order Cetacea</b>							
<b>Suborder Mysticeti (baleen whales)</b>							
<b>Family Balaenopteridae (rorquals)</b>							
Blue whale*	Central North Pacific	0	3	0	0	21	0
	Eastern North Pacific	3	32	0	21	224	0
Fin whale*	Northeast Pacific	104	1,125	0	728	7,875	0
Humpback whale	California, Oregon, & Washington <sup>†</sup>	1	8	0	7	56	0
	Central North Pacific	4	66	0	28	462	0
	Western North Pacific <sup>†</sup>	0	0	0	0	0	0
Minke whale	Alaska	4	44	0	28	308	0
North Pacific right whale*	Eastern North Pacific	0	2	0	0	14	0
Sei whale*	Eastern North Pacific	2	34	0	14	238	0
<b>Family Eschrichtiidae (gray whale)</b>							
Gray whale	Eastern North Pacific	0	0	0	0	0	0
	Western North Pacific <sup>†</sup>	0	0	0	0	0	0

Table C-1: Estimated Marine Mammals Impacts from Sonar Training Activities (continued)

Species	Stock	Alternative 1 – Annual			Alternative 1 – 7 Year		
		Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS
<b>Suborder Odontoceti (toothed whales)</b>							
<b>Family Delphinidae (dolphins)</b>							
Killer whale	Alaska Resident	0	0	0	0	0	0
	AT1 Transient	0	0	0	0	0	0
	Eastern Pacific, Offshore	64	17	0	448	119	0
	Gulf of Alaska, Aleutian Island, & Bering Sea Transient	119	24	0	833	168	0
Pacific white-sided dolphin	North Pacific	1,102	472	0	7,714	3,304	0
<b>Family Phocoenidae (porpoises)</b>							
Dall's porpoise	Alaska	310	8,710	19	2,170	60,970	133
Harbor porpoise	Gulf of Alaska	0	0	0	0	0	0
	Southeast Alaska	0	0	0	0	0	0
<b>Family Physeteridae (sperm whale)</b>							
Sperm whale*	North Pacific	107	5	0	749	35	0
<b>Family Ziphiidae (beaked whales)</b>							
Baird's beaked whale	Alaska	106	0	0	742	0	0
Cuvier's beaked whale	Alaska	429	3	0	3,003	21	0
Stejneger's beaked whale	Alaska	467	15	0	3,269	105	0

Table C-1: Estimated Marine Mammals Impacts from Sonar Training Activities (continued)

Species	Stock	Alternative 1 – Annual			Alternative 1 – 7 Year		
		Behavioral Response	TTS	PTS	Behavioral Response	TTS	PTS
<b>Suborder Pinnipedia</b>							
<b>Family Otariidae (sea lions and fur seals)</b>							
California sea lion	U.S. Stock	0	0	0	0	0	0
Steller sea lion	Eastern U.S.	0	0	0	0	0	0
	Western U.S. <sup>†</sup>	0	0	0	0	0	0
Northern fur seal	Eastern Pacific	2,836	25	0	19,854	181	0
	California	58	1	0	405	4	0
<b>Family Phocidae (true seals)</b>							
Harbor seal	Cook Inlet / Shelikof Strait	0	0	0	0	0	0
	North Kodiak	0	0	0	0	0	0
	Prince William Sound	0	0	0	0	0	0
	South Kodiak	0	0	0	0	0	0
Northern elephant seal	California	898	1,634	0	6,286	11,438	0
Ribbon seal	Alaska	0	0	0	0	0	0

\*ESA-listed species (all stocks) within the TMAA. †Only designated stocks are ESA-listed.

Notes: PTS = permanent threshold shift, TTS = temporary threshold shift



## **C.2 Estimated Marine Mammal Impacts from Explosives Under Navy Training Activities**

Table C-2 provides a summary of the estimated number of marine mammal impacts from exposure to explosives used during Navy training activities under Alternative 1 over the course of a year (annual maximum usage) and seven years.

