

Field Guide to Study Sites on the Island of Hawai'i

West Hawai'i Aquarium Project

Prepared by

Brian N. Tissot
Washington State University
Vancouver, WA

William J. Walsh
Division of Aquatic Resources
Kailua-Kona, HI

Leon E. Hallacher
University of Hawai'i at Hilo
Hilo, HI

December 2001

Lapakahi, Hawai'i (Site #1)

20° 09.6' N 155° 54.0' W

Depth: 10-15 m

Management Status: Marine Life Conservation District

Summary of findings: there were significant changes in *Forcipiger longirostris* and *Labroides phthirophagus*

Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 174
 Number of quadrats analyzed = 80



Substrate	Mean % cover
Boulder	14.8
Flat	9.7
Macroalgae	0.0
<i>Montipora</i> spp	0.1
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	0.7
Old dead <i>P. lobata</i>	6.6
Old dead <i>P. meandrina</i>	0.1
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.3
<i>Porites compressa</i>	1.3
<i>Porites compressa</i> hole	0.3
<i>Porites lobata</i>	14.3
Rubble	28.1
Sand	23.3
Unknown coral	0.3

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)		Mean density (no./100m ²)		% change	P
		Pre-closure	SD	Post-closure	SD		
<i>Abudefduf abdominalis</i>		0.2	0.3	0.2	0.3	0.0	0.70
<i>Acanthurus leucopareius</i>	A	0.0	0.0	0.1	0.1	100.0	0.45
<i>Acanthurus nigricans</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Acanthurus nigrofuscus</i>	A	10.2	3.5	9.3	2.0	-8.4	0.68
<i>Acanthurus nigroris</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Acanthurus olivaceus</i>	A	0.6	0.5	0.3	0.3	-54.5	0.11
<i>Acanthurus thompsoni</i>		0.4	0.5	0.0	0.0	-100.0	0.30
<i>Anampses chrysocephalus</i>	A	0.1	0.2	0.1	0.1	0.0	0.73
<i>Apogon kallopterus</i>		0.1	0.2	0.1	0.1	-50.0	0.86
<i>Apogon spp.</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Arothron meleagris</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Aulostomus chinensis</i>		0.1	0.1	0.2	0.2	200.0	0.61
<i>Bodianus bilunulatus</i>		0.6	0.3	0.8	0.4	36.4	0.80
<i>Calotomus carolinus</i>		0.1	0.2	0.2	0.3	100.0	0.37
<i>Cantherhines dumerilii</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Canthigaster coronata</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Canthigaster jactator</i>		3.1	0.5	2.7	0.6	-14.5	0.28
<i>Centropyge potteri</i>	A1	2.0	0.9	1.9	1.0	-7.5	0.52
<i>Cephalopholis argus</i>	A	0.2	0.2	0.1	0.2	-50.0	0.78
<i>Chaetodon fremblii</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Chaetodon lunula</i>	A	0.4	0.5	0.4	0.2	0.0	0.87
<i>Chaetodon miliaris</i>	A	0.6	0.5	0.4	0.5	-36.4	0.19
<i>Chaetodon multicinctus</i>	A1	5.9	1.1	4.3	1.3	-28.0	0.34
<i>Chaetodon ornatissimus</i>	A1	0.4	0.4	0.2	0.2	-62.5	0.28
<i>Chaetodon quadrimaculatus</i>	A1	0.1	0.1	0.2	0.3	100.0	0.24
<i>Chromis agilis</i>		8.4	1.7	10.5	3.2	24.4	0.90
<i>Chromis hanui</i>		7.5	0.9	6.2	0.7	-18.0	0.13
<i>Chromis ovalis</i>		0.2	0.2	1.4	2.3	833.3	0.14
<i>Chromis vanderbilti</i>		53.1	13.8	36.6	11.8	-31.2	0.06
<i>Chromis verater</i>		0.7	0.7	0.7	1.5	-7.1	0.76
<i>Cirrhitops fasciatus</i>		0.5	0.6	0.9	0.7	100.0	0.09
<i>Cirrhitus pinnulatus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Cirripectes vanderbilti</i>		0.0	0.0	2.2	4.8	100.0	0.24
<i>Coris gaimard</i>	A	0.4	0.4	0.5	0.5	28.6	0.38

