

Kahekili, Maui

20° 56.257' N 156° 41.595' W

Management Status: Open Access

Area Description: Watershed forest reserve. Upslope sugarcane fields have been fallow since 1999 with area planned for nearshore housing and resort development. Sewage treatment plant in close proximity (south of Honokowai) with 4 injection wells. Exposed limestone rubble and sand beach shoreline. Mixed carbonate/sand sloping shallow reef with high coral cover. Deep site characterized by aggregated coral heads with moderate to high rugosity and interspersed with sand patches. Northern exposure, sheltered Management concerns include nutrient inputs from agriculture



and injection wells, sedimentation from runoff.

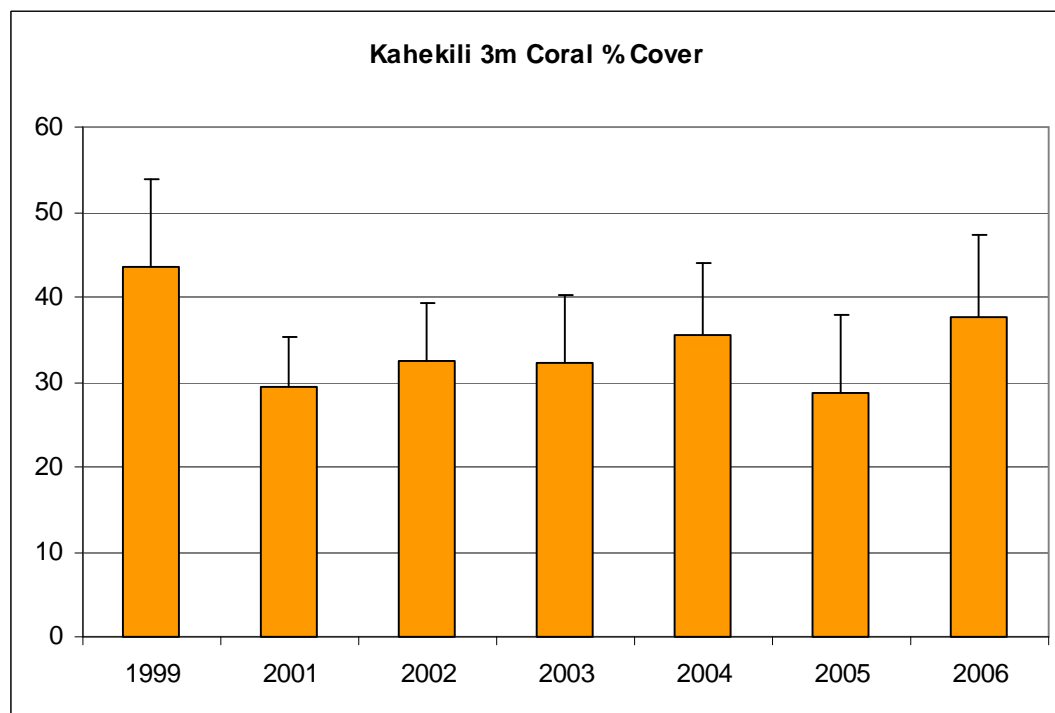
Benthic Habitat Data: 3 m

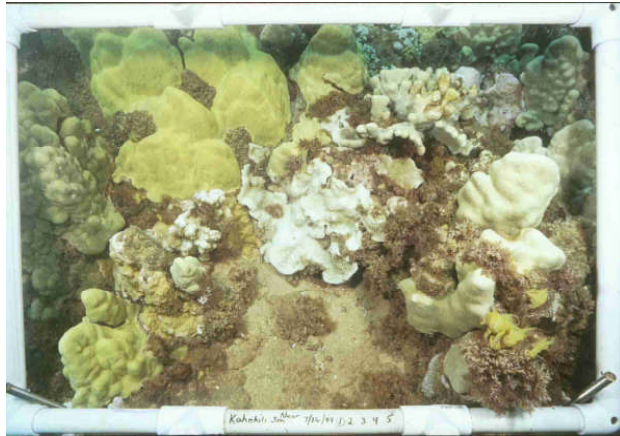
	Depth (m)	Rugosity	Sediment Composition (% wt.)		Sediment Grain Size (% wt.)			
			LOI	H ₂ CO ₃	Gravel	Coarse	Fine	Silt
Mean	3	1.58	2.63	83.69	38.55	50.41	10.47	0.58
S.D.		0.15	0.28	0.62	8.84	4.09	4.61	0.14