**Table C-2: Estimated Marine Mammals Impacts from Explosive Training Activities**

Species	Stock	Alternative 1 – Annual				Alternative 1 – 7 Year			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
<b>Order Cetacea</b>									
<b>Suborder Mysticeti (baleen whales)</b>									
<b>Family Balaenopteridae (rorquals)</b>									
Blue whale*	Central North Pacific	0	0	0	0	0	0	0	0
	Eastern North Pacific	1	0	0	0	7	0	0	0
Fin whale*	Northeast Pacific	11	2	2	0	77	14	14	0
Humpback whale	California, Oregon, & Washington <sup>†</sup>	1	0	0	0	7	0	0	0
	Central North Pacific	7	2	0	0	49	14	0	0
	Western North Pacific <sup>†</sup>	0	0	0	0	0	0	0	0
Minke whale	Alaska	2	0	0	0	14	0	0	0
North Pacific right whale*	Eastern North Pacific	1	0	0	0	7	0	0	0
Sei whale*	Eastern North Pacific	1	0	0	0	7	0	0	0
<b>Family Eschrichtiidae (gray whale)</b>									
Gray whale	Eastern North Pacific	0	0	0	0	0	0	0	0
	Western North Pacific <sup>†</sup>	0	0	0	0	0	0	0	0

Table C-2: Estimated Marine Mammals Impacts from Explosive Training Activities (continued)

Species	Stock	Alternative 1 – Annual				Alternative 1 – 7 Year			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
<b>Suborder Odontoceti (toothed whales)</b>									
<b>Family Delphinidae (dolphins)</b>									
Killer whale	Alaska Resident	0	0	0	0	0	0	0	0
	AT1 Transient	0	0	0	0	0	0	0	0
	Eastern Pacific, Offshore	0	0	0	0	0	0	0	0
	Gulf of Alaska, Aleutian Island, & Bering Sea Transient	0	0	0	0	0	0	0	0
Pacific white-sided dolphin	North Pacific	0	0	0	0	0	0	0	0
<b>Family Phocoenidae (porpoises)</b>									
Dall's porpoise	Alaska	38	229	45	0	266	1,603	315	0
Harbor porpoise	Gulf of Alaska	0	0	0	0	0	0	0	0
	Southeast Alaska	0	0	0	0	0	0	0	0
<b>Family Physeteridae (sperm whale)</b>									
Sperm whale*	North Pacific	0	0	0	0	0	0	0	0
<b>Family Ziphiidae (beaked whales)</b>									
Baird's beaked whale	Alaska	0	0	0	0	0	0	0	0
Cuvier's beaked whale	Alaska	1	0	0	0	7	0	0	0
Stejneger's beaked whale	Alaska	0	0	0	0	0	0	0	0

Table C-2: Estimated Marine Mammals Impacts from Explosive Training Activities (continued)

Species	Stock	Alternative 1 – Annual				Alternative 1 – 7 Year			
		Behavioral Response	TTS	PTS	Injury	Behavioral Response	TTS	PTS	Injury
<b>Suborder Pinnipedia</b>									
<b>Family Otariidae (sea lions and fur seals)</b>									
California sea lion	U.S. Stock	0	0	0	0	0	0	0	0
Steller sea lion	Eastern U.S.	0	0	0	0	0	0	0	0
	Western U.S. †	0	0	0	0	0	0	0	0
Northern fur seal	Eastern Pacific	0	0	0	0	0	0	0	0
	California	0	0	0	0	0	0	0	0
<b>Family Phocidae (true seals)</b>									
Harbor seal	Cook Inlet / Shelikof Strait	0	0	0	0	0	0	0	0
	North Kodiak	0	0	0	0	0	0	0	0
	Prince William Sound	0	0	0	0	0	0	0	0
	South Kodiak	0	0	0	0	0	0	0	0
Northern elephant seal	California	6	9	8	0	42	63	56	0
Ribbon seal	Alaska	0	0	0	0	0	0	0	0

\*ESA-listed species (all stocks) within the TMAA. †Only designated stocks are ESA-listed.

Notes: PTS = permanent threshold shift, TTS = temporary threshold shift

### **C.3 Estimated Sea Turtle Impacts from Sonar and Other Transducers Under Navy Training Activities**

Based on the quantitative analysis, no sea turtle impacts are anticipated from exposure to sonar and other transducers used during Navy training activities under Alternative 1 over the course of a year (annual maximum usage) or seven years.

### **C.4 Estimated Sea Turtle Impacts from Explosives Under Navy Training Activities**

Based on the quantitative analysis, no sea turtle impacts are anticipated from exposure to explosives used during Navy training activities under Alternative 1 over the course of a year (annual maximum usage) or seven years.

## **REFERENCES**

U.S. Department of the Navy. (2018). *Quantifying Acoustic Impacts on Marine Mammals and Sea Turtles: Methods and Analytical Approach for Phase III Training and Testing* (Technical Report prepared by NUWC Division Newport, Space and Naval Warfare Systems Center Pacific, G2 Software Systems, and the National Marine Mammal Foundation). Newport, RI: Naval Undersea Warfare Center.