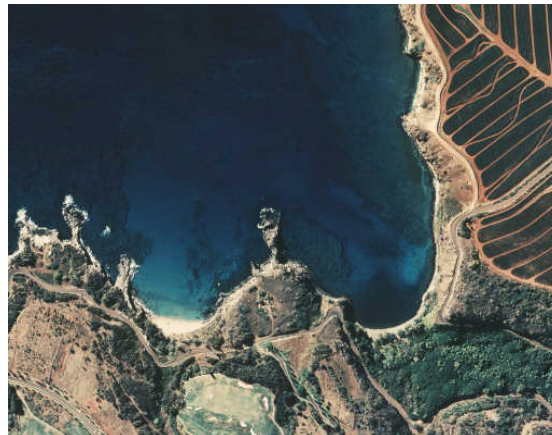


Honolua, Maui

21° 00.923' N 156° 38.343' W

Management Status: No take Marine Life Conservation District.

Area Description: Semi-enclosed bay bordered by north and south basalt cliffs. Surrounding area conservation and agriculture use. Intermittent stream input. Sand, rock and boulder shoreline. North and south bay reef flats crest and slope to central 8 to 13 m deep coarse sand channel with beds of *Halimeda incrassata*. South reef coral colonized basalt. North reef more developed with higher coral coverage. Coverage on both reefs increases with depth. Reefs home to resident green turtles (*Chelonia mydas*). North reef sheltered except from winter North Pacific swell. High human use: water



recreation, boat traffic, tourism. Fish feeding, anchoring, trampling, sedimentation.

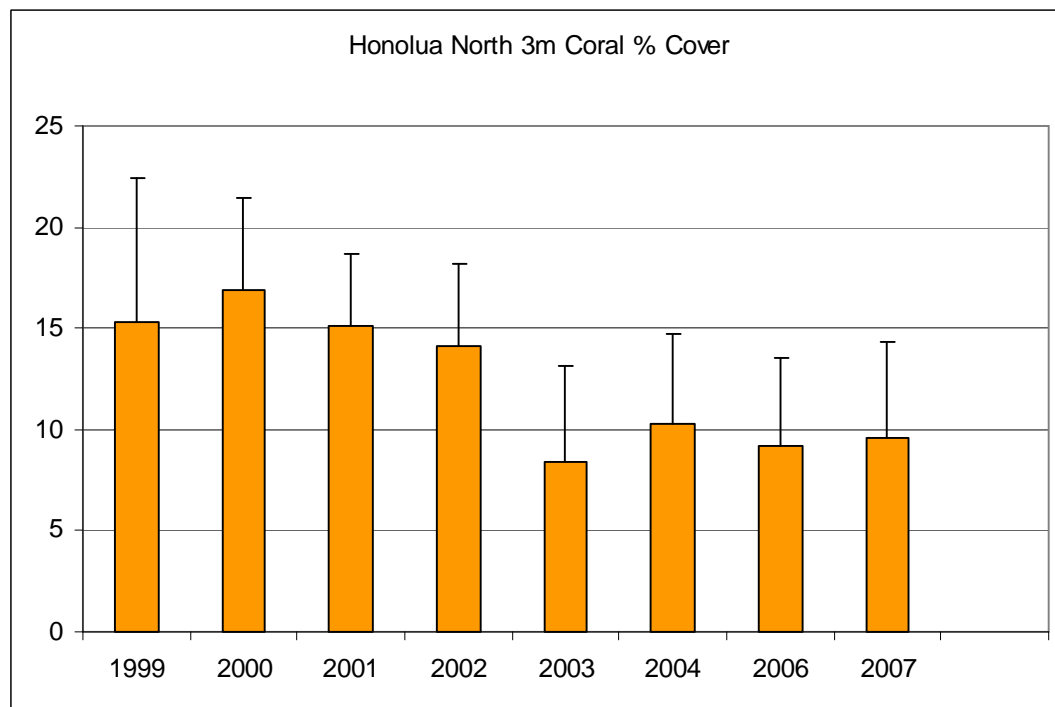
Benthic Habitat Data (Honolua North): 3 m