Video Transect data (3 m)

Species	% Cover:		1999		2001		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	0	0	0	0	0	0	0
<i>Leptastrea purpurea</i>	0	0	0.0	0.1	0	0	0	0	0	0	0	0
<i>Montipora flabellata</i>	0.2	0.4	0	0	0	0	0	0	0	0	0	0
<i>Montipora patula</i>	2.4	1.8	2.3	1.0	2.3	1.5	3.1	1.5	3.9	3.0	3.0	3.1
<i>Montipora studeri</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Montipora verrucosa</i>	4.9	2.6	2.7	1.4	3.3	2.0	3.0	3.0	4.3	3.1	3.1	3.1
<i>Pavona duerdeni</i>	0.1	0.1	0.0	0.1	0	0	0	0	0	0	0	0
<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	0	0	0	0.0	0.1	0	0	0	0
<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	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>	2.0	1.3	1.0	0.7	0.7	0.6	1.2	0.9	1.0	0.9	1.0	0.9
<i>Porites brighami</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Porites compressa</i>	11.0	7.5	2.8	1.7	3.0	2.2	3.7	1.9	1.3	1.2	1.3	1.2
<i>Porites evermanni</i>	0.2	0.3	0	0	0	0	0.9	1.3	0.4	1.0	0.4	1.0
<i>Porites lichen</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>Porites lobata</i>	22.8	5.6	20.5	4.2	23.3	4.4	20.3	4.7	24.6	6.2	24.6	6.2
<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	0.1	0	0	0	0	0	0	0	0
Total Coral	43.5	10.3	29.4	5.8	32.5	6.7	32.3	7.8	35.5	8.6	35.5	8.6
Species Richness:	9		8		5		6		6		6	
Macroalgae	22.3	7.6	19.9	9.9	0	0	35.4	18.7	10.5	7.7	10.5	7.7

% Cover: Species	2005		2006	
	Mean	SD	Mean	SD
<i>Cyphastrea ocellina</i>	0	0	0	0
<i>Fungia scutaria</i>	0	0	0	0
<i>Leptastrea purpurea</i>	0	0	0	0
<i>Montipora flabellata</i>	0	0	0	0
<i>Montipora patula</i>	2.6	2.1	2.2	1.7
<i>Montipora studeri</i>	0	0	0	0
<i>Montipora verrucosa</i>	3.6	2.8	9.3	6.0
<i>Pavona duerdeni</i>	0	0	0	0
<i>Pavona maldivensis</i>	0	0	0	0
<i>Pavona varians</i>	0	0	0	0
<i>Pocillopora damicornis</i>	0	0	0	0
<i>Pocillopora eydouxi</i>	0	0	0	0
<i>Pocillopora ligulata</i>	0	0	0	0
<i>Pocillopora meandrina</i>	1.3	1.1	1.5	1.6
<i>Porites brighami</i>	0	0	0	0
<i>Porites compressa</i>	0	0	0	0
<i>Porites evermanni</i>	0	0	0	0
<i>Porites lichen</i>	0	0	0	0
<i>Porites lobata</i>	21.2	6.9	24.8	8.2
<i>Porites rus</i>	0	0	0	0
<i>Psammocora nierstraszi</i>	0	0	0	0
Unknown Coral	0	0	0	0
Total Coral	28.8	9.0	37.8	9.5
Species Richness:	4		4	
Macroalgae	2.6	1.6	15.1	4.9





Photoquadrat Data (3 m): Photo analysis pending

Findings: Initial coral cover rank is 10 among 60 reefs. Coral community dominated by *Porites* spp. High percentage of macroalgal cover. Occasional blooms of *Cladophora sercea* and *Ulva fasciata*. High percentage turf algae. Low percentage of fine sediments with low content of terrigenous material. No rare or unusual species observed.

