

Hanalei, Kauai

22° 12.656' N 159° 30.727' W

Management Status: Open Access. Natural Heritage River status.

Area Description: Watershed conservation land. Hanalei river drainage with valley taro cultivation. Shoreline residential/tourist development. White sand beach extends to shallow carbonate platform. Gradual slope to deeper areas with various reef structures. Diverse reef community. North exposed site. Heavily human use. Heavy freshwater input. Fish community has been well studied.



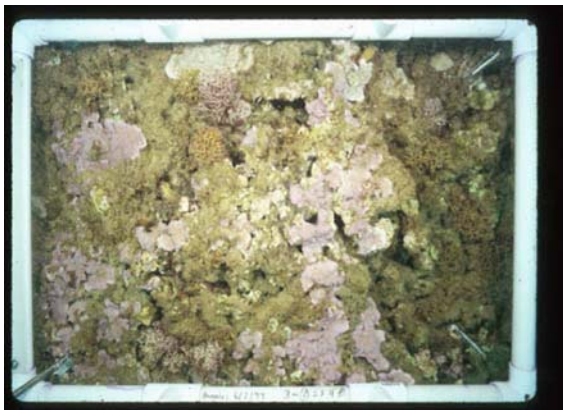
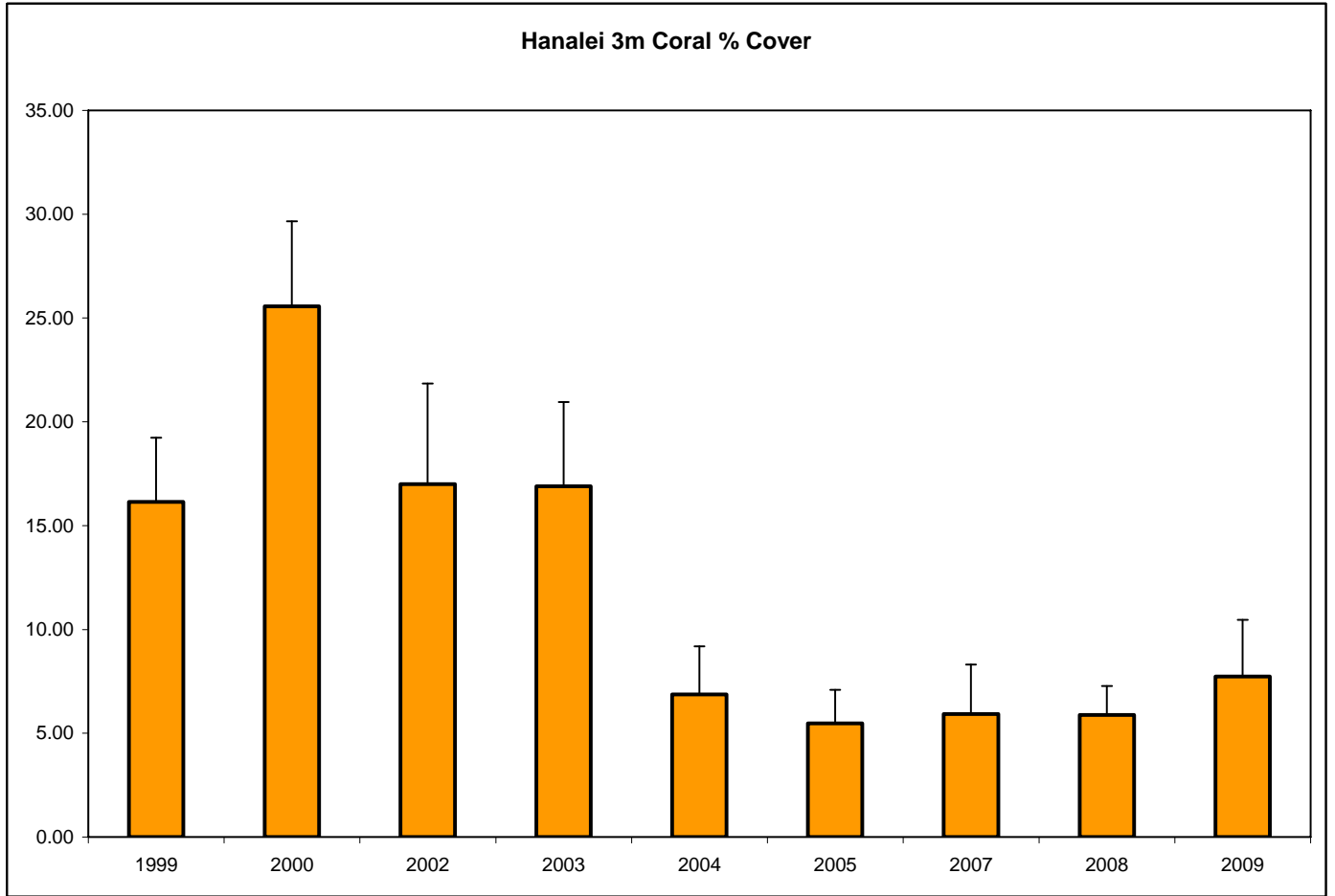
Benthic Habitat Data: 3 m