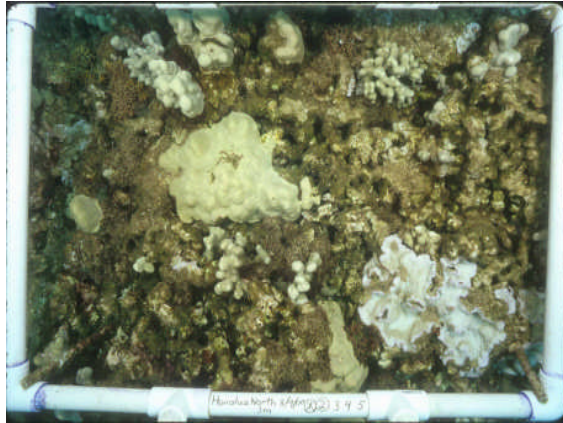
	Depth (m)	Rugosity	Sediment Composition (% wt.)		Sediment Grain Size (% wt.)			
			LOI	H ₂ CO ₃	Gravel	Coarse	Fine	Silt
Mean	3	1.47	3.60	87.94	44.90	33.35	20.34	1.42
S.D.		0.14	0.15	0.28	11.35	2.06	13.57	0.17

Video Transect data (3 m):

% Cover:	1999		2000		2001		2002		2003	
	Species	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean
<i>Cyphastrea ocellina</i>	0	0	0.1	0.1	0.0	0.1	0.1	0.1	0	0
<i>Fungia scutaria</i>	0	0	0	0	0	0	0	0	0	0
<i>Leptastrea purpurea</i>	0.1	0.3	0	0	0	0	0	0	0	0
<i>Montipora flabellata</i>	1.3	1.3	0.8	0.8	0.8	0.5	0.8	0.5	0.9	0.6
<i>Montipora patula</i>	1.2	0.8	1.7	1.4	1.3	0.6	1.5	1.1	0.5	0.8
<i>Montipora studeri</i>	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0	0
<i>Montipora verrucosa</i>	1.6	0.9	1.5	1.0	2.3	1.2	2.6	1.0	1.0	0.7
<i>Pavona duerdeni</i>	0.4	0.5	0.3	0.8	0.2	0.5	0.2	0.5	0	0
<i>Pavona maldivensis</i>	0	0	0	0	0	0	0	0	0	0
<i>Pavona varians</i>	0.6	0.6	3.2	1.6	2.7	1.1	0.7	0.3	0	0
<i>Pocillopora damicornis</i>	0	0	0	0	0	0	0	0	0	0
<i>Pocillopora eydouxi</i>	0	0	0	0	0	0	0	0	0	0
<i>Pocillopora ligulata</i>	0	0	0	0	0	0	0	0	0	0
<i>Pocillopora meandrina</i>	0.7	0.7	0.5	0.8	0.5	0.6	1.1	0.7	0.4	0.6
<i>Porites brighami</i>	0.1	0.1	0	0	0	0	0	0	0	0
<i>Porites compressa</i>	0.8	0.6	0.6	0.7	0.9	0.8	0.5	0.5	0.1	0.2
<i>Porites evermanni</i>	0	0	0.1	0.2	0.1	0.4	0	0	0	0
<i>Porites lichen</i>	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0	0
<i>Porites lobata</i>	8.6	7.3	7.9	5.0	6.2	5.2	6.4	4.1	5.5	4.1
<i>Porites rus</i>	0	0	0	0	0	0	0	0	0	0
<i>Psammocora nierstraszi</i>	0	0	0	0	0.1	0.1	0	0	0	0
Unknown Coral	0	0	0	0	0	0	0	0	0	0
Total Coral	15.3	7.1	16.9	4.5	15.1	3.5	14.1	4.0	8.4	4.7
Species Richness:	12		12		13		11		6	
Species Diversity:	1.52		1.65							
Macroalgae	5.8	3.1	4.7	2.4	5.9	2.8	7.8	3.3	7.4	4.3