<i>Coris venusta</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Ctenochaetus hawaiiensis</i>	A	0.3	0.3	0.3	0.4	20.0	0.28
<i>Ctenochaetus strigosus</i>	A1	16.9	4.3	11.7	2.8	-30.9	0.03
<i>Dascyllus albisella</i>	A	2.9	1.9	2.5	1.1	-15.5	0.70
<i>Exallias brevis</i>		0.4	0.4	0.1	0.1	-85.7	0.27
<i>Forcipiger flavissimus</i>	A1	0.8	0.6	0.6	0.5	-26.7	0.18
<i>Forcipiger longirostris</i>	A1	0.4	0.3	1.5	0.5	328.6	*0.00
<i>Gymnothorax flavimarginatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Gymnothorax meleagris</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Halichoeres ornatissimus</i>	A	3.4	1.6	3.0	0.9	-11.9	0.85
<i>Hemitaenichthys polylepis</i>	A	3.5	3.8	3.7	4.1	7.2	0.59
<i>Labroides phthirophagus</i>	A	0.8	0.1	0.4	0.2	-50.0	*0.00
<i>Melichthys vidua</i>	A	0.0	0.0	0.1	0.1	100.0	0.06
<i>Monotaxis grandoculis</i>		0.7	1.1	0.2	0.2	-71.4	0.41
<i>Myrichthys magnificus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Myripristis berndti</i>		0.1	0.1	0.1	0.1	100.0	0.81
<i>Myripristis kuntee</i>		0.0	0.0	0.2	0.2	100.0	0.21
<i>Naso hexacanthus</i>		0.0	0.0	0.2	0.2	100.0	0.86
<i>Naso lituratus</i>	A	0.7	0.5	0.8	0.3	15.4	0.67
<i>Neoniphon sammara</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Ostracion meleagris</i>	A	0.1	0.1	0.1	0.1	-50.0	0.11
<i>Oxycheilinus unifasciatus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Paracirrhites arcatus</i>	A	5.3	1.1	4.7	1.3	-11.4	0.92
<i>Paracirrhites forsteri</i>	A	0.3	0.2	0.3	0.3	20.0	0.26
<i>Parupeneus bifasciatus</i>		0.6	0.5	0.5	0.7	-16.7	0.85
<i>Parupeneus cyclostomus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Parupeneus multifasciatus</i>	A	5.5	4.1	1.9	0.9	-66.1	0.14
<i>Parupeneus pleurostigma</i>		0.1	0.1	0.2	0.2	200.0	0.21
<i>Parupeneus porphyreus</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Pervagor aspricaudus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Plagiotremus ewaensis</i>		0.2	0.3	0.2	0.2	0.0	0.60
<i>Plagiotremus goslinei</i>		0.2	0.1	0.1	0.1	-50.0	0.65
<i>Plectroglyphidodon imparipennis</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Plectroglyphidodon johnstonianus</i>		1.1	0.7	1.6	0.6	40.9	0.10
<i>Pseudocheilinus evanidus</i>		6.4	2.5	5.6	1.0	-11.8	0.65
<i>Pseudocheilinus octotaenia</i>	A	4.9	1.6	4.6	2.2	-6.2	0.64
<i>Pseudocheilinus tetrataenia</i>	A	2.1	1.6	1.2	1.0	-43.9	0.69
<i>Pseudojuloides cerasinus</i>	A	0.4	0.1	0.3	0.3	-37.5	0.90
<i>Sargocentron punctatissimum</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Sargocentron spiniferum</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus dubius</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus psittacus</i>		0.4	0.4	0.7	1.1	62.5	0.38
<i>Scarus rubroviolaceus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Scorpaenopsis cacopsis</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Stethojulis balteata</i>	A	0.5	0.4	0.5	0.4	11.1	0.58
<i>Sufflamen bursa</i>	A	0.8	0.6	0.6	0.4	-31.3	0.37
<i>Synodus spp.</i>		0.1	0.1	0.0	0.0	-100.0	0.24

<i>Synodus ulae</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Synodus variegatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Thalassoma ballieui</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Thalassoma duperrey</i>	A	8.9	3.1	6.2	0.6	-30.3	0.23
<i>Zanclus cornutus</i>	A1	0.1	0.1	0.2	0.4	300.0	0.34
<i>Zebrasoma flavescens</i>	A1	5.7	2.3	3.6	1.1	-36.8	0.06

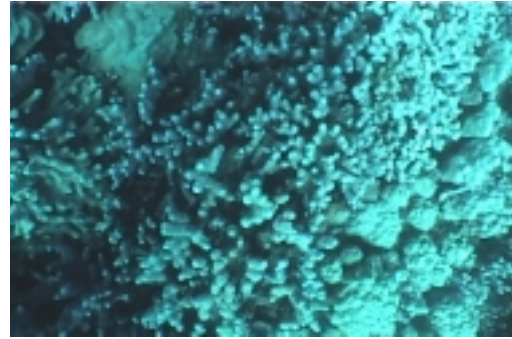
Kamilo Gultch, Hawai'i (Site #2)

20° 04.9' N 155° 52.1' W

Depth: 11-15 m

Management Status: none

Summary of findings: there were significant changes in *Chaetodon multicinctus*, *Forcipiger longirostris* and *Zebrasoma flavescens*



Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 153
 Number of quadrats analyzed = 79

Substrate	Mean % cover
Boulder	7.9
Flat	0.8
Macroalgae	0.0
<i>Montipora</i> spp	0.2
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	9.1
Old dead <i>P. lobata</i>	8.2
Old dead <i>P. meandrina</i>	0.0
<i>Palythoa tuberculosa</i>	0.1
<i>Pavona varians</i>	0.1
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.2
<i>Porites compressa</i>	34.8
<i>Porites compressa</i> hole	5.5
<i>Porites lobata</i>	25.4
Rubble	4.6
Sand	2.0
Unknown coral	1.0

