

Community structure of reef fishes in shallow waters of the Fernando de Noronha archipelago: effects of different levels of environmental protection

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Table S1. Average (\pm s.d.) density per 60 m² and frequency of occurrence of the species sampled in the seven sampled areas of Fernando de Noronha archipelago, Brazil

MPA, Marine protected area

Family and species	Trophic group	Individuals per 60 m ² (mean \pm standard deviation) and frequency of occurrence (%)																
		No-take MPAs				MPAs				Total								
		Alagados		Golfinhos		Sueste no-take MPA		Boldró		Porto		Sancho		Sueste MPA		Density T	%T	
Density	%	Density	%	Density	%	Density	%	Density	%	Density	%	Density	%	Density	%			
Dasyatidae																		
<i>Dasyatis americana</i> Hildebrand e Schroeder, 1928	Carnivore	–	–	–	–	–	–	–	–	0.1 \pm 0.2	5	–	–	–	–	0.0 \pm 0.1	0.7	
Muraenidae																		
<i>Gymnothorax miliaris</i> (Kaup, 1856)	Carnivore	–	–	–	–	–	–	–	–	–	–	0.1 \pm 0.2	5	–	–	0.0 \pm 0.2	2.1	
<i>Muraena retifera</i> Richardson, 1845	Carnivore	–	–	0.1 \pm 0.5	5	–	–	–	–	–	–	0.2 \pm 0.4	15	–	–	0.0 \pm 0.2	2.9	
<i>Echidna catenata</i> (Bloch, 1795)	Carnivore	–	–	–	–	–	–	–	–	–	–	0.1 \pm 0.2	5	–	–	0.0 \pm 0.1	0.7	
Ophichthidae																		
<i>Myrichthys ocellatus</i> (Lesueur, 1825)	Mobile invertivore	–	–	–	–	0.1 \pm 0.3	10	–	–	–	–	–	–	0.1 \pm 0.2	5	0.0 \pm 0.2	2.1	
Clupeidae																		
<i>Harengula jaguana</i>	Carnivore	–	–	3.0 \pm 13.4	5	–	–	–	–	–	–	10.0 \pm 44.7	5	–	–	1.9 \pm 17.6	1.4	
Hemiramphidae																		
<i>Hemiramphus brasiliensis</i> (Linnaeus, 1758)	Omnivore	5.1 \pm 15.7	20	–	–	1.4 \pm 4.7	10	–	–	–	–	–	–	–	–	0.9 \pm 6.3	3.6	
Belonidae																		
<i>Platybelone argulus</i> (Le Sueur, 1821)	Piscivore	0.2 \pm 0.9	5	–	–	–	–	–	–	–	–	–	–	–	–	0.0 \pm 0.3	0.7	
Holocentridae																		
<i>Holocentrus adscensionis</i> (Osbeck, 1765)	Mobile invertivore	0.5 \pm 0.8	35	0.2 \pm 0.4	20	1.0 \pm 2.9	25	2.3 \pm 3.1	60	0.5 \pm 1.0	30	1.2 \pm 1.0	75	1.0 \pm 2.2	30	1.0 \pm 1.9	39.3	
<i>Myripristis jacobus</i> Cuvier, 1829	Planktivore	–	–	0.3 \pm 0.6	5	–	–	–	–	–	–	–	–	–	–	–	2.1	
Aulostomidae																		
<i>Aulostomus maculatus</i> Valenciennes, 1837	Piscivore	–	–	0.1 \pm 0.2	5	0.1 \pm 0.2	5	–	–	0.2 \pm 0.5	15	–	–	–	–	0.0 \pm 0.2	3.6	
Serranidae																		
<i>Cephalopholis fulva</i> (Linnaeus, 1758)	Carnivore	1.8 \pm 2.4	60	10.2 \pm 6.3	100	0.3 \pm 0.6	20	1.2 \pm 2.2	45	0.9 \pm 1.0	55	4.6 \pm 4.1	80	0.5 \pm 0.7	40	2.8 \pm 4.5	57.1	
<i>Paranthias furcifer</i> (Valenciennes, 1828)	Planktivore	–	–	0.2 \pm 0.7	5	–	–	0.1 \pm 0.5	5	–	–	4.7 \pm 9.6	65	–	–	0.7 \pm 3.9	10.7	
Carangidae																		
<i>Carangoides bartholomaei</i> (Cuvier, 1833)	Piscivore	0.2 \pm 0.7	5	0.5 \pm 1.4	15	–	–	0.5 \pm 1.8	10	–	–	0.2 \pm 0.7	5	0.1 \pm 0.5	5	0.2 \pm 0.9	5.7	
<i>Caranx crysos</i> (Mitchill, 1815)	Piscivore	–	–	–	–	–	–	–	–	–	–	0.1 \pm 0.5	5	–	–	0.0 \pm 0.2	0.7	
<i>Caranx latus</i> Agassiz, 1831	Piscivore	0.2 \pm 0.7	5	–	–	0.5 \pm 1.8	15	0.1 \pm 0.3	10	0.1 \pm 0.5	5	0.9 \pm 2.3	25	0.4 \pm 1.2	15	0.3 \pm 1.3	10.0	
<i>Caranx lugubris</i> Poey, 1860	Piscivore	–	–	0.1 \pm 0.2	5	–	–	–	–	–	–	0.1 \pm 0.2	5	–	–	0.0 \pm 0.1	1.4	
Lutjanidae																		
<i>Lutjanus jocu</i> (Bloch e Schneider, 1801)	Carnivore	0.1 \pm 0.2	5	0.1 \pm 0.2	5	–	–	–	–	–	–	–	–	–	–	0.0 \pm 0.1	1.4	
Haemulidae																		
<i>Haemulon chrysargyreum</i> Günther, 1859	Mobile invertivore	48.2 \pm 139.1	50	0.6 \pm 1.5	20	22.3 \pm 89.5	10	2.7 \pm 6.3	20	0.3 \pm 0.9	10	0.4 \pm 0.7	25	2.3 \pm 6.6	35	11.0 \pm 63.6	24.3	
<i>Haemulon parra</i> (Desmarest, 1823)	Mobile invertivore	5.0 \pm 9.2	70	0.3 \pm 0.6	25	7.3 \pm 8.2	95	0.8 \pm 1.9	25	1.0 \pm 0.8	70	0.2 \pm 0.4	20	4.2 \pm 10.0	35	2.7 \pm 6.5	47.9	
<i>Anisotremus surinamensis</i> (Bloch, 1791)	Mobile invertivore	–	–	0.3 \pm 0.4	25	0.1 \pm 0.2	5	0.1 \pm 0.2	5	–	–	–	–	–	–	0.1 \pm 0.2	5.0	

