

Supplementary material

Appendix 2. Summary of estimated changes in relative population abundance and the average annual rates of population decline over the period studied (r) for sharks. Rows highlighted in bold identify entries lacking species-level identifications and were not included in GLMM analyses since species-specific data on fixed effects could not be collated.

species	common name	abundance	locality	time span	r
<i>Alopias</i> spp.	Thresher sharks	-80%	Northwest Atlantic [1]	1986-2000	-0.115
<i>Alopias superciliosus</i>	Bigeye thresher	-33.02%	Hawaii [2]	1995-2006	-0.036
<i>Alopias vulpinus</i>	Common thresher	-80.82%	Adriatic Sea [3]	1995-2006	-0.150
		-99.19%	Ionian Sea [3]	1986-2007	-0.229
		-94.67%	Ligurian Sea [3]	1950-2006	-0.052
<i>Carcharhinus</i> spp.	Coastal requiem sharks	-61%	Northwest Atlantic [1]	1992-2000	-0.118
		>-90%	Chagos Archip. [4]	1975-2006	-0.074
	Group 1*	-76%	Northwest Atlantic [5]	1992-2005	-0.110
	Group 2**	-55%	Northwest Atlantic [5]	1992-2005	-0.061
<i>Carcharhinus brevipinna</i>	Spinner shark	+14%	Northwest Atlantic [6]	1995-2009	+0.009
<i>Carcharhinus falciformis</i>	Silky shark	-91%	Gulf of Mexico [7]	1950s-1990s	-0.049
		-47.1%	Hawaii [2]	1995-2006	-0.058

<i>Carcharhinus leucas</i>	Bull shark	-98.6%	Lake Pontchartrain, Louisiana [8]	1953-2005	-0.082
		-98.15%	Northwest Atlantic [9]	1973-1995	-0.181
		+18.59%	Texas estuary [10]	1976-2010	+0.023
		+12%	Northwest Atlantic [6]	1995-2009	+0.008
<i>Carcharhinus limbatus</i>	Blacktip shark	-92.5%	Northwest Atlantic [9]	1972-2003	-0.084
<i>Carcharhinus longimanus</i>	Oceanic whitetip shark	- >99%	Gulf of Mexico [7]	1950s-1990s	-0.094
		-70%	Northwest Atlantic [1]	1992-2000	-0.150
		-50%	Northwest Atlantic [5]	1992-2005	-0.053
		-64.53%	Hawaii [2]	1995-2006	-0.094
		-92.19%	West/Central Pacific [11]	1995-2010	-0.170
<i>Carcharhinus obscurus</i>	Dusky shark	-79%	Gulf of Mexico [7]	1950s-1990s	-0.032
		-91%	Northwest Atlantic [9]	1972-2003	-0.075
		-94.25%	Northwest Atlantic [9]	1972-2003	-0.092
		-93.8%	Northwest Atlantic [9]	1972-2003	-0.199
		-99%	Northwest Atlantic [9]	1972-2003	-0.149
<i>Carcharhinus plumbeus</i>	Sandbar shark	- 85 to 90%	Northwest Atlantic [12]	1980s-1990s	-0.109

		-75%	Northwest Atlantic [9]	1970-2004	-0.041
		-84%	Northwest Atlantic [9]	1966-2004	-0.048
		-84.25%	Northwest Atlantic [9]	1976-2000	-0.077
		-96.55%	Northwest Atlantic [9]	1983-1995	-0.281
<i>Carcharodon carcharias</i>	Great white shark	-84%	Adriatic Sea [13]	1868-1970	-0.018
		-86%	Northwest Atlantic [13]	1874-1999	-0.016
		-79%	Northwest Atlantic [1] + [9]	1986-2000	-0.111
<i>Centrophorus granulosus</i>	Gulper shark	>-99.99%	Mediterranean Sea [14]	1995-2006	-0.837
<i>Centrophorus harrissoni</i>	Dumb gulper shark	-99.7%	Southern Australia [15]	1976-1997	-0.277
<i>Centrophorus moluccensis</i>	Smallfin gulper shark	-98.4%	Southern Australia [15]	1976-1997	-0.197
<i>Centrophorus zeehaani</i>	Southern dogfish	-99.7%	Southern Australia [15]	1976-1997	-0.277
<i>Cephaloscyllium albipinnun</i>	Whitefin swellshark	-31.9%	Southern Australia [15]	1976-1997	-0.018
<i>Cetorhinus maximus</i>	Basking shark	- >95%	West Coast Ireland [16]	1950-1975	-0.120
<i>Deania quadrispinosa</i>	Longsnout dogfish	-87.3%	Southern Australia [15]	1976-1997	-0.098
<i>Etomopterus spinax</i>	Velvet belly shark	>-99.99%	Mediterranean Sea [14]	1995-2006	-0.837
<i>Furgaleus macki</i>	Whiskery shark	-61.2%	Southern Australia [17]	1975-1998	-0.041

