

Acoustic behaviors in Hawaiian coral reef fish-communities

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Supplement. Table S1 provides a list of all sonic and non-sonic species observed by divers at Puako Reef over the course of the study. Table S2 provides detailed acoustic behavior data and statistics for each sound type

Table S1. Resident fish species (n = 96) and those identified as acoustically active (n = 45) recorded on video camera during encounters with rebreather divers at Puako Reef, Hawai'i, HI, USA. Acoustic behavior indicates resident species for which acoustic behaviors were confirmed (+, shown in **bold**) by screening of video in the lab, whereas species not confirmed (0) may also be acoustically active but remain to be documented

Family	Acoustic behavior	Species	Common name, Hawaiian name
Acanthuridae	0	<i>Acanthurus achilles</i>	Achilles tang, paku ikui
	0	<i>Acanthurus dussumieri</i>	Eyestripe surgeonfish, palani
	0	<i>Acanthurus nigrofuscus</i>	Brown surgeonfish, ma'i'i'i
	+	<i>Acanthurus olivaceus</i>	Orange spot surgeonfish, na'ena'e
	0	<i>Acanthurus triostegus</i>	Convict surgeonfish, manini
	+	<i>Ctenochaetus hawaiiensis</i>	Hawaiian bristletooth, kole
	+	<i>Ctenochaetus strigosus</i>	Goldring bristletooth, kole
	0	<i>Naso brevirostris</i>	Spotted unicornfish, kala lolo
	0	<i>Naso hexacanthus</i>	Sleek unicornfish, opelu kala
	0	<i>Naso litturatus</i>	Orangespine unicornfish, umaumalei
	0	<i>Naso unicornis</i>	Bluespine unicornfish, kala
	+	<i>Zebrasoma flavescens</i>	Yellow tang, lau'ipala
	0	<i>Zebrasoma veliferum</i>	Sailfin tang, maneoneo
Apogonidae	0	<i>Apogon kallopterus</i>	Iridescent cardinalfish, 'upapalu
Aulostomidae	0	<i>Aulostomus chinensis</i>	Trumpetfish, nunu
Balistidae	+	<i>Melichthys niger</i>	Black durgon, humumumu 'ele'ele
	0	<i>Melichthys vidua</i>	Pinktail durgon, humuhumu hi'u kole
	+	<i>Sufflamen bursa</i>	Lei triggerfish, humuhumu lei
	0	<i>Sufflamen frenatum</i>	Bridled triggerfish, humuhumu mimi
	+	<i>Xanthichthys auromarginatus</i>	Gilded triggerfish, not known
Carangidae	0	<i>Caranx melampygus</i>	Blue trevally, omilu
Chaetodontidae	0	<i>Chaetodon auriga</i>	Threadfin butterflyfish, kikakapu
	+	<i>Chaetodon kleinii</i>	Blacklip butterflyfish, lauhau
	0	<i>Chaetodon lunula</i>	Raccoon butterflyfish, kikakapu
	0	<i>Chaetodon miliaris</i>	Milletseed butterflyfish, lau wiliwili
	+	<i>Chaetodon multicinctus</i>	Multiband butterflyfish, kikakapu
	+	<i>Chaetodon ornatissimus</i>	Ornate butterflyfish kikakapu
	0	<i>Chaetodon quadrimaculatus</i>	Fourspot butterflyfish, lauhau
	+	<i>Forcipiger flavissimus</i>	Forcepsfish, lau wiliwili nukunuko 'oi'oi
+	<i>Forcipiger longirostris</i>	Longnose butterflyfish, lau wiliwili nukunuko 'oi'oi	