% Cover:	2004		2006		2007		Mean	SD	Mean	SD
	Species	Mean	SD	Mean	SD	Mean				
<i>Cyphastrea ocellina</i>	0.0	0.1	0.0	0.1	0.8	2.6				
<i>Fungia scutaria</i>	0	0	0	0	0	0				
<i>Leptastrea purpurea</i>	0	0	0	0	0	0				
<i>Montipora flabellata</i>	1.5	1.4	1.5	1.4	0.1	0.3				
<i>Montipora patula</i>	0.5	1.1	0.5	1.1	0.9	1.1				
<i>Montipora studeri</i>	0	0	0	0	0	0				
<i>Montipora verrucosa</i>	1.6	1.4	1.6	1.4	1.0	1.3				
<i>Pavona duerdeni</i>	0.1	0.3	0.1	0.3	0.1	0.3				
<i>Pavona maldivensis</i>	0	0	0	0	0	0				
<i>Pavona varians</i>	0.8	0.9	0.8	0.9	0.3	0.4				
<i>Pocillopora damicornis</i>	0	0	0	0	0	0				
<i>Pocillopora eydouxi</i>	0	0	0	0	0	0				
<i>Pocillopora ligulata</i>	0.1	0.4	0.1	0.4	0	0				
<i>Pocillopora meandrina</i>	0.3	0.6	0.3	0.6	1.0	1.1				
<i>Porites brighami</i>	0	0	0	0	0.2	0.4				
<i>Porites compressa</i>	0.3	0.7	0.3	0.7	0	0				
<i>Porites evermanni</i>	0	0	0	0	0.6	1.9				
<i>Porites lichen</i>	0	0	0	0	0	0				
<i>Porites lobata</i>	5.1	5.0	5.1	5.0	4.5	3.8				
<i>Porites rus</i>	0	0	0	0	0.1	0.4				
<i>Psammocora nierstraszi</i>	0	0	0	0	0	0				
Unknown Coral	0	0	0	0	0	0				
Total Coral	10.3	4.4	10.3	4.4	9.6	4.7				
Species Richness:	10		10		11					
Species Diversity:										
Macroalgae	3.8	2.7	3.8	2.7	0	0				





Findings: Initial coral cover rank is 34 among 60 reefs. Coral cover stayed roughly the same between the 2 sampling periods. High diversity of macroalgae with occasional blooms of Golden blue-green algae. High percentage of crustose coralline algae and turf algae. High percentage of fine sediments with low content of terrigeous material. *Porites lichen* and *Montipora studeri* notable as not common at sites surveyed.

