

Table S1. A complete list of rhino rays (Chondrichthyes: Rhinopristiformes) by family with their extinction risk status according to the IUCN Red List of Threatened Species (IUCN 2024). The number of extant species is given in parentheses after each family name. IUCN Red List Categories: CR, Critically Endangered; EN, Endangered; VU, Vulnerable; NT, Near Threatened; LC, Least Concern; DD, Data Deficient; NE, Not Evaluated

Family	Species name	Common name	IUCN Red List Category
Pristidae (5)	<i>Anoxypristis cuspidata</i>	Narrow sawfish	CR
	<i>Pristis clavata</i>	Dwarf sawfish	CR
	<i>Pristis pectinata</i>	Smalltooth sawfish	CR
	<i>Pristis pristis</i>	Largetooth sawfish	CR
	<i>Pristis zijsron</i>	Green sawfish	CR
Trygonorrhinidae (8)	<i>Aptychotrema rostrata</i>	Eastern shovelnose ray	LC
	<i>Aptychotrema timorensis</i>	Spotted shovelnose ray	VU
	<i>Aptychotrema vincentiana</i>	Western shovelnose ay	LC
	<i>Trygonorrhina dumerilii</i>	Southern fiddler ray	LC
	<i>Trygonorrhina fasciata</i>	Eastern fiddler ray	LC
	<i>Zapteryx brevirostris</i>	Shortnose guitarfish	EN
	<i>Zapteryx exasperata</i>	Banded guitarfish	DD
	<i>Zapteryx xyster</i>	Southern banded guitarfish	VU
Glaucostegidae (7)	<i>Glaucostegus cemiculus</i>	Blackchin guitarfish	CR
	<i>Glaucostegus granulatus</i>	Sharpnose guitarfish	CR
	<i>Glaucostegus halavi</i>	Halavi guitarfish	CR
	<i>Glaucostegus obtusus</i>	Widenose guitarfish	CR
	<i>Glaucostegus thouin</i>	Clubnose guitarfish	CR
	<i>Glaucostegus typus</i>	Giant guitarfish	CR
	<i>Glaucostegus younholeei</i>	Bangladeshi guitarfish	CR
Rhinidae (11)	<i>Rhina ancylostomus</i>	Bowmouth guitarfish	CR
	<i>Rhynchobatus australiae</i>	Bottlenose wedgefish	CR
	<i>Rhynchobatus cooki</i>	Clown wedgefish	CR
	<i>Rhynchobatus djiddensis</i>	Whitespotted wedgefish	CR
	<i>Rhynchobatus immaculatus</i>	Taiwanese wedgefish	CR
	<i>Rhynchobatus laevis</i>	Smoothnose wedgefish	CR
	<i>Rhynchobatus luebberti</i>	African wedgefish	CR
	<i>Rhynchobatus mononoke</i>	Japanese wedgefish	CR
	<i>Rhynchobatus palpebratus</i>	Eyebrow wedgefish	NT
	<i>Rhynchobatus springeri</i>	Broadnose wedgefish	CR
	<i>Rhynchorhina mauritaniensis</i>	False shark ray	CR
Rhinobatidae (37)	<i>Acroteriobatus andysabini</i>	Malagasy blue-spotted guitarfish	NE
	<i>Acroteriobatus annulatus</i>	Lesser guitarfish	VU
	<i>Acroteriobatus blochii</i>	Bluntnose guitarfish	LC
	<i>Acroteriobatus leucospilus</i>	Greyspot guitarfish	EN
	<i>Acroteriobatus ocellatus</i>	Speckled guitarfish	DD
	<i>Acroteriobatus omanensis</i>	Oman guitarfish	DD
	<i>Acroteriobatus salalah</i>	Salalah guitarfish	NT
	<i>Acroteriobatus stehmanni</i>	Socotra blue-spotted guitarfish	NE
	<i>Acroteriobatus variegatus</i>	Stripenose guitarfish	CR
	<i>Acroteriobatus zanzibarensis</i>	Zanzibar guitarfish	NT
	<i>Pseudobatos buthi</i>	Spadenose guitarfish	VU
	<i>Pseudobatos glaucostigmus</i>	Greyspotted guitarfish	VU
	<i>Pseudobatos horkelii</i>	Brazilian guitarfish	CR