<i>Galeocerdo cuvier</i>	Tiger shark	-65%	Northwest Atlantic [1] + [9]	1986-2000	-0.075
		-96.6%	Northwest Atlantic [9]	1973-2002	-0.117
		-38%	Northwest Atlantic [9]	1992-2005	-0.037
		+3%	Northwest Atlantic [6]	1995-2009	+0.002
<i>Galeorhinus galeus</i>	Tope shark	-99.97%	Tyrrhenian Sea [18]	1898-1922	-0.338
		-87% [†]	Southwest Australia [19]	1927-1995	-0.030
<i>Galeus melastomus</i>	Blackmouth catshark	-73.07%	Tyrrhenian Sea [18]	1984-2004	-0.066
		-93.81%	Mediterranean Sea [14]	1995-2006	-0.253
<i>Heptranchias perlo</i>	Sharpnose seven-gill	-91.4%	Southern Australia [15]	1976-1997	-0.117
<i>Hexanchus griseus</i>	Bluntnose six-gill shark	- >99%	Georgia Straight [20]	2001-2007	-0.768
<i>Holohalaelurus regani</i>	Izak catshark	+87.55%	South Africa [21]	1986-1999	+0.048
<i>Isurus</i> spp.	Mako sharks	-40%	Northwest Atlantic [1] + [9]	1986-2000	-0.036
		-34%	Northwest Atlantic [3] + [9]	1992-2005	-0.032
<i>Isurus oxyrinchus</i>	Shortfin mako	-65.01%	West/Central Pacific [11]	1995-2010	-0.07
		+218.30%	Hawaii [2]	1995-2006	+0.105
Lamnids	Mackerel sharks	- 98.79%	Adriatic Sea [3]	129 years	-0.034

		-98.88%	Ionian Sea [3]	1986-2007	-0.214
		- >99.99%	Ligurian Sea [3]	1950-2006	-0.164
		-83.19%	Tyrrhenian Sea [3]	1898-1922	-0.074
<i>Lamna ditropis</i>	Salmon shark	+47%	North Pacific [22]	1992-2002	+0.039
<i>Lamna nasus</i>	Porbeagle shark	- >90%	Northwest Atlantic [23]	1961-2000	-0.059
<i>Mustelus asterias</i>	Starry smooth-hound	- >99%	Tyrrhenian Sea [18]	1898-1922	-0.192
<i>Mustelus mustelus</i>	Smooth-hound	- 94.38%	Tyrrhenian Sea [18]	1898-1922	-0.120
<i>Negaprion brevirostris</i>	Lemon shark	+6%	Northwest Atlantic [6]	1995-2009	+0.004
		-75.93%	Southwest Atlantic [24]	1999-2003	-0.356
<i>Oxynotus centrina</i>	Angular roughshark	-97.03%	Tyrrhenian Sea [18]	1972-2004	-0.110
<i>Prionace glauca</i>	Blue shark	-73.76%	Ionian Sea [3]	1986-2007	-0.064
		- >99.99%	Ligurian Sea [3]	1950-2006	-0.164
		c. -30%	Northwest Atlantic [25]	1950s-1990s	-0.007
		c. -80% (♂) /	Northwest Atlantic [26]	1980s-1990s	
		NC (♀)			
		-60%	Northwest Atlantic [1]	1986-2000	-0.065

		-53%	Northwest Atlantic [5]	1992-2005	-0.058
		-60%	Northwest Atlantic [27]	1995-2003	-0.115
		-23.2%	North Pacific [28]	1996-2006	-0.026
		-52.76%	West/Central Pacific [11]	1995-2010	-0.050
		-29.37%	Hawaii [2]	1995-2006	-0.032
<i>Pristiophorus</i> sp. A	Sawshark	-47.9%	Southern Australia [15]	1976-1997	-0.031
<i>Pseudocarcharias kamoharai</i>	Crocodile shark	-56.52%	Hawaii [2]	1995-2006	-0.076
Reef sharks		- >90%	Chagos Archipelago [4]	1975-2006	-0.074
		NC	Great Barrier Reef [29]	1989-2006	
<i>Rhincodon typus</i>	Whale shark	-96%	Andaman Sea [30]	1991-2001	-0.322
		c. -40%	Ningaloo Reef [31]	1995-2004	-0.057
		-79%	Mozambique [32]	2005-2011	-0.260
<i>Rhizoprionodon terraenovae</i>	Atlantic sharpnose shark	+1150%	Northwest Atlantic [9]	1973-2003	+0.084
		+246%	Northwest Atlantic [9]	1983-1995	+0.103
		+185%	Northwest Atlantic [9]	1989-2005	+0.065
<i>Scyliorhinus canicula</i>	Small-spotted catshark	-81.44%	Tyrrhenian Sea [18]	1984-2004	-0.084