Photoquadrat Data (3 m): Photo analysis pending

Honolua, Maui

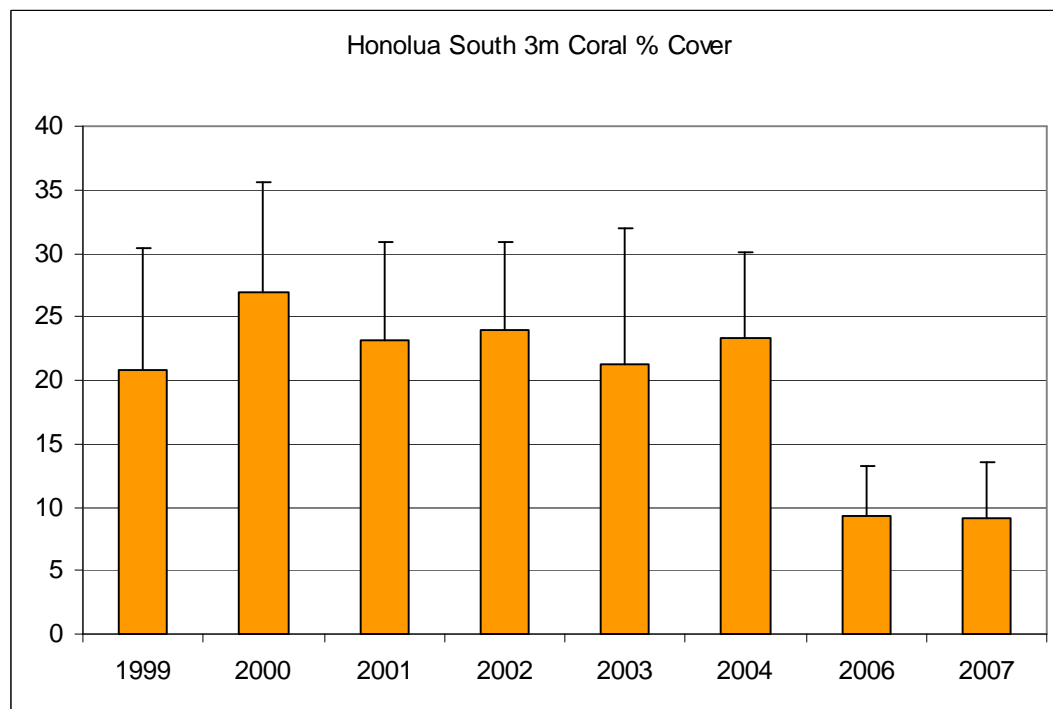
Benthic Habitat Data (Honolua South): 3 m

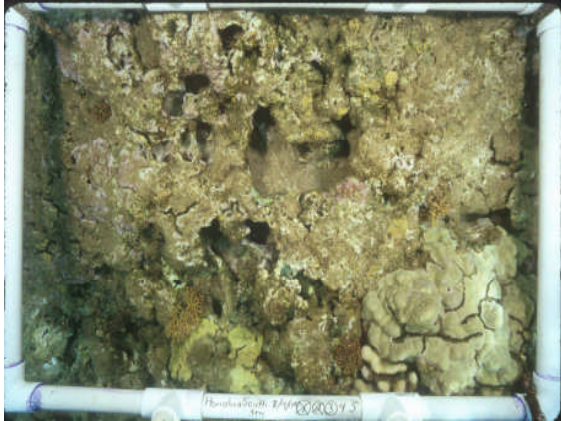
	Depth (m)	Rugosity	Sediment Composition (% wt.)		Sediment Grain Size (% wt.)			
			LOI	H ₂ CO ₃	Gravel	Coarse	Fine	Silt
Mean	3	1.67	4.68	64.50	42.64	42.32	12.80	2.24
S.D.		0.30	0.28	0.58	3.20	3.92	0.31	1.04

Video Transect data (3 m):