	Depth (m)	Rugosity	Sediment Composition (% wt.)		Sediment Grain Size (% wt.)			
			LOI	H2CO3	Gravel	Coarse	Fine	Silt
Mean	3	1.24	No Data	No Data	No Data	No Data	No Data	No Data
S.D.		0.06						

Video Transect data (3 m):

Species	% Cover:		1999		2000		2002		2003		2004	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
<i>Cyphastrea ocellina</i>	0.0	0.0	0	0	0	0	0	0	0	0	0	0
<i>Fungia scutaria</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Leptastrea bottae</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Leptastrea purpurea</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Leptoseris incrustans</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Montipora capitata</i>	0.1	0.2	0.0	0.1	0.2	0.3	0.1	0.2	0.1	0.2	0.1	0.2
<i>Montipora flabellata</i>	8.0	4.7	16.1	5.6	10.4	5.6	9.5	4.3	2.8	1.7	1.4	1.4
<i>Montipora patula</i>	5.8	2.3	6.2	4.8	3.0	1.9	3.4	3.9	1.6	1.4	1.4	1.4
<i>Montipora studeri</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pavona duerdeni</i>	0.1	0.2	0.0	0.1	0.2	0.3	0.1	0.2	0.1	0.2	0.1	0.2
<i>Pavona maldivensis</i>	0	0	0	0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2
<i>Pavona varians</i>	0	0	0	0	0	0	0.0	0.1	0.0	0.1	0.0	0.1
<i>Pocillopora damicornis</i>	0.1	0.3	0	0	0.0	0.1	0.7	0.5	0.1	0.1	0.1	0.2
<i>Pocillopora eydouxi</i>	0.1	0.2	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	0	0
<i>Pocillopora meandrina</i>	0	0	0	0	0	0	0.1	0.1	0	0	0	0
<i>Porites brighami</i>	0.6	0.9	1.0	0.9	0.9	0.9	0.8	0.8	0.6	0.7	0.6	0.7
<i>Porites compressa</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Porites evermanni</i>	0.5	0.4	0.6	0.4	0.6	0.7	0.6	0.6	0.4	0.4	0.4	0.4
<i>Porites lichen</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Porites lobata</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Porites rus</i>	1.0	0.9	1.6	1.2	1.7	0.9	1.8	1.2	1.2	1.2	0.8	0.8
<i>Psammocora nierstraszi</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Psammocora stellata</i>	0	0	0	0	0	0	0	0	0	0	0	0
Unknown Coral	0	0	0	0	0	0	0	0	0	0	0	0
Total Coral	16.2	3.0	25.6	4.1	17.0	4.9	16.9	4.1	6.9	2.3	2.3	2.3
Species Richness:	9		7		8		10		9		9	