		-15.95%	Mediterranean Sea [14]	1995-2006	-0.016
		+8225%	West England Channel [33]	1913-2009	+0.046
<i>Scyliorhinus retifer</i>	Chain catshark	+800%	Northwest Atlantic [9]	1963-2005	+0.052
		+1050%	Northwest Atlantic [9]	1970-2005	+0.070
<i>Scyliorhinus stellaris</i>	Nursehound shark	-99.25%	Tyrrhenian Sea [18]	1984-2004	-0.245
<i>Somniosus pacificus</i>	Pacific sleeper shark	+10,300%	Northeast Pacific [34]	1980-2003	+0.202
<i>Sphyrna</i> spp.	Hammerhead sharks	- >99.99%	Ionian Sea [3]	1986-2007	-0.439
		- >99.99%	Ligurian Sea [3]	1950-2006	-0.164
		-89%	Northwest Atlantic [1] + [9]	1986-2000	-0.158
		-76%	Northwest Atlantic [5] + [9]	1992-2005	-0.110
		-94.95%	Tyrrhenian Sea [3]	1898-1922	-0.124
<i>Sphyrna lewini</i>	Scalloped hammerhead	- >99%	North Gulf of Mexico [35]	1972-2002	-0.154
		-98%	Northwest Atlantic [9]	1972-2003	-0.126
		-77.75%	Northwest Atlantic [9]	1989-2005	-0.094
		-83%	Northwest Atlantic + Gulf of Mexico [36]	1981-2005	-0.074
<i>Sphyrna tiburo</i>	Bonnethead shark	-96%	North Gulf of Mexico [35]	1972-2002	-0.107

		+58%	Northwest Atlantic [9]	1989-2005	+0.028
<i>Sphyrna zygaena</i>	Smooth hammerhead	- >96%	Mediterranean Sea (off Sicily) [37]	1978-2004	-0.124
		-93.6%	Northwest Atlantic [9]	1973-1989	-0.172
<i>Squalus acanthias</i>	Spiny dogfish	-99.26%	Tyrrhenian Sea [18]	1972-2004	-0.153
		-89.27%	Tyrrhenian Sea [18]	1984-2004	-0.112
		-95%	Georges Bank [38]	1996-2004	-0.374
		+290.25%	Northeast Pacific [39]	1979-2007	+0.049
		+40.5%	Northeast Pacific [39]	1997-2006	+0.038
<i>Squalus blainville</i>	Longnose spurdog	-98.16%	Tyrrhenian Sea [18]	1972-2004	-0.125
		-97.03%	Mediterranean Sea [14]	1995-2006	-0.320
<i>Squalus grahami</i>	Eastern longnose spurdog	-97.3%	Southern Australia [15]	1976-1997	-0.172
<i>Squalus megalops</i>	Shortnose spurdog	+18%	Southern Australia [15]	1976-1997	+0.009
<i>Squalus mitsukurii</i>	Shortspine spurdog	-97.3%	Southern Australia [15]	1976-1997	-0.172
<i>Squatina</i> spp.	Angel sharks	-98.65%	Tyrrhenian Sea [18]	1904-1922	-0.239

		EXTIRPATED	Tyrrhenian Sea [18]	1972-2004	
<i>Squatina albipunctata</i>	Eastern angel shark	-96%	Southern Australia [15]	1976-1997	-0.153
<i>Squatina squatina</i>	Angel shark	-100%	West England Channel [33]	1913-2009	-0.120

NC, No change

*includes *Carcharhinus falciformis*, *C. obscurus* and *C. signatus*; **includes Group 1 + *C. altimus*, *C. brevipinna*, *C. limbatus*, *C. leucas*, *C. plumbeus* and all other unidentified sharks. †Denotes most pessimistic estimate reported by authors.