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)		Mean density (no./100m ²)		% change	P
		Pre-closure	SD	Post-closure	SD		
<i>Acanthurus achilles</i>	A1	0.7	0.5	0.5	0.6	-30.8	0.07
<i>Acanthurus nigrofuscus</i>	A	5.4	1.3	3.8	0.7	-29.9	0.11
<i>Acanthurus nigroris</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Acanthurus olivaceus</i>	A	0.1	0.1	0.1	0.1	0.0	0.78
<i>Acanthurus thompsoni</i>		3.6	5.5	2.6	4.3	-26.8	0.93
<i>Apogon maculiferus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Aulostomus chinensis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Bodianus bilunulatus</i>		0.4	0.4	0.1	0.1	-85.7	0.27
<i>Calotomus carolinus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Cantherhines dumerilii</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Cantherhines sandwichiensis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Canthigaster jactator</i>		0.2	0.3	0.1	0.1	-33.3	0.54
<i>Centropyge potteri</i>	A1	1.9	1.1	2.2	0.7	15.8	0.71
<i>Cephalopholis argus</i>	A	0.6	0.4	0.4	0.3	-41.7	0.51
<i>Chaetodon lunula</i>	A	0.1	0.2	0.1	0.1	-50.0	0.86
<i>Chaetodon multicinctus</i>	A1	6.3	1.0	5.4	1.8	-14.3	*0.02
<i>Chaetodon ornatissimus</i>	A1	1.2	0.4	0.6	0.2	-52.2	0.09
<i>Chaetodon quadrimaculatus</i>	A1	0.0	0.0	0.1	0.1	100.0	0.24
<i>Chaetodon unimaculatus</i>	A	0.0	0.0	0.1	0.1	100.0	0.78
<i>Chromis agilis</i>		37.6	15.6	33.6	6.6	-10.8	0.72
<i>Chromis hanui</i>		7.9	0.6	8.6	3.0	8.9	0.35
<i>Chromis ovalis</i>		0.3	0.3	0.1	0.1	-80.0	0.31
<i>Chromis vanderbilti</i>		0.3	0.4	0.1	0.2	-60.0	0.72
<i>Chromis verater</i>		0.5	1.0	0.6	0.8	33.3	0.65
<i>Cirrhitops fasciatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Cirripectes vanderbilti</i>		0.1	0.1	0.1	0.1	0.0	0.24
<i>Coris gaimard</i>	A	0.0	0.0	0.1	0.1	100.0	0.45
<i>Ctenochaetus hawaiiensis</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Ctenochaetus strigosus</i>	A1	27.2	4.4	26.8	3.7	-1.3	0.98
<i>Dascyllus albisella</i>	A	0.6	0.7	0.5	0.6	-16.7	0.33
<i>Exallias brevis</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Fistularia commersonii</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Forcipiger flavissimus</i>	A1	0.1	0.1	0.6	0.8	500.0	0.88
<i>Forcipiger longirostris</i>	A1	0.6	0.4	0.3	0.4	-54.5	*0.02
<i>Gomphosus varius</i>	A	0.2	0.1	0.0	0.0	-100.0	0.11

<i>Gymnothorax meleagris</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Halichoeres ornatissimus</i>	A	0.7	0.5	0.3	0.3	-57.1	0.48
<i>Labroides phthirophagus</i>	A	0.5	0.4	0.4	0.5	-20.0	0.77
<i>Melichthys vidua</i>	A	0.4	0.4	0.0	0.0	-100.0	0.12
<i>Mulloidichthys flavolineatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Mulloidichthys vanicolensis</i>	A	0.5	0.7	0.0	0.0	-100.0	0.28
<i>Myripristis berndti</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Myripristis kuntee</i>		0.0	0.0	0.2	0.2	100.0	0.08
<i>Naso hexacanthus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Naso lituratus</i>	A	2.0	0.8	1.8	1.1	-10.3	0.14
<i>Naso unicornis</i>	A	0.2	0.2	0.0	0.0	-100.0	0.28
<i>Neoniphon sammara</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Ostracion meleagris</i>	A	0.1	0.1	0.1	0.1	0.0	0.78
<i>Oxycheilinus unifasciatus</i>		0.2	0.2	0.4	0.3	100.0	0.49
<i>Paracirrhites arcatus</i>	A	1.4	1.1	0.7	0.5	-51.9	0.50
<i>Paracirrhites forsteri</i>	A	0.1	0.1	0.2	0.1	200.0	0.08
<i>Parupeneus bifasciatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Parupeneus cyclostomus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Parupeneus multifasciatus</i>	A	0.3	0.4	0.3	0.3	20.0	0.52
<i>Pervagor aspricaudus</i>		0.1	0.1	0.1	0.1	0.0	0.24
<i>Pervagor spilosoma</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Plagiotremus ewaensis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Plectroglyphidodon johnstonianus</i>		1.5	0.6	1.5	1.1	0.0	0.61
<i>Pseudocheilinus evanidus</i>		0.7	0.8	0.8	0.6	15.4	0.54
<i>Pseudocheilinus octotaenia</i>	A	1.2	0.8	1.0	1.1	-16.7	0.82
<i>Pseudocheilinus tetrataenia</i>	A	1.6	1.2	1.9	0.9	19.4	0.37
<i>Pseudojuloides cerasinus</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Scarus psittacus</i>		0.5	1.0	0.0	0.0	-100.0	0.39
<i>Scarus rubroviolaceus</i>		0.2	0.3	0.0	0.0	-100.0	0.45
<i>Scarus sordidus</i>		0.0	0.0	0.3	0.4	100.0	1.00
<i>Scorpaenopsis diabolus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Seriola dumerili</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Stethojulis balteata</i>	A	0.3	0.5	0.2	0.2	-33.3	1.00
<i>Sufflamen bursa</i>	A	0.4	0.3	0.3	0.2	-28.6	0.90
<i>Synodus variegatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Thalassoma duperrey</i>	A	5.2	1.4	3.4	1.3	-35.6	0.49
<i>Zanclus cornutus</i>	A1	0.2	0.2	0.2	0.2	0.0	0.78
<i>Zebrasoma flavescens</i>	A1	13.4	2.4	9.6	4.6	-28.1	*0.00