Kahekili, Maui

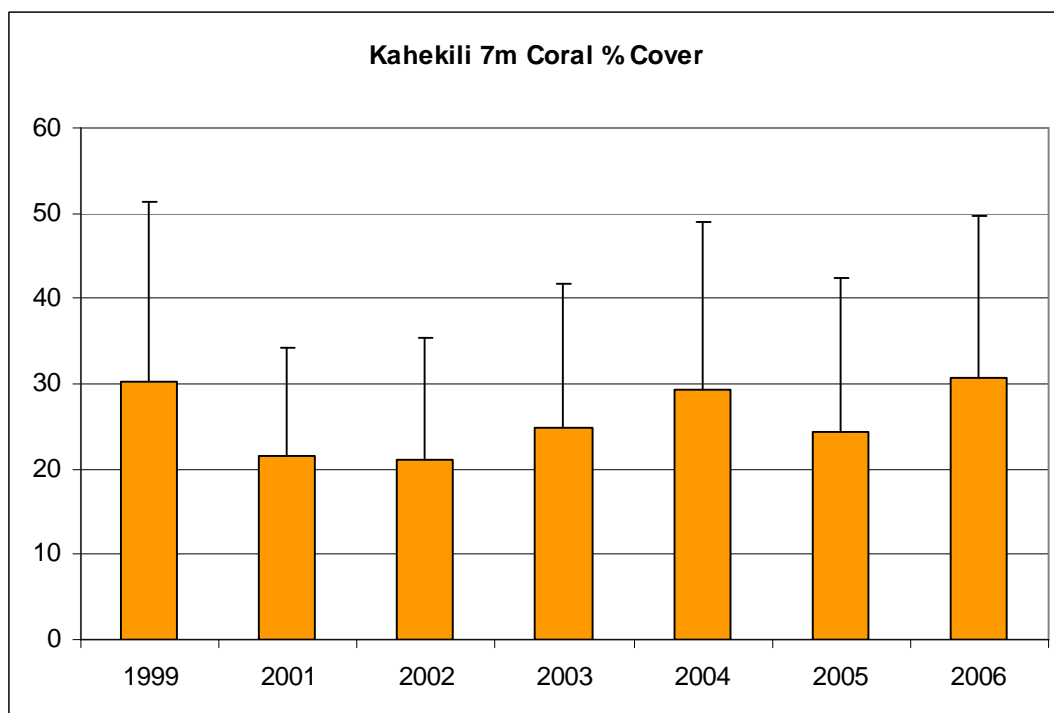
Benthic Habitat: 7 m

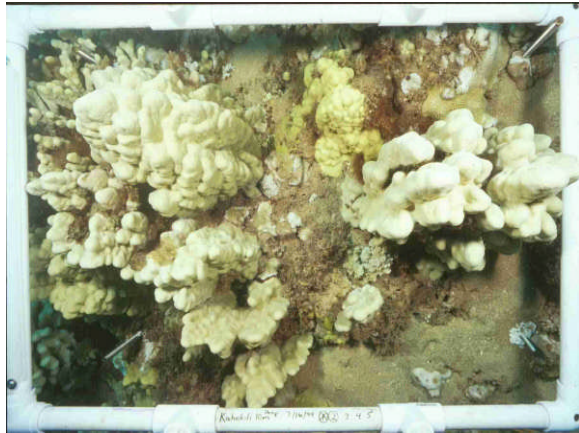
	Depth (m)	Rugosity	Sediment Composition (% wt.)		Sediment Grain Size (% wt.)			
			LOI	H ₂ CO ₃	Gravel	Coarse	Fine	Silt
Mean	7	1.40	2.78	85.85	42.40	49.38	7.46	0.75
S.D.		0.33	0.18	0.52	20.22	15.30	4.58	0.34