[1] Baum et al. (2003); [2] Walsh et al. (2009); [3] Ferretti et al. (2008); [4] Graham et al. (2010); [5] Baum & Blanchard (2010); [6] Carlson et al. (2012); [7] Baum & Myers (2004); [8] O'Connell et al. (2007); [9] Myers et al. (2007); [10] Froeschke et al. (2013); [11] Clarke et al. (2013); [12] Musick (1995); [13] McPherson & Myers (2009); [14] Damalas & Vassilopoulou (2011); [15] Graham et al. (2001); [16] Fowler (1996); [17] Simpfendorfer et al. (2000); [18] Ferretti et al. (2005); [19] Punt & Walker (1998); [20] Dunbrack (2008); [21] Richardson et al. (2000); [22] Muto (2004); [23] Campana et al. (2002); [24] Ache de Freitas et al. (2009); [25] Aires-da-Silva et al. (2008); [26] Simpfendorfer et al. (2002); [27] Campana et al. (2006); [28] Polovina et al. (2009); [29] Heupel et al. (2009); [30] Theberge & Dearden (2006); [31] Bradshaw et al. (2008); [32] Rohner et al. (2013); [33] McHugh et al. (2011); [34] Courtney & Sigler (2007); [35] Shepherd & Myers (2005); [36] Hayes et al. (2009); [37] Celona & Maddalena (2005); [38] Wallace et al. (2009); [39] Conrath & Foy (2009)

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Appendix 3: Average annual rates of shark population changes for reports where the median year of the time range recorded was greater than 1970, along with ecological characteristics and random effects included in analyses.