% Cover:	1999		2000		2001		2002		2003	
	Species	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean
<i>Cyphastrea ocellina</i>	0	0	0.1	0.1	0.0	0.1	0.1	0.1	0	0
<i>Fungia scutaria</i>	0	0	0	0	0	0	0	0	0	0
<i>Leptastrea purpurea</i>	0.1	0.2	0.0	0.1	0.1	0.3	0.0	0.1	0	0
<i>Montipora flabellata</i>	9.7	6.0	9.5	8.8	9.3	6.2	9.9	6.0	11.4	7.8
<i>Montipora patula</i>	2.9	1.2	4.1	3.2	2.8	1.1	3.9	2.4	1.8	1.5
<i>Montipora studeri</i>	0	0	0.1	0.2	0	0	0	0	0	0
<i>Montipora verrucosa</i>	2.2	2.6	3.1	3.1	2.8	3.0	2.9	2.6	2.0	2.4
<i>Pavona duerdeni</i>	0.1	0.2	0.2	0.3	0.3	0.5	0.2	0.2	0	0
<i>Pavona maldivensis</i>	0	0	0	0	0.0	0.1	0	0	0	0
<i>Pavona varians</i>	0.6	0.6	4.1	2.1	1.1	0.7	1.2	0.7	0.2	0.2
<i>Pocillopora damicornis</i>	0.0	0.1	0.0	0.1	0	0	0.0	0.1	0.0	0.1
<i>Pocillopora eydouxi</i>	0.0	0.1	0	0	0	0	0	0	0	0
<i>Pocillopora ligulata</i>	0	0	0	0	0	0	0	0	0	0
<i>Pocillopora meandrina</i>	1.6	1.7	1.6	1.3	2.3	1.4	1.8	1.1	2.0	1.5
<i>Porites brighami</i>	0	0	0	0	0.0	0.1	0	0	0	0
<i>Porites compressa</i>	0.2	0.2	0.4	0.4	0.3	0.5	0.2	0.3	0	0
<i>Porites evermanni</i>	0	0	0	0	0	0	0	0	0	0
<i>Porites lichen</i>	0	0	0.3	0.3	0.0	0.1	0.1	0.1	0	0
<i>Porites lobata</i>	3.6	2.5	3.6	3.2	4.0	2.9	3.7	2.4	3.6	2.2
<i>Porites rus</i>	0	0	0	0	0	0	0	0	0.1	0.2
<i>Psammocora nierstraszi</i>	0	0	0.0	0.1	0.1	0.2	0	0	0	0
Unknown Coral	0	0	0	0	0	0	0	0	0	0
Total Coral	20.9	9.6	26.9	8.6	23.1	7.7	23.9	7.0	21.3	10.7
Species Richness:	11		14		14		12		8	
Species Diversity:	1.56		1.80							
Macroalgae	2.0	0.8	4.8	2.4	5.7	1.8	4.2	1.3	8.4	5.7

% Cover: Species	2004		2006		2007	
	Mean	SD	Mean	SD	Mean	SD
<i>Cyphastrea ocellina</i>	0.0	0.1	0.0	0.1	0	0
<i>Fungia scutaria</i>	0	0	0	0	0	0
<i>Leptastrea purpurea</i>	0.1	0.3	0.1	0.3	0	0
<i>Montipora flabellata</i>	9.2	4.4	9.2	4.4	0.4	0.6
<i>Montipora patula</i>	4.5	2.8	4.5	2.8	2.1	1.5
<i>Montipora studeri</i>	0	0	0	0	0	0
<i>Montipora verrucosa</i>	2.9	2.5	2.9	2.5	1.0	1.1
<i>Pavona duerdeni</i>	0	0	0	0	0	0
<i>Pavona maldivensis</i>	0	0	0	0	0	0
<i>Pavona varians</i>	1.2	0.9	1.2	0.9	0.3	0.6
<i>Pocillopora damicornis</i>	0.1	0.2	0.1	0.2	0.0	0.1
<i>Pocillopora eydouxi</i>	0	0	0	0	0	0
<i>Pocillopora ligulata</i>	0	0	0	0	0	0
<i>Pocillopora meandrina</i>	0.8	0.7	0.8	0.7	1.5	1.6
<i>Porites brighami</i>	0	0	0	0	0	0
<i>Porites compressa</i>	0	0	0	0	0	0
<i>Porites evermanni</i>	0	0	0	0	0	0
<i>Porites lichen</i>	0	0	0	0	0	0
<i>Porites lobata</i>	4.5	3.5	4.5	3.5	3.9	3.7
<i>Porites rus</i>	0	0	0	0	0	0
<i>Psammocora nierstraszi</i>	0	0	0	0	0	0
Unknown Coral	0	0	0	0	0	0
Total Coral	23.3	6.7	23.3	6.7	9.1	4.4
Species Richness:	9		9		7	
Species Diversity:						
Macroalgae	6.0	5.8	6.0	5.8	0	0





Findings: Initial coral cover rank is 29 among 60 reefs. No statistically detectable change in coral cover between the 2 sampling periods. High diversity of macroalgae (e.g. *Turbinaria ornata*) with occasional blooms of Golden blue-green algae. Moderate level of macroinvertebrates with *Echinometra mathaei* prevalent. High percentage of crustose coralline algae and turf algae. Moderate percentage of fine sediments with moderate content of terrigenous material. *Porites lichen* and *Montipora studeri* notable as not common at sites surveyed.