%Cover:	2005		2007		2008		2009	
Species:	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<i>Cyphastrea ocellina</i>	0	0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Fungia scutaria</i>	0	0	0.0	0.0	0.0	0.1	0.0	0.0
<i>Leptastrea bottae</i>	0	0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Leptastrea purpurea</i>	0	0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Leptoseris incrustans</i>	0	0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Montipora capitata</i>	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.4
<i>Montipora flabellata</i>	2.2	1.3	2.1	1.1	1.8	0.9	1.7	1.0
<i>Montipora patula</i>	1.5	1.4	1.9	1.4	1.4	1.0	2.9	1.4
<i>Montipora studeri</i>	0	0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Pavona duerdeni</i>	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.1
<i>Pavona maldivensis</i>	0	0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Pavona varians</i>	0	0	0.1	0.2	0.1	0.1	0.1	0.1
<i>Pocillopora damicornis</i>	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
<i>Pocillopora eydouxi</i>	0	0	0.0	0.0	0.0	0.1	0.0	0.0
<i>Pocillopora ligulata</i>	0	0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Pocillopora meandrina</i>	0.1	0.3	0.8	0.8	1.2	1.0	1.4	1.3
<i>Porites brighami</i>	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0
<i>Porites compressa</i>	0	0	0.3	0.3	0.3	0.4	0.3	0.4
<i>Porites evermanni</i>	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
<i>Porites lichen</i>	0	0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Porites lobata</i>	0	0	0.7	0.5	1.0	0.7	1.0	0.7
<i>Porites rus</i>	1.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0
<i>Psammocora nierstraszi</i>	0	0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Psammocora stellata</i>	0	0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Coral	0	0	0.0	0.0	0.0	0.0	0.0	0.0
Total Coral	5.5	1.6	5.9	4.5	5.9	4.4	7.7	5.5
Species Richness:	8							



Photoquadrat Data (3 m): Photo analysis pending

Findings: Initial coral cover rank is 32 among 60 reefs. Substantial increase in coral over the 2 sampling periods. High diversity and coverage of macroalgae (e.g. *Galaxura spp.*, *Liagora spp.* and *Halimeda spp.*). High percentage of crustose coralline algae and turf algae. No rare or unusual species observed.