Family and species	Trophic group	Individuals per 60 m ² (mean ± standard deviation) and frequency of occurrence (%)																
		No-take MPAs				MPAs								Total				
		Alagados		Golfinhos		Sueste no-take MPA		Boldró		Porto		Sancho		Sueste MPA		Density T	%T	
Density	%	Density	%	Density	%	Density	%	Density	%	Density	%	Density	%	Density	%			
Mullidae																		
<i>Pseudupeneus maculatus</i> (Bloch, 1793)	Mobile invertivore	0.7±1.2	35	0.2±0.4	15	1.1±2.1	25	0.7±0.9	50	2.0±3.9	55	0.6±0.8	45	1.4±2.2	45	0.9±2.0	38.6	
<i>Mulloidichthys martinicus</i> (Cuvier, 1829)	Mobile invertivore	–	–	–	–	–	–	0.3±1.3	5	–	–	–	–	–	–	0.0±0.5	0.7	
Kyphosidae																		
<i>Kyphosus</i> sp.	Roving herbivore	–	–	0.8±2.3	20	–	–	–	–	–	–	0.1±0.5	5	–	–	0.1±0.9	3.6	
Chaetodontidae																		
<i>Chaetodon ocellatus</i> Bloch, 1787	Mobile invertivore	0.2±0.9	5	0.1±0.5	5	0.3±0.6	25	0.2±0.4	20	–	–	–	–	0.2±0.4	15	0.1±0.5	10.0	
Pomacanthidae																		
<i>Pomacanthus paru</i> (Bloch.,1787)	Omnivore	0.1±0.5	5	–	–	–	–	–	–	–	–	–	–	–	–	0.0±0.2	0.7	
Pomacentridae																		
<i>Abudefduf saxatilis</i> (Linnaeus, 1758)	Omnivore	13.2±15.2	80	4.0±8.2	65	4.4±5.11	80	2.3±3.0	65	5.3±10.1	80	5.8±4.2	95	3.7±8.8	25	5.5±9.1	70.0	
<i>Stegastes rocasensis</i> (Emery, 1972)	Territorial herbivore	10.0±9.2	90	21.8±14.7	100	5.5±7.1	75	3.7±6.1	80	5.9±4.7	90	17.4±9.1	100	5.0±8.3	50	9.9±10.9	83.6	
<i>Chromis multilineata</i> (Guichenot, 1855)	Planktivore	0.2±0.9	5	11.5±22.9	80	–	–	4.9±18.1	15	0.5±1.6	10	3.2±9.0	30	–	–	2.9±12.0	20.0	
Sphyraenidae																		
<i>Sphyraena barracuda</i> (Walbaum, 1792)	Piscivore	0.1±0.2	5	–	–	–	–	–	–	–	–	–	–	–	–	0.0±0.1	0.7	
<i>Sphyraena guachancho</i> (Cuvier, 1829)	Carnivore	–	–	–	–	5.8±17.2	15	–	–	–	–	–	–	–	–	0.8±6.7	2.1	
Labridae																		
<i>Halichoeres radiatus</i> (Linnaeus, 1758)	Mobile invertivore	2.1±2.0	75	1.0±1.1	60	2.5±3.0	75	0.5±0.8	30	1.1±1.2	65	0.3±0.4	25	1.7±1.8	70	1.3±1.8	57.1	
<i>Halichoeres dimidiatus</i> (Agassiz, 1831)	Mobile invertivore	–	–	0.9±1.5	30	–	–	0.1±0.2	5	–	–	0.1±0.2	5	–	–	0.1±0.7	5.7	
<i>Doratonotus megalepis</i> Gunther, 1862	Carnivore	–	–	–	–	–	–	–	–	0.1±0.2	5	–	–	–	–	0.0±0.1	0.7	
<i>Thalassoma noronhanum</i> (Boulenger, 1890)	Planktivore, mobile invertivore	34.1±20.2	95	25.9±20.9	90	16.6±12.3	80	66.7±26.3	100	36.6±13.6	95	71.5±70.5	100	23.1±18.8	100	39.2±37.2	94.3	
Tribe Scarini																		
<i>Sparisoma amplum</i> (Ranzani, 1842)	Roving herbivore	0.6±0.9	30	0.2±0.9	5	–	–	–	–	0.1±0.3	10	0.2±0.5	10	–	–	0.1±0.6	7.9	
<i>Sparisoma axillare</i> (Steindachner, 1878)	Roving herbivore	0.9±1.3	40	1.3±1.9	55	1.6±1.4	85	0.1±0.3	10	2.9±2.1	85	0.5±0.6	45	1.7±2.0	55	1.3±1.7	53.6	
<i>Sparisoma frondosum</i> (Agassiz, 1831)	Roving herbivore	1.6±2.4	60	1.5±1.1	85	0.4±1.6	10	0.5±1.2	20	1.1±1.2	55	1.5±1.7	70	0.3±0.7	15	1.0±1.6	45.0	
Labrisomidae																		
<i>Malacotenus</i> aff. <i>triangulatus</i>	Mobile invertivore	2.3±2.9	65	2.6±4.3	50	0.8±1.5	40	2.3±2.8	70	1.8±2.8	45	2.6±4.2	50	4.1±3.9	80	2.4±3.4	56.4	