Video Transect data (7 m):

Species	% Cover:		1999		2001		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	0.1	0	0		
<i>Fungia scutaria</i>	0	0	0	0	0	0	0	0	0	0		
<i>Leptastrea purpurea</i>	0	0	0	0	0	0	0.0	0.1	0	0		
<i>Montipora flabellata</i>	0	0	0.0	0.1	0.0	0	0	0	0	0		
<i>Montipora patula</i>	0.3	0.7	0.4	0.3	0.3	0.7	0.8	1.1	0.6	0.8		
<i>Montipora studeri</i>	0	0	0	0	0	0	0	0	0	0		
<i>Montipora verrucosa</i>	3.0	4.2	2.6	2.7	2.9	2.8	3.8	3.9	4.2	4.7		
<i>Pavona duerdeni</i>	0	0	0	0	0	0	0	0	0	0		
<i>Pavona maldivensis</i>	0	0	0	0	0	0	0	0	0	0		
<i>Pavona varians</i>	0	0	0	0	0	0	0	0	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>	0.8	0.6	0.9	0.8	0.3	0.3	0.2	0.3	0.3	0.4		
<i>Porites brighami</i>	0	0	0	0	0	0	0	0	0	0		
<i>Porites compressa</i>	7.2	7.2	1.7	1.6	1.8	2.2	2.6	2.8	1.6	2.5		
<i>Porites evermanni</i>	0	0	0.3	0.9	0	0	1.3	1.2	0.5	1.1		
<i>Porites lichen</i>	0	0	0	0	0	0	0	0	0	0		
<i>Porites lobata</i>	18.8	14.0	15.7	8.9	15.9	10.1	16.2	10.2	22.2	13.7		
<i>Porites rus</i>	0	0	0	0	0	0	0	0	0	0		
<i>Psammocora nierstraszi</i>	0	0	0	0	0	0	0	0	0	0		
Unknown Coral	0	0	0	0	0	0	0	0	0	0		
Total Coral	30.2	21.1	21.7	12.5	21.2	14.3	24.9	16.8	29.3	19.6		
Species Richness:	5		7		6		8		6			
Macroalgae	8.7	5.4	16.2	6.8	1.2	1.1	6.5	9.0	2.8	4.6		

% Cover: Species	2005		2006	
	Mean	SD	Mean	SD
<i>Cyphastrea ocellina</i>	0	0	0	0
<i>Fungia scutaria</i>	0	0	0	0
<i>Leptastrea purpurea</i>	0.1	0.3	0	0
<i>Montipora flabellata</i>	0	0	0	0
<i>Montipora patula</i>	0.8	0.9	0.4	0.7
<i>Montipora studeri</i>	0	0	0	0
<i>Montipora verrucosa</i>	3.2	4.8	3.3	4.7
<i>Pavona duerdeni</i>	0	0	0	0
<i>Pavona maldivensis</i>	0	0	0	0
<i>Pavona varians</i>	0	0	0	0
<i>Pocillopora damicornis</i>	0.0	0.1	0	0
<i>Pocillopora eydouxi</i>	0	0	0	0
<i>Pocillopora ligulata</i>	0	0	0	0
<i>Pocillopora meandrina</i>	0.3	0.5	0.4	0.7
<i>Porites brighami</i>	0	0	0	0
<i>Porites compressa</i>	1.1	1.5	0.4	1.3
<i>Porites evermanni</i>	0	0	0	0
<i>Porites lichen</i>	0	0	0	0
<i>Porites lobata</i>	18.8	12.3	26.1	14.4
<i>Porites rus</i>	0	0	0	0
<i>Psammocora nierstraszi</i>	0	0	0	0
Unknown Coral	0	0	0	0
Total Coral	24.3	18.2	30.6	19.0
Species Richness:	7		5	
Macroalgae	2.0	4.2	2.0	5.0