Family	Acoustic behavior	Species	Common name, Hawaiian name
	+	<i>Hemitaurichthys polylepis</i>	Pyramid butterflyfish, not known
	+	<i>Hemitaurichthys thompsoni</i>	Thompson's butterflyfish, not known
Cirrhitidae	0	<i>Paracirrhites arcatus</i>	Arc-eye hawkfish, piliko'a
	0	<i>Paracirrhites forsteri</i>	Blackside hawkfish, hilu piliko'a
Diodontidae	0	<i>Diodon hystrix</i>	Spot-fin porcupinefish, kokala
Fistulariidae	0	<i>Fistularia commersonii</i>	Cornetfish, nunu peke
Holocentridae	+	<i>Myripristis amaena</i>	Brick soldierfish, 'u'u
	+	<i>Myripristis berndti</i>	Bigscale soldierfish, 'u'u
	+	<i>Myripristis kuntzei</i>	Epaulette soldierfish, 'u'u
	+	<i>Neoniphon aurolineatus</i>	Goldlined squirrelfish 'ala'ih
	+	<i>Neoniphon sammara</i>	Sammara squirrelfish, 'ala'ih
	+	<i>Sargocentron spiniferum</i>	Saber squirrelfish 'ala'ih
	+	<i>Sargocentron tiere</i>	Blue-lined squirrelfish, 'ala'ih
Labridae	0	<i>Bodianus albotaeniatus</i>	Hawaiian hogfish, 'a'awa
	0	<i>Coris gaimard</i>	Yellowtail coris, hinalea 'aki-lolo
	+	<i>Gomphosus varius</i>	Bird wrasse, hinalea i'wi
	0	<i>Novaculichthys taeniourus</i>	Rockmover wrasse, not known
	0	<i>Pseudocheilnus evanidus</i>	Disappearing wrasse, not known
	0	<i>Pseudocheilnus octotaenia</i>	Eightline wrasse, not known
	0	<i>Pseudocheilnus tetrataenia</i>	Fourline wrasse, not known
	0	<i>Stethojulis balteata</i>	Belted wrasse, 'omaka
	+	<i>Thalassoma duperrey</i>	Saddle wrasse, hinalea lau-wili
	0	<i>Thalassoma purpuraceum</i>	Surge wrasse, hou
	0	<i>Thalassoma trilobatum</i>	Christmas wrasse, 'awela
Lutjanidae	0	<i>Aphareus furca</i>	Smalltooth jobfish, wahanui
	+	<i>Lutjanus kasmira</i>	Common bluestripe snapper, ta'ape
Monacanthidae	0	<i>Aluterus scriptus</i>	Scrawled filefish, loulu
	+	<i>Cantherines dumerilii</i>	Barred filefish, 'o'ili
Mullidae	+	<i>Mulloidichthys flavolineatus</i>	Yellowstripe goatfish, weke'a
	0	<i>Mulloidichthys vanicolensis</i>	Yellowfin goatfish, weke 'ula
	0	<i>Parupeneus chrysostomus</i>	Goldsaddle goatfish, moano hulu
	+	<i>Parupeneus insularis</i>	Island goatfish, munu
	+	<i>Parupeneus multifasciatus</i>	Mmanybar goatfish, moano
	0	<i>Parupeneus pleurostigma</i>	Sidespot goatfish, malu
	+	<i>Parupeneus porphyreus</i>	White saddle goatfish, kumu

Family	Acoustic behavior	Species	Common name, Hawaiian name
Muraenidae	0	<i>Gymnothorax melagris</i>	Whitemouth moray, puhi 'oni'o
	0	<i>Gymnothorax flavimarginatus</i>	Yellowmargin moray, puhi paka
Ostraciidae	0	<i>Ostracion meleagris</i>	Hawaiian spotted boxfish, moa
Pomacanthidae	+	<i>Apolemichthys arcuatus</i>	Bandit angelfish, not known
	+	<i>Centropyge loricula</i>	Flame angel, not known
	0	<i>Centropyge potteri</i>	Potter's angel, not known
Pomacentridae	+	<i>Abudefduf abdominalis</i>	Hawaiian sergeant, mamo