Family	Species name	Common name	IUCN Red List Category
	<i>Pseudobatos lentiginosus</i>	Freckled guitarfish	VU
	<i>Pseudobatos leucorhynchus</i>	Whitesnout guitarfish	VU
	<i>Pseudobatos percellens</i>	Chola guitarfish	EN
	<i>Pseudobatos planiceps</i>	Pacific guitarfish	VU
	<i>Pseudobatos prahli</i>	Gorgona guitarfish	VU
	<i>Pseudobatos productus</i>	Shovelnose guitarfish	NT
	<i>Rhinobatos albomaculatus</i>	Whitespotted guitarfish	CR
	<i>Rhinobatos annandalei</i>	Bengal guitarfish	CR
	<i>Rhinobatos austini</i>	Austin's guitarfish	DD
	<i>Rhinobatos borneensis</i>	Borneo guitarfish	EN
	<i>Rhinobatos holcorhynchus</i>	Slender guitarfish	DD
	<i>Rhinobatos hynnicephalus</i>	Ringed guitarfish	EN
	<i>Rhinobatos irvinei</i>	Spineback guitarfish	CR
	<i>Rhinobatos jimbaranensis</i>	Jimbaran guitarfish	CR
	<i>Rhinobatos lionotus</i>	Smoothback guitarfish	CR
	<i>Rhinobatos manai</i>	Papuan guitarfish	LC
	<i>Rhinobatos nudidorsalis</i>	Bareback guitarfish	DD
	<i>Rhinobatos penggali</i>	Indonesian guitarfish	EN
	<i>Rhinobatos punctifer</i>	Spotted guitarfish	NT
	<i>Rhinobatos ranongensis</i>	Bengal guitarfish	VU
	<i>Rhinobatos rhinobatos</i>	Common guitarfish	CR
	<i>Rhinobatos sainsburyi</i>	Goldeneye guitarfish	LC
	<i>Rhinobatos schlegelii</i>	Brown guitarfish	CR
	<i>Rhinobatos whitei</i>	Philippine guitarfish	CR

Table S2. The extinction risk status of all extant vertebrate orders (n = 136) ranked by critical endangerment (% CR; right-hand column). The percentages of threatened (THR, which comprises all CR, EN, VU species) and CR species is based on the number of extant species in the wild in each order that have been assessed against the IUCN Red List Categories and Criteria (IUCN 2024). Therefore, the number of species may be lower than the total species richness (e.g., 2 rhino rays have not yet been assessed giving 66 assessed species vs 68 total species; **bold row**). IUCN Red List categories: EX, Extinct; EW, Extinct in the Wild; CR, Critically Endangered; EN, Endangered; VU, Vulnerable (IUCN 2012)

Class	Order	No. species (extinct & extant)	EX	EW	No. species (extant)	CR	EN	VU	THR	% THR	% CR
Actinopterygii	Acipenseriformes	27	1	1	25	17	3	5	25	100.0	68.0
Sarcopterygii	Coelacanthiformes	2	0	0	2	1	0	1	2	100.0	50.0
Chondrichthyes	Rhinopristiformes	66	0	0	66	32	6	10	48	72.7	48.5
Mammalia	Monotremata	5	0	0	5	2	0	1	3	60.0	40.0
Mammalia	Pholidota	8	0	0	8	3	3	2	8	100.0	37.5
Chondrichthyes	Squatiniiformes	23	0	0	23	8	4	1	13	56.5	34.8
Mammalia	Proboscidea	3	0	0	3	1	2	0	3	100.0	33.3
Reptilia	Crocodylia	23	0	0	23	7	1	3	11	47.8	30.4
Reptilia	Testudines	272	8	0	264	68	47	58	173	65.5	25.8
Mammalia	Perissodactyla	16	0	0	16	4	5	3	12	75.0	25.0
Amphibia	Caudata	758	3	0	755	132	184	109	425	56.3	17.5
Mammalia	Primates	525	2	0	523	88	145	116	349	66.7	16.8
Actinopterygii	Salmoniformes	157	13	2	142	21	20	33	74	52.1	14.8
Actinopterygii	Lepisosteiformes	7	0	0	7	1	0	0	1	14.3	14.3
Aves	Cathartiformes	7	0	0	7	1	0	1	2	28.6	14.3
Actinopterygii	Atheriniformes	335	1	0	334	45	56	42	143	42.8	13.5
Actinopterygii	Osmeriformes	205	1	0	204	26	26	11	63	30.9	12.7
Aves	Procellariiformes	148	2	0	146	17	20	29	66	45.2	11.6
Aves	Otidiformes	26	0	0	26	3	2	3	8	30.8	11.5
Actinopterygii	Percopsiformes	9	0	0	9	1	0	0	1	11.1	11.1
Mammalia	Diprotodontia	147	8	0	139	15	14	23	52	37.4	10.8
Mammalia	Pilosa	10	0	0	10	1	0	2	3	30.0	10.0
Actinopterygii	Cyprinodontiformes	1235	11	7	1217	119	205	196	520	42.7	9.8
Amphibia	Anura	7047	34	2	7011	663	1068	698	2429	34.6	9.5