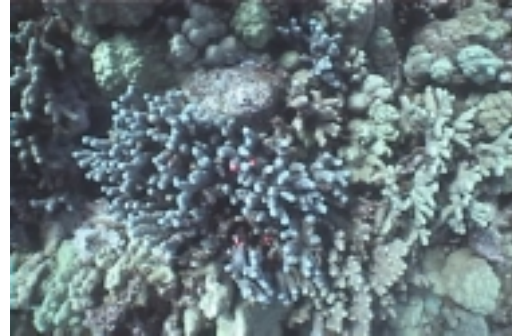
Waiakailio Bay, Hawai'i (Site #3)

20° 04.4' N 155° 51.9' W

Depth: 12-14 m

Management Status: Fishery Replenishment Area

Summary of findings: there were significant changes in *Acanthurus nigrofuscus*, *Chromis hanui*, and *Oxycheilinus unifasciatus*



Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 151
 Number of quadrats analyzed = 80

Substrate	Mean % cover
Boulder	3.3
Flat	0.0
Macroalgae	0.0
<i>Montipora</i> spp	0.6
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	10.2
Old dead <i>P. lobata</i>	8.3
Old dead <i>P. meandrina</i>	0.0
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.2
<i>Porites compressa</i>	31.4
<i>Porites compressa</i> hole	4.5
<i>Porites lobata</i>	39.9
Rubble	0.8
Sand	0.0
Unknown coral	0.8

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)		Mean density (no./100m ²)		% change	P
		Pre-closure	SD	Post-closure	SD		
<i>Abudefduf abdominalis</i>		0.3	0.7	0.2	0.3	-50.0	0.86
<i>Acanthurus achilles</i>	A1	0.2	0.2	0.0	0.0	-100.0	0.28
<i>Acanthurus nigricans</i>		0.2	0.2	0.1	0.1	-75.0	0.39
<i>Acanthurus nigrofuscus</i>	A	3.3	0.8	1.8	0.5	-44.6	*0.01
<i>Acanthurus nigroris</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Acanthurus olivaceus</i>	A	0.1	0.1	0.1	0.1	0.0	0.78
<i>Acanthurus thompsoni</i>		3.1	3.0	3.0	2.6	-4.8	0.75
<i>Amblycirrhitis bimacula</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Aulostomus chinensis</i>		0.4	0.4	0.1	0.1	-75.0	0.33
<i>Bodianus bilunulatus</i>		0.1	0.2	0.1	0.1	0.0	0.73
<i>Cantherhines dumerilii</i>		0.2	0.2	0.2	0.3	-25.0	0.09
<i>Canthigaster jactator</i>		0.2	0.3	0.2	0.1	-25.0	0.90
<i>Centropyge potteri</i>	A1	1.2	0.6	1.5	0.3	30.4	0.23
<i>Cephalopholis argus</i>	A	0.2	0.2	0.4	0.2	166.7	0.09
<i>Chaetodon lineolatus</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Chaetodon lunula</i>	A	0.1	0.1	0.2	0.3	100.0	0.31
<i>Chaetodon multicoloratus</i>	A1	5.2	1.1	5.5	1.8	4.8	0.66
<i>Chaetodon ornatissimus</i>	A1	1.7	0.5	1.9	0.2	15.2	0.32
<i>Chaetodon quadrimaculatus</i>	A1	0.1	0.1	0.3	0.7	500.0	0.30
<i>Chaetodon unimaculatus</i>	A	0.3	0.3	0.2	0.2	-40.0	0.91
<i>Chromis agilis</i>		23.5	4.7	15.9	3.5	-32.6	0.01
<i>Chromis hanui</i>		4.7	0.8	3.9	0.6	-17.0	*0.03
<i>Chromis ovalis</i>		5.5	7.9	2.2	3.2	-60.9	0.42
<i>Chromis vanderbilti</i>		0.2	0.3	0.4	0.5	133.3	0.28
<i>Chromis verater</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Coris gaimard</i>	A	0.3	0.3	0.1	0.1	-66.7	0.49
<i>Ctenochaetus hawaiiensis</i>	A	0.2	0.2	0.1	0.1	-66.7	0.61
<i>Ctenochaetus strigosus</i>	A1	20.5	5.1	17.7	3.8	-13.7	0.09
<i>Exallias brevis</i>		0.0	0.0	0.1	0.2	100.0	0.45
<i>Forcipiger flavissimus</i>	A1	1.2	0.7	0.8	0.5	-33.3	0.33
<i>Forcipiger longirostris</i>	A1	0.5	0.5	0.7	0.5	55.6	0.74
<i>Gomphosus varius</i>	A	0.3	0.3	0.1	0.1	-80.0	0.06
<i>Gymnothorax flavimarginatus</i>		0.0	0.0	0.2	0.2	100.0	0.08
<i>Halichoeres ornatissimus</i>	A	0.4	0.4	0.3	0.3	-25.0	0.86
<i>Hemitaenichthys polylepis</i>	A	0.5	1.1	0.0	0.0	-100.0	0.45