Species	Genus	Family	Order	Locality	MedianYear	HumanImpact	r100	LogTL	LogLat	LogDepth	LogMPDepth	TrophicLev
<i>Alopias superciliosus</i>	<i>Alopias</i>	<i>Alopiidae</i>	Lamniformes	WestCentPac	2000.5	11.4	-3.6434193	2.68841982	1.93449845	2.86332286	1.69897	4.5
<i>Alopias vulpinus</i>	<i>Alopias</i>	<i>Alopiidae</i>	Lamniformes	MedSea	1978	12.52577338	-5.235391	2.88081359	2.09691001	2.74036269	2.43933269	4.5
<i>Alopias vulpinus</i>	<i>Alopias</i>	<i>Alopiidae</i>	Lamniformes	MedSea	1996.5	14.3	-22.932815	2.88081359	2.09691001	2.74036269	2.43933269	4.5
<i>Alopias vulpinus</i>	<i>Alopias</i>	<i>Alopiidae</i>	Lamniformes	MedSea	2000.5	12.1	-15.011837	2.88081359	2.09691001	2.74036269	2.43933269	4.5
<i>Carcharhinus brevipinna</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	2002	11.17538813	0.93591616	2.47712125	1.8920946	2	1.69897	4.2
<i>Carcharhinus falciformis</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	GoM	1974.5	6.639649946	-4.9141747	2.54406804	1.92941893	3.60205999	3.30103	4.5
<i>Carcharhinus falciformis</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	WestCentPac	2000.5	11.4	-5.7905082	2.54406804	1.92941893	3.60205999	3.30103	4.5
<i>Carcharhinus leucas</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	GoM	1979	6.5	-8.2090345	2.54406804	1.90848502	2.18184359	1.17609126	4.3
<i>Carcharhinus leucas</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1984	11.17538813	-18.136293	2.54406804	1.90848502	2.18184359	1.17609126	4.3
<i>Carcharhinus leucas</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	GoM	1993	6.5	2.30000003	2.54406804	1.90848502	2.18184359	1.17609126	4.3
<i>Carcharhinus leucas</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	2002	11.17538813	0.80949061	2.54406804	1.90848502	2.18184359	1.17609126	4.3
<i>Carcharhinus limbatus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1987.5	11.17538813	-8.3557005	2.43933269	1.91907809	1.80617997	1.17609126	4.2
<i>Carcharhinus longimanus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	GoM	1974.5	6.639649946	-9.3983065	2.59769519	1.94939001	2.36172784	1.88081359	4.2
<i>Carcharhinus longimanus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1996	11.17538813	-15.04966	2.59769519	1.94939001	2.36172784	1.88081359	4.2
<i>Carcharhinus longimanus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1998.5	11.17538813	-5.3319014	2.59769519	1.94939001	2.36172784	1.88081359	4.2
<i>Carcharhinus longimanus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	WestCentPac	2000.5	11.4	-9.422572	2.59769519	1.94939001	2.36172784	1.88081359	4.2
<i>Carcharhinus longimanus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	WestCentPac	2002.5	7.304309633	-16.998435	2.59769519	1.94939001	2.36172784	1.88081359	4.2
<i>Carcharhinus obscurus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	GoM	1974.5	6.639649946	-3.1849954	2.62324929	1.95904139	2.60205999	2.47712125	4.5
<i>Carcharhinus obscurus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1983	11.17538813	-7.52483	2.62324929	1.95904139	2.60205999	2.47712125	4.5
<i>Carcharhinus obscurus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1987.5	11.17538813	-14.855388	2.62324929	1.95904139	2.60205999	2.47712125	4.5
<i>Carcharhinus obscurus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1989.5	11.17538813	-9.2128075	2.62324929	1.95904139	2.60205999	2.47712125	4.5
<i>Carcharhinus obscurus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1997	11.17538813	-19.861578	2.62324929	1.95904139	2.60205999	2.47712125	4.5
<i>Carcharhinus plumbeus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1985	11.17538813	-4.8225828	2.39794001	1.91907809	3.25527251	1.63346846	4.5
<i>Carcharhinus plumbeus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1987	11.17538813	-4.0773364	2.39794001	1.91907809	3.25527251	1.63346846	4.5
<i>Carcharhinus plumbeus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1988	11.17538813	-7.7013743	2.39794001	1.91907809	3.25527251	1.63346846	4.5
<i>Carcharhinus plumbeus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1989	11.17538813	-28.056633	2.39794001	1.91907809	3.25527251	1.63346846	4.5
<i>Carcharhinus plumbeus</i>	<i>Carcharhinus</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1989.5	11.17538813	-10.944429	2.39794001	1.91907809	3.25527251	1.63346846	4.5
Galeocerdo cuvier	Galeocerdo	Carcharhinidae	Carcharhiniformes	NWAtl	1987.5	11.17538813	-11.659982	2.87506126	2.01703334	2.56937391	2.26834391	4.5
Galeocerdo cuvier	Galeocerdo	Carcharhinidae	Carcharhiniformes	NWAtl	1993	11.17538813	-7.4987295	2.87506126	2.01703334	2.56937391	2.26834391	4.5
Galeocerdo cuvier	Galeocerdo	Carcharhinidae	Carcharhiniformes	NWAtl	1998.5	11.17538813	-3.6771985	2.87506126	2.01703334	2.56937391	2.26834391	4.5
Galeocerdo cuvier	Galeocerdo	Carcharhinidae	Carcharhiniformes	NWAtl	2002	11.17538813	0.2111343	2.87506126	2.01703334	2.56937391	2.26834391	4.5
<i>Negaprion brevirostris</i>	<i>Negaprion</i>	<i>Carcharhinidae</i>	Carcharhiniformes	SWatl	2001	8.131336048	-35.605098	2.53147892	1.92427929	1.96378783	1.66275783	4.4
<i>Negaprion brevirostris</i>	<i>Negaprion</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	2002	11.17538813	0.41620649	2.53147892	1.92427929	1.96378783	1.66275783	4.4
<i>Prionace glauca</i>	<i>Prionace</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1974.5	11.17538813	-0.727908	2.60205999	2.08278537	2.54406804	2.17609126	4.2
<i>Prionace glauca</i>	<i>Prionace</i>	<i>Carcharhinidae</i>	Carcharhiniformes	MedSea	1978	12.52577338	-16.447036	2.60205999	2.08278537	2.54406804	2.17609126	4.2
<i>Prionace glauca</i>	<i>Prionace</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1989.5	11.17538813	-8.4707259	2.60205999	2.08278537	2.54406804	2.17609126	4.2
<i>Prionace glauca</i>	<i>Prionace</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1993	11.17538813	-6.5449338	2.60205999	2.08278537	2.54406804	2.17609126	4.2
<i>Prionace glauca</i>	<i>Prionace</i>	<i>Carcharhinidae</i>	Carcharhiniformes	MedSea	1996.5	14.3	-6.370882	2.60205999	2.08278537	2.54406804	2.17609126	4.2
<i>Prionace glauca</i>	<i>Prionace</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1998.5	11.17538813	-5.807866	2.60205999	2.08278537	2.54406804	2.17609126	4.2
<i>Prionace glauca</i>	<i>Prionace</i>	<i>Carcharhinidae</i>	Carcharhiniformes	NWAtl	1999	11.17538813	-11.453634	2.60205999	2.08278537	2.54406804	2.17609126	4.2
<i>Prionace glauca</i>	<i>Prionace</i>	<i>Carcharhinidae</i>	Carcharhiniformes	WestCentPac	2000.5	11.4	-3.1610473	2.60205999	2.08278537	2.54406804	2.17609126	4.2
<i>Prionace glauca</i>	<i>Prionace</i>	<i>Carcharhinidae</i>	Carcharhiniformes	WestCentPac	2001	11.4	-2.6396555	2.60205999	2.08278537	2.54406804	2.17609126	4.2