	+	<i>Abudefduf vaigiensis</i>	Indo-Pacific sergeant, mamo
	0	<i>Chromis agilis</i>	Agile chromis, not known
	+	<i>Chromis hanui</i>	Chocolate-dip chromis, not known
	0	<i>Chromis leucura</i>	Whitetailed chromis, not known
	+	<i>Chromis ovalis</i>	Oval chromis, not known
	0	<i>Chromis vanderbilti</i>	Blackfin chromis, not known
	+	<i>Chromis verater</i>	Threespot chromis, not known
	+	<i>Dascyllus albisella</i>	Hawaiian dascyllus, 'alo'ilo'i
	+	<i>Plectroglyphidodon johnstonianus</i>	Blue-eye damselfish, not known
	+	<i>Stegastes marginatus</i>	Hawaiian gregory, not known
Scarinae	0	<i>Chlorurus perspicillatus</i>	Spectacled parrotfish, uhu 'ahu'ula
	+	<i>Chlorurus spilurus</i>	Pacific bullethead parrotfish, uhu
	0	<i>Scarus dubius</i>	Regal parrotfish, lauia
	+	<i>Scarus psittacus</i>	Palenose parrotfish, uhu
	+	<i>Scarus rubroviolaceus</i>	Ember parrotfish, uhu palukaluka
Serranidae	+	<i>Cephalopholis argus</i>	Peacock grouper, roi
	+	<i>Pseudanthias bicolor</i>	Bicolor anthias, not known
Sphyraenidae	0	<i>Sphyraena barracuda</i>	Great barracuda, kaku
	0	<i>Sphyraena helleri</i>	Heller's barracuda, kawele'a
Tetraodontidae	0	<i>Arothron hispidus</i>	Stripbelly puffer, 'o'pu hue
	0	<i>Arothron meleagris</i>	Guineafowl puffer, 'o'opu hue
	0	<i>Canthigaster amboinensis</i>	Ambon toby, not known
	0	<i>Canthigaster jactator</i>	Hawaiian whitespotted toby, not known
Zanclidae	+	<i>Zanclus cornutus</i>	Moorish idol, kihikihi

Table S2. Spectral and temporal characteristics of sound events and trains recorded from wild fish populations on Hawaiian coral reefs. Values indicate mean and standard error unless otherwise indicated. Peak frequency range is for all waveforms recorded for each sound type. Proportions of total observations in a particular behavioral context are indicated. N = number of individuals, Nt = number of individuals that produced trains, n = number of sounds, nt = number of trains, pps = pulses per second. BW prop: bandwidth proportion (proportion of power spectrum [FFT frequency bins] that is within 10 dB from frequency peaks; Agg12: aggressive short pulse identified by 1 to 2 pulses; Agg>2: aggressive short pulse identified by >2 pulses; HF: high frequency, LF: low frequency. Behavioral contexts: A = agonistic, C = courtship, N = nest defense, F = feeding, D = disturbance by diver (vigilance), S = spawning, Sc = schooling or shoaling, T = territorial aggression, U = unknown

Taxon	Sound	N, n	Behavioral context	Acoustic properties								Event train properties					
				Duration (ms)	Peak (range)	Frequency (Hz)					BW prop	Nt, nt	Events per train	Event duration (ms)	Train segment duration (ms)	Event rate (pps)	Inter-event interval (ms)
						Min.	1 st Quart	Median	3 rd Quart	Max.							