<i>Hemitaurichthys thompsoni</i>	A	0.7	1.5	2.1	4.6	215.4	0.32
<i>Labroides phthirophagus</i>	A	1.0	0.4	0.8	0.4	-15.8	1.00
<i>Lutjanus kasmira</i>		0.0	0.0	0.3	0.7	100.0	0.24
<i>Melichthys niger</i>	A	0.2	0.3	0.3	0.4	25.0	0.52
<i>Melichthys vidua</i>	A	0.8	0.4	0.6	0.5	-20.0	0.66
<i>Monotaxis grandoculis</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Mulloidichthys flavolineatus</i>		0.4	0.8	0.1	0.2	-71.4	0.67
<i>Mulloidichthys vanicolensis</i>	A	0.2	0.3	0.2	0.3	0.0	0.23
<i>Myripristis kuntzei</i>		0.2	0.1	0.4	0.5	100.0	0.37
<i>Naso hexacanthus</i>		0.3	0.7	0.0	0.0	-100.0	0.45
<i>Naso lituratus</i>	A	0.9	0.2	1.0	0.4	5.6	0.24
<i>Neoniphon sammara</i>		0.2	0.3	0.1	0.1	-75.0	0.48
<i>Ostracion meleagris</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Oxycheilinus unifasciatus</i>		0.1	0.2	0.5	0.2	350.0	*0.02
<i>Paracirrhites arcatus</i>	A	2.9	1.2	3.3	1.1	14.0	0.98
<i>Paracirrhites forsteri</i>	A	0.1	0.1	0.1	0.1	0.0	0.78
<i>Parupeneus bifasciatus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Parupeneus multifasciatus</i>	A	0.2	0.2	0.2	0.2	0.0	0.67
<i>Pervagor aspricaudus</i>		0.0	0.0	0.1	0.1	100.0	0.06
<i>Pervagor spilosoma</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Plagiotremus ewaensis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Plectroglyphidodon imparipennis</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Plectroglyphidodon johnstonianus</i>		0.9	0.5	0.5	0.3	-50.0	0.10
<i>Pseudocheilinus evanidus</i>		0.7	0.6	0.9	0.6	30.8	0.29
<i>Pseudocheilinus octotaenia</i>	A	1.5	0.8	1.7	1.1	10.0	0.34
<i>Pseudocheilinus tetrataenia</i>	A	2.0	1.0	2.4	1.2	20.0	0.25
<i>Sargocentron spiniferum</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus psittacus</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Scarus rubroviolaceus</i>		0.0	0.0	0.1	0.1	100.0	0.06
<i>Scarus sordidus</i>		0.5	0.5	0.8	0.8	50.0	0.22
<i>Stethojulis balteata</i>	A	0.1	0.1	0.1	0.1	-50.0	0.81
<i>Sufflamen bursa</i>	A	0.7	0.3	0.4	0.2	-50.0	0.21
<i>Synodus spp.</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Synodus ulae</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Synodus variegatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Thalassoma duperrey</i>	A	3.2	0.4	2.4	1.2	-25.0	0.44
<i>Zanclus cornutus</i>	A1	0.5	0.7	0.5	0.5	0.0	1.00
<i>Zebrasoma flavescens</i>	A1	18.1	2.8	15.9	3.9	-12.2	0.06

Puako, Hawai'i (Site #4)

19° 58.2' N 155° 50.9' W

Depth: 10-13 m

Management Status: Fishery Management Area

Summary of findings: there were significant changes in *Aphareus furca*

Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 162
 Number of quadrats analyzed = 80

Substrate	Mean % cover
Boulder	1.2
Flat	0.0
Macroalgae	0.0
<i>Montipora</i> spp	0.6
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.4
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	9.6
Old dead <i>P. lobata</i>	6.3
Old dead <i>P. meandrina</i>	0.0
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.3
<i>Porites compressa</i>	31.2
<i>Porites compressa</i> hole	3.1
<i>Porites lobata</i>	41.8
Rubble	3.6
Sand	0.8
Unknown coral	0.9



Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at $P < 0.05$ and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)		Mean density (no./100m ²)		% change	P
		Pre-closure	SD	Post-closure	SD		
<i>Abudefduf abdominalis</i>		4.5	4.5	6.7	4.8	49.4	0.31
<i>Acanthurus achilles</i>	A1	0.1	0.1	0.1	0.1	0.0	0.78
<i>Acanthurus leucopareius</i>	A	1.2	1.4	0.2	0.3	-87.0	0.12
<i>Acanthurus nigricans</i>		0.2	0.2	0.1	0.1	-75.0	0.39
<i>Acanthurus nigrofuscus</i>	A	1.8	0.8	1.0	0.5	-47.2	0.15
<i>Acanthurus olivaceus</i>	A	0.3	0.3	0.2	0.2	-40.0	0.90
<i>Acanthurus thompsoni</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Acanthurus triostegus</i>	A	0.8	0.7	0.2	0.3	-75.0	0.33
<i>Aluterus scriptus</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Aphareus furca</i>		0.0	0.0	0.2	0.1	100.0	*0.01
<i>Apogon kallopterus</i>		0.2	0.2	0.4	0.1	133.3	0.12
<i>Apogon spp.</i>		0.0	0.0	0.1	0.1	100.0	0.06
<i>Aulostomus chinensis</i>		0.1	0.2	0.1	0.1	-50.0	0.86
<i>Bodianus bilunulatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Cantherhines dumerilii</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Canthigaster jactator</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Centropyge potteri</i>	A1	0.5	0.3	0.3	0.4	-33.3	0.05
<i>Cephalopholis argus</i>	A	0.7	0.4	0.8	0.4	15.4	0.46
<i>Chaetodon auriga</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Chaetodon lunula</i>	A	0.1	0.1	0.3	0.4	500.0	0.13
<i>Chaetodon multicolor</i>	A1	3.2	1.3	3.3	0.6	3.2	0.63
<i>Chaetodon ornatissimus</i>	A1	0.6	0.6	0.5	0.7	-18.2	0.80
<i>Chaetodon quadrimaculatus</i>	A1	0.2	0.2	0.3	0.3	66.7	0.23
<i>Chaetodon unimaculatus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Chanos chanos</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Chromis agilis</i>		3.8	1.8	4.9	1.1	30.7	0.87
<i>Chromis hanui</i>		2.2	1.0	2.1	0.9	-4.7	0.82
<i>Chromis ovalis</i>		0.2	0.3	0.0	0.0	-100.0	0.45
<i>Chromis vanderbilti</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Coris gaimard</i>	A	0.1	0.1	0.1	0.1	0.0	0.65
<i>Ctenochaetus strigosus</i>	A1	23.1	3.2	24.2	3.6	5.0	0.89
<i>Exallias brevis</i>		0.4	0.2	0.3	0.4	-14.3	0.59
<i>Fistularia commersonii</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Forcipiger flavissimus</i>	A1	0.9	0.8	0.6	0.6	-38.9	0.23