Photoquadrat Data (7 m): Photo analysis pending

Findings: Initial coral cover rank is 19 among 60 reefs. Coral community dominated by *Porites* spp. High percentage of macroalgal cover. Occasional blooms of *Cladophora sercea*. High percentage of turf algae. Low percentage of fine sediments with low content of terrigenous material. No rare or unusual species observed.

Kahekili, Maui Fish Data: 3 m and 7 m

Species	Density (#/125m ²)				Biomass (g/125m ²)			
	3 m		7 m		3 m		7 m	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<i>Acanthurus nigrofuscus</i>	223.0	78.4	13.0	8.1	8822.4	3795.5	324.4	246.8
<i>Acanthurus olivaceus</i>	3.5	3.4	2.0	4.0	787.0	854.0	453.3	906.7
<i>Acanthurus triostegus</i>	22.0	15.7			1521.4	1052.9		
<i>Anampses cuvier</i>	2.0	2.8	1.0	1.2	13.8	18.5	12.3	15.8
<i>Aprion virescens</i>	1.0	1.2			78.7	90.9		
<i>Calotomus carolinus</i>	1.0	2.0	1.0	1.2	280.3	560.7	18.8	22.2
<i>Cantherhines sandwichiensis</i>			0.5	1.0			8.1	16.2
<i>Canthigaster jactator</i>	10.5	1.9	10.5	3.0	68.0	9.5	68.0	20.1
<i>Centropyge potteri</i>			1.0	2.0			31.3	62.7
<i>Cephalopholis argus</i>	1.0	2.0			693.5	1387.1		
<i>Chaetodon lunula</i>	1.0	1.2			55.3	63.9		
<i>Chaetodon ornatissimus</i>	2.0	2.3	1.5	1.9	290.9	336.6	215.1	288.5
<i>Chaetodon unimaculatus</i>	1.0	2.0			57.6	115.2		
<i>Chlorurus sordidus</i>			2.0	2.3			67.0	77.7
<i>Chromis hanui</i>	2.5	3.0	1.5	3.0	7.9	10.1	6.3	12.5
<i>Chromis vanderbilti</i>	1.0	1.2	33.5	65.7	4.6	5.4	155.3	304.5
<i>Cirrhitops fasciatus</i>	1.5	1.9	0.5	1.0	33.7	49.2	11.0	22.0
<i>Cirripectes vanderbilti</i>	3.0	4.8			16.2	25.0		
<i>Coris gaimard</i>			4.0	3.3			60.1	48.2
<i>Coris venusta</i>			2.5	2.5			38.9	37.9
<i>Ctenochaetus strigosus</i>	5.5	7.2	7.0	7.4	188.0	267.2	129.5	132.6
<i>Dascyllus albisella</i>			13.5	27.0			386.3	772.6
<i>Exallias brevis</i>			0.5	1.0			18.9	37.8
<i>Forcipiger flavissimus</i>	1.0	1.2	1.0	1.2	46.8	54.0	46.8	54.0
<i>Gomphosus varius</i>	9.0	4.8	3.5	3.4	204.5	135.4	100.5	112.0
<i>Gymnothorax meleagris</i>			0.5	1.0			153.5	307.1
<i>Halichoeres ornatissimus</i>	0.5	1.0			3.0	6.1		
<i>Labroides phthirophagus</i>	0.5	1.0			1.6	3.1		
<i>Macropharyngodon geoffroyi</i>	0.5	1.0	4.5	1.9	2.6	5.2	105.1	67.9