Holocentridae																	
<i>Myripristis amaena</i>																	
	Growl	2,12	D	80+31	134+28 (39–219)	57+14	121+6	180+25	230+29	298+21	0.09	2,3	8.3+4.6	80+31	338+128	13.2+5.5	6
	Grunt	3,14	D	99+27	124+24 (35–242)	17+10	93+7	187+24	252+24	334+13	0.11+0.01	3,4	6.8+2.4	100+25	487+35	9.8+3.8	46+29
	Staccato	3,24	D	48+10	219+33 (35–363)	23+7	119+27	207+36	287+37	410+25	0.13+0.02	3,6	10.3+2.3	47+11	249+86	18.8+5.2	20+15
<i>Myripristis berndti</i>																	
	Knock	2,5	D	19+10	583+45 (551–621)	94+133	243+175	490+82	647+116	860+68	0.30+0.08	1,1	4	12	201	19.9	51
	Growl	3,5	D	591+346	102+67 (33–207)	42+42	102+48	157+43	219+38	298+43	0.09+0.01	1,1	9	32	402	7.5	102
	Grunt	2,7	D	85+22	173+39 (84–215)	96+8	139+22	188+29	240+45	301+71	0.08+0.02	1,1	2	67	160	12.5	9
	Staccato	5,23	D	183+131	194+17 (137–258)	68+27	128+17	190+11	241+14	299+24	0.09+0.02	4,5	9.1+4.0	67+18	516+77	8.4+1.1	83+35
<i>Myripristis kuntee</i>																	
	Grunt	1,5	D	44	218 (160–262)	134	197	235	302	340	0.08	1,1	2	52	141	14.2	12
	Knock	3,49	D	7+0.3	682+39 (148–895)	319+26	516+22	712+20	911+21	1117+12	0.39+0.01	3,9	9.0+3.3	8	689+312	11.1+3.3	293+85
	Staccato	3,17	D	49+23	191+26 (156–477)	101+24	158+39	221+58	280+85	347+122	0.11+0.06	2,4	7.0+1.0	52+32	718+217	6.4+2.1	176+24
<i>Neoniphon aurolineatus</i>																	
	Grunt	1,5	D	71	83 (35–168)	17	57	132	170	206	0.08	1,1	4	73	486	8.2	64
	Knock	1,2	D	11	926 (555–1297)	205	565	868	1296	1480	0.37						
	Staccato	1,8	D	41	209 (35–469)	29	104	207	284	354	0.11	1,1	5	54	243	16.5	9
<i>Neoniphon sammara</i>																	
	Growl	6,7	D	539+100	193+41 (16–258)	92+18	152+26	219+10	274+8	334+12	0.06+0.01						
	Knock	2,11	D	21+3	360+95 (51–727)	222+21	306+55	391+89	486+136	572+173	0.17+0.07						
	Staccato	2,5	D	186+184	227+45 (195–316)	84+46	177+2	231+42	320+38	376+46	0.09+0.06	1,1	7	55	642	6.2	140
<i>Sargocentron tere</i>																	
	Growl	2,10	D	395+506	202+5 (113–246)	73+54	147+48	204+18	258+2	319+1	0.09+0.05	1,2	4	37	302	17.6	52
	Grunt	2,5	D	74+1	191+28 (168–238)	82+106	130+79	227+38	269+36	339+21	0.08+0.02						
	Knock	2,11	D	28+7	387+105 (43–594)	56+69	379+77	589+145	787+177	1060+173	0.36+0.12	3,2	5.3+3.2	28+7	237+70	17.1+1.5	55+15
Serranidae																	
<i>Cephalopholis argus</i>																	
	Pulse	3,4	A	104+44	82+67 (4–191)	46+37	86+52	145+69	207+91	304+129	0.08+0.03	1,1	1	123	450	4.4	204

Taxon	Sound	N, n	Behavioral context	Acoustic properties								Event train properties					
				Duration (ms)	Peak (range)	10 dB bandwidth					BW prop	N _t , n _t	Events per train	Event duration (ms)	Train segment duration (ms)	Event rate (pps)	Inter-event interval (ms)
						Min.	1 st Quart	Median	3 rd Quart	Max.							