<i>Forcipiger longirostris</i>	A1	0.9	0.3	0.9	0.6	5.9	0.30
<i>Gomphosus varius</i>	A	1.0	0.8	0.8	0.3	-15.8	0.59
<i>Gymnothorax eurostus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Gymnothorax meleagris</i>		0.4	0.1	0.1	0.1	-87.5	0.05
<i>Gymnothorax spp.</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Halichoeres ornatissimus</i>	A	0.3	0.1	0.5	0.5	66.7	0.26
<i>Heteropriacanthus cruentatus</i>		0.2	0.2	0.1	0.1	-66.7	0.15
<i>Labroides phthirophagus</i>	A	1.4	0.5	1.1	0.3	-18.5	0.82
<i>Melichthys niger</i>	A	4.2	3.5	8.1	8.6	95.2	0.12
<i>Melichthys vidua</i>	A	0.4	0.4	0.2	0.3	-50.0	0.10
<i>Monotaxis grandoculis</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Mulloidichthys flavolineatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Mulloidichthys vanicolensis</i>	A	4.6	4.8	0.8	1.8	-82.6	0.30
<i>Myripristis amaena</i>		0.3	0.7	0.0	0.0	-100.0	0.45
<i>Myripristis berndti</i>		1.4	0.9	1.8	0.4	29.6	0.79
<i>Myripristis kuntee</i>		1.5	1.4	0.8	0.9	-46.7	0.67
<i>Naso brevirostris</i>		0.3	0.6	0.0	0.0	-100.0	0.45
<i>Naso hexacanthus</i>		0.0	0.0	0.8	1.7	100.0	0.24
<i>Naso lituratus</i>	A	0.6	0.1	0.6	0.3	0.0	0.90
<i>Naso unicornis</i>	A	0.6	1.2	0.0	0.0	-100.0	0.45
<i>Neoniphon sammara</i>		1.1	0.5	1.2	0.9	9.1	0.90
<i>Ostracion meleagris</i>	A	0.1	0.1	0.1	0.1	100.0	0.31
<i>Oxycheilinus unifasciatus</i>		0.3	0.2	0.4	0.4	33.3	0.20
<i>Paracirrhites arcatus</i>	A	1.6	0.7	1.5	0.5	-3.2	0.66
<i>Paracirrhites forsteri</i>	A	0.4	0.3	0.3	0.3	-37.5	0.07
<i>Parupeneus bifasciatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Parupeneus multifasciatus</i>	A	0.3	0.2	0.4	0.3	16.7	0.45
<i>Parupeneus porphyreus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Pervagor aspricaudus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Plagiotremus ewaensis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Plectroglyphidodon johnstonianus</i>		1.9	0.1	2.2	0.8	13.2	0.13
<i>Priacanthus meeki</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Pseudocheilinus evanidus</i>		1.1	0.5	0.9	0.7	-19.0	0.83
<i>Pseudocheilinus octotaenia</i>	A	3.1	1.2	2.0	0.9	-37.1	0.49
<i>Pseudocheilinus tetrataenia</i>	A	0.9	0.5	0.9	0.4	0.0	0.58
<i>Pseudojuloides cerasinus</i>	A	0.0	0.0	0.1	0.2	100.0	0.45
<i>Sargocentron ensiferum</i>		0.0	0.0	0.1	0.2	100.0	0.45
<i>Scarus dubius</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Scarus perspicillatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus psittacus</i>		0.3	0.4	0.7	0.5	116.7	0.28
<i>Scarus rubroviolaceus</i>		0.1	0.1	0.3	0.4	400.0	0.20
<i>Scarus sordidus</i>		4.3	3.3	4.0	1.7	-7.1	0.97
<i>Stegastes fasciolatus</i>		1.7	0.5	1.7	0.6	0.0	0.70
<i>Stethojulis balteata</i>	A	0.8	0.7	0.9	1.2	6.2	0.77
<i>Sufflamen bursa</i>	A	0.3	0.4	0.3	0.2	-16.7	0.77

<i>Synodus spp.</i>		0.0	0.0	0.1	0.1	100.0	0.06
<i>Synodus variegatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Thalassoma duperrey</i>	A	2.5	0.9	2.3	1.4	-8.0	0.54
<i>Xanthichthys auromarginatus</i>	A	0.3	0.3	0.1	0.1	-60.0	0.24
<i>Zanclus cornutus</i>	A1	0.1	0.2	0.1	0.1	-50.0	0.86
<i>Zebrasoma flavescens</i>	A1	28.4	5.6	29.3	4.0	3.4	0.75
<i>Zebrasoma veliferum</i>		0.1	0.1	0.0	0.0	-100.0	0.45

Anaeho'omalū, Hawai'i (Site #5)

19° 57.2' N 155° 52.0' W

Depth: 9-11 m

Management Status: Fishery Replenishment Area

Summary of findings: there were significant changes in *Pseudocheilinus tetrataenia*



Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 149
 Number of quadrats analyzed = 80



Substrate	Mean % cover
Boulder	2.8
Flat	0.0
Macroalgae	0.0
<i>Montipora</i> spp	1.9
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.1
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	17.3
Old dead <i>P. lobata</i>	8.1
Old dead <i>P. meandrina</i>	0.0
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.4
<i>Porites compressa</i>	26.7
<i>Porites compressa</i> hole	2.1
<i>Porites lobata</i>	35.0
Rubble	3.3
Sand	1.4
Unknown coral	0.9

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)		Mean density (no./100m ²)		% change	P
		Pre-closure	SD	Post-closure	SD		
<i>Acanthurus achilles</i>	A1	0.3	0.4	0.4	0.4	60.0	0.74
<i>Acanthurus dussumieri</i>	A	2.0	4.5	0.0	0.0	-100.0	0.45
<i>Acanthurus nigrofuscus</i>	A	7.0	1.9	4.3	1.4	-38.6	0.26
<i>Acanthurus nigroris</i>	A	0.2	0.3	0.0	0.0	-100.0	0.45
<i>Apogon kallopterus</i>		0.0	0.0	0.2	0.3	100.0	0.24
<i>Apogon menesemus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Apogon spp.</i>		0.0	0.0	0.2	0.2	100.0	0.21
<i>Aulostomus chinensis</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Bodianus bilunulatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Cantherhines dumerilii</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Canthigaster jactator</i>		1.1	0.5	0.3	0.3	-71.4	0.20
<i>Centropyge potteri</i>	A1	0.4	0.4	0.3	0.2	-14.3	0.54
<i>Cephalopholis argus</i>	A	1.5	0.7	1.5	1.0	-3.3	0.54
<i>Chaetodon multicoloratus</i>	A1	2.6	0.8	2.8	0.4	5.8	0.78
<i>Chaetodon ornatissimus</i>	A1	0.4	0.4	0.3	0.2	-14.3	0.68
<i>Chromis agilis</i>		3.2	1.2	4.1	2.3	26.6	0.51
<i>Chromis hanui</i>		0.9	0.3	0.8	0.2	-16.7	0.45
<i>Chromis ovalis</i>		0.5	0.6	0.1	0.1	-88.9	0.18
<i>Chromis vanderbilti</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Cirripectes vanderbilti</i>		0.2	0.1	0.0	0.0	-100.0	0.04
<i>Coris gaimard</i>	A	0.0	0.0	0.1	0.2	100.0	0.24
<i>Ctenochaetus strigosus</i>	A1	31.8	4.2	27.6	5.4	-13.4	0.41
<i>Diodon holocanthus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Exallias brevis</i>		0.3	0.4	0.1	0.1	-66.7	0.27
<i>Fistularia commersonii</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Forcipiger flavissimus</i>	A1	0.6	0.7	0.3	0.3	-50.0	0.75
<i>Forcipiger longirostris</i>	A1	0.1	0.1	0.5	0.3	800.0	0.09
<i>Gomphosus varius</i>	A	2.0	1.2	0.7	0.4	-66.7	0.21
<i>Gymnothorax eurostus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Gymnothorax flavimarginatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Gymnothorax meleagris</i>		0.2	0.2	0.1	0.1	-66.7	0.61
<i>Halichoeres ornatissimus</i>	A	1.0	0.5	1.3	0.8	36.8	0.14
<i>Labroides phthirophagus</i>	A	0.6	0.2	0.4	0.1	-36.4	0.36
<i>Macropharyngodon geoffroyi</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Melichthys niger</i>	A	0.5	0.9	0.1	0.1	-90.0	0.41

<i>Melichthys vidua</i>	A	0.3	0.2	0.3	0.2	0.0	0.54
<i>Monotaxis grandoculis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Myripristis berndti</i>		0.3	0.3	0.1	0.1	-80.0	0.31
<i>Myripristis kuntee</i>		0.3	0.4	0.0	0.0	-100.0	0.25
<i>Naso lituratus</i>	A	0.6	0.5	0.3	0.4	-54.5	0.13
<i>Ostracion meleagris</i>	A	0.0	0.0	0.1	0.1	100.0	0.06
<i>Oxycheilinus unifasciatus</i>		0.8	0.6	0.6	0.4	-26.7	0.17
<i>Paracirrhites arcatus</i>	A	1.5	0.3	0.9	0.8	-40.0	0.20
<i>Paracirrhites forsteri</i>	A	0.4	0.1	0.3	0.2	-28.6	0.45
<i>Parupeneus bifasciatus</i>		0.0	0.0	0.2	0.2	100.0	0.08
<i>Parupeneus multifasciatus</i>	A	0.5	0.4	0.8	1.0	77.8	0.41
<i>Plectroglyphidodon johnstonianus</i>		1.0	0.6	1.2	0.3	26.3	0.57
<i>Pseudocheilinus evanidus</i>		0.9	0.7	1.3	0.7	47.1	0.10
<i>Pseudocheilinus octotaenia</i>	A	1.8	0.6	2.2	1.3	22.2	0.07
<i>Pseudocheilinus tetrataenia</i>	A	0.4	0.4	1.0	0.4	185.7	*0.04
<i>Saurida gracilis</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus dubius</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus psittacus</i>		0.0	0.0	0.4	0.7	100.0	0.11
<i>Scarus rubroviolaceus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus sordidus</i>		2.2	1.1	2.5	1.7	11.4	0.84
<i>Stegastes fasciolatus</i>		5.7	1.5	3.7	0.9	-36.0	0.08
<i>Stethojulis balteata</i>	A	1.5	0.8	1.6	1.7	6.9	0.47
<i>Sufflamen bursa</i>	A	0.3	0.2	0.2	0.2	-50.0	0.05
<i>Synodus spp.</i>		0.1	0.2	0.1	0.1	-50.0	0.86
<i>Taenianotus triacanthus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Thalassoma ballieui</i>		0.2	0.1	0.0	0.0	-100.0	0.04
<i>Thalassoma duperrey</i>	A	6.1	2.5	4.3	1.4	-29.5	0.11
<i>Xanthichthys auromarginatus</i>	A	0.0	0.0	0.2	0.2	100.0	0.86
<i>Zanclus cornutus</i>	A1	0.3	0.4	0.0	0.0	-100.0	0.28
<i>Zebrasoma flavescens</i>	A1	12.8	3.1	12.9	2.4	0.8	0.57