Class	Order	No. species (extinct & extant)	EX	EW	No. species (extant)	CR	EN	VU	THR	% THR	% CR
Chondrichthyes	Carcharhiniformes	295	0	0	295	24	30	42	96	32.5	8.1
Actinopterygii	Cichliformes	1574	5	0	1569	117	82	112	311	19.8	7.5
Chondrichthyes	Myliobatiformes	221	1	0	220	16	45	45	106	48.2	7.3
Chondrichthyes	Lamniformes	15	0	0	15	1	5	4	10	66.7	6.7
Aves	Psittaciformes	421	16	1	404	24	29	55	108	26.7	5.9
Actinopterygii	Cypriniformes	3528	44	1	3483	196	356	386	938	26.9	5.6
Aves	Gruiformes	193	24	0	169	9	11	28	48	28.4	5.3
Petromyzonti	Petromyzontiformes	38	0	0	38	2	4	3	9	23.7	5.3
Aves	Accipitriformes	252	1	0	251	13	21	24	58	23.1	5.2
Aves	Podicipediformes	23	3	0	20	1	3	1	5	25.0	5.0
Mammalia	Artiodactyla	336	8	1	327	15	50	57	122	37.3	4.6
Aves	Bucerotiformes	73	1	0	72	3	5	17	25	34.7	4.2
Actinopterygii	Beloniformes	178	0	0	178	7	9	7	23	12.9	3.9
Aves	Columbiformes	369	16	1	352	13	18	33	64	18.2	3.7
Aves	Pelecaniformes	116	6	0	110	4	8	6	18	16.4	3.6
Aves	Galliformes	309	1	1	307	11	18	44	73	23.8	3.6
Reptilia	Squamata	10013	24	2	9987	355	741	564	1660	16.6	3.6
Aves	Anseriformes	177	7	0	170	6	8	12	26	15.3	3.5
Actinopterygii	Gasterosteiformes	31	1	0	30	1	1	2	4	13.3	3.3
Chondrichthyes	Torpediniformes	63	0	0	63	2	6	19	27	42.9	3.2
Actinopterygii	Gymnotiformes	237	0	0	237	7	4	16	27	11.4	3.0
Aves	Charadriiformes	387	7	0	380	11	16	26	53	13.9	2.9
Chondrichthyes	Rajiformes	299	0	0	299	8	15	24	47	15.7	2.7
Actinopterygii	Siluriformes	3438	2	0	3436	90	191	196	477	13.9	2.6
Mammalia	Rodentia	2375	37	0	2338	60	142	128	330	14.1	2.6
Mammalia	Eulipotyphla	498	7	0	491	12	39	25	76	15.5	2.4
Chondrichthyes	Orectolobiformes	45	0	0	45	1	4	12	17	37.8	2.2
Actinopterygii	Gobiiformes	1714	0	0	1714	37	60	65	162	9.5	2.2
Aves	Coraciiformes	187	0	1	186	4	0	12	16	8.6	2.2