Prionace glauca	Prionace	Carcharhinidae	Carcharhiniformes	WestCentPac	2002.5	7.304309633	-4.999528	2.60205999	2.08278537	2.54406804	2.17609126	4.2	
Rhizoprionodon terraenovae	Rhizoprionodon	Carcharhinidae	Carcharhiniformes	NWAtl	1988	11.17538813	8.41909548	2.04139269	1.83250891	2.43136376	1	4.3	
Rhizoprionodon terraenovae	Rhizoprionodon	Carcharhinidae	Carcharhiniformes	NWAtl	1989	11.17538813	10.3439049	2.04139269	1.83250891	2.43136376	1	4.3	
Rhizoprionodon terraenovae	Rhizoprionodon	Carcharhinidae	Carcharhiniformes	NWAtl	1997	11.17538813	6.54574371	2.04139269	1.83250891	2.43136376	1	4.3	
Centrophorus granulosus	Centrophorus	Centrophoridae	Squaliformes	MedSea	2000.5	12.52577338	-83.730367	2.20411998	1.97312785	3.1430148	2.60205999	4.1	
Centrophorus harissoni	Centrophorus	Centrophoridae	Squaliformes	SouthAUS	1986.5	10.58387449	-27.662586	2.04139269	1.23044892	2.73239376	2.71600334	4.2	
Centrophorus moluccensis	Centrophorus	Centrophoridae	Squaliformes	SouthAUS	1986.5	10.58387449	-19.691269	2	1.8573325	2.84385542	2.67577834	4.3	
Centrophorus zeehaani	Centrophorus	Centrophoridae	Squaliformes	SouthAUS	1986.5	10.58387449	-27.662586	1.95904139	0.84509804	2.69284692	2.65753389	4.1	
Deania quadrispinosa	Deania	Centrophoridae	Squaliformes	SouthAUS	1986.5	10.58387449	-9.8265152	2.05690485	1.65321251	3.08278537	2.78532984	4.5	
Etmopterus spinax	Etmopterus	Etmopteridae	Squaliformes	MedSea	2000.5	12.52577338	-83.730367	1.77815125	2.08990511	3.39619935	2.54406804	3.8	
Heptranchias perlo	Heptranchias	Hexanchidae	Hexanchiformes	SouthAUS	1986.5	10.58387449	-11.682895	2.14612804	1.97772361	3	2.49831055	4.2	
Hexanchus griseus	Hexanchus	Hexanchidae	Hexanchiformes	Npac	2004		19.3	-76.752836	2.68304704	2.05307844	3.39794001	2.80617997	4.3
Carcharodon carcharias	Carcharodon	Lamnidae	Lamniformes	NWAtl	1993	11.17538813	-11.147484	2.89872518	2.09342169	3.10720997	2.09691001	4.5	
Isurus oxyrinchus	Isurus	Lamnidae	Lamniformes	WestCentPac	2000.5		11.4	10.5256741	2.60205999	2.0681859	2.8692317	2.09691	4.5
Isurus oxyrinchus	Isurus	Lamnidae	Lamniformes	WestCentPac	2002.5	7.304309633	-7.0007192	2.60205999	2.0681859	2.8692317	2.09691	4.5	
Lamna ditropis	Lamna	Lamnidae	Lamniformes	Npac	1997	12.21048314	3.85262401	2.48429984	1.64345268	2.81291336	1.88081359	4.5	
Lamna nasus	Lamna	Lamnidae	Lamniformes	NWAtl	1980.5	11.17538813	-5.9040643	2.54406804	2.13033377	2.85125835	2.55022835	4.5	
Oxynotus centrina	Oxynotus	Oxynotidae	Squaliformes	MedSea	1988	12.52577338	-10.989401	2.17609126	2.02938378	2.86746749	2.61119206	3.1	
Pseudocarcharias kamoharai	Pseudocarcharias	Pseudocarchariidae	Lamniformes	WestCentPac	2000.5		11.4	-7.5715375	2.04139269	1.90308999	2.77085201	2	4.2
Rhincodon typus	Rhincodon	Rhincodontidae	Orectolobiformes	Indian	1996		10.6	-32.188758	3.32221929	1.91907809	2.84509804	1.54406804	3.6
Rhincodon typus	Rhincodon	Rhincodontidae	Orectolobiformes	Indian	1999.5		3.9	-5.6758403	3.32221929	1.91907809	2.84509804	1.54406804	3.6
Rhincodon typus	Rhincodon	Rhincodontidae	Orectolobiformes	SouthAfrica	2008	6.119763792	-26.010796	3.32221929	1.91907809	2.84509804	1.54406804	3.6	
Cephaloscyllium albipinnum	Cephaloscyllium	Scyliorhinidae	Carcharhiniformes	SouthAUS	1986.5	10.58387449	-1.8294903	2.00432137	0.95424251	2.63144377	2.53147892	4.2	
Galeus melastomus	Galeus	Scyliorhinidae	Carcharhiniformes	MedSea	1994	12.52577338	-6.5596464	1.87506126	1.69897	3.25959388	2.82930377	4.2	
Galeus melastomus	Galeus	Scyliorhinidae	Carcharhiniformes	MedSea	2000.5	12.52577338	-25.293046	1.87506126	1.69897	3.25959388	2.82930377	4.2	
Holohalaelurus regani	Holohalaelurus	Scyliorhinidae	Carcharhiniformes	SouthAfrica	1992.5	9.561637523	4.83750223	1.83884909	1.51851394	3.03140846	2.35218252	4.2	
Scyliorhinus canicula	Scyliorhinus	Scyliorhinidae	Carcharhiniformes	MedSea	1994	12.52577338	-8.4208073		2	1.70757018	2.88649073	1.95424251	3.7
Scyliorhinus canicula	Scyliorhinus	Scyliorhinidae	Carcharhiniformes	MedSea	2000.5	12.52577338	-1.5800538		2	1.70757018	2.88649073	1.95424251	3.7
Scyliorhinus retifer	Scyliorhinus	Scyliorhinidae	Carcharhiniformes	NWAtl	1984	11.17538813	5.23148709	1.68124124	1.47712125	2.85369821	2.59439255	4.4	
Scyliorhinus retifer	Scyliorhinus	Scyliorhinidae	Carcharhiniformes	NWAtl	1987.5	11.17538813	6.97813439	1.68124124	1.47712125	2.85369821	2.59439255	4.4	
Scyliorhinus stellaris	Scyliorhinus	Scyliorhinidae	Carcharhiniformes	MedSea	1994	12.52577338	-24.464261	2.23044892	1.71600334	2.60205999	1.6180481	4	
Somniosus pacificus	Somniosus	Somniosidae	Squaliformes	Npac	1991.5	12.21048314	20.1930039	2.64345268	2.06818586	3.30103	3	4.3	
Sphyrna lewini	Sphyrna	Sphyrnidae	Carcharhiniformes	GoM	1987		6.5	-15.350567	2.63346846	1.91381385	2.70926996	1.09691001	4.1
Sphyrna lewini	Sphyrna	Sphyrnidae	Carcharhiniformes	NWAtl	1987.5	11.17538813	-12.619429	2.63346846	1.91381385	2.70926996	1.09691001	4.1	
Sphyrna lewini	Sphyrna	Sphyrnidae	Carcharhiniformes	NWAtl	1993	11.17538813	-7.3831535	2.63346846	1.91381385	2.70926996	1.09691001	4.1	
Sphyrna lewini	Sphyrna	Sphyrnidae	Carcharhiniformes	NWAtl	1997	11.17538813	-9.3926761	2.63346846	1.91381385	2.70926996	1.09691001	4.1	
Sphyrna tiburo	Sphyrna	Sphyrnidae	Carcharhiniformes	GoM	1987		6.5	-10.729586	2.17609126	1.90848501	1.84509804	1.24303805	3.9
Sphyrna tiburo	Sphyrna	Sphyrnidae	Carcharhiniformes	NWAtl	1997	11.17538813	2.85890529	2.17609126	1.90848501	1.84509804	1.24303805	3.9	
Sphyrna zygaena	Sphyrna	Sphyrnidae	Carcharhiniformes	NWAtl	1981	11.17538813	-17.180451	2.69897	2.05690485	2.30103	1	4.5	
Sphyrna zygaena	Sphyrna	Sphyrnidae	Carcharhiniformes	MedSea	1991	12.52577338	-12.380292	2.69897	2.05690485	2.30103	1	4.5	
Squalus acanthias	Squalus	Squalidae	Squaliformes	MedSea	1988	12.52577338	-15.33211	2.20411998	2.10720997	3.16435286	2	4.3	
Squalus acanthias	Squalus	Squalidae	Squaliformes	Npac	1993	12.21048314	4.86291919	2.20411998	2.10720997	3.16435286	2	4.3	
Squalus acanthias	Squalus	Squalidae	Squaliformes	MedSea	1994	12.52577338	-11.160633	2.20411998	2.10720997	3.16435286	2	4.3	
Squalus acanthias	Squalus	Squalidae	Squaliformes	NWAtl	2000		13.2	-37.446653	2.20411998	2.10720997	3.16435286	2	4.3
Squalus acanthias	Squalus	Squalidae	Squaliformes	Npac	2001.5	12.21048314	3.77630914	2.20411998	2.10720997	3.16435286	2	4.3	
Squalus blainville	Squalus	Squalidae	Squaliformes	MedSea	1988	12.52577338	-12.485639		2	1.89762709	2.88309336	2.59988307	4

