

A review of direct and indirect impacts of marine dredging activities on marine mammals

Family	Scientific name (excluding subspecies)	Common name (including subspecies)	Range of best hearing (10 dB from max; kHz)	Frequency of minimum hearing threshold (kHz)	Minimum hearing threshold (dB re 1 µPa)	Methodology	Diet	Region	Habitat	Documented Effects of Dredging	Potential Effects of Dredging
Otariidae	<i>Arctocephalus pusillus</i>	Cape & Australian fur seal	Unknown; fundamental frequency of male in air barks is 0.14 & female in air barks is 0.15 (Tripovich <i>et al.</i> , 2008)	—	—	—	Fish (e.g. <i>Emmelichthys nitidus</i> , <i>Pseudophycis bachus</i> , <i>Trachurus declivis</i> , <i>Neoplatycephalus richardsoni</i>) (Australian fur seal) (Page <i>et al.</i> , 2005)	F, J (Kirkman <i>et al.</i> , 2007; IUCN, 2013; Perrin, 2013)	Continental shelf waters (IUCN, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
	<i>Arctophoca gazella</i>	Antarctic fur seal	Unknown; peak frequency of in air barks is 0.3–5.9 (Page <i>et al.</i> , 2002)	—	—	—	Fish (e.g. <i>Gymnoscopelus piabilis</i> , <i>Electrona subaspera</i> , <i>Champscephalus gunnari</i>) (Guinet <i>et al.</i> , 2001)	A, F, J (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Forage in deep waters (>500 m) with a strong chlorophyll concentration & steep bathymetric gradients, otherwise remains close to the colony in areas with Polar Fronts and high Sea Surface Temperature (SST) gradients (Guinet <i>et al.</i> , 2001)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
	<i>A. tropicalis</i>	Subantarctic fur seal	Unknown; frequency of female in air calls is 0.4–6 (Charrier <i>et al.</i> , 2003)	—	—	—	Fish (e.g. <i>Electrona paucirastra</i> , <i>Myctophum phengodes</i> , <i>Symbolophorus</i> spp., <i>Hygophum hansenii</i>) (Beauplet <i>et al.</i> , 2004)	F, J (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Oceanic waters with 14-16°C surface isotherms (Georges <i>et al.</i> , 2000)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
	<i>A. australis</i>	Falkland Islands, New Zealand, South American & Peruvian fur seal	Unknown; dominant frequency of in air growls is 0.4–0.7 (Phillips and Stirling, 2001)	—	—	—	Aves (<i>Eudyptula minor</i>), fish (e.g. <i>Emmelichthys nitidus</i>), cephalopods (e.g. <i>Nototodarus gouldi</i>) (New Zealand fur seal) (Page <i>et al.</i> , 2005)	F, J, K (Túnez <i>et al.</i> , 2007; IUCN, 2013; Perrin, 2013)	Forage near continental slope but have been known to travel far offshore (IUCN, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
	<i>A. galapagoensis</i>	Galápagos fur seal	Unknown; peak frequency of female in air pup attraction calls is 0.7–1.5 (Trillmich, 1981)	—	—	—	Fish (unspecified myctophid & bathylagid species) & cephalopods (e.g. <i>Onychoteuthis banksii</i>) (IUCN, 2012)	I, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Galápagos Archipelago but breeds mostly in western & northern areas (IUCN, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
	<i>A. philippii</i>	Juan Fernández & Guadalupe fur seal	Unknown; frequency of underwater vocalisations is 0.12–0.2 (Norris and Watkins, 1971)	—	—	—	Fish (e.g. <i>Symbolophorus</i> spp., <i>Myctophum phengodes</i> , <i>Lampanyctus</i> spp., <i>Protomyctophum</i> spp., <i>Scopelogadus</i> spp., <i>Citharichthys sordidus</i>) & cephalopods (e.g. <i>Onychoteuthis banksii</i> , <i>O. borealajaponica</i> , <i>Tremoctopus violaceus</i> , <i>Loligo opalescens</i> , <i>Gonatopsis</i> spp.) (Hanni <i>et al.</i> , 1997; Francis <i>et al.</i> , 1998)	H, I, K (Goldsworthy <i>et al.</i> , 2000; IUCN, 2013; Perrin, 2013; Peterson <i>et al.</i> , 1968; Rice, 1998)	Forage offshore (>500 km), mostly in waters with <10 m depth, but sometimes in water 50–90 m deep (Francis <i>et al.</i> , 1998; IUCN, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
	<i>Callorhinus ursinus</i>	Northern fur seal	2–28	—	—	Female, underwater, behavioural (Schusterman and Moore, 1978)	Fish (e.g. <i>Engraulis mordax</i> , <i>Merluccius productus</i> , <i>Cololabis saira</i>) & cephalopods (e.g. <i>Loligo opalescens</i> , <i>Onychoteuthis</i> spp.) (Perez and Bigg, 1986)	B, I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	In the North Pacific Transition Zone (NPTZ), generally in open ocean near seamounts, canyons, valleys & continental shelves but hauls out on rocky beaches (NOAA, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
	<i>Zalophus californianus</i>	California sea lion	1–>32	4	65	Male, underwater, behavioural (staircase) (Mulsow <i>et al.</i> , 2012)	Fish (e.g. <i>Engraulis mordax</i> , <i>Merluccius productus</i> , <i>Trachurus symmetricus</i> , <i>Sebastes</i> spp.) & cephalopods (e.g. <i>Loligo opalescens</i>) (Lowry <i>et al.</i> , 1991)	I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Shallow coastal & estuarine waters near sandy beaches, marina docks, jetties or buoys (NOAA, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
	<i>Z. wollebaeki</i>	Galápagos sea lion	Unknown; dominant frequency of in air female pup attraction calls is 0.3–0.6 (Trillmich, 1981)	—	—	—	Unspecified Clupeidae, myctophid & bathylagid fish & cephalopods (unspecified small squid) (IUCN, 2012)	I, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Galápagos Archipelago (IUCN, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic

<i>Eumetopias jubatus</i>	Western Steller & Loughlin's northern sea lion	5–10	5	15 dB re 20 μPa^{a}	Male, in-air, Auditory Steady State Response (ASSR) (Mulsow and Reichmuth, 2010)	Fish (e.g. <i>Pleurogrammus monopterygius</i> , <i>Theragra chalcogramma</i> , <i>Gadus macrocephalus</i> , <i>Merluccius productus</i>) & unspecified cephalopods (Merrick <i>et al.</i> , 1997)	B, I (IUCN, 2013; Perrin, 2013; Ridgway and Carder, 2001; Perrin <i>et al.</i> , 2009)	Colder temperate to subarctic waters, often found close to gravel, rocky, or sand beaches, near ledges & rocky reefs (NOAA, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic	
		5–14.1	10	7 dB re 20 μPa^{a}	Male, in-air, behavioural (staircase) (Mulsow and Reichmuth, 2010)						
		1–16	1 ^b	77 rms ^c	Male, underwater, behavioural (staircase) (Kastelein <i>et al.</i> , 2005)						
		16–25	25 ^b	73 rms ^c	Female, underwater, behavioural (staircase) (Kastelein <i>et al.</i> , 2005)						
<i>Neophoca cinerea</i>	Australian sea lion	Unknown; mean fundamental frequency of female in air calls is 0.53 (Charrier and Harcourt, 2006)	—	—	—	Prey on unspecified shallow water benthic animals (IUCN, 2012)	F (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Southwest & Southern coasts of Australia (IUCN, 2012)	No adverse reactions noted whilst dredging close to haul out sites in Geraldton, Western Australia (EPA, 2007)	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic	
<i>Phocarcctos hookeri</i>	New Zealand sea lion	—	—	—	—	Mammalia (<i>Arctocephalus forsteri</i>) (Bradshaw <i>et al.</i> , 1998), fish (e.g. <i>Caelorinchus</i> spp. <i>Hemerocoetes</i> spp. <i>Pseudophycis bachus</i>) & cephalopods (e.g. <i>Nototodarus sloanii</i> , <i>Enteroctopus zealandicus</i>) (Meynier <i>et al.</i> , 2009)	F (Childerhouse and Gales, 1998; IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Subantarctic waters of Southern New Zealand (IUCN, 2012) breeding on the Subantarctic islands (e.g. Auckland) (Chilvers, 2008)	Incidental capture in trawl nets of squid fishery (Chilvers, 2008)	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic	
<i>Otaria flavescens</i>	South American sea lion	Unknown; fundamental frequency of male in air high pitched calls is 0.3–0.5 (Fernández-Juricic <i>et al.</i> , 1999)	—	—	—	Opportunistic feeding on fish (e.g. <i>Merluccius hubbsi</i> , <i>Raneya brasiliensis</i>) & cephalopods (e.g. <i>Loligo gahi</i> , <i>Enteroctopus megalocyathus</i>) (Alonso <i>et al.</i> , 2000).	J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; Túnez <i>et al.</i> , 2007)	Widely distributed in coastal waters around South America (IUCN, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic	
Odobenidae	<i>Odobenus rosmarus</i>	Atlantic & Pacific walrus	1.5, 3–12	12	67	Male, underwater, behavioural (staircase) (Kastelein <i>et al.</i> , 2002b)	Gastropods (e.g. <i>Polinices</i> spp., <i>Neptunea</i> spp., <i>Buccinum</i> spp.), Bivalves (<i>Serripes</i> spp., <i>Hiatella</i> spp., <i>Yoldia</i> spp.) & unspecified polychaeta (Sheffield and Grebmeier, 2009)	B, H, I (Estes and Gilbert, 1978; IUCN, 2013; Lindqvist <i>et al.</i> , 2009; Perrin, 2013)	Remains close to sea ice, hauling out on ice floes, remote coastlines, islands & beaches (IUCN, 2012)	—	Habitat & feeding area destruction, disturbance of hauled out animals, avoidance or masking
Phocidae	<i>Erignathus barbatus</i>	Atlantic & Pacific bearded seal	Unknown; frequency range of vocalisations is 0.02–11 (Cleator <i>et al.</i> , 1989; Risch <i>et al.</i> , 2007; Stirling <i>et al.</i> , 1983)	—	—	—	Fish (e.g. <i>Boreogadus saida</i> , <i>Myoxocephalus Scorpius</i> , <i>Gymnocanthus tricuspis</i> , <i>Lycodes polaris</i> , <i>Arctogadus glacialis</i>), crustaceans (e.g. <i>Sclerocrangon boreas</i>) & gastropods (e.g. <i>Buccinum</i> spp.) (Finley and Evans, 1983)	B, H, I (IUCN, 2013; Perrin, 2013; Rice, 1998)	Arctic waters (<200 m), often with drifting sea ice (NOAA, 2012)	—	Habitat destruction & change to benthic environment will impact prey species; increased shipping, masking & avoidance
	<i>Phoca vitulina</i>	Eastern Atlantic, western Atlantic, Ungava, eastern Pacific, western Pacific common, or harbour seal	8–16	8	15 dB re 20 μPa^2 .s rms ^d	Female, in-air, Auditory Brainstem Response (ABR) (Wolski <i>et al.</i> , 2003)	Fish (e.g. <i>Merlangius merlangus</i> , <i>Solea solea</i> , <i>Callionymus lyra</i> , <i>Pomatoschistus minutus</i>) (Hall <i>et al.</i> , 1998)	B, C, H, I (IUCN, 2013; Perrin, 2013; Perrin <i>et al.</i> , 2009)	Around rocks, reefs, beaches & drifting glacial ice in temperate coastal waters (NOAA, 2012)	Increased shipping traffic & habitat alteration resulted in loss of haul out sites which possibly contributed to population size reductions in the Tess estuary (Woods, 2012)	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic

		6–12	8	8.1 dB re 20 $\mu\text{Pa}^2\text{s rms}^d$	Female, in-air, behavioural (staircase) (Wolski <i>et al.</i> , 2003)					
		6–14	12	14.7 dB re 20 $\mu\text{Pa}^2\text{s rms}^d$	Female, in-air, behavioural (constant stimuli) (Wolski <i>et al.</i> , 2003)					
		0.5–40	1	54 rms ^c	Female, underwater, behavioural (staircase) (Kastelein <i>et al.</i> , 2009)					
<i>P. largha</i>	Spotted seal, largha seal	Unknown; frequency of underwater growls, drums, snorts, chirps & barks is 0.5–3.5 (Beier and Wartzok, 1979)	—	—	—	Wide variety of fish (e.g. <i>Theragra chalcogramma</i> , <i>Arctogadus glacialis</i> , <i>Eleginus gracilis</i>) & unspecified cephalopods & crustaceans (IUCN, 2012)	B, I (IUCN, 2013; Perrin, 2013)	Arctic to subarctic open waters around the outer edges of moving ice floes but has been known to haul out on shore (NOAA, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
<i>Pusa hispida</i>	Arctic, Baltic, Okhotsk, Lake Ladoga & Saimaa ringed seal	—	44.9	69	Male, underwater, behavioural (staircase) (Terhune and Ronald, 1975*)	Fish (e.g. <i>Boreogadus saida</i> & unspecified Stichaeidae & Cottidae species), cephalopods (e.g. <i>Gonatus fabricii</i>) & crustaceans (e.g. <i>Parathemisto libellula</i> , <i>Gammarus wilkitzkii</i>) (Labansen <i>et al.</i> , 2007)	B, C, I (Heide-Jørgensen and Lydersen, 1998; IUCN, 2013; Perrin, 2013)	Arctic waters in ice floes & pack ice (NOAA, 2012)	No adverse reactions observed in ringed seals during industrial activities (including dredging) around Northstar Island, Alaska; possible habituation (Blackwell <i>et al.</i> , 2004)	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
		—	11.3–16	68	Female, underwater, behavioural (staircase) (Terhune and Ronald, 1975*)					
<i>P. caspica</i>	Caspian seal	—	—	—	—	A number of fish species (e.g. <i>Clupeonella</i> spp., <i>Atherina mochon</i> , <i>Neogobius caspius</i>) (IUCN, 2012)	E (IUCN, 2013; Palo and Väinölä, 2006; Perrin, 2013)	Caspian sea (IUCN, 2012)	—	Pollution, masking, decline in prey availability, habitat destruction, increased shipping traffic & an increased chance of collisions or injury
<i>P. sibirica</i>	Baikal seal	—	—	—	—	Fish (e.g. <i>Comephorus</i> spp., <i>Cottocomephorus</i> spp.) & crustaceans (<i>Macrohectopus branickii</i>) (Watanabe <i>et al.</i> , 2004)	M (IUCN, 2013; Palo and Väinölä, 2006; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Lake Baikal (IUCN, 2012)	—	Pollution & redistribution of toxins, masking, decline in prey availability & habitat destruction
<i>Halichoerus grypus</i>	Western Atlantic & eastern Atlantic grey seal	3–5, 12	4, 12	74	Male, in air, ABR (Ridgeway and Joyce, 1975*)	Fish (e.g. <i>Ammodytes</i> spp., <i>Merluccius bilinearis</i> , <i>Gadus morhua</i> , <i>Sebastes</i> spp., <i>Mallotus villosus</i>) (Bowen and Harrison, 1994)	B, C, D, H (Gladilina <i>et al.</i> , 2013; IUCN, 2013; Perrin, 2013; Bonner, 1981)	Cold coastal waters, near rocky coasts, islands, sandbars, ice shelves & icebergs (NOAA, 2012)	Increased shipping traffic & habitat alteration resulted in loss of haul out sites which possibly contributed to population size reductions in the Tess estuary (Woods, 2012); Possible short term avoidance to construction related vessel activity (Anderwald <i>et al.</i> , 2013)	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
		Animal 1: 20–30 Animal 2: 20–25	Animal 1: 20 Animal 2: 25	Animal 1: 62 Animal 2: 61	Female, underwater, ABR (Ridgeway and Joyce, 1975*)					
<i>Histiophoca fasciata</i>	Ribbon seal	Unknown; frequency of underwater sweeps & puffs 0.1–7.1 (Watkins and Ray, 1977)	—	—	—	Diet will vary with age. Adults (>2yrs) fish (e.g. <i>Pollachius</i> spp.) & cephalopods (unspecified squid and octopus) (IUCN, 2012)	B, I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	At sea or on thick, stable sea ice and ice floes with even surfaces (NOAA, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
<i>Pagophilus groenlandicus</i>	Harp seal	ca. 1.2–32 (est. from plot)	22.9	63	Female, underwater, behavioural (staircase) (Terhune and Ronald, 1972*)	Fish (e.g. <i>Gadus morhua</i> , <i>Clupea harengus</i> , <i>Reinhardtius hippoglossoides</i>) & crustaceans (<i>Pandalus borealis</i>) (Lawson and Hobson, 2000)	B, H (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Generally found around pack ice (NOAA, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic

<i>Cystophora cristata</i>	Hooded seal	Unknown; frequency of underwater vocalisations is <6 (Terhune and Ronald, 1973)	—	—	—	Fish (e.g., <i>Ammodytes</i> spp., <i>Boreogadus saida</i> , <i>Gadus morhua</i> , <i>Clupea harengus</i> , <i>Sebastes</i> spp.) (Hammill and Stenson, 2000)	B, H (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	In deep waters close to drifting pack ice (NOAA, 2012)	—	Habitat destruction, turbidity, prey alterations masking, incidental capture, avoidance & increase in shipping traffic
<i>Monachus monachus</i>	Mediterranean monk seal	Unknown; frequency range of in air vocalisations is 1–2.1 (Muñoz <i>et al.</i> , 2011)	—	—	—	Fish (e.g. <i>Mullus surmuletus</i> , <i>Dentex</i> spp., <i>Boops boops</i> , <i>Mugil cephalus</i>) (IUCN, 2012) & cephalopods (e.g. <i>Sepia officinalis</i> , <i>Eledone moschata</i> , <i>Bathypolypus sponsalis</i>) (Salman <i>et al.</i> , 2001)	G, H (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Warm temperate, subtropical & tropical waters with isolated haul out sites in sea caves & grottos (NOAA, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
<i>M. schauinslandi</i>	Hawaiian monk seal	12–28 (20 dB from max)	16	65	Male, underwater, behavioural (staircase) (Thomas <i>et al.</i> , 1990)	Fish (unspecified Labridae, Holocentridae, Balistidae, Scaridae, Ophichthidae Muraenidae & Congridae species), cephalopods (e.g. <i>Octopus cyanea</i> , <i>Ocythoe tuberculata</i> , <i>Haliphron atlanticus</i> , <i>Pterygioteuthis</i> spp.) & unspecified crustaceans (Goodman-Lowe, 1998)	I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; Ragen and Lavigne, 1999)	Warm subtropical waters near atolls, islands, submerged banks, deep water coral beds & sandy beaches (NOAA, 2012)	No adverse reactions of seals to bucket dredging at Tern Island, Individuals remained a safe distance away (Gilmartin, 2003)	Habitat destruction (coral reefs), change in prey availability, masking, incidental capture, avoidance & an increase in shipping traffic
<i>Mirounga leonina</i>	Southern elephant seal	Unknown; mean fundamental frequency of aggressive male vocalisations 0.025 (Sanvito and Galimberti, 2000)	—	—	—	Cephalopods (e.g. <i>Psychroteuthis glacialis</i> , <i>Gonatus antarcticus</i> , <i>Moroteuthis knipovitchi</i> , <i>Kondakovia longimana</i> , <i>Alluroteuthis antarcticus</i> , <i>Chiroteuthis veranyi</i> , <i>Brachioteuthis</i> spp., <i>Pareledone polymorpha</i> , <i>P. turqueti</i>) (Daneri <i>et al.</i> , 2000)	A, F, J (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Southern hemisphere, circumpolar distribution (IUCN, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
<i>M. angustirostris</i>	Northern elephant seal	3.2–15	6.3	43 dB re 20 µPa ^b	Female, in air, behavioural (staircase & constant stimuli) (Kastak and Schusterman, 1999)	Fish (e.g. <i>Merluccius productus</i> , <i>Sebastes</i> spp., <i>Coryphaenoides acrolapis</i>), cephalopods (e.g. <i>Octopoteuthis deletron</i>) & crustaceans (e.g. <i>Pleuroncodes planipes</i>) (Antonelis <i>et al.</i> , 1987)	I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Usually in deep water, diving between 330–800 m but hauls out on sandy beaches (NOAA, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
		3.2–45	6.4	58	Female, underwater, behavioural (staircase & constant stimuli) (Kastak and Schusterman, 1999)					
<i>Leptonychotes weddellii</i>	Weddell seal	Unknown; Frequency range of underwater vocalisations is 0.1–15 (Thomas and Kuechle, 1982; Thomas and Stirling, 1983; Thomas <i>et al.</i> , 1983; Thomas <i>et al.</i> , 1988b; Evans <i>et al.</i> , 2004; Morrice <i>et al.</i> , 1994)	—	—	—	Fish (e.g. <i>Trematomus bernacchii</i> , <i>Pleuragramma antarcticum</i> , <i>Trematomus newnesi</i>), cephalopods (e.g. <i>Psychroteuthis glacialis</i> , <i>Pareledone polymorpha</i>) & crustaceans (e.g. <i>Chorismus antarcticus</i> , <i>Notocrangon antarcticus</i>) (Lake <i>et al.</i> , 2003)	A, F, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Southern hemisphere species which is widespread in Antarctic waters & around pack ice (IUCN, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
<i>Ommatophoca rossii</i>	Ross seal	Unknown; frequency of vocalisations in air: 0.1–1 & underwater: 1–4 (Watkins and Ray, 1985)	—	—	—	Fish (e.g. <i>Pleuragramma antarcticum</i>) & unspecified cephalopods & crustaceans (IUCN, 2012)	A, F (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Seasonal variation in distribution but common in waters surrounding Antarctica; near pack ice in summer & open ocean in autumn (IUCN, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic

	<i>Lobodon carcinophaga</i>	Crabeater seal	Unknown; frequency of low moan: 0.26–2.5 & high moan: 1–4.9 (Klinck <i>et al.</i> , 2010)	—	—	—	Fish (e.g. <i>Pleuragramma antarcticum</i> , <i>Electrona Antarctica</i> , <i>E. carlsbergi</i>) & crustaceans (e.g. <i>Euphausia superba</i>) (Huckstadt <i>et al.</i> , 2012)	A, F (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Pack ice around Antarctica (IUCN, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
	<i>Hydrurga leptonyx</i>	Leopard seal	Unknown; ABR to 4kHz sound at 82 dB pe SPL ^e	—	—	Male, in air, ABR measurements taken for 1, 2 & 4 kHz (Tripovich <i>et al.</i> , 2011)	Mammalia (<i>Arctocephalus gazelle</i> , <i>Mirounga leonina</i>) & aves (<i>Pygoscelis papua</i> , <i>Eudyptes chrysolophus</i> , <i>Pelecanoides</i> spp., <i>Duption cupense</i>) (Walker <i>et al.</i> , 1998)	A, F (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Southern hemisphere in Antarctic & Subantarctic waters (IUCN, 2012)	—	Habitat destruction, increase in turbidity, changes to prey availability, masking, incidental capture or injury, avoidance & an increase in shipping traffic
Ursidae	<i>Ursus maritimus</i>	Atlantic & Pacific polar bear	—	11.2 (est. from plot)	58 (est. from plot)	Male, in air, AEP (Nachtigall <i>et al.</i> , 2007)	Mammalia (<i>Pusa hispida</i> , <i>Erignathus barbatus</i> , <i>Phoca largha</i> , <i>Histiophoca fasciata</i> , <i>Balaena mysticetus</i> , <i>Eschrichtius robustus</i> , <i>Delphinapterus leucas</i> & possibly <i>Odobenus rosmarus</i>) (Derocher <i>et al.</i> , 2002; Bentzen <i>et al.</i> , 2007)	B, H, I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Pelagic sea ice habitats & shallow continental shelf waters; Distribution & sea ice concentration (80% in spring, 65% in summer, 60% in autumn & 95% in winter) preferences vary with season as often seen nearer land in winter (Durner <i>et al.</i> , 2009)	—	Change in the availability of prey species
			—	Animal 1: 16 (est. from plot) Animal 2: 16 (est. from plot)	Animal 1: 59 (est. from plot) Animal 2: 62 (est. from plot)	Female, in air, AEP (Nachtigall <i>et al.</i> , 2007)					
Mustelidae	<i>Enhydra lutris</i>	Western, eastern & southern sea otter	0.125–32 (lower & upper frequency limits)	—	—	Unknown sex, in air, behavioural (Ghoul and Reichmuth, 2012)	Crustaceans (e.g. <i>Cancer</i> spp., <i>Pugettia</i> spp.), gastropods (e.g. <i>Tegula</i> spp., <i>Haliotis</i> spp.), bivalves (e.g. <i>Mytilus californianus</i>) & echinoidea (e.g. <i>Strongylocentrotus purpuratus</i>) (Estes <i>et al.</i> , 2003)	I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; Wilson <i>et al.</i> , 1991)	Sheltered near shore marine waters with kelp beds & rocky substrates; forage in waters < 30 m. (IUCN, 2012)	Removal of kelp beds by dredging possibly contributed to the decline in population size around Point Grenville, Washington (Lance <i>et al.</i> , 2004)	Avoidance & pollution or contamination of habitat due to disturbance of near shore areas (U.S. Fish and Wildlife USFWS, 1993); Masking, loss of prey species & destruction of kelp beds
	<i>Lontra felina</i>	Marine otter	—	—	—	—	Fish (e.g. <i>Eleginops maclovinus</i>), cephalopods (e.g. <i>Octopus vulgaris</i>) & crustaceans (e.g. <i>Taliepus dentatus</i> , <i>Petrolisthes desmarestii</i> , <i>Cancer edwardsii</i>) (Medina-Vogel <i>et al.</i> , 2004)	J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; Larivière and Walton, 1998; Vianna <i>et al.</i> , 2010)	South American Pacific coast (6–56°S); Feeds in aquatic habitats but shelters on land in areas with large rocks, caves & cracks; common on coasts with rocky shores but can be found up to 150 m offshore (Medina-Vogel <i>et al.</i> , 2006)	—	Destruction of habitat, loss of prey species & pollution
Balaenidae	<i>Eubalaena glacialis</i>	North Atlantic right whale	0.01–22	—	—	Predicted audiogram (Parks <i>et al.</i> , 2007)	Crustaceans (e.g. <i>Calanus finmarchicus</i>) (IUCN, 2012)	G, H (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciarra, 2006; Reeves <i>et al.</i> , 2002)	Temperate to sub-polar regions in shallow, coastal & shelf waters (NOAA, 2012)	—	Habitat avoidance, behavioural changes, masking & collisions
			—	0.1–0.4	—	Inferred from vocalisations (Erbe, 2002)					
	<i>E. japonica</i>	North Pacific right whale	Unknown; North Atlantic right whale could be used as proxy (Department of the Navy, 2011)	—	—	—	Crustaceans (e.g. <i>Calanus marshallae</i> , <i>Metridia</i> spp., <i>Neocalanus</i> spp., <i>Euphausia pacifica</i>) (Shelden <i>et al.</i> , 2005)	B, I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Temperate to sub-polar regions with shallow, coastal & shelf waters (NOAA, 2012); South-eastern Bering Sea slope, Gulf of Alaska slope, Unimak Pass & Aleutian Islands (Shelden <i>et al.</i> , 2005)	—	Habitat avoidance, behavioural changes, masking & collisions
	<i>E. australis</i>	Southern right whale	0.03–2.2	0.05–0.5	—	Inferred from vocalisations (Erbe, 2002)	Crustaceans (unspecified species of euphausiids & copepoda) (IUCN, 2012)	F, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Feeds in cold, nutrient rich higher latitude waters & breeds in shallow, warm, lower latitude waters (NOAA, 2012)	Collision with a dredging vessel (Best <i>et al.</i> , 2001)	Habitat avoidance, behavioural changes, masking & collisions
	<i>Balaena mysticetus</i>	Bowhead whale	0.02–5	0.1–0.5	—	Inferred from vocalisations (Erbe, 2002)	A number of prey species including crustaceans (e.g. <i>Limnocalanus macrurus</i> , <i>Mysis oculata</i>) (Pomerleau <i>et al.</i> , 2011)	B, I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Arctic ocean & adjacent seas in ice free waters during summer & near ice between autumn & spring (NOAA, 2012)	Avoidance, shorter surfacing times & reduced number of blows (Erbe, 2002; Richardson <i>et al.</i> , 1990); Altered dive duration, increased surface swim speed & cessation of feeding (Richardson <i>et al.</i> , 1990)	Habitat avoidance, alterations to surfacing behaviour & masking

Neobalaenidae	<i>Caperea marginata</i>	Pygmy right whale	Unknown; frequency of underwater vocalisations is 0.06–0.135 (Dawbin and Cato, 1992)	—	—	—	Crustaceans (unspecified species of calanoida & euphausiids) (Kemper, 2002)	F, J, K (Fordyce and Marx, 2013; IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Southern hemisphere temperate waters (Brownell <i>et al.</i> , 1989)	—	Habitat avoidance, behavioural changes, masking & collisions
Eschrichtiidae	<i>Eschrichtius robustus</i>	Gray whale	0.02–4.5	0.02–1.2	—	Inferred from vocalisations (Erbe, 2002)	Crustaceans (e.g. <i>Ampelisca agassizi</i> , <i>A. careyi</i> & unspecified species of mysida) (Dunham and Duffus, 2002)	B, F, G, I, J (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002; Weller <i>et al.</i> , 2002; Scheinin <i>et al.</i> , 2011)	Shallow coastal waters (NOAA, 2012)	Abandonment of critical habitat (Tyack, 2008; Bryant <i>et al.</i> , 1984)	Habitat destruction around feeding grounds (Weller <i>et al.</i> , 2004), habitat avoidance, masking & behavioural changes
Balaenopteridae	<i>Megaptera novaeangliae</i>	Humpback whale	0.7–10	2–6	—	Predicted audiogram (Houser <i>et al.</i> , 2001)	Fish (e.g. <i>Scomber</i> spp., <i>Sardinella</i> spp.) & crustaceans (unspecified species of euphausiids) (Mikhalev, 1997)	A, B, F, G, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002; Schevill, 1964; Frantzis <i>et al.</i> , 2004)	Feeds in cold, productive coastal waters and calves in warm, shallow waters around reefs, islands & continental shelves (NOAA, 2012)	Movement away from habitat (Borggaard <i>et al.</i> , 1999)	Noise pollution, habitat degradation, behavioural alterations, masking of conspecifics at close range (<1 km), alterations to migration routes & avoidance (Lammers <i>et al.</i> , 2001)
	<i>Balaenoptera acutorostrata</i>	Common, North Atlantic & North Pacific minke whale	0.03–7.5	—	—	Middle Ear Transfer Function (METF) (Tubelli <i>et al.</i> , 2012)	Fish (e.g. <i>Clupea harengus</i> , <i>Mallotus villosus</i> & unspecified Ammodytidae species) (Haug <i>et al.</i> , 1995a; Pierce <i>et al.</i> , 2004); In spring mainly fish but in summer & autumn diet consists of fish & crustaceans (e.g. <i>Thysanoessa</i> spp.) (Haug <i>et al.</i> , 1995b)	A, B, C, D, F, G, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002)	Cooler temperate, tropical & subtropical waters in coastal, inshore & oceanic regions (NOAA, 2012); shallow shelf waters (<= 200 m) (Hooker <i>et al.</i> , 1999)	Change in distribution & movement away from habitats possibly caused by changes to prey distribution & habitat destruction (by dredging) (Borggaard <i>et al.</i> , 1999; Tetley, 2004). Possible short term avoidance to construction related vessel activity (Anderwald <i>et al.</i> , 2013)	Increased shipping traffic (Broker and Ilangakoon, 2008), masking & behavioural alterations
	<i>B. bonaerensis</i>	Antarctic minke whale	—	—	—	—	Feed mainly on crustaceans (e.g. <i>Euphausia superba</i>) in the Antarctic but diet is unknown elsewhere (IUCN, 2012)	A, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Southern hemisphere in pack ice and near the ice edge in summer, distribution is unknown in winter (IUCN, 2012)	—	Behavioural alterations & masking
	<i>B. edeni</i>	Bryde's whale	—	0.07–0.9	—	Inferred from vocalisations (Erbe, 2002)	Fish (e.g. <i>Engraulis japonicas</i> , <i>Scomber</i> spp., <i>Vinciguerria nimbaria</i> , <i>Auxis rochei</i>), cephalopods (e.g. <i>Todarodes pacificus</i>) & crustaceans (e.g. <i>Euphausia</i> spp., <i>Thysanoessa gregaria</i> , <i>Nematoscelis difficilis</i>), (Tamura <i>et al.</i> , 2009)	F, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; Wada <i>et al.</i> , 2003; Mead and Brownell Jr, 2005)	Highly productive tropical & subtropical warm temperate waters (16–20° C) (NOAA, 2012)	—	Behavioural alterations & masking
	<i>B. omurai</i>	Omura's whale	—	—	—	—	Unknown (IUCN, 2012)	F, I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Deep & inshore waters of the Solomon sea & in waters around Southern Japan (IUCN, 2012)	—	Increased shipping traffic, behavioural alterations & possible masking
	<i>B. borealis</i>	Northern & southern sei whale	—	1.5–3.5	—	Inferred from vocalisations (Erbe, 2002)	Fish (e.g. <i>Engraulis japonicas</i> , <i>Cololabis saira</i> , <i>Scomber</i> spp.) & crustaceans (e.g. <i>Neocalanus</i> spp., <i>Calanus</i> spp., <i>Euphausia</i> spp., <i>Thysanoessa gregaria</i>) (Tamura <i>et al.</i> , 2009)	A, B, F, G, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002)	Subtropical to subpolar continental shelf & deep oceanic waters (NOAA, 2012)	—	Behavioural alterations & masking
	<i>B. physalus</i>	Northern, southern, & pygmy fin whale	0.02–0.15	—	—	Inferred from vocalisations (Erbe, 2002)	Crustaceans (e.g. <i>Nyctiphanes simplex</i>) (Tershy <i>et al.</i> , 1993)	A, B, F, G, H, I, J, K (IUCN, 2013; Perrin, 2013)	Deep, offshore temperate to polar regions but can also be found in tropical waters (NOAA, 2012)	—	Habitat avoidance & masking

	<i>B. musculus</i>	Northern, southern, northern Indian & pygmy blue whale	8–25	0.02	—	Inferred from vocalisations (Erbe, 2002)	Crustaceans (e.g. <i>Thysanoessa spinifera</i> , <i>Euphausia pacifica</i>) (Croll <i>et al.</i> , 1998; Fiedler <i>et al.</i> , 1998)	A, B, F, H, I, J, K (IUCN, 2013; Perrin, 2013; Rice, 1998; Branch <i>et al.</i> , 2007)	Coastal subpolar waters in spring & subtropical waters in autumn (NOAA, 2012); Cold, productive, well-mixed water, foraging off shelf edge (Fiedler <i>et al.</i> , 1998)	—	Increased shipping traffic (Broker and Hlangakoon, 2008), behavioural alterations & masking
Physeteridae	<i>Physeter macrocephalus</i>	Sperm whale	2.5–60	5–20	—	Neonate male, underwater, ABR (Ridgway and Carder, 2001)	Fish (e.g. <i>Sebastes</i> spp.) & cephalopods (e.g. <i>Onykia robusta</i> , <i>Histioteuthis</i> spp., <i>Octopoteuthis deletron</i>) (Smith and Whitehead, 2000; Flinn <i>et al.</i> , 2002)	A, B, F, G, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002)	Usually found in deep water (250 – 750 m) (Hooker <i>et al.</i> , 1999); Females often in low latitude oceanic waters (>= 1000 m, SST > 15°C) but males migrate towards the poles where older males are often found near the edge of pack ice (NOAA, 2012)	—	Increased shipping traffic (Broker and Hlangakoon, 2008), changes to cephalopod availability or distribution
Kogiidae	<i>Kogia breviceps</i>	Pygmy sperm whale	90–150	—	—	Female, in air, ABR (Ridgway and Carder, 2001)	Occasional fish species (e.g. <i>Chauliodus sloani</i>) but mostly cephalopods (e.g. <i>Histioteuthis revers</i> , <i>H. bonnellii</i> , <i>Lepidoteuthis grimaldi</i> , <i>Todarodes sagittatus</i> , <i>Teuthowenia megalops</i>) (Santos <i>et al.</i> , 2006)	F, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Tropical, subtropical & temperate waters beyond the continental shelf towards the open ocean (NOAA, 2012); Temperate & tropical Pacific, Atlantic and Indian Oceans (Santos <i>et al.</i> , 2006)	—	Changes to cephalopod availability or distribution & increased shipping traffic
	<i>K. sima</i>	Dwarf sperm whale	—	—	—	—	Cephalopods (e.g. <i>Enoploteuthis chunii</i> , <i>Taonius pavo</i> , <i>Histioteuthis Miranda</i>) (Wang <i>et al.</i> , 2002)	F, G, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002)	Warm tropical, subtropical & temperate waters near the continental shelf (NOAA, 2012)	—	Increased shipping traffic (Broker and Hlangakoon, 2008) & changes to prey availability
Ziphiidae	<i>Ziphius cavirostris</i>	Cuvier's beaked whale	Unknown; frequency of echolocation clicks is 15–80 (peak at 40) (Zimmer <i>et al.</i> , 2005)	—	—	—	Cephalopods (<i>Taonius pavo</i> , <i>T. sagittatus</i> , <i>Histioteuthis</i> spp., <i>Mastigoteuthis schmidtii</i> , <i>Octopoteuthis sicula</i>), (Santos <i>et al.</i> , 2007; Blanco and Raga, 2000)	F, G, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002; MacLeod <i>et al.</i> , 2005)	Deep temperate, subtropical & tropical continental shelf waters (>1000 m) with steep underwater features (banks, seamounts, submarine canyons), currents, current boundaries or core rings (NOAA, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
	<i>Berardius arnuxii</i>	Arnoux's beaked whale	Unknown; mean frequency of whistles is 1–8.5 (Rogers and Brown, 1999)	—	—	—	Unknown, but likely to be similar to other beaked whales so mainly cephalopod species (IUCN, 2012)	A, F, J, K (MacLeod <i>et al.</i> , 2005; IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002)	Circumpolar in the southern hemisphere in deep, subpolar & temperate waters (IUCN, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
	<i>B. bairdii</i>	Baird's beaked whale	Unknown; peak frequency of clicks is 22–25 (Dawson <i>et al.</i> , 1998)	—	—	—	Varies with region but diet consists mainly of fish (e.g. <i>Laemonema longipes</i> , <i>Antimora microlepis</i> , <i>Coryphaenoides</i> spp.) & cephalopods (e.g. <i>Berryteuthis magister</i> , <i>Gonatus</i> spp.) (Walker <i>et al.</i> , 2002)	B, I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; MacLeod <i>et al.</i> , 2005)	Cold, deep oceanic waters (>=1000 m), submarine canyons, seamounts & continental shelves (NOAA, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
	<i>Tasmacetus shepherdi</i>	Shepherd's beaked whale	—	—	—	—	Fish (unspecified Zoarcidae species) & unspecified cephalopods & crustaceans (IUCN, 2012)	A, F, K (Holyoake <i>et al.</i> , 2013; IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Southern Ocean in cold temperate deep waters (Pitman <i>et al.</i> , 2006)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
	<i>Indopacetus pacificus</i>	Longman's beaked whale	Unknown; frequency of clicks is 15–25 (Rankin <i>et al.</i> , 2011)	—	—	—	Cephalopods (e.g. <i>Taonius pavo</i> , <i>Onykia loennbergi</i> ; <i>Onychoteuthis borealijaponica</i> , <i>Chiroteuthis picteti</i> , <i>Histioteuthis</i> spp.) (Yatabe <i>et al.</i> , 2010)	F, H, I, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; MacLeod <i>et al.</i> ,	Deep pelagic tropical & subtropical waters (21–31° C, >1000 m) (NOAA, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic

<i>Hyperoodon ampullatus</i>	Northern bottlenose whale	Unknown; peak frequency of deep water clicks is 21–25 & shallow water clicks is 4–21 (Hooker and Whitehead, 2002)	—	—	—	—	Cephalopods (e.g. <i>Gonatus steenstrupi</i> , <i>Taonius pavo</i> , <i>Teuthowenia</i> spp. & <i>Histioteuthis reversa</i>) (Hooker <i>et al.</i> , 2001)	B, C, G, H (IUCN, 2013; Lick and Piatkowski, 1998; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002)	Cold, deep (>2000 m), temperate to subarctic oceanic waters with steep underwater structures (submarine canyons, seamounts, continental slopes) (NOAA, 2012); Deep offshore water of North Atlantic, often in the submarine canyon 'the Gully' (Hooker <i>et al.</i> , 2001)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
<i>H. planifrons</i>	Southern bottlenose whale	—	—	—	—	—	Cephalopods (e.g. <i>Taonius pavo</i> , <i>Gonatus antarcticus</i> , <i>Onykia ingens</i> , <i>Kondakovia longimana</i>) (MacLeod <i>et al.</i> , 2003)	A, F, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Epipelagic, shelf waters of the Southern Ocean; Around the Antarctic Circumpolar Current (ACC) & associated frontal regions with hydrographic canyons (Santora and Brown, 2010)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
<i>Mesoplodon hectori</i>	Hector's beaked whale	—	—	—	—	—	Cephalopods (e.g. <i>Octopoteuthis deletron</i>) (MacLeod <i>et al.</i> , 2003)	F, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; MacLeod <i>et al.</i> , 2005)	Cool, temperate waters of the southern hemisphere & deep waters of the Atlantic & Indian Oceans (IUCN, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
<i>M. mirus</i>	True's beaked whale	—	—	—	—	—	Unspecified fish & cephalopods (e.g. <i>Teuthowenia</i> spp.) (MacLeod <i>et al.</i> , 2003)	F, I, J, K (MacLeod <i>et al.</i> , 2005; IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Warm, deep temperate waters (NOAA, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
<i>M. europaeus</i>	Gervais' beaked whale	20–80/90	40	ca. 95 (est. from plot)	Female, underwater, AEP (Finneran <i>et al.</i> , 2009)	Fish (e.g. <i>Chauliodus</i> spp., <i>Lampadena</i> spp.) & cephalopods (e.g. <i>Taonius pavo</i>) (Santos <i>et al.</i> , 2007)	G, H, J (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002; MacLeod <i>et al.</i> , 2005)	Deep tropical, subtropical & warm temperate waters, but can also occur in colder temperate areas (NOAA, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic	
<i>M. bidens</i>	Sowerby's beaked whale	Unknown; mean peak frequency of clicks is 26–67 (Cholewiak <i>et al.</i> , 2013)	—	—	—	—	Fish (unspecified Merlucciidae & Gadidae species) (MacLeod <i>et al.</i> , 2003)	B, C, G, H (MacLeod <i>et al.</i> , 2005; IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002)	Deep, cold temperate & subarctic waters, sometimes near ice pack (NOAA, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
<i>M. grayi</i>	Grey's beaked whale	—	—	—	—	—	Fish (e.g. <i>Lampadena</i> spp.) & unspecified cephalopods (IUCN, 2012) (MacLeod <i>et al.</i> , 2003)	A, F, H, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; MacLeod <i>et al.</i> , 2005)	Cool, temperate waters of the southern hemisphere in Antarctic and subantarctic waters (IUCN, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
<i>M. perrini</i>	Perrin's beaked whale	—	—	—	—	—	Cephalopods (e.g. <i>Octopoteuthis</i> spp.) (IUCN, 2012)	I (MacLeod <i>et al.</i> , 2005; IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Oceanic, deep waters of southern & central California (IUCN, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
<i>M. peruvianus</i>	Pygmy beaked whale	—	—	—	—	—	Fish (e.g. <i>Notoscopelus resplendens</i> & other unspecified species) (MacLeod <i>et al.</i> , 2003)	F, I, K (MacLeod <i>et al.</i> , 2005; IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> ,	Eastern Pacific in warm temperate & tropical waters (IUCN, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic

<i>M. bowdoini</i>	Andrew's beaked whale	—	—	—	—	Data deficient but suspected to feed on cephalopods (IUCN, 2012)	F, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; MacLeod <i>et al.</i> , 2005)	Indian & South Pacific Ocean; suspected circumpolar distribution in southern hemisphere (IUCN, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
<i>M. traversii</i>	Spade-toothed beaked whale	—	—	—	—	Unknown, but suspected to feed on cephalopods (IUCN, 2012)	F, K (MacLeod <i>et al.</i> , 2005; IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Southern hemisphere, around New Zealand and Chile (IUCN, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
<i>M. carlhubbsi</i>	Hubbs' beaked whale	Unknown; peak frequency of clicks is 1.77 (Martens, 2000; Lynn and Reiss, 1992; Buerki <i>et al.</i> , 1989**)	—	—	—	Fish (e.g. <i>Chauliodus macouni</i> , <i>Poromitra crassiceps</i> , <i>Ichthyos lockingtoni</i> , <i>Melamphaes acanthomus</i>) & cephalopods (e.g. <i>Gonatus</i> spp., <i>Onychoteuthis borealijaponica</i> , <i>Octopoteuthis deletron</i> , <i>Histioteuthis dofeini</i> , <i>Mastigoteuthis pyrodes</i>) (Mead <i>et al.</i> , 1982)	I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; MacLeod <i>et al.</i> , 2005)	North Pacific Ocean (IUCN, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
<i>M. ginkgodens</i>	Ginkgo-toothed beaked whale	—	—	—	—	Diet unknown but likely to feed on cephalopods and possibly some fish (IUCN, 2012)	I, K (Brownell <i>et al.</i> , 2013; Dalebout <i>et al.</i> , 2012; IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; MacLeod <i>et al.</i> , 2005)	Indo-Pacific Ocean in both temperate & tropical waters (IUCN, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
<i>M. hotaula</i>	Deraniyagala's beaked whale ^f	Unknown; possible mean peak frequency of FM pulses is 40.5 (Baumann-Pickering <i>et al.</i> , 2010b) ^g	—	—	—	Diet unknown but likely to feed on cephalopods and some fish (Brownell <i>et al.</i> , 2013)	F, I (Brownell <i>et al.</i> , 2013; Dalebout <i>et al.</i> , 2012)	Most often associated with Palmyra Atoll, Line Islands; at sea range more restricted than <i>M. ginkgodens</i> (Brownell <i>et al.</i> , 2013)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
<i>M. stejnegeri</i>	Stejneger's beaked whale	—	—	—	—	Cephalopods (e.g. <i>Gonatus pyros</i> , <i>Belonella borealis</i> , <i>Berryteuthis</i> spp.) (MacLeod <i>et al.</i> , 2003)	B, I (MacLeod <i>et al.</i> , 2005; IUCN, 2013; Perrin, 2013)	Deep, cold temperate & subarctic waters (750–1,500 m) beyond the continental slope (NOAA, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
<i>M. layardii</i>	Strap-toothed whale	—	—	—	—	Cephalopods (e.g. <i>Taonius pavo</i> , <i>Histioteuthis</i> spp., <i>Teuthoweinia pellucida</i> , <i>Chiroteuthis</i> spp., <i>Gonatus antarcticus</i> , <i>Mastigoteuthis</i> spp.) (MacLeod <i>et al.</i> , 2003)	A, F, J, K (IUCN, 2013; Perrin, 2013; MacLeod <i>et al.</i> , 2005)	Deep, temperate waters of the southern hemisphere (IUCN, 2012)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic
<i>M. densirostris</i>	Blainville's beaked whale	40–50	50	48.9	Male, underwater, AEP (Pacini <i>et al.</i> , 2011)	Unspecified fish & cephalopods (<i>Octopoteuthis sicula</i> , <i>Histioteuthis reversa</i> , <i>H. meleagroteuthis</i> , <i>Taonius pavo</i>) (Santos <i>et al.</i> , 2007)	F, G, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; MacLeod <i>et al.</i> , 2005)	Deep, offshore tropical to temperate continental shelf waters with steep undersea structures (seamounts, submarine canyons, banks, continental slope) (NOAA, 2012); oceanic water (136–1319 m) with gradients (68–296 m/km) and where the Deep Water Boundary Current (DWBC) is forced towards the surface (MacLeod and Zuur, 2005)	—	Change to behavioural (surfacing, feeding) patterns, avoidance & increased shipping traffic