Class	Order	No. species (extinct & extant)	EX	EW	No. species (extant)	CR	EN	VU	THR	% THR	% CR
Mammalia	Lagomorpha	96	1	0	95	2	14	8	24	25.3	2.1
Aves	Strigiformes	243	5	0	238	5	11	24	40	16.8	2.1
Mammalia	Didelphimorphia	98	1	0	97	2	0	6	8	8.2	2.1
Actinopterygii	Synbranchiformes	100	0	0	100	2	6	6	14	14.0	2.0
Amphibia	Gymnophiona	206	0	0	206	4	11	4	19	9.2	1.9
Aves	Suliformes	54	1	0	53	1	5	9	15	28.3	1.9
Mammalia	Chiroptera	1335	9	0	1326	25	86	110	221	16.7	1.9
Aves	Caprimulgiformes	603	2	0	601	11	13	27	51	8.5	1.8
Mammalia	Afrosoricida	55	0	0	55	1	7	9	17	30.9	1.8
Mammalia	Carnivora	297	6	0	291	4	29	45	78	26.8	1.4
Aves	Passeriformes	6694	60	1	6633	90	197	320	607	9.2	1.4
Aves	Cuculiformes	153	2	0	151	2	2	8	12	7.9	1.3
Myxini	Myxiniiformes	80	0	0	80	1	2	6	9	11.3	1.3
Actinopterygii	Characiformes	2004	0	0	2004	21	76	98	195	9.7	1.0
Actinopterygii	Gobiesociformes	103	0	0	103	1	1	9	11	10.7	1.0
Actinopterygii	Clupeiformes	421	1	0	420	4	11	12	27	6.4	1.0
Actinopterygii	Lophiiformes	354	0	0	354	3	4	0	7	2.0	0.8
Actinopterygii	Perciformes	4966	1	0	4965	42	105	185	332	6.7	0.8
Chondrichthyes	Squaliformes	141	0	0	141	1	15	16	32	22.7	0.7
Actinopterygii	Scorpaeniformes	572	1	0	571	4	5	7	16	2.8	0.7
Aves	Piciformes	484	1	0	483	3	5	12	20	4.1	0.6
Actinopterygii	Gadiformes	162	0	0	162	1	1	2	4	2.5	0.6
Actinopterygii	Syngnathiformes	300	0	0	300	1	3	14	18	6.0	0.3
Actinopterygii	Tetraodontiformes	391	0	0	391	1	7	8	16	4.1	0.3
Actinopterygii	Ophidiiformes	538	0	0	538	1	6	4	11	2.0	0.2
Actinopterygii	Anguilliformes	902	0	0	902	1	4	4	9	1.0	0.1
Actinopterygii	Pleuronectiformes	782	0	0	782	0	2	12	14	1.8	0.0
Actinopterygii	Stomiiformes	440	0	0	440	0	0	0	0	0.0	0.0
Actinopterygii	Aulopiformes	282	0	0	282	0	0	0	0	0.0	0.0