<i>Squalus blainville</i>	<i>Squalus</i>	<i>Squalidae</i>	<i>Squaliformes</i>	<i>MedSea</i>	2000.5	12.52577338	-31.969166		2	1.89762709	2.88309336	2.59988307	4	
<i>Squalus grahami</i>	<i>Squalus</i>	<i>Squalidae</i>	<i>Squaliformes</i>	<i>SouthAUS</i>	1986.5	10.58387449	-17.199611	1.77959649	1.25527251	2.55145	2.52504481		4.3	
<i>Squalus megalops</i>	<i>Squalus</i>	<i>Squalidae</i>	<i>Squaliformes</i>	<i>SouthAUS</i>	1986.5	10.58387449	0.78816399	1.85125835	1.91907809	2.8573325	2.2787536		4.3	
<i>Squalus mitsukurii</i>	<i>Squalus</i>	<i>Squalidae</i>	<i>Squaliformes</i>	<i>SouthAUS</i>	1986.5	10.58387449	-17.199611	2.09691001		2	2.75663611	2.46314614		4.5
<i>Squatina albipunctata</i>	<i>Squatina</i>	<i>Squatiniidae</i>	<i>Squatatiniformes</i>	<i>SouthAUS</i>	1986.5	10.58387449	-15.32798	1.99343623	1.32221929	2.5774918	2.35410844		4	
<i>Furgaleus macki</i>	<i>Furgaleus</i>	<i>Triakidae</i>	<i>Carcharhiniformes</i>	<i>SouthAUS</i>	1986.5	10.58387449	-4.1163041	2.20411998	1.38021124	2.34242268	2.04139269		3.8	