<i>Melichthys niger</i>	4.5	3.4	0.5	1.0	1498.8	1287.0	143.2	286.5
<i>Melichthys vidua</i>	2.0	4.0			614.0	1228.0		
<i>Mulloidichthys flavolineatus</i>	26.0	35.9			3036.1	4110.9		
<i>Naso brevirostris</i>	15.5	14.5	3.5	1.0	4066.8	3507.2	590.1	414.3
<i>Naso hexacanthus</i>			0.5	1.0			56.5	113.1
<i>Naso lituratus</i>	5.0	2.0	6.5	4.1	844.9	392.5	1148.1	942.2
<i>Naso unicornis</i>	4.5	4.4			837.1	739.9		
<i>Oxycheilinus unifasciatus</i>	0.5	1.0			33.5	67.0		
<i>Paracirrhites arcatus</i>	0.5	1.0	3.5	1.9	19.6	39.2	87.7	48.3
<i>Paracirrhites forsteri</i>			1.0	1.2			92.1	107.3
<i>Parupeneus cyclostomus</i>			0.5	1.0			4.2	8.4

Kahekili, Maui Fish Data: 3 m and 7 m

Species	Density (#/125m ²)				Biomass (g/125m ²)			
	3 m		7 m		3 m		7 m	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<i>Parupeneus multifasciatus</i>	3.5	3.0	5.5	3.4	344.0	300.7	597.6	404.7
<i>Pervagor aspricaudus</i>	1.0	1.2			10.7	12.3		
<i>Plagiotremus goslinei</i>	0.5	1.0			1.1	2.2		
<i>Plectroglyphidodon imparipennis</i>	0.5	1.0			1.8	3.5		
<i>Plectroglyphidodon johnstonianus</i>	34.0	3.7	24.0	4.9	195.7	21.8	132.5	27.0
<i>Pseudocheilinus octotaenia</i>	4.0	2.8	9.5	5.3	65.2	44.7	198.1	120.9
<i>Pseudocheilinus tetrataenia</i>			1.0	1.2			4.0	5.7
<i>Rhinecanthus rectangulus</i>	7.0	2.0	7.0	3.5	980.6	162.0	873.8	450.5
<i>Scarus psittacus</i>	4.5	3.8	79.0	67.6	250.5	311.4	1102.7	940.5
<i>Scarus rubroviolaceus</i>	2.0	1.6			366.1	322.6		
<i>Stegastes fasciolatus</i>	35.5	6.0	13.5	7.5	525.7	88.9	232.6	156.7
<i>Stethojulis balteata</i>	17.5	5.0	15.0	6.6	206.6	66.1	204.4	10.3
<i>Sufflamen bursa</i>	0.5	1.0	0.5	1.0	38.3	76.6	38.3	76.6
<i>Thalassoma duperrey</i>	79.5	18.1	39.5	3.8	2617.2	626.4	1106.3	49.5
<i>Zanclus cornutus</i>	0.5	1.0			63.1	126.2		
<i>Zebrasoma flavescens</i>	4.5	4.1	2.0	4.0	562.8	510.7	46.8	93.6
Total/Depth Avg ± SD:	546.5	5.9	317.5	6.7	30357.9	520.3	9069.7	200.6
Species Richness	44		39					
Species Diversity	2.19		2.43					

Findings: Among 60 reefs, Kahekili 3m ranked 2 in species richness, 4 in density, 10 in biomass, and 33 in diversity. Kahekili 7m ranked 7 in species richness, 15 in density, 39 in biomass, and 11 in diversity. The most abundant species were the Brown surgeonfish (*Acanthurus nigrofuscus*) and the Palenose parrotfish (*Scarus psittacus*) at the 3m and 7m reefs respectively. The species with the highest biomass were the Brown surgeonfish (*Acanthurus nigrofuscus*) and the Orangespine unicornfish (*Naso lituratus*) at the 3m and 7m reefs respectively. No rare or unusual species observed.