Platanistidae	<i>Platanista gangetica</i>	Ganges & Indus South Asian river dolphin	—	—	—	—	Freshwater fish 3.5–20 cm in size (e.g. <i>Cirrhinus reba</i> , <i>Mastacembelus armatus</i>) (Bashir <i>et al.</i> , 2010)	L (Committee on taxonomy, 2012; IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Shallow fresh & brackish murky waters (<30 m) but in the main river channels, tributaries & lakes during the flood season (NOAA, 2012); Ganges river in deep water pools or confluence areas (11.9–30.6° C, pH 9.1–20.8) (Bashir <i>et al.</i> , 2010)	Small, isolated populations susceptible to habitat loss from activities such as dredging (Harwood, 2001)	Increased turbidity & downstream sedimentation but an increase in counter-current habitats could be beneficial (Smith and Reeves, 2000); Habitat loss
Iniidae	<i>Inia geoffrensis</i>	Boto & Orinoco bufeo Amazon river dolphin	75–90	—	50 dB re 1 dyn/cm ² h	Male, underwater, behavioural (staircase) (Jacobs and Hall, 1972)	Freshwater fish between 40–117 mm in length (e.g. <i>Semaprochilodus kneri</i>) (McGuire and Winemiller, 1998)	N (Committee on taxonomy, 2012; IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Freshwater (Amazon river) in confluence areas with rocks, sandbanks (Leatherwood <i>et al.</i> , 2000) & habitat heterogeneity (McGuire and Winemiller, 1998); often close to river edge & in low current areas (confluences, bays, floating vegetation) where sediment-rich waters meet acidic black water (Martin <i>et al.</i> , 2004)	Small, isolated populations susceptible to habitat loss from activities such as dredging (Harwood, 2001)	Increased turbidity from downstream sedimentation & habitat loss
	<i>I. boliviensis</i>	Bolivian bufeo	—	—	—	—	Varied, broad diet including fish (unspecified Doradidae, Heptapteridae Auchenipteridae & Characidae species) (Aliaga-Rossel <i>et al.</i> , 2010)	N (IUCN, 2013; Perrin, 2013; Tavera <i>et al.</i> , 2010)	Rivers & isolated water bodies of Bolivia including the upper Madeira basins, Tijamuchi and Ibare rivers (Aliaga-Rossel and Quevedo, 2011)	—	Increase in boat traffic, pollution & isolation of small populations
Pontoporiidae	<i>Pontoporia blainvillei</i>	Franciscana, La Plata dolphin	Unknown; frequency of clicks is 130–149 (peak at 139) (Melcón <i>et al.</i> , 2012)	—	—	—	Fish (e.g. <i>Cynoscion guatucupa</i> , <i>Trichiurus lepturus</i> , <i>Paralonchurus brasiliensis</i> , <i>Anchoa marmorata</i> , <i>Urophycis brasiliensis</i> , <i>Stellifer rastrifer</i>) & cephalopods (e.g. <i>Loligo sanpaulensis</i>) (Basso, 2005)	J (IUCN, 2013; Perrin, 2013; Crespo <i>et al.</i> , 1998)	Tropical & temperate marine or estuarine shallow waters (6–35 m) but also present in deeper waters up to 55–60 m (Danilewicz <i>et al.</i> , 2009)	—	Habitat loss, isolation of small populations, increased sedimentation & turbidity
Monodontidae	<i>Monodon monoceros</i>	Narwhal	Unknown; frequency of clicks is 24–95 (peak at 48) (Miller <i>et al.</i> , 1995)	—	—	—	Fish (e.g. <i>Boreogadus saida</i>), cephalopods (e.g. <i>Gonatus</i> spp.) & crustaceans (e.g. <i>Pandalus</i> spp.) (Laidre and Heide-Jørgensen, 2005)	B, H, I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Usually in high Arctic in summer and low Arctic in winter, remaining in cold (0–1.5°C), deep (0–2300 m) waters (Laidre <i>et al.</i> , 2004); Northeast Canada & in the fjords of northwest Greenland in summer; home ranges vary between 3,400 km ² in summer & 12,000 km ² in winter (Heide-Jørgensen <i>et al.</i> , 2002)	—	Possible habitat avoidance or increased shipping traffic & changes to prey availability
	<i>Delphinapterus leucas</i>	Beluga, white whale	32–108 Animal 1: 50–70 Animal 2: 25–35	54 Animal 1: 50 Animal 2: 32–34	54.6 Animal 1: 43 Animal 2: 52	Male, underwater, AEP (Klishin <i>et al.</i> , 2000) Male, underwater, behavioural (staircase) (Finneran <i>et al.</i> , 2005);	Diet varies with distribution but includes fish (e.g. <i>Arctogadus glacialis</i> & unspecified Salmonidae & Clupeidae species) & unspecified cephalopods (IUCN, 2012)	B, H, I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Northern hemisphere generally spending summer in fjords & estuaries before moving to wintering grounds (IUCN, 2012)	Avoidance of habitat in response to industrial noise including dredging (Hoffman, 2010)	Habitat avoidance
Delphinidae	<i>Cephalorhynchus commersonii</i>	Commerson's dolphin	Unknown; peak frequency of clicks is 132 (Kyhn <i>et al.</i> , 2010)	—	—	—	Fish (e.g. <i>Odontheistes</i> spp., <i>Sprattus fuegensis</i> , <i>Merluccius hubbsi</i> , <i>M. australis</i> , <i>Salilota australis</i> , <i>Micromesistius australis</i>) & cephalopods (e.g. <i>Illex argentinus</i> , <i>Loligo gahi</i>), (Ricciardelli <i>et al.</i> , 2010)	A, F, J, K (IUCN, 2013; Perrin, 2013; Rice, 1998; de Bruyn <i>et al.</i> , 2006; Branch <i>et al.</i> , 2007)	Coastal & shallow continental shelf waters around the Patagonian shelf (Ricciardelli <i>et al.</i> , 2010)	—	Changes to behaviour, increased boat traffic & changes to prey distribution
	<i>C. eutropia</i>	Chilean dolphin	Unknown; peak frequency of clicks is 126.3 (Gotz <i>et al.</i> , 2010)	—	—	—	Fish (e.g. <i>Engravilis ringens</i> , <i>Clupea bentincki</i> , <i>Genypterus chilensis</i>) & cephalopods (e.g. <i>Loligo gahi</i>) (Torres <i>et al.</i> , 1992)	K (IUCN, 2013; Perrin, 2013; Ribeiro <i>et al.</i> , 2007)	Coasts or rivers, (5–10 m) (Ribeiro <i>et al.</i> , 2007); Close to shore (<500 m) in shallow areas (<20 m depth) with estuarine influence (Heinrch, 2006)	—	Changes to behaviour as a result of increased boat traffic & possible isolation of important areas of habitats

<i>C. heavisidii</i>	Heaviside's dolphin	Unknown; peak frequency of clicks is 125 (Morisaka <i>et al.</i> , 2011)	—	—	—	Diet is relatively specialised & consists of mainly fish (e.g. <i>Merluccius</i> spp., <i>Sufflogobius bibarbatus</i> , <i>Trachurus trachurus capensis</i>) & some unspecified cephalopods (Elwen <i>et al.</i> , 2009)	J (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; Findlay <i>et al.</i> , 1992)	Coastal waters off the west coast of South Africa remaining inshore during the day and moving offshore at night (Elwen <i>et al.</i> , 2006)	—	Changes to behaviour, increased boat traffic & changes to prey distribution
<i>C. hectori</i>	South Island & North Island Hector's dolphin	Unknown; peak frequency of clicks is 129 (Kyhn <i>et al.</i> , 2009)	—	—	—	Fish (e.g. <i>Pseudophycis bachus</i> , <i>Auchenoceros punctatus</i> , <i>Sprattus</i> spp., <i>Peltorhamphus</i> spp., <i>Lampanyctodes hectoris</i>) & cephalopods (e.g. <i>Nototodarus</i> spp.) (Miller <i>et al.</i> , 2012)	F (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Coastal waters off New Zealand (Bejder and Dawson, 2001); habitat selection varies with location (East or West coast) & season (summer or winter) but common in waters with <39 m depth, <4 m visibility & >14°C (Brager <i>et al.</i> , 2003)	—	Disturbance from increased shipping traffic & noise levels, destruction & alteration of habitat, redistribution of prey species & remobilisation of contaminants (Slooten <i>et al.</i> , 2011)
<i>Steno bredanensis</i>	Rough-toothed dolphin	Unknown; frequency range of whistles is 2.2–13.9 (de Lima <i>et al.</i> , 2012; Norris and Evans, 1967**; Busnel and Dziedzic, 1966**)	—	—	—	Fish (e.g. <i>Pranesus insularum</i> , <i>Tylosurus crocodilus</i> , <i>Atherinops affinis</i> , <i>A. californiensis</i> , <i>Macrorhamphosus scolopax</i>) & cephalopods (e.g. <i>Ommastrephes bartrami</i> , <i>Onychoteuthis borealijaponica</i> , <i>Tremoctopus violaceus</i> , <i>Loligo plei</i>) (West <i>et al.</i> , 2011)	D, F, G, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002)	Deep, warm, temperate or tropical waters (NOAA, 2012)	—	Increased shipping traffic, possible masking & noise pollution, habitat alterations & changes to prey availability
<i>Sousa teuszii</i>	Atlantic humpback dolphin	Unknown; fundamental frequency of whistles is 2.5–23.5 (Weir, 2010)	—	—	—	Fish (e.g. <i>Pristipoma jubelini</i> , <i>Ethmalosa fimbriata</i> , <i>Mugil</i> spp.) (Van Waerebeek <i>et al.</i> , 2004)	H, J (IUCN, 2013; Mendez <i>et al.</i> , 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Coastal & estuarine waters of the tropical & subtropical eastern Atlantic & in the near shore waters of West Africa (Van Waerebeek <i>et al.</i> , 2004)	—	Habitat degradation, restricted use of habitat & increased vessel traffic (Weir <i>et al.</i> , 2011)
<i>S. chinensis</i>	Indo-Pacific humpback dolphin	20–120 (20 dB from max)	45	47 rms ^c	Male, underwater, AEP (Li <i>et al.</i> , 2012)	Fish (e.g. <i>Nematalosa</i> spp., <i>Sardinella</i> spp., <i>Thryssa</i> spp., <i>Apogon</i> spp., <i>Johnius</i> spp., <i>Otolithes ruber</i> , <i>Pomadasys</i> spp., <i>Sillago</i> spp., <i>Sphyraena</i> spp., <i>Trichiurus</i> spp., <i>Platycephalus</i> spp.) (Parra and Jedensjo, 2009)	F, I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; Jefferson and Karczmarski, 2001)	Shallow (<15 m) inshore waters (<400 m from shore), often in association with reefs (Karczmarski <i>et al.</i> , 2000) or close to river mouths, dredged channels or breakwaters (Parra, 2006)	Direct loss of habitat (Dungan <i>et al.</i> , 2011)	Increased shipping traffic (Broker and Ilangakoon, 2008) & loss of habitat
<i>S. Plumbea</i>	Indian humpback dolphin	—	—	—	—	Fish in family Sciaenidae (Baldwin <i>et al.</i> , 2002)	F (Jefferson and Waerebeek, 2004; Mendez <i>et al.</i> , 2013)	Low energy shallow waters of Arabian Gulf with soft sediments (Baldwin <i>et al.</i> , 2002)	—	Increased shipping traffic & loss of habitat
<i>Sotalia fluviatilis</i>	Tucuxi	40–90	80	59	Unknown sex, underwater, ABR (Popov and Supin, 1990)	Fish (e.g. <i>Diapterus</i> spp., <i>Eucinostomus</i> spp., <i>Pseudopeneus maculatus</i> , <i>Pomadasys corvinaeformis</i> , <i>Myrichthys ocellatus</i>) & cephalopods (e.g. <i>Octopus</i> spp., <i>Loligo plei</i> , <i>Lolliguncula brevis</i>) (de Gurjão <i>et al.</i> , 2003)	H, J, N (Reeves <i>et al.</i> , 2002; IUCN, 2013; Perrin, 2013)	Low current areas (confluences, bays, floating vegetation) where sediment-rich water meets acidic black water; Often seen close to river edges (Martin <i>et al.</i> , 2004); or sandbanks with deep pools (Leatherwood <i>et al.</i> , 2000)	Small, isolated populations susceptible to habitat loss (Harwood, 2001)	Habitat destruction & isolation
<i>S. guianensis</i>	Guiana dolphin	64–105	85	50	Male, underwater, behavioural (staircase) (Sauerland and Dehnhardt, 1998)	Fish (e.g. <i>Trichiurus lepturus</i> , <i>Micropogonias furnieri</i> , <i>Isopisthus parvipinnis</i>) & cephalopods (e.g. <i>Lolliguncula brevis</i>) (Daura-Jorge <i>et al.</i> , 2011)	H, J (IUCN, 2013; Perrin, 2013)	Central & South American coastal waters (<5 m), often in Guanabara Bay & south-eastern Brazil where waters are between 2–35m deep (Azevedo <i>et al.</i> , 2007)	Habitat avoidance (Cremer <i>et al.</i> , 2011)	Habitat destruction (Cremer <i>et al.</i> , 2011) & isolation of small populations
<i>Tursiops truncatus</i>	Common & Black Sea bottlenose dolphin	20–50	50	69.7	Male, in air, AEP (Schlundt <i>et al.</i> , 2007)	Opportunistic feeders, with diet of fish (e.g. <i>Merluccius merluccius</i> , <i>Conger conger</i> , <i>Cepola rubescens</i> , <i>Pagellus erythrinus</i> , <i>Trachurus</i> spp.) & cephalopods (e.g. <i>Octopus vulgaris</i> , <i>Eledone moschata</i> , <i>Loligo vulgaris</i> , <i>Todarodes sagittatus</i> , <i>T. eblanae</i> , <i>Rondeletiola minor</i> , <i>Sepia</i>	C, D, F, G, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Wells and Scott, 1999)	Temperate & tropical waters in both coastal & offshore areas (NOAA, 2012)	—	Altered feeding patterns (Lammers <i>et al.</i> , 2001), increased shipping traffic (Broker and Ilangakoon, 2008) & potential disturbance to the nursing behaviour of more isolated coastal populations (Stockin <i>et al.</i> , 2006)
		ca. 20–100 (est. from plot: mean)	ca. 30–40 (est. from plot: mean)	ca. 50–60 (est. from plot: mean)	Male & female, in air, AEP (Finneran <i>et al.</i> , 2008)					
		10–50	50	67.9	Male, in air, behavioural (constant stimulus)					