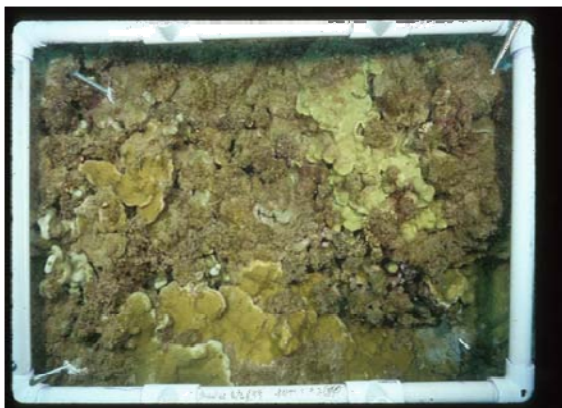
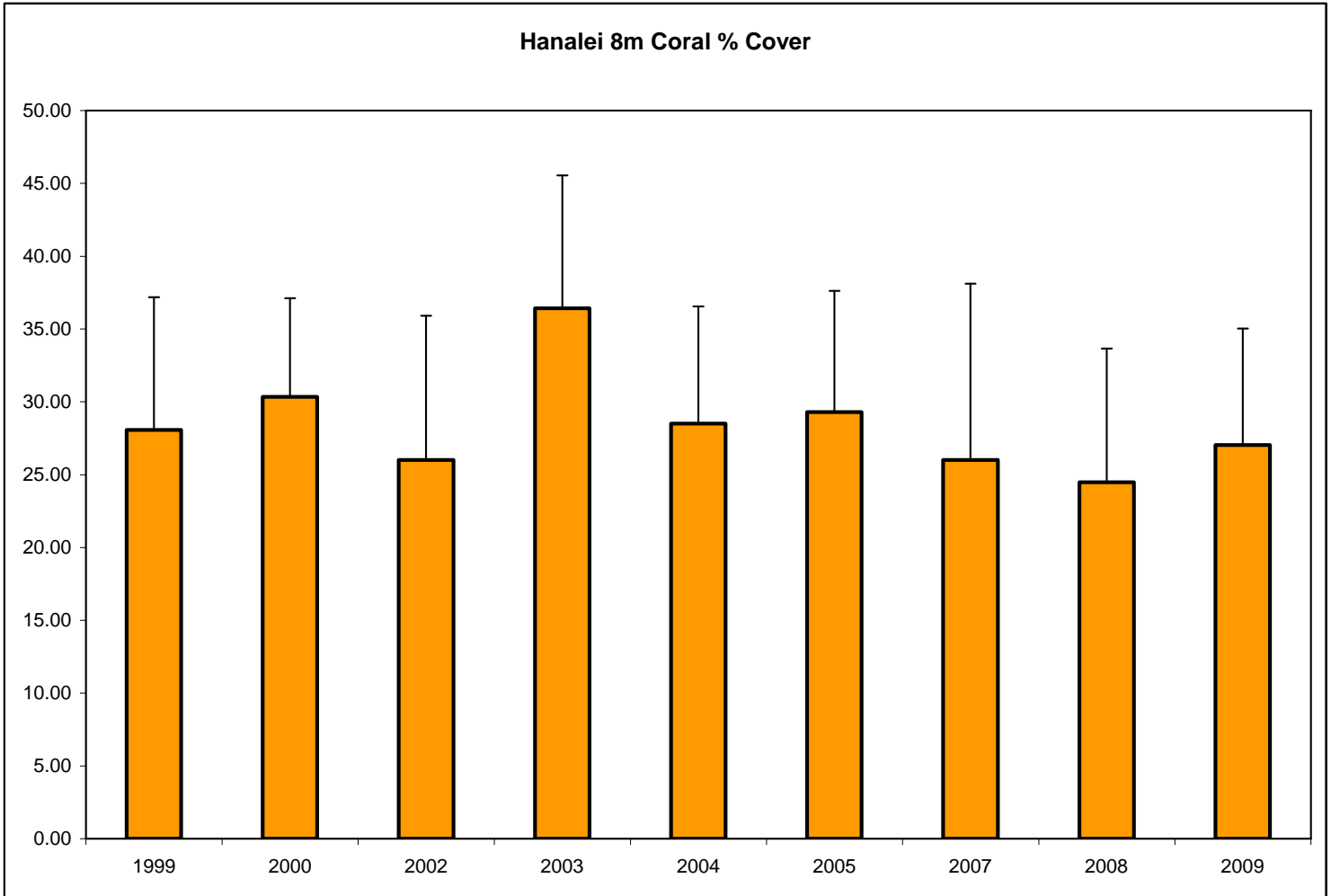
Hanalei, Kauai

Benthic Habitat Data: 8 m

	Depth (m)	Rugosity	Sediment Composition (% wt.)		Sediment Grain Size (% wt.)			
			LOI	H ₂ CO ₃	Gravel	Coarse	Fine	Silt
Mean	8	1.53	No Data	No Data	No Data	No Data	No Data	No Data
S.D.		0.19						

Video Transect data (8 m):