<i>Pseudanthias bicolor</i>	Pulse	1,2	Sc	24	488 (469–508)	174	338	486	598	793	0.19						
Lutjanidae																	
<i>Lutjanus kasmira</i>	Pulse	1,1	Sc	59	188	8	80	139	201	258	0.12						
Mullidae																	
<i>Parupeneus insularis</i>	Pulse	3,6	C	34+10	308+168 (133–891)	115+34	215+66	366+127	471+168	571+206	0.18+0.07						
	Pulse Train	6,34	C	111+49	227+88 (8–621)	136+87	198+83	250+83	309+85	435+132	0.08+0.01	6,10	4.1+0.6	111+49	470+128	13.4+6.3	45+27
<i>Parupeneus multifasciatus</i>	Pulse	5,8	0.8 C, 0.2 U	103+258	145+362 (16–418)	52+131	110+276	221+552	360+901	648+1621	0.08+0.20						
	Pulse Train	3,12	C	119+29	132+70 (23–324)	18+4	83+33	133+61	184+87	243+118	0.08+0.04	3,3	5.0+1.2	119+29	562+186	8.6+3.4	29+36
	HF Pulse	2,4	C	18+5	833+57 (773–945)	455+279	715+208	896+292	1049+375	1199+459	0.31+0.17						
<i>Parupeneus porphyreus</i>	Pulse	2,2	Sc	80+37	246+171 (125–367)	21+19	137+32	227+94	318+175	449+293	0.16+0.14						
	Pulse Train	1,3	Sc	97	83 (8–227)	3	47	112	160	214	0.09	1,1	3	97	500	6	104
Pomacanthidae																	
<i>Apolemichthys arcuatus</i>	Pulse	1,4	D	44	245 (31–395)	85	186	290	485	673	0.16						
<i>Centropyge loricula</i>	Pulse	1,3	D	36	355 (168–672)	283	329	378	440	490	0.1						
Chaetodontidae																	
<i>Chaetodon kleinii</i>	HF Pulse	1,1	A	7	3609	2906	3621	6516	7254	9797	0.12						
<i>Chaetodon multicinctus</i>	Pulse	2,2	0.5 D, 0.5 A	50+10	184+22 (168–199)	10+14	114+14	207+28	304+41	445+116	0.17+0.03						
<i>Chaetodon ornatissimus</i>	Pulse	2,2	A, C	36+12	346+130 (254–438)	115+75	216+13	308+32	450+17	549+41	0.17+0.07						
<i>Forcipiger flavissimus</i>	Pulse	1,1	D	51	840	219	759	836	897	1086	0.12						
<i>Hemitaurichthys polylepis</i>	Pulse	16, 99	0.3 C, 0.64 D, 0.06 A	84+11	144+13 (52–266)	67+12	120+12	170+12	217+15	287+28	0.07+0.01	11,19	5.4+7	100+17	527+63	8.2+1.1	67+17
	Blended Pulse	6,16	0.42C, 0.42D, 0.17A	186+64	147+7 (128–164)	88+44	124+12	159+11	198+12	241+12	0.06+0.01	5,9	5.2+0.9	153+67	571+172	8.8+2.7	48+17
<i>Hemitaurichthys thompsoni</i>	Pulse	2,7	D	56+16	170+58 (51–227)	4+6	98+43	183+34	272+72	457+177	0.12+0.02	1,1	4	61	356	11.2	92
Pomacentridae																	
<i>Abudefduf abdominalis</i>	Agg12	12,19	N	88+15	251+29 (16–469)	102+18	192+22	286+27	422+42	544+53	0.15+0.02	2,2	2.0+0.0	82+17	224+15	12.1+1.5	44+15
	Agg>2	5,18	N	53+14	228+44 (12–320)	117+54	178+51	238+46	295+43	377+52	0.10+0.01	5,5	3.6+0.3	53+14	246+54	16.7+3.3	25+25
	HF Pulse	3,5	N	23+10	1162+203 (805–1969)	411+303	749+238	1052+199	1296+120	1703+152	0.49+0.16						

Taxon	Sound	N, n	Behavioral context	Acoustic properties								Event train properties					
				Duration (ms)	Peak (range)	Frequency (Hz)					BW prop	N _t , n _t	Events per train	Event duration (ms)	Train segment duration (ms)	Event rate (pps)	Inter-event interval (ms)
						10 dB bandwidth											
						Min.	1 st Quart	Median	3 rd Quart	Max.							