Family and species	Trophic group	Individuals per 60 m ² (mean ± standard deviation) and frequency of occurrence (%)															
		No-take MPAs				MPAs								Total			
		Alagados		Golfinhos		Sueste no-take MPA		Boldró		Porto		Sancho		Sueste MPA		Density T	%T
		Density	%	Density	%	Density	%	Density	%	Density	%	Density	%	Density	%		
Blenniidae																	
<i>Ophioblennius trinitatis</i> Miranda Ribeiro, 1919	Omnivore	0.2±0.5	10	0.2±0.5	15	0.1±0.2	5	0.3±0.9	15	0.1±0.5	5	0.3±0.6	15	–	–	0.2±0.5	9.3
<i>Coryphopterus glaucofraenum</i> Gill, 1836	Planktivore	0.1±0.2	5	–	–	0.1±0.2	5	–	–	–	–	–	–	–	–	0.0±0.1	1.4
Acanthuridae																	
<i>Acanthurus coeruleus</i> Bloch e Schneider, 1801	Roving herbivore	0.4±1.0	20	1.0±1.2	55	0.1±0.2	5	0.5±1.1	20	1.1±1.9	35	0.2±0.5	10	–	–	0.4±1.1	20.7
<i>Acanthurus bahianus</i> Castelnau, 1855	Roving herbivore	–	–	–	–	–	–	0.1±0.2	5	–	–	–	–	–	–	0.0±0.1	0.7
<i>Acanthurus chirurgus</i> (Bloch, 1787)	Roving herbivore	4.8±4.6	85	1.3±1.5	55	6.8±7.6	75	5.6±4.0	90	2.4±4.2	50	0.8±1.2	35	6.6±6.2	85	4.0±5.2	67.9
Bothidae																	
<i>Bothus lunatus</i> (Linnaeus, 1758)	Carnivore	0.1±0.22	5	–	–	–	–	0.1±0.31	10	0.1±0.22	5	0.1±0.22	5	–	–	0.0±0.19	3.6
Balistidae																	
<i>Melichthyes niger</i> (Bloch), 1786	Omnivore	–	–	2.3±2.56	65	–	–	0.1±0.22	5	–	–	1.0±1.91	35	–	–	0.5±1.44	15.7
Monacanthidae																	
<i>Cantherhines pullus</i> (Ranzani, 1842)	Omnivore	–	–	–	–	–	–	0.2±0.37	15	–	–	0.1±0.45	5	–	–	0.0±0.22	2.9
<i>Aluterus scriptus</i> (Osbeck, 1765)	Omnivore	0.1±0.31	10	–	–	–	–	–	–	–	–	0.1±0.31	10	–	–	0.0±0.17	2.9
Ostraciidae																	
<i>Lactophrys trigonus</i> (Linnaeus, 1758)	Omnivore	–	–	–	–	–	–	0.2±0.49	10	0.1±0.22	5	0.1±0.22	5	–	–	0.0±0.22	2.9
<i>Acanthostracion polygonius</i> Poey, 1876	Omnivore	–	–	–	–	–	–	0.1±0.31	10	–	–	–	–	0.1±0.22	5	0.0±0.15	2.1