Species	% Cover:		1999		2000		2002		2003		2004	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<i>Cyphastrea ocellina</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Fungia scutaria</i>	0	0	0.0	0.1	0	0	0	0	0	0	0	0
<i>Leptastrea purpurea</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Montipora flabellata</i>	0.1	0.2	0.3	0.3	0.1	0.2	0.3	0.8	0.2	0.2	0.2	0.2
<i>Montipora patula</i>	22.0	8.0	24.0	5.4	19.5	7.7	25.7	7.7	22.7	7.5	7.5	7.5
<i>Montipora studeri</i>	0	0	0	0	0	0	0.0	0.1	0	0	0	0
<i>Montipora capitata</i>	2.3	1.7	1.6	1.3	2.8	2.7	3.6	2.4	2.6	1.7	1.7	1.7
<i>Pavona duerdeni</i>	0	0	0	0	0	0	0.1	0.2	0.1	0.1	0.1	0.1
<i>Pavona maldivensis</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pavona varians</i>	0.0	0.1	0.1	0.1	0.1	0.1	1.7	1.3	0.3	0.3	0.3	0.3
<i>Pocillopora damicornis</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pocillopora eydouxi</i>	0	0	0	0	0.4	1.3	0.1	0.3	0	0	0	0
<i>Pocillopora ligulata</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pocillopora meandrina</i>	0.5	0.6	0.8	1.2	0.4	0.8	0.7	1.3	0.4	1.0	1.0	1.0
<i>Porites brighami</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Porites compressa</i>	0.8	0.8	1.0	1.1	0.7	1.0	1.0	1.3	0.5	0.7	0.7	0.7
<i>Porites evermanni</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Porites lichen</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Porites lobata</i>	2.3	1.9	2.5	1.6	2.1	2.4	3.3	3.5	1.8	1.9	1.9	1.9
<i>Porites rus</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Psammocora nierstraszi</i>	0	0	0	0	0	0	0	0	0	0	0	0
Unknown Coral	0	0	0	0	0	0	0	0	0	0	0	0
Total Coral	28.1	9.1	30.4	6.8	26.0	9.9	36.4	9.1	28.5	8.0	8.0	8.0
Species Richness:	7		8		8		10		8			
Macroalgae	11.5	18.3	7.0	9.4	0.2	0.2	0.1	0.1	0.3	0.2	0.2	0.2



Photoquadrat Data (8 m): Photo analysis pending

Findings: Initial coral cover rank is 21 among 60 reefs. Coral cover stayed roughly the same between the 2 sampling periods. Moderate coverage of macroalgae (e.g. *Galaxura spp.*, and *Halimeda spp.*). High percentage of crustose coralline algae and turf algae. No rare or unusual species observed.