Photoquadrat Data (3 m): Photo analysis pending

Honolua, Maui

Fish Data: 3 m Honolua North and 3 m Honolua South

Species	Density (#/125m ²)				Biomass (g/125m ²)			
	North		South		North		South	
	3 m		3 m		3 m		3 m	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<i>Abudefduf abdominalis</i>			1.3	2.5			44.7	89.4
<i>Abudefduf sordidus</i>			0.3	0.5			30	60.1
<i>Acanthurus blochii</i>	1.0	2.0	7.3	13.8	355.3	710.7	1780.4	3307.4
<i>Acanthurus dussumieri</i>			0.3	0.5			80.8	161.6
<i>Acanthurus leucopareius</i>	1.0	1.2			156.8	182.8		
<i>Acanthurus nigrofuscus</i>	18.0	5.0	40.8	15.9	1034.5	289.1	2055.0	825.9
<i>Acanthurus olivaceus</i>	1.8	1.3	0.5	1.0	599.3	406.0	104.4	208.8
<i>Acanthurus triostegus</i>	1.3	1.5	3.8	6.8	102.6	118.5	374.5	706.6
<i>Arothron hispidus</i>			0.3	0.5			111.8	223.6
<i>Aulostomus chinensis</i>	0.3	0.5	0.5	0.6	10.3	20.6	23.2	27.1
<i>Calotomus carolinus</i>	0.8	1.0	0.5	0.6	142.5	164.5	188.1	230.3
<i>Cantherhines dumerilii</i>	0.3	0.5	1.5	3.0	98.8	197.7	818.5	1637.1
<i>Cantherhines sandwichiensis</i>			0.3	0.5			7.2	14.4
<i>Canthigaster jactator</i>	2.5	1.3	2.5	2.4	18.2	9.4	10.3	9.6
<i>Cephalopholis argus</i>			0.3	0.5			17.7	35.4
<i>Chaetodon lunula</i>	0.8	1.0			61.9	79.0		
<i>Chaetodon multinctus</i>	0.5	1.0	0.3	0.5	14.6	29.3	7.3	14.6
<i>Chaetodon ornatissimus</i>	1.3	1.3	0.3	0.5	204.2	263.1	38.1	76.3
<i>Chaetodon quadrimaculatus</i>	0.8	1.0	1.3	1.5	54.3	63.3	82.8	98.5
<i>Chaetodon trifascialis</i>	1.0	1.2	2.3	0.5	71.2	93.1	99.7	22.2
<i>Chaetodon unimaculatus</i>	1.0	0.8	1.5	1.0	66.6	50.4	86.4	57.6
<i>Chlorurus perspicillatus</i>	0.8	1.0			1478.8	2257.8		
<i>Chlorurus sordidus</i>	1.5	1.0			632.9	346.5		
<i>Chromis ovalis</i>	1.3	2.5	3.0	6.0	1.2	2.4	3.7	7.4
<i>Chromis vanderbilti</i>	7.0	5.0	15.3	5.1	27.1	19.0	58.8	22.9

<i>Cirrhitops fasciatus</i>	0.3	0.5	0.3	0.5	0.9	1.8	2.5	5.0
<i>Cirrhitus pinnulatus</i>			0.3	0.5			40.4	80.7
<i>Cirripectes vanderbilti</i>	0.3	0.5	1.0	1.4	1.1	2.1	6.5	11.9
<i>Coris venusta</i>	0.8	1.0			11.3	14.9		
<i>Ctenochaetus strigosus</i>	1.5	3.0	1.3	2.5	151.9	303.8	125.9	251.8
<i>Fistularia commersonii</i>	0.3	0.5			25.1	50.2		
<i>Gomphosus varius</i>	4.8	2.2	3.5	1.9	72.3	30.9	79.1	54.3
<i>Gymnothorax eurostus</i>			0.3	0.5			17.1	34.2
<i>Kyphosus species</i>			19.8	21.2			4686.4	5556.7
<i>Labroides phthirophagus</i>			0.5	0.6			0.9	1.5
<i>Lutjanus kasmira</i>	0.3	0.5	0.3	0.5	27.2	54.4	27.2	54.4
<i>Melichthys vidua</i>	0.5	0.6	0.5	1.0	129.7	152.4	262.6	525.1
<i>Mulloidichthys vanicolensis</i>	17.0	34.0			3196.7	6393.4		
<i>Naso lituratus</i>	3.3	2.1	3.8	1.0	1162.6	446.8	1337.2	275.4