Class	Order	No. species (extinct & extant)	EX	EW	No. species (extant)	CR	EN	VU	THR	% THR	% CR
Actinopterygii	Myctophiformes	258	0	0	258	0	0	0	0	0.0	0.0
Actinopterygii	Osteoglossiformes	213	1	0	212	0	6	15	21	9.9	0.0
Actinopterygii	Beryciformes	144	0	0	144	0	0	2	2	1.4	0.0
Actinopterygii	Stephanoberyciformes	79	0	0	79	0	0	0	0	0.0	0.0
Actinopterygii	Mugiliformes	53	0	0	53	0	1	0	1	1.9	0.0
Actinopterygii	Batrachoidiformes	84	0	0	84	0	3	8	11	13.1	0.0
Actinopterygii	Gonorynchiformes	34	0	0	34	0	1	4	5	14.7	0.0
Actinopterygii	Lampriformes	25	0	0	25	0	0	0	0	0.0	0.0
Actinopterygii	Cetomimiformes	28	0	0	28	0	0	0	0	0.0	0.0
Actinopterygii	Saccopharyngiformes	28	0	0	28	0	0	0	0	0.0	0.0
Actinopterygii	Notacanthiformes	13	0	0	13	0	0	0	0	0.0	0.0
Actinopterygii	Zeiformes	12	0	0	12	0	0	0	0	0.0	0.0
Actinopterygii	Polypteriformes	14	0	0	14	0	0	0	0	0.0	0.0
Actinopterygii	Elopiformes	9	0	0	9	0	0	1	1	11.1	0.0
Actinopterygii	Esociformes	12	0	0	12	0	0	1	1	8.3	0.0
Actinopterygii	Ateleopodiformes	11	0	0	11	0	0	0	0	0.0	0.0
Actinopterygii	Albuliformes	10	0	0	10	0	0	1	1	10.0	0.0
Actinopterygii	Polymixiiformes	10	0	0	10	0	0	0	0	0.0	0.0
Actinopterygii	Amiiformes	1	0	0	1	0	0	0	0	0.0	0.0
Aves	Falconiformes	65	2	0	63	0	2	6	8	12.7	0.0
Aves	Struthioniformes	61	2	0	59	0	1	10	11	18.6	0.0
Aves	Trogoniformes	43	0	0	43	0	0	2	2	4.7	0.0
Aves	Musophagiformes	24	0	0	24	0	1	0	1	4.2	0.0
Aves	Ciconiiformes	20	0	0	20	0	3	0	3	15.0	0.0
Aves	Pterocliiformes	16	0	0	16	0	0	0	0	0.0	0.0
Aves	Sphenisciformes	18	0	0	18	0	5	4	9	50.0	0.0
Aves	Gaviiformes	5	0	0	5	0	0	0	0	0.0	0.0
Aves	Phoenicopteriformes	6	0	0	6	0	0	1	1	16.7	0.0
Aves	Coliiformes	6	0	0	6	0	0	0	0	0.0	0.0

Class	Order	No. species (extinct & extant)	EX	EW	No. species (extant)	CR	EN	VU	THR	% THR	% CR
Aves	Phaethontiformes	3	0	0	3	0	0	0	0	0.0	0.0
Aves	Mesitornithiformes	3	0	0	3	0	0	3	3	100.0	0.0
Aves	Cariamiformes	2	0	0	2	0	0	0	0	0.0	0.0
Aves	Eurypygiformes	2	0	0	2	0	1	0	1	50.0	0.0
Aves	Opisthocomiformes	1	0	0	1	0	0	0	0	0.0	0.0
Aves	Leptosomiformes	1	0	0	1	0	0	0	0	0.0	0.0
Reptilia	Rhynchocephalia	1	0	0	1	0	0	0	0	0.0	0.0
Mammalia	Dasyuromorphia	72	1	0	71	0	5	5	10	14.1	0.0
Mammalia	Scandentia	23	0	0	23	0	1	1	2	8.7	0.0
Mammalia	Peramelemorphia	22	3	0	19	0	3	6	9	47.4	0.0
Mammalia	Cingulata	20	0	0	20	0	0	2	2	10.0	0.0
Mammalia	Macroscelidea	19	0	0	19	0	1	1	2	10.5	0.0
Mammalia	Paucituberculata	7	0	0	7	0	0	3	3	42.9	0.0
Mammalia	Hyracoidea	5	0	0	5	0	0	0	0	0.0	0.0
Mammalia	Sirenia	5	1	0	4	0	0	4	4	100.0	0.0
Mammalia	Notoryctemorphia	2	0	0	2	0	0	0	0	0.0	0.0
Mammalia	Dermoptera	2	0	0	2	0	0	0	0	0.0	0.0
Mammalia	Microbiotheria	1	0	0	1	0	0	0	0	0.0	0.0
Mammalia	Tubulidentata	1	0	0	1	0	0	0	0	0.0	0.0
Chondrichthyes	Chimaeriformes	53	0	0	53	0	0	4	4	7.5	0.0
Chondrichthyes	Hexanchiformes	7	0	0	7	0	0	1	1	14.3	0.0
Chondrichthyes	Pristiophoriformes	10	0	0	10	0	0	0	0	0.0	0.0
Chondrichthyes	Heterodontiformes	9	0	0	9	0	0	0	0	0.0	0.0
Sarcopterygii	Lepidosireniformes	5	0	0	5	0	0	0	0	0.0	0.0
Sarcopterygii	Ceratodontiformes	1	0	0	1	0	1	0	1	100.0	0.0