Hanalei, Kaua'i
Fish Data: 3m and 8m

Species:	Density (#/125m ²)				Biomass (g/125m ²)			
	3 m		8 m		3 m		8 m	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<i>Abudefduf abdominalis</i>	59.5	9.6			3987.9	499.3		
<i>Abudefduf sordidus</i>	3.5	2.5			322.5	212		
<i>Acanthurus achilles</i>	9	2	13	2.4	1478.5	251.4	999	171.1
<i>Acanthurus dussumieri</i>			0.5	0.5			60	60
<i>Acanthurus guttatus</i>	2.5	2.1			624.8	554.9		
<i>Acanthurus leucopareius</i>			18.5	12.8			3741.5	2586.4
<i>Acanthurus nigrofuscus</i>	28	10.8	16.5	7.3	1120.8	449.3	642.9	335.7
<i>Acanthurus nigroris</i>	0.5	0.6	2.5	2.5	82.6	95.4	159	159
<i>Acanthurus olivaceus</i>			8	2.9			1770.3	675.1
<i>Acanthurus triostegus</i>	2	2.2	3	2.4	76	87.6	174.7	135.1
<i>Acanthurus xanthopterus</i>	0.5	0.6			99.7	115.1		
<i>Aluterus scriptus</i>	0.5	0.6			827.5	955.5		
<i>Anampses cuvier</i>	0.5	0.6			64.2	74.1		
<i>Aulostomus chinensis</i>			0.5	0.5			20.6	20.6
<i>Bodianus bilunulatus</i>	2	1.5	2	1.6	347.4	276.9	449.3	448.6
<i>Calotomus carolinus</i>	0.5	0.6	0.5	0.5	65.6	75.7	759.3	759.3
<i>Cantherhines dumerilii</i>	1	1.2			503.4	581.2		
<i>Canthigaster amboinensis</i>	0.5	0.6	1.5	0.5	7.4	8.5	31.1	10.4
<i>Canthigaster jactator</i>	4	1.5	13.5	2.7	18	6.9	67.2	9.9
<i>Caranx melampygus</i>	0.5	0.6			142.8	164.9		
<i>Centropyge potteri</i>			3.5	1.8			102.8	54
<i>Cephalopholis argus</i>	0.5	0.6	3	1	1097.7	1267.5	1099.5	822.3
<i>Chaetodon lunula</i>	1	1.2	0.5	0.5	44.3	51.1	34	34
<i>Chaetodon lunulatus</i>	1	1.2	1	1	105.4	121.7	77.4	77.4
<i>Chaetodon miliaris</i>	31	20	3	1.9	1854.9	1198.7	167.1	113.1
<i>Chaetodon multicinctus</i>	5.5	0.6	2.5	1	161.1	16.9	73.2	28
<i>Chaetodon ornatissimus</i>			0.5	0.5			62.5	62.5
<i>Chaetodon quadrimaculatus</i>	1	1.1	1	1	87.2	93.2	77	77
<i>Chaetodon unimaculatus</i>	1	1.2	1.5	1.5	50.3	58.1	111.2	111.2
<i>Chlorurus perspicillatus</i>	3	1			4771.3	825.7		
<i>Chlorurus sordidus</i>			3.5	0.5			627.8	90.4
<i>Chromis hanui</i>			20	4.9			59.7	18.4
<i>Chromis ovalis</i>			86.5	37.8			2899.1	1474.8
<i>Chromis vanderbilii</i>	1	1.1	11.5	10.8	1.6	1.8	30.9	29.1
<i>Chromis verater</i>			2	2			116.8	116.8
<i>Cirrhitops fasciatus</i>	1.5	1.2	2	1.4	17.6	14.5	17	11.3
<i>Cirrhitus pinnulatus</i>	0.5	0.6	1	1	55.4	64	122.7	122.7
<i>Ctenochaetus strigosus</i>	23.5	4.2	183.5	25.6	1661.6	294.4	12878	1822.4
<i>Dascyllus albisella</i>			20.5	12.9			1404.9	930.1
<i>Exallias brevis</i>	0.5	0.6	0.5	0.5	9.4	10.8	13.5	13.5
<i>Fistularia commersonii</i>	2	1.7			153.2	171.8		
<i>Forcipiger flavissimus</i>	1.5	1.7			70.2	81		
<i>Gomphosus varius</i>	4	1.2	2.5	1.1	145.5	99.1	37.8	23.6
<i>Gymnothorax flavimarginatus</i>	0.5	0.6			856	988.4		
<i>Gymnothorax meleagris</i>			0.5	0.5			195.2	195.2
<i>Halichoeres ornatissimus</i>	0.5	0.5	1	0.6	2.3	2.3	3.3	2.2
<i>Kyphosus species</i>	1	0.6			189.4	132.2		
<i>Labroides phthirophagus</i>	0.5	0.6	5.5	2	1	1.2	8.8	4.8
<i>Lutjanus fulvus</i>			0.5	0.5			30.5	30.5