					(Schlundt <i>et al.</i> , 2007)	<i>elegans</i> (Blanco <i>et al.</i> , 2001)				
		16–32	32	38.9 (average)	Male & female, underwater, AEP (Tarakanov <i>et al.</i> , 2005)					
		10–50	20	79.7 (mean)	Male & female, underwater, AEP (Houser and Finneran, 2006)					
<i>T. aduncus</i>	Indo-Pacific bottlenose dolphin	Unknown; centroid frequency of clicks is 91 (Wahlberg <i>et al.</i> , 2011)	—	—	No	Fish (<i>Uroconger lepturus</i> , <i>Apogon apogonides</i> , <i>Lethrinus crocineus</i> , <i>Lutjanus fulvus</i>) & cephalopods (<i>Sepioteuthis lessoniana</i> , <i>Loligo duvauceli</i> , <i>Sepia latimanus</i>) (Amir <i>et al.</i> , 2005)	F, I (IUCN, 2013; Perrin, 2013)	Shallow habitats (<4.0 m) with sea grasses; In colder months often in deeper (>6.0 m) waters with sand or silt sediments; habitat use is a trade-off between food availability and shark predation risk (Heithaus and Dill, 2002); forage near shore, but rest in deeper water (Amir <i>et al.</i> , 2005)	—	Behavioural alterations, increased shipping traffic & disturbance to feeding or nursing
<i>Stenella attenuata</i>	Offshore & coastal pantropical spotted dolphin	Unknown; frequency range of whistles is 9–20 (Oswald <i>et al.</i> , 2004)	—	—	—	Fish (e.g. <i>Symbolophorus</i> spp., <i>Myctophum aurolaternatum</i> , <i>Lampanyctus parvicauda</i> , <i>Lampadena luminosa</i> , <i>Diaphus splendidus</i> , <i>Cubiceps pauciradiatus</i> , <i>Bregmaceros bathymaster</i>) & cephalopods (e.g. <i>Ommastrephes bartrami</i> , <i>Onychoteuthis banksi</i> , <i>Abraliopsis affinis</i> , <i>Mastigoteuthis dentate</i> , <i>Leachia dislocata</i>) (Robertson and Chivers, 1997)	F, H, I, J, K (IUCN, 2013; Perrin, 2013; Escorza-Trevino <i>et al.</i> , 2005)	Spends daytime in shallower water (90 – 300 m) but moves to deeper water at night (NOAA, 2012)	—	Disruption of feeding patterns (Lammers <i>et al.</i> , 2001), behavioural alterations or changes to prey availability
<i>S. frontalis</i>	Atlantic spotted dolphin	Unknown; peak frequency of clicks is 40.3 (Lammers <i>et al.</i> , 2003)	—	—	—	Unspecified fish & cephalopod species (IUCN, 2012)	G, H, J (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002)	Tropical to warm temperate coastal or continental shelf waters (20–250 m) but occasionally in deeper oceanic regions (NOAA, 2012)	—	Possible disruption of feeding (Lammers <i>et al.</i> , 2001), habitat avoidance & behavioural alterations
<i>S. longirostris</i>	Gray's, eastern, central American & dwarf spinner dolphin	Unknown; peak frequency of clicks is 32.2 (Lammers <i>et al.</i> , 2003)	—	—	—	Fish (e.g. <i>Melamphae</i> spp., <i>Scopeloberyx</i> spp., <i>Scopelogadus</i> spp.) & cephalopods (<i>Abraliopsis</i> spp.) (Dolar <i>et al.</i> , 2003)	F, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Deep oceanic tropical & subtropical waters; Spends daytime in bays or protected areas but moves to deeper waters at night (NOAA, 2012)	—	Noise, habitat degradation, disturbance of behavioural cycles, (migration or feeding) (Lammers <i>et al.</i> , 2001), increased shipping traffic (Broker and Ilangakoon, 2008) & habitat avoidance
<i>S. clymene</i>	Clymene dolphin	Unknown; frequency range of whistles is 6–19 (Nachtigall <i>et al.</i> , 2000)	—	—	—	Opportunistic feeders (Fertl <i>et al.</i> , 1997); diet includes fish (e.g. <i>Ceratoscopelus</i> spp., <i>Lampanyctus</i> spp., <i>Symbolophorus</i> spp.) & unspecified cephalopods (Perrin <i>et al.</i> , 1981)	H, J (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Deep tropical, subtropical & warm temperate oceanic waters (250–5,000 m) (NOAA, 2012)	—	Habitat alterations & changes to prey distribution
<i>S. coeruleoalba</i>	Striped dolphin	29–123	64	42	Female, underwater, behavioural (staircase) (Kastelein <i>et al.</i> , 2003)	Fish (e.g. <i>Notoscopelus kroyeri</i> , <i>Micromesistius poutassou</i> , <i>Trisopterus</i> spp., <i>Atherina presbyter</i>) & cephalopods (e.g. <i>Alloteuthis</i> spp., <i>Sepia officinalis</i>) (Spitz <i>et al.</i> , 2006)	D, F, G, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Deep (> 1000 m), oceanic, highly productive tropical warm to temperate waters (10–26° C) with steep inclines (Hooker <i>et al.</i> , 1999) & upwelling (NOAA, 2012)	—	Noise pollution, habitat degradation & behavioural alterations
<i>Delphinus delphis</i>	Short-beaked & Black Sea common dolphin	ca. 36–80 (est. from plot)	ca. 60–70 (est. from plot)	ca. 53 (est. from plot)	Male, underwater, AEP (Popov and Klislin, 1998)	Fish (<i>Maurolicus muelleri</i> , <i>Bentosema glaciale</i> , <i>Myctophum punctatum</i> , <i>Notoscopelus kroyeri</i> , <i>Sardina pilchardus</i> , <i>Micromesistius poutassou</i> , <i>Merluccius merluccius</i>), cephalopods (e.g. <i>Ancistroteuthis lichtensteini</i> , <i>Gonatus steenstrupi</i> ,	D, F, G, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006)	Oceanic, offshore, continental slope waters between 200–2,000m; deep; cool temperate to warm tropical regions (10–28° C) & often associated with upwelling areas & the Gulf Stream (NOAA, 2012)	—	Habitat alterations & changes to prey distribution

							<i>Brachioteuthis riisei</i>) & crustaceans (<i>Meganyctiphanes norvegica</i> , <i>Sergestes arcticus</i>) (Pusineri <i>et al.</i> , 2007; Santos <i>et al.</i> , 2013)				
<i>D. capensis</i>	Long-beaked & Indo-Pacific common dolphin	Unknown; frequency range of whistles is 8.4–16.2 (Oswald <i>et al.</i> , 2007b; Roch <i>et al.</i> , 2011)	—	—	—	—	Fish (e.g. <i>Merluccius productus</i>) & cephalopods (e.g. <i>Loligo opalescens</i>) (Osnes-Erie, 1999)	F, H, I, J, K (IUCN, 2013; Perrin, 2013)	Shallow, tropical, subtropical & warmer temperate waters, often 90–180 km from the coast near the continental shelf (NOAA, 2012)	—	Habitat alterations & changes to prey distribution
<i>Lagenodelphis hosei</i>	Fraser's dolphin	Unknown; frequency range of whistles is 6.6–23.5 (Oswald <i>et al.</i> , 2007a)	—	—	—	—	Fish (e.g. <i>Diretmoides parini</i> , <i>Melamphae</i> spp., <i>Scopeloberyx</i> spp., <i>Scopelogadus</i> spp., <i>Caelorinchus</i> spp.) & cephalopods (<i>Abraliopsis</i> spp., <i>Onychoteuthis banksi</i> , <i>Histioteuthis miranda</i>) (Dolar <i>et al.</i> , 2003)	F, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Warm temperate, subtropical to tropical pelagic waters (>1000 m) in areas of upwelling (NOAA, 2012)	—	Increased shipping traffic, habitat destruction, changes to prey availability & coastal pollution
<i>Lagenorhynchus albirostris</i>	White-beaked dolphin	45–128	50–64	45.3–47.8	Male, underwater, AEP (Nachtigall <i>et al.</i> , 2008)	—	Fish (e.g. <i>Merlangius merlangus</i> , <i>Gadus morhua</i> , <i>Melanogrammus aeglefinus</i>) (Jansen <i>et al.</i> , 2010)	B, C, H (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Shallow cold temperate & sub polar oceanic waters (<200 m) & the offshore waters of north eastern U.S. Atlantic coast (NOAA, 2012)	—	Behavioural changes, increased shipping, alterations to prey availability & avoidance due to increased noise levels
<i>L. acutus</i>	Atlantic white-sided dolphin	Unknown; frequency range of squeals is 1–24 (Steiner, 1981; Schevill and Watkins, 1962)	—	—	—	—	Fish (e.g. <i>Clupea</i> spp., <i>Gadus</i> spp.) & unspecified species of cephalopods & crustaceans (IUCN, 2012)	B, C, G, H (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002)	Around continental slopes of temperate oceanic waters (NOAA, 2012) with cool SST) & depths over 200 m (Hooker <i>et al.</i> , 1999)	—	Increased shipping & possible avoidance or behavioural alterations due to increased noise levels
<i>L. obliquidens</i>	Pacific white-sided dolphin	2–128	64	64	Female, underwater, behavioural (staircase) (Tremel <i>et al.</i> , 1998)	—	Fish (e.g. <i>Clupea pallasii</i> , <i>Oncorhynchus gorbuscha</i> , <i>O. nerka</i>) (Heise, 1996)	I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Continental shelf & oceanic temperate waters (NOAA, 2012)	—	Behavioural changes, increased shipping & alterations to prey availability
<i>L. obscurus</i>	African, South American, Peruvian/Chilean & New Zealand dusky dolphin	Unknown; frequency of echolocation clicks is 30–130 (Au and Wursig, 2004)	—	—	—	—	Fish (e.g. <i>Engraulis anchoita</i>) & cephalopods (e.g. <i>Loligo gahi</i>) (Alonso <i>et al.</i> , 1998; Benoit-Bird <i>et al.</i> , 2004)	F, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Two distinct habitat types: One in deep Kaikoura canyon waters, foraging when Deep Scattering Layer (DSL) is within 125 m of surface & in shallow, near shore waters of Admiralty Bay (Benoit-Bird <i>et al.</i> , 2004)	—	Increased shipping traffic, changes to behaviour or avoidance of coastal habitat due to increased noise levels & habitat destruction
<i>L. australis</i>	Peale's dolphin	Unknown; peak frequency of clicks is 126 (Kyhn <i>et al.</i> , 2010)	—	—	—	—	Fish (e.g. <i>Odonthestes</i> spp., <i>Patagonotothen sima</i> , <i>P. tessellata</i>) (Ricciardelli <i>et al.</i> , 2010)	J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Shallow near shore waters (Heinrch, 2006) off the South American coast (near Tierra del Fuego) & in protected channels & fjords with giant kelp (<i>Macrocystis pyrifera</i>) beds but can be found in pelagic & continental shelf waters towards northern end of range (Ricciardelli <i>et al.</i> , 2010)	—	Increased boat traffic, avoidance of inshore habitats, changes to prey distribution, habitat destruction & pollution
<i>L. cruciger</i>	Hourglass dolphin	Unknown; peak frequency of clicks is 126 (Kyhn <i>et al.</i> , 2009)	—	—	—	—	Fish (e.g. <i>Merluccius hubbsi</i>), cephalopods (e.g. <i>Semirossia tenera</i> , <i>Loligo gahi</i>) & crustaceans (<i>Heterosquilla</i> spp.) (Fernández <i>et al.</i> , 2003)	A, F, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Offshore oceanic cold Antarctic & subantarctic waters, close to the Antarctic Convergence 50–60° S (Ricciardelli <i>et al.</i> , 2010)	—	Behavioural changes, increased shipping & alterations to prey availability
<i>Lissodelphis borealis</i>	Northern right whale dolphin	Unknown; peak frequency of clicks is 31.3 (Rankin <i>et al.</i> , 2007)	—	—	—	—	Fish (unspecified Myctophidae species) & cephalopods (e.g. <i>Loligo opalescens</i>) (IUCN, 2012)	I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Cold, deep temperate waters (<19° C) near the continental slope (NOAA, 2012); cool, deep offshore waters (8–19° C) & inshore coastal waters of the California Current System (CCS) (Jefferson <i>et al.</i> , 1994)	—	Mainly pelagic but seasonal movements shore wards may put increase risk from human activities (including dredging) at certain times (Jefferson <i>et al.</i> , 1994); alterations of habitat or prey availability