<i>Abudefduf vaigiensis</i>	Agg12	2,5	N	52+28	327+164 (211–492)	182+86	281+134	361+177	494+160	603+206	0.15+0.07						
	Agg>2	2,7	N	82+65	316+46 (43–461)	137+144	261+79	358+49	456+59	614+88	0.16+0.01	2,2	4.0+1.4	82+65	640+131	5.5+0.0	139+81
	HF Pulse	1,1	N	18	805	363	486	611	783	906	0.25						
<i>Chromis hanui</i>	Pulse	1,1	D	22	1012	645	861	1033	1205	1426	0.34						
<i>Chromis ovalis</i>	Pulse	1,1	D	154	27	16	21	27	34	39	0.01						
<i>Chromis verater</i>	Pulse	1,2	D	186	35 –35	12	18	33	43	49	0.02						
	Pulse Train	1,4	A	28	333 (301–402)	10	154	298	355	442	0.11	1,1	9	28	113	35.5	0.02
<i>Dascyllus albisella</i>	Agg/signal jump	5,70	0.8 U, 0.2 C	25+3	409+40 (254–574)	207+32	318+32	414+38	515+41	610+49	0.16+0.01	5,18	5.7+0.7	25	240+45	19.1+3.1	47+14
	Mate/visit	1,6	U	16	479 (434–512)	335	424	514	610	688	0.16	1,2	3	16	108	27.7	30
<i>Plectroglyphidodon johnstonianus</i>	Growl 1	1,3	T	403	180 (152–227)	102	155	223	299	368	0.09	1,1	2	419	1396	1.4	186
	Growl 2	1,5	T	125	430 (128–606)	125	399	686	943	1373	0.31	1,1	5	73	880	4.5	196
	Half Pulse	3,13	0.33 A, 0.67 T	40+10	49+2 (31–59)	2+1	39+5	78+11	116+17	153+23	0.08+0.01	1,1	2	39	151	13.2	73
	Pulse	5,26	0.2 A, 0.8 T	33+5	284+59 (93–707)	121+24	212+49	288+69	372+91	501+121	0.14+0.04	3,4	4.8+0.9	36+5	420+94	10.6+2.1	98+23
<i>Stegastes marginatus</i>	Half Pulse	1,4	T	51	44 (31–51)	4	48	94	149	200	0.09	1,1	4	51	663	6	153
	Pulse	4,9	T	43+3	292+65 (191–473)	153+85	228+80	290+81	350+90	457+83	0.11+0.01	3,3	5.7+3.7	42	307+136	13.0+6.1	197+157
Labridae																	
<i>Gomphosus varius</i>	Pulse I	7,41	0.19 AC, 0.38 S, 0.44 C	57+30	436+86 (27–793)	220+62	367+73	529+93	704+101	978+171	0.24+0.05	8,11	7.5+1.6	58+30	222+81	38.3+13.8	20+10
	Pulse II	4,14	C	28+3	474+50 (35–785)	135+57	446+55	710+55	946+69	1381+90	0.42+0.03	4,4	4.3+0.4	28	289+11	11.9+0.6	89+10
	Buzz	1,1	C	141	371	0	61	338	385	469	0.09						
<i>Thalassoma duperrey</i>	Pulse I	2,9	0.5 C, 0.5 S	85+88	605+811 (27–1715)	437+598	547+687	663+797	792+890	909+999	0.17+0.17	2,2	5.5+3.5	87+84	482+510	14.6+14.0	52+46
	Pulse I	3,3	C	157+133	531+205 (203–750)	267+209	523+247	705+326	928+445	1349+624	0.26+0.14						
	Blended Pulse II	1,4	C	11	423 (<50–671)	83	366	589	740	890	0.3	1,1	4	11	317	12.6	90
Scarinae																	
<i>Chlorurus spilurus</i>	LF Pulse	5,16	0.8 C, 0.2 ACT	252+134	111+30 (35–348)	20+8	67+26	114+24	160+29	224+44	0.07+0.04						
	LF Train	3,12	0.67 C, 0.33 ACT	45+17	137+27 (35–184)	43+36	118+29	211+41	281+49	353+54	0.11+0.01	3,3	9.0+5.4	45+17	208+53	21.3+6.2	3+2.4
	Scrape	23,56	F	181+22	2941+522 (<50–8156)	666+217	2504+281	4013+364	6032+458	8860+731	0.08+0.01						
<i>Scarus psittacus</i>	Scrape	1,4	F	125	3387 (<50–3469)	1652	3357	3949	6565	7395	0.07						

Taxon	Sound	N, n	Behavioral context	Acoustic properties								Event train properties					
				Duration (ms)	Peak (range)	10 dB bandwidth					BW prop	N _t , n _t	Events per train	Event duration (ms)	Train segment duration (ms)	Event rate (pps)	Inter-event interval (ms)
						Min.	1 st Quart	Median	3 rd Quart	Max.							