Hanalei, Kaua'i
Fish Data: 3m and 8m

	Density (#/125m ²)				Biomass (g/125m ²)			
	3 m		8 m		3 m		8 m	
Species:	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<i>Lutjanus kasmira</i>	5.0	1.5	22.0	12.3	589.1	251.6	3528.6	1972.3
<i>Melichthys niger</i>	4	2.9	2	1.4	1056.1	784.7	422	309.3
<i>Melichthys vidua</i>	1	0.6	6	2	294.3	169.9	1789.1	659.3
<i>Mulloidichthys vanicolensis</i>	3.5	4			658.1	760		
<i>Myripristis kuntee</i>	4	3.8			399.3	389.3		
<i>Naso hexacanthus</i>			10	6.7			1242.3	466.4
<i>Naso lituratus</i>	2	0.6			1000.1	318.2		
<i>Naso unicornis</i>			0.5	0.5			842.8	842.8
<i>Neoniphon sammara</i>	0.5	0.6			46.7	54		
<i>Ostracion meleagris</i>	0.5	0.6	0.5	0.5	21.4	24.8	5.1	5.1
<i>Paracirrhites arcatus</i>	2.5	1.9	2	2	28.9	21.9	47.6	47.6
<i>Paracirrhites forsteri</i>			0.5	0.5			60	60
<i>Parupeneus cyclostomus</i>	1	1.1	1.5	1.1	14.5	16.6	66.2	64.7
<i>Parupeneus multifasciatus</i>	4	1.5	8	3.2	90.2	87	284.5	159
<i>Parupeneus pleurostigma</i>			2	0.8			156.9	52.3
<i>Parupeneus porphyreus</i>			1	0.6			126.4	74.9
<i>Plectroglyphidodon imparipennis</i>	1	0.6			3.5	2		
<i>Plectroglyphidodon johnstonianus</i>	5	1.5	16.5	3.3	65.9	18.6	289	52.5
<i>Pseudocheilinus octotaenia</i>			2.5	1.5			37	18.4
<i>Rhinecanthus rectangulus</i>	1	0.6	1	1	112.2	64.8	157.1	157.1
<i>Scarus dubius</i>			1	0.6			98.2	69.1
<i>Scarus psittacus</i>	2.5	2.1	24.5	10.2	193.1	158.8	1562.2	651
<i>Scarus rubroviolaceus</i>	0.5	0.6	1.5	1	1794.1	2071.6	134.9	103.7
<i>Scomberoides lysan</i>	0.5	0.6			28.3	32.7		
<i>Sebastapistes coniora</i>	1	1			7.3	7.3		
<i>Stegastes fasciolatus</i>	15	2.7	19.5	5.6	319.6	54	385.3	122.8
<i>Stethojulis balteata</i>	16.5	6.6	11.5	7.8	57.5	33.2	92.7	69.8
<i>Sufflamen bursa</i>			6	1.2			636.4	141.9
<i>Synodus binotatus</i>			0.5	0.5			22.1	22.1
<i>Thalassoma ballieui</i>			0.5	0.5			47.4	47.4
<i>Thalassoma duperrey</i>	39.5	12.8	34	6.1	197.6	75.7	316.1	48.4
<i>Zebbrasoma flavescens</i>	5.5	3.2	17	5.2	473.5	276.7	1545.4	538
<i>Zebbrasoma veliferum</i>	1	1.2			441.4	509.7		
Total/Depth Avg ± SD:	313	2.2	629.5	3.7	28997.5	272.6	43021.8	301.5
Species Richness	59		61					
Species Diversity	1.99		2.45					

Findings: Among 60 reefs, Hanalei 3m ranked 32 in species richness, 37 in density, 23 in biomass, and 43 in diversity. Hanalei 10m ranked 9 in species richness, 16 in density, 16 in biomass, and 9 in diversity. The most abundant species were the Hawaiian sergeant (*Abudefduf abdominalis*) and the Goldring surgeonfish (*Ctenochaetus strigosus*) at the 3m and 10m reefs respectively. The species with the highest biomass were the Spectacled parrotfish (*Chlorurus perspicillatus*) and the Goldring surgeonfish (*Ctenochaetus strigosus*) at the 3m and 10m reefs respectively. *Sebastapistes coniora* presence is notable as this species is not common to sites surveyed.