Honolua, Maui Fish Data: 3 m

Species	Density (#/125m ²)				Biomass (g/125m ²)			
	North		South		North		South	
	3 m		3 m		3 m		3 m	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<i>Naso unicornis</i>	0.8	1.0	2.3	3.3	274.6	317.4	1292.2	1990.4
<i>Oxycheilinus unifasciatus</i>			0.3	0.5			13.5	27.0
<i>Paracirrhites arcatus</i>	1.3	1.5	3.3	3.2	34.0	40.8	102.2	78.0
<i>Paracirrhites forsteri</i>	0.3	0.5	0.3	0.5	13.8	27.7	20.9	41.8
<i>Parupeneus bifasciatus</i>			0.3	0.5			13.1	26.3
<i>Parupeneus cyclostomus</i>			1.5	1.7			155.0	179.0
<i>Parupeneus multifasciatus</i>	1.5	0.6	3.3	3.3	182.5	102.1	240.3	173.8
<i>Plagiotremus goslinei</i>			0.3	0.5			0.6	1.1
<i>Plectroglyphidodon imparipennis</i>	1.0	0.8	2.3	1.7	2.2	1.7	5.7	6.0
<i>Plectroglyphidodon johnstonianus</i>	2.0	0.8	2.5	1.7	12.4	5.1	14.4	10.5
<i>Rhinecanthus rectangulus</i>	2.5	1.9	1.0	0.8	344.1	186.2	134.6	111.5
<i>Scarus psittacus</i>	3.8	3.2	7.5	6.6	327.7	314.1	197.0	200.1
<i>Scarus rubroviolaceus</i>	0.5	0.6	1.8	1.0	2707.1	3869.2	2659.6	3498.1
<i>Scomberoides lysan</i>	0.3	0.5	0.3	0.5	31.4	62.9	38.2	76.3
<i>Stegastes fasciolatus</i>	5.0	4.1	11.3	4.2	69.6	72.8	167.8	52.6
<i>Stethojulis balteata</i>	1.0	0	2.5	2.5	10.1	6.2	27.5	31.5
<i>Thalassoma ballieui</i>	1.0	0.8	0.3	0.5	94.8	77.4	23.7	47.4
<i>Thalassoma duperrey</i>	19.8	3.0	30.5	4.1	409.1	123.4	815.2	236.6
<i>Zebrasoma flavescens</i>	0.8	1.5			70.7	141.4		
Total/Depth Avg ± SD:	112.5	2.2	185.8	2.7	14493.9	411.4	18530.5	429.5
Species Richness	44		50					
Species Diversity	2.61		2.50					

Findings: Among 60 reefs, Honolua North ranked 3 in species richness, 49 in density, 30 in biomass, and 3 in diversity. Honolua South ranked 1 in species richness, 34 in density, 21 in biomass, and 7 in diversity. The most abundant species were the Saddle wrasse (*Thalassoma duperrey*) and the Brown surgeonfish (*Acanthurus nigrofuscus*) at the North and South reefs respectively. The species with the highest biomass were the Yellowfin goatfish (*Mulloidichthys vanicolensis*) and the Chubs (*Kyphosus spp.*) at the North and South reefs respectively. *Gymnothorax eurostus* presence notable as this species is not common to sites surveyed.