<i>Scarus rubroviolaceus</i>	Scrape	5,24	F	87+20	1277+666 (47–6000)	97+47	1437+639	2433+906	3993+1404	6157+2167	0.08+0.03						
Zanclidae																	
<i>Zanclus cornutus</i>	Pulse	1,1	A, C	102	176	125	145	166	188	219	0.04						
	Pulse Train	1,2	A, C	30	520 (512–527)	227	379	479	541	607	0.12	1,1	2	30	184	10.9	125
Acanthuridae																	
<i>Acanthurus olivaceus</i>	Pulse	5,6	A, C	40+13	556+162 (125–813)	212+141	297+134	482+142	578+151	671+165	0.17+0.07						
<i>Ctenochaetus hawaiiensis</i>	Pulse Train	1,2	A, C	31	344 (293–395)	0	180	315	447	586	0.23	1,1	2	31	97	20.7	35
	Long Pulse	1,1	A, C	120	242	16	240	301	389	555	0.11						
<i>Ctenochaetus strigosus</i>	Pulse	1,9	A, C	32	350 (164–590)	250	329	418	507	726	0.13						
<i>Zebrasoma flavescens</i>	AC Pulse	1,8	A, C	45	200 (117–520)	77	153	223	323	388	0.12						
	Collision	3,8	ASD	160+124	200+215 (31–1593)	27+20	109+94	335+313	411+383	550+509	0.13+0.11						
	C Pulse	4,16	C	39+9	274+117 (<50–637)	111+72	237+55	347+55	461+57	649+45	0.16+0.03						
	R Pulse	2,3	D	56+1	285+182 (39–414)	90+105	190+94	285+92	393+71	518+25	0.19						
	S Pulse	4,9	S	42+15	349+40 (20–555)	211+80	330+62	433+78	548+90	664+92	0.17+0.02						
Monacanthidae																	
<i>Cantherines dumerilii</i>	Scrape	1,1	F	71	35	0	204	262	319	457	0.12						
Balistidae																	
<i>Melichthys niger</i>	Scrape	1,4	F	63	3246 (55–8718)	176	2150	3973	6434	11637	0.1						
	Thump Pulse	1,1	A	68	86	16	39	76	102	125	0.05						
	Rasp Pulse	1,2	A	319	313 (203–422)	94	224	338	520	840	0.11						
<i>Sufflamen bursa</i>	Pulse	6,30	0.5 T, 0.17 D, 0.29 A, 0.04 N	45+6	583+114 (<50–844)	224+72	465+82	639+95	850+119	1164+181	0.26+0.05	6,8	9.8+2.8	45+6	628+66	6.7+0.9	175+46
<i>Xanthichthys auromarginatus</i>	Pulse	1,1	D	44	457	234	362	492	622	863	0.26						
	Pulse Train	2,19	0.9 A, 0.1 U	58+25	287+299 (16–836)	91+117	256+115	380+130	626+99	907+113	0.19+0.01	2,5	4.8+1.1	57+25	618+266	6.9+2.7	136+46