Appendix 4. Values for the index of human impact included in Appendix S3 were derived from Halpern et al. (2008) and are represented by weighted average from the size of individual localities within a geographical region. Numbers in table below correspond to rows in Supplementary Table 3 in Halpern et al. (2008).

Locality	Human Impact	Rows
Adriatic Sea	12.1	30
Andaman Sea	10.6	109
Georges Bank	13.2	39, 40
Georgia Strait	19.3	56
Gulf of Mexico	6.6	43, 69
Hawai'i	11.4	152
Ionian Sea	14.3	34
Mediterranean Sea	12.5	30-36
Mozambique	6.1	100-102
Northeast Atlantic	12.6	20-26
Northeast Pacific	12.2	54-57
Ningaloo Reef	3.9	209-211
Northern Gulf of Mexico	6.5	43
North Pacific	12.2	45-57
Northwest Atlantic	11.2	37-42
South Africa	9.6	190-194
South Australia	10.6	203, 204
Southwest Atlantic	8.1	175-179, 187, 188
West Central Pacific	7.3	112-163, 195-204

Reference:

Halpern, B. S., et al. 2008. A global map of human impact on marine ecosystems. – Science 319: 948-952.

Appendix 5. Summary of the top 5 models for average annual rate of shark population change based on AICc. Models are shown including the ΔAIC_c and Akaike weights (w_i) of each model given the data. Please note that all models also include shark Species:Genus:Family:Order and Geographical locality as random effects.

Model	ΔAIC_c	w_i
123456	0	0.38
23456	1.02	0.23
123 56	3.34	0.07
1234 6	3.90	0.05

1, Human impact; 2, Depth; 3, Latitudinal range; 4, Mid point of the depth range; 5, Total length; 6, Trophic level