<i>L. peronii</i>	Southern right whale dolphin	—	—	—	—	Fish (e.g. <i>Micromesistius australis</i> , <i>Coelorinchus fasciatus</i> , <i>Ilucoetes fimbriatus</i>) & cephalopods (<i>Illex argentinus</i> , <i>Loligo gahi</i> , <i>Onykia ingens</i>) (Riccialdelli <i>et al.</i> , 2010)	A, F, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Cool, deep offshore waters (1–20°C) but at times can be near shore (Jefferson <i>et al.</i> , 1994); subantarctic (35–65° S), sub-tropical & Antarctic convergences & around Patagonian shelf-slope (Riccialdelli <i>et al.</i> , 2010)	—	Mainly pelagic but seasonal movements shore wards may put them at higher risk from human activities at certain times (Jefferson <i>et al.</i> , 1994); alterations of habitat or prey availability
<i>Grampus griseus</i>	Risso's dolphin	22.5–90	90	49.5	Infant male, underwater, AEP (Nachtigall <i>et al.</i> , 2005)	Fish (e.g. <i>Micromesistius australis</i> , <i>Sprattus fuegensis</i> , & Myctophidae species), cephalopods (e.g. <i>Argonauta argo</i> , <i>Loligo vulgaris reynaudii</i> , <i>Onykia ingens</i> , <i>Loligo gahi</i> , <i>Illex argentinus</i> , <i>Todarodes sagittatus</i> , <i>Ommastrephes bartramii</i>) & unspecified molluscs (Riccialdelli <i>et al.</i> , 2010; Blanco <i>et al.</i> , 2006)	C, D, F, G, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002)	Temperate, sub-tropical & tropical waters (>1000 m; 10–30°C) beyond the continental shelf; northern Gulf of Mexico (GoM) in areas with steep topography but prefer shallower, coastal waters in northern Europe (NOAA, 2012)	—	Avoidance or behavioural alterations due to increased boat traffic & elevated noise levels, & possible changes to prey distribution
		4–64	8	63.7	Female, underwater, behavioural (staircase) (Nachtigall <i>et al.</i> , 1995*)					
<i>Peponocephala electra</i>	Melon-headed whale	Unknown; median peak frequency of clicks is 24.4–29.7 (Baumann-Pickering <i>et al.</i> , 2010a)	—	—	—	Cephalopods (unspecified squid species) (Van Waerebeek <i>et al.</i> , 2008)	F, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Warm, deep tropical waters (NOAA, 2012)	—	Increased shipping traffic (Broker and Ilangakoon, 2008)
<i>Feresa attenuata</i>	Pygmy killer whale	Animal 1: 30–40 Animal 2: 30–40	Animal 1: 40 Animal 2: 40	Animal 1: 48 Animal 2: 54	Male, underwater, AEP (Montie <i>et al.</i> , 2011)	Unspecified fish & cephalopods (e.g. <i>Illex argentinus</i> , <i>Loligo plei</i>) (Zerbini and Santos, 1997)	F, G, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002)	Warm tropical & sub-tropical deep waters (NOAA, 2012)	—	Small population sizes & high levels of site fidelity mean populations are susceptible to habitat or prey alterations in the presence of human activities (McSweeney <i>et al.</i> , 2009),
<i>Pseudorca crassidens</i>	False killer whale	16–22.5	22.5	80.9	Female, underwater, AEP (Yuen <i>et al.</i> , 2005)	Cephalopods (e.g. <i>Martialia hyadesi</i> , <i>Illex argentinus</i> , <i>Todarodes</i> spp., <i>Ocythoe</i> spp., <i>Onykia ingens</i>) (Alonso <i>et al.</i> , 1999)	C, F, G, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciara, 2006; Reeves <i>et al.</i> , 2002)	Usually in deep tropical to temperate waters (>1000 m) (NOAA, 2012) but infrequently in cold temperate regions; usually pelagic but sometimes found closer to shore near oceanic islands (Baird, 2008) or on the Patagonian shelf-slope (Riccialdelli <i>et al.</i> , 2010)	—	Increased shipping traffic, habitat destruction & changes to prey availability
		16–64	64	38–42	Male, underwater, behavioural (staircase) (Thomas <i>et al.</i> , 1988a);					
		15–24	20	69.5	Female, underwater, behavioural (staircase) (Yuen <i>et al.</i> , 2005)					
<i>Orcinus orca</i>	Resident & transient killer whale or Orca	20-45	20	37 pk-pk ^l	Female, underwater, ABR (Szymanski <i>et al.</i> , 1999)	Residents feed on fish (e.g. <i>Clupea</i> spp.) (Simila <i>et al.</i> , 1996) & transients mainly on Mammalia (e.g. <i>Lagenorhynchus acutus</i> , <i>Phocoena phocoena</i> , <i>Phocoenoides dalli</i> , <i>Zalophus californianus</i> , <i>Eumetopias jubatus</i> , <i>Phoca vitulina</i>) (Matkin <i>et al.</i> , 2002)	A, B, F, G, H, I, J, K (Forney and Wade, 2006; IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; Baird, 2000)	Usually colder water, but also temperate & sometimes tropical to subtropical waters (NOAA, 2012)	—	Increased boat traffic, masking, alterations to prey availability, habitat avoidance or behaviour alterations
		—	15	70 dB re 1 dyne/cm ^{2 h}	Male, underwater, behavioural (staircase) (Hall and Johnson, 1972)					
		—	20	34 rms ^c	Female, underwater, behavioural (staircase) (Szymanski <i>et al.</i> , 1999)					

	<i>Globicephala melas</i>	North Atlantic, southern & North Pacific long-finned pilot whale	11.2–50	40	53.1	Male, underwater, AEP (Pacini <i>et al.</i> , 2010)	Fish (<i>Scomber scombrus</i> , <i>Clupea harengus</i> , <i>Merluccius bilinearis</i>) & cephalopods (e.g. <i>Loligo pealeii</i>) (Gannon <i>et al.</i> , 1997)	A, C, F, G, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Deep pelagic temperate to sub polar oceanic waters but sometimes coastal or on the continental slope (NOAA, 2012)	—	Increased shipping traffic & chance of collisions & changes to prey availability
	<i>G. macrorhynchus</i>	Short-finned pilot whale	10–100	40–56	78–79	Female, underwater, AEP (Schlundt <i>et al.</i> , 2011)	Some fish (e.g. <i>Scopelogadus beanii</i>) but mainly cephalopods (e.g. <i>Brachioteuthis riisei</i> , <i>Histioteuthis reversa</i> , <i>Taonius pavo</i> , <i>Chiroteuthis</i> spp.) (Mintzer <i>et al.</i> , 2008)	F, H, I, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Deep warm tropical or temperate waters in areas of high squid density (NOAA, 2012)	—	Increased shipping traffic & chance of collisions & changes to prey availability
			20–40	40	ca. 70 (est. from plot)	Female, underwater, AEP (Greenhow <i>et al.</i> , 2014)					
	<i>Orcaella brevirostris</i>	Irrawaddy dolphin	Unknown; frequency of clicks is >22 & mean frequency of whistles is 3.2–4.2 (Van Parijs <i>et al.</i> , 2000)	—	—	—	Fish (e.g. <i>Lobocheilus melanotaenia</i> , <i>Crossocheilus cf. reticulatus</i> , <i>Paralaubuca cf. typus</i> , <i>Bagarius yarrelli</i> , <i>Kryptopterus apogon</i> , <i>Pangasius hypophthalmus</i> , <i>Mystus microphthalmus</i> , <i>Cosmochilus harmandi</i>) (Baird and Mounsouphom, 1994)	F (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Freshwater rivers, estuaries or coastal marine waters of the tropics & subtropics: South-east Asia in the Mekong, Mahakam & Ayeyarwady river systems, in areas 10–30m deep (>8–10 m in dry season) with eddy counter currents (Baird and Beasley, 2005) & murky deep pools, 10–30 m (Baird and Mounsouphom, 1994)	—	Behaviour (surfacing, feeding) alterations, avoidance of key habitats, pollution, habitat destruction & increased shipping
	<i>O. heinsohni</i>	Australian snubfin dolphin	Unknown; frequency range of whistles is 0.6–12.9 (Berg Soto, 2012)	—	—	—	Fish (e.g. <i>Apogon</i> spp.) & cephalopods (<i>Uroteuthis</i> spp., <i>Sepia</i> spp.) (Parra and Jedensjo, 2009)	F (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	River mouths, dredged channels, breakwaters & areas with water depths between 1–2 m with sea grass (Parra, 2006)	—	Behaviour (surfacing, feeding) alterations, avoidance of key habitats, pollution, habitat destruction & increased shipping
Phocoenidae	<i>Neophocaena phocaenoides</i>	Indo-pacific finless porpoise	Unknown; frequency range of clicks is 87–145 (Labansen <i>et al.</i> , 2007)	—	—	—	Fish (e.g. unspecified Apogonidae, Sciaenidae, Engraulidae, Leiognathidae species, <i>Thryssa</i> spp., <i>Gazza minuta</i>), cephalopods (e.g. <i>Loliginidae</i> spp., <i>Sepia</i> spp.) & unspecified molluscs (Barros <i>et al.</i> , 2002)	F (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Inshore waters of the South China sea in shallow (<50m) bays & areas with a soft seafloor; feeds in estuaries, coastal and near shore waters (Barros <i>et al.</i> , 2002; Wang, 2010)	Elimination of counter-current habitat (Smith and Reeves, 2000)	Behaviour (surfacing, feeding) alterations, avoidance of key habitats, pollution, habitat destruction, increased shipping, changes to river flow & sediment transport
	<i>N. asiaeorientalis</i>	Yangtze & East Asian narrow-ridged finless porpoise	45–139	54	47.2	Male, underwater, AEP (Popov <i>et al.</i> , 2005)	Unspecified species of fish, cephalopods & crustaceans (IUCN, 2012)	F, I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Chinese coastal waters including the central & lower Yangtze River; mainly in shallow (3 m) areas with gentle slopes, counter-current eddies & low water velocity (0–0.5 m/s); Prefers areas with riparian vegetation; mud bottoms with organic matter & many small fish (Ding <i>et al.</i> , 2000)	—	Behaviour (surfacing, feeding) alterations, avoidance of key habitats, pollution, habitat destruction, increased shipping, changes to sediment transport, river flow & loss of counter current habitats
			45–139	54	48.5	Female, underwater, AEP (Popov <i>et al.</i> , 2005)					
	<i>Phocoena phocoena</i>	Atlantic, eastern Pacific, Black Sea & western Pacific harbour porpoise, common porpoise	—	125	60	Unknown sex, underwater, AEP (Popov <i>et al.</i> , 1986*)	Fish (e.g. <i>Hyperoplus</i> spp., <i>Trisopterus</i> spp., <i>Gadus morhua</i> , <i>Clupea</i> spp.) & cephalopods (e.g. <i>Sepioida</i> spp., <i>Sepietta</i> spp., <i>Rossia</i> spp.) (Santos <i>et al.</i> , 2004)	A, C, D, G, H, I (IUCN, 2013; Perrin, 2013; Reeves and Notarbartolo di Sciarra, 2006; Reeves <i>et al.</i> , 2002)	Northern temperate to subarctic coastal or offshore waters but also in bays, estuaries, harbours & fjords with depths <200m (NOAA, 2012); Northern Hemisphere temperate coastal waters (Read, 2010)	—	Habitat alterations, avoidance & increased boat traffic
			130–140	130	9	Unknown sex, underwater, ABR (Bibikov, 1992*)					
			16–140	100	44	Male, underwater, behavioural (staircase) (Kastelein <i>et al.</i> , 2002a; Kastelein <i>et al.</i> , 2010)					
			—	150	30	Unknown sex, underwater, behavioural (unknown) (Anderson,					

	<i>P. sinus</i>	Vaquita	Unknown; mean frequency of clicks is 132.9 (Silber, 1991)	—	—	—	—	Unspecified species of fish, cephalopods & crustaceans (IUCN, 2012)	I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002; Gerrodette <i>et al.</i> , 1995)	Shallow, murky coastal waters (<50 m within 25 km of shore) (NOAA, 2012); of the northern Gulf of California, Baja California & Mexico (Jefferson, 2010)	—	Changes to small isolated populations, avoidance of habitat due to prey alterations or destruction, pollution or changes to water circulation
	<i>P. spinipinnis</i>	Burmeister's porpoise	—	—	—	—	Fish (<i>Odontheistes</i> spp., <i>Sprattus fuegensis</i> , <i>Merluccius hubbsi</i> , <i>M. australis</i> , <i>Salilota australis</i> , <i>Micromesistius australis</i> , <i>Genypterus blacodes</i>), cephalopods (<i>Illex argentinus</i> , <i>Loligo gahi</i>) & crustaceans (unspecified euphausiids) (Ricciardelli <i>et al.</i> , 2010; Torres <i>et al.</i> , 1992)	J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Near shore Patagonian shelf (Ricciardelli <i>et al.</i> , 2010); South American coastal waters of Peru to Tierra del Fuego & southern Brazil (Jefferson, 2010)	—	Avoidance of habitat due to prey alterations or destruction, pollution or changes to water circulation	
	<i>P. dioptrica</i>	Spectacled porpoise	—	—	—	—	Fish (Engraulidae species) & crustaceans (Stomatopods) (IUCN, 2012)	F, J, K (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Southern coastal & offshore oceanic subantarctic waters & around Antarctic Convergence 50–60° S (Ricciardelli <i>et al.</i> , 2010; Jefferson, 2010)	—	Avoidance of habitat due to prey alterations or destruction, pollution & changes to water circulation	
	<i>Phocoenoides dalli</i>	Dalli-type & Truei-type dall's porpoise	Unknown; peak frequency of clicks is 117–141 (Bassett <i>et al.</i> , 2009)	—	—	—	Fish (e.g. <i>Sardinops sagax</i> , <i>Theragra chalcogramma</i>) & cephalopods (e.g. <i>Beryteuthis magister</i>) (Walker, 1996)	I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Temperate to boreal waters >180 m, 2–27°C in offshore & inshore areas (NOAA, 2012)	—	Avoidance of habitat due to prey alterations or destruction, pollution & changes to water circulation	
Trichechidae	<i>Trichechus manatus</i>	Antillean & Florida West Indian manatee	Animal 1: 6–20 Animal 2: 6–18	Animal 1: 16–18 Animal 2: 18	Animal 1: 50 Animal 2: 53	Male, underwater, behavioural (staircase) (Gerstein <i>et al.</i> , 1999)	Plantae (e.g. <i>Halodule wrightii</i> , <i>Thalassia testudinum</i> , <i>Syringodium filiforme</i>) (Lefebvre <i>et al.</i> , 2000)	H, J (Domning, 1981; IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Marine waters (27–30°C, 35–36 ppt salinity, 0.3 m tidal range) in temperate & tropical shallow, protected coves & bays with sea grass communities (Lefebvre <i>et al.</i> , 2000)	Masking of important biological sounds (Gerstein <i>et al.</i> , 2006)	Loss of sea grass beds & increased risk of boat collisions due to masking	
	<i>T. senegalensis</i>	West African manatee	—	—	—	—	Plantae (e.g. <i>Eichornia crassipes</i> , <i>Cymodocea nodosa</i> , <i>Ceratophyllum demersum</i> , <i>Echinochloa</i> spp., <i>Lemna</i> spp., <i>Myriophyllum</i> spp., <i>Rhizophora racemosa</i>) (IUCN, 2012)	H, J (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	Coastal & riverine habitats (Marsh and Lefebvre, 1994) along the coast of west Africa; Lagoons, rivers, estuaries, mangrove creeks, islands, rivers & tributaries (Silva and Araujo, 2001)	—	Loss of sea grass beds & increased risk of boat collisions due to masking	
	<i>T. inunguis</i>	Amazonian manatee	Unknown; mean fundamental frequency of vocalisations is 4 (Sousa-Lima <i>et al.</i> , 2002)	—	—	—	Plantae (e.g. <i>Paspalum repens</i> , <i>Eichornia crassipes</i> , <i>Luziola spruceana</i> , <i>Utricularia foliosa</i> , <i>Echinochloa polystachya</i>) (Colares and Colares, 2002)	N (IUCN, 2013; Marmontel, 2008; Perrin, 2013; Reeves <i>et al.</i> , 2002; Rosas, 1994)	Amazon basin in freshwater rivers or floodplain lakes (Marsh and Lefebvre, 1994); Undisturbed black water lagoons in the lowland rainforests (pH 5.5–6.0 & 25.0–30.7°C) (Timm <i>et al.</i> , 1986)	—	Increased risk of boat collisions, masking & loss of sea grass beds	
Dugongidae	<i>Dugong dugon</i>	Dugong	Unknown; frequency of chirp-squeaks, barks & trills is 0.0031–2.2 (Anderson and Barclay, 1995)	—	—	—	Vegetation (e.g. <i>Thalassia hemprichii</i> , <i>Halodule pinifolia</i> , <i>Enhalus acoroides</i> , <i>Halophila spinulosa</i>) (Johnstone and Hudson, 1981; Marsh and Lefebvre, 1994)	F, I (IUCN, 2013; Perrin, 2013; Reeves <i>et al.</i> , 2002)	27°N–27°S in tropical & subtropical Indo-Pacific shallow coastal waters (Marsh and Lefebvre, 1994)	—	Masking, loss of sea grass beds & increased risk of vessel collisions	

Table 1. Marine mammal characteristics.

An extensive amount of information on the direct and indirect effects of dredging on marine mammals has been discussed within the review paper, *A review of direct and indirect impacts of marine dredging activities on marine mammals*, which was written simultaneously with this table to aid in the planning of dredging operations. Unlike the review paper, which focuses on cetaceans, pinnipeds and sirenians, this table includes all known species of marine mammal. For brevity, subspecies have not been listed separately, but where known they have been acknowledged in the 'common name' column of the table. An up to date list of marine mammal species and subspecies was referenced from Committee on taxonomy (2012), where deviations from the list occur common names have been underlined, and an explanation provided in the footnote. Species thought to extinct have been excluded. Given that one of the primary threats to marine mammals from dredging is noise, where possible known hearing ranges have been included within the table. Details of how hearing ranges have been estimated, including audiogram type and sex, are listed in the 'Methodology' column. When data were deficient, vocalisations have been included as a proxy for hearing abilities. Range, habitat preferences, diet, and recorded effects of dredging have been reported, and along with the hearing ranges, used to estimate the potential effects. Information cited has been collated from original research papers i.e. has not relied on accurate reporting of information by other studies; however, on occasion, original research articles have not been available. In these instances, information is still presented, but as 'second-hand' citations with a footnote listing the study quoting the work.

*Cited in Nedwell *et al.* (2004)

** Cited in Richardson *et al.* (1995)

^a Within the paper, the authors acknowledge that the large differences between female and male hearing thresholds are due possibly to individual hearing thresholds, rather than sexual dimorphism in hearing

^b dB re 20 μ Pa: 20 is the reference pressure for sound in air, ca. threshold for human hearing at 1 kHz (Richardson, 1995)

^c *Root Mean Square (rms)*: Average pressure calculated by taking instantaneous sound pressures (can be positive or negative), squaring them, averaging them, then taking the square root of that average (i.e. the square root of the average of squares).

^d dB re 20 μ Pa².s rms: used to measure energy of pulsed sounds, which is proportional to the time integral of pressure squared (Richardson *et al.*, 1995)

^e dB peSPL: *peak equivalent Sound Pressure Level*; used to acoustically calibrate transient pulses, it is the rms SPL of a continuous pure tone which has the same amplitude as the transient pulse (i.e. the noise used as stimulus for the audiogram) (Stapells *et al.*, 1982).

^f Taxonomy under debate; potentially a subspecies of Ginkgo-toothed beaked whale (Dalebout *et al.*, 2012).

^g Recordings thought to be *M. hotaula* due to geographic location, and comparison with other beaked whale vocalisations, but identification was not visually confirmed.

^h dB re 1 dyne/cm²: alternative unit for reference pressure, 0.01 re 1 dyne/cm² is equivalent to 60 dB re 1 μ Pa (Richardson *et al.*, 1995).

ⁱ Taxonomy under debate; considered a species as per Baldwin *et al.* (2002) and Mendez *et al.* (2013)

^j peak to peak (pk-pk): Pressure measured from the minima to the maxima

Regions:

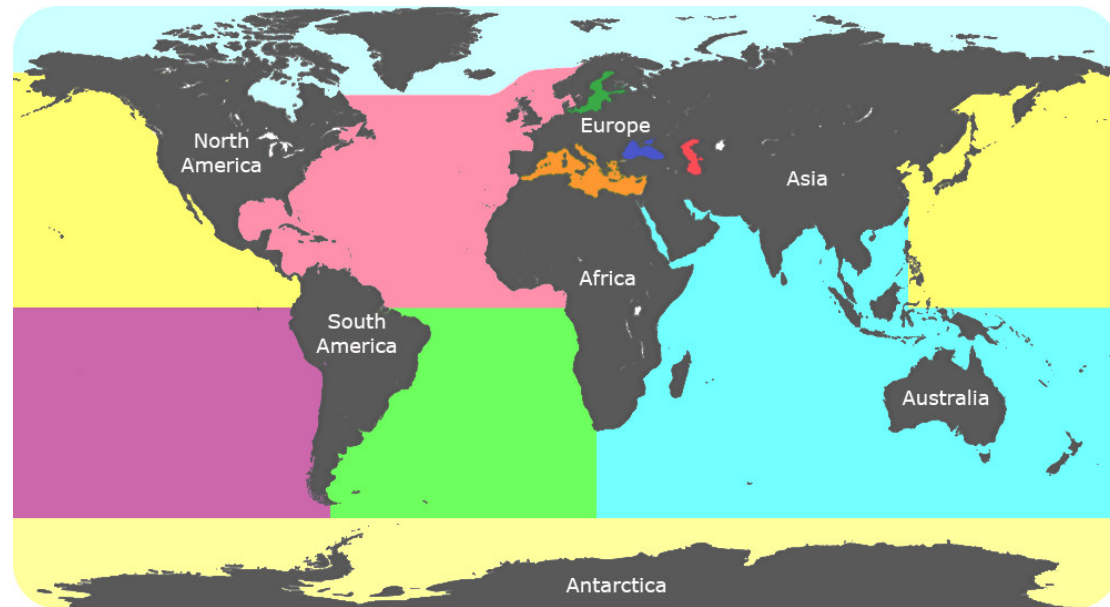


Figure 1. World map of regional boundaries used to compose distributions of marine mammals.

Source: OSC, 2014.

Regions are divided-up as follows:

- A. Antarctic: Amundsen Sea, Bellingshausen Sea, Drake Passage, Ross Sea, Scotia Sea, and Weddell Sea;
- B. Arctic: Baffin Bay, Barents Sea, Beaufort Sea, Chukchi Sea, Davis Strait, East Siberian Sea, Greenland Sea, Hudson Bay, Hudson Strait Kara Sea, Labrador Sea, Laptev sea, North-western Passages, Norwegian Sea, and White Sea;
- C. Baltic: Gulf of Bothnia, Gulf of Finland and, Gulf of Riga;
- D. Black Sea: Sea of Azov;
- E. Caspian Sea: Not Applicable (N/A);
- F. Indo-Pacific: Andaman Sea, Arabian Sea, Arafura Sea, Banda Sea, Bay of Bengal, Bismarck Sea, Coral Sea, Great Australian Bight, Gulf of Aden, Gulf of Oman, Gulf of Thailand, Java Sea, Laccadive Sea, Mozambique Channel, Solomon Sea, Tasman Sea, and Timor Sea;
- G. Mediterranean Sea: Adriatic Sea, Aegean, Alboran Sea, Balearic Sea, Garabogözkal Basin, Ionian Sea, Ligurian Sea, Sea of Marmara, and Tyrrhenian Sea;
- H. North Atlantic: Bay of Biscay, Bristol Channel, Caribbean Sea, Celtic Sea, English Channel, Firth of Clyde, Gulf of Guinea, Gulf of México (GoM), Gulf of St Lawrence, Irish Sea, Kattegat, North Sea, Sargasso Sea, Skagerrak, St George's Channel;
- I. North Pacific: Bearing Sea, Celebes Sea, East China Sea, Gulf of Alaska, Gulf of California, Sea of Japan, Sea of Okhotsk, South China Sea, and, Sulu Sea;
- J. South Atlantic: Bahía Grande, Estrecho de Magallanes, Golfo San Jorge, Golfo Nuevo, Rio de La Plata, and San Matías;
- K. South Pacific: N/A

Freshwater

- L. Asia
- M. Europe
- N. South America

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