Keawaiki, Hawai'i (Site #6)

19° 53.5' N 155° 54.6' W

Depth: 11-15 m

Management Status: none

Summary of findings: there were significant changes in *Aulostomus chinensis*



Benthic habitat summary:

Survey conducted Spring 2000

Number of quadrats archived = 205

Number of quadrats analyzed = 80

Substrate	Mean % cover
Boulder	2.2
Flat	0.6
Macroalgae	1.1
<i>Montipora</i> spp	1.8
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	27.4
Old dead <i>P. lobata</i>	8.5
Old dead <i>P. meandrina</i>	0.0
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.3
<i>Porites compressa</i>	30.1
<i>Porites compressa</i> hole	1.3
<i>Porites lobata</i>	14.6
Rubble	11.5
Sand	0.2
Unknown coral	0.4

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)		Mean density (no./100m ²)		% change	P
		Pre-closure	SD	Post-closure	SD		
<i>Acanthurus achilles</i>	A1	0.2	0.1	0.0	0.0	-100.0	0.11
<i>Acanthurus nigrofuscus</i>	A	1.1	0.5	0.8	0.6	-28.6	0.33
<i>Acanthurus olivaceus</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Acanthurus thompsoni</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Aluterus scriptus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Arothron meleagris</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Aulostomus chinensis</i>		0.0	0.0	0.3	0.3	100.0	*0.01
<i>Bodianus bilunulatus</i>		0.2	0.1	0.0	0.0	-100.0	0.11
<i>Canthigaster jactator</i>		1.2	0.8	0.1	0.1	-91.7	0.08
<i>Centropyge potteri</i>	A1	0.8	0.4	0.9	0.6	6.2	0.95
<i>Cephalopholis argus</i>	A	0.9	0.4	0.4	0.5	-55.6	0.17
<i>Chaetodon lunula</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Chaetodon multicinctus</i>	A1	3.8	1.5	2.7	0.6	-30.3	0.23
<i>Chaetodon ornatissimus</i>	A1	0.8	0.7	0.7	0.4	-12.5	0.60
<i>Chromis agilis</i>		6.0	1.9	4.5	1.1	-25.0	0.66
<i>Chromis hanui</i>		1.3	0.3	0.8	0.5	-40.0	0.51
<i>Chromis ovalis</i>		0.2	0.4	0.0	0.0	-100.0	0.45
<i>Cirrhitus pinnulatus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Cirripectes vanderbilti</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Coris gaimard</i>	A	0.0	0.0	0.1	0.1	100.0	0.45
<i>Ctenochaetus strigosus</i>	A1	22.4	7.3	21.5	6.5	-4.2	0.82
<i>Dascyllus albisella</i>	A	0.3	0.3	0.0	0.0	-100.0	0.16
<i>Exallias brevis</i>		0.1	0.1	0.2	0.1	50.0	1.00
<i>Forcipiger flavissimus</i>	A1	0.2	0.2	0.3	0.4	66.7	0.53
<i>Forcipiger longirostris</i>	A1	0.3	0.4	0.3	0.7	20.0	0.64
<i>Gomphosus varius</i>	A	1.0	1.2	0.5	0.3	-47.4	0.52
<i>Gymnothorax meleagris</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Gymnothorax spp.</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Halichoeres ornatissimus</i>	A	0.2	0.2	0.1	0.1	-66.7	0.15
<i>Labroides phthirophagus</i>	A	0.4	0.2	0.5	0.2	42.9	0.08
<i>Myripristis berndti</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Myripristis kuntee</i>		0.2	0.3	0.1	0.1	-66.7	0.71
<i>Naso lituratus</i>	A	0.5	0.6	0.1	0.1	-90.0	0.12
<i>Neoniphon sammara</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Ostracion meleagris</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45

<i>Oxycheilinus unifasciatus</i>		0.3	0.3	0.4	0.5	60.0	0.49
<i>Paracirrhites arcatus</i>	A	0.5	0.4	0.4	0.4	-30.0	0.94
<i>Paracirrhites forsteri</i>	A	0.6	0.3	0.5	0.4	-16.7	0.93
<i>Parupeneus multifasciatus</i>	A	0.4	0.3	0.3	0.2	-37.5	0.50
<i>Parupeneus porphyreus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Pervagor aspricaudus</i>		0.2	0.3	0.3	0.4	100.0	0.56
<i>Pervagor spilosoma</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Plectroglyphidodon imparipennis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Plectroglyphidodon johnstonianus</i>		1.4	0.6	1.1	0.2	-18.5	0.40
<i>Pseudocheilinus evanidus</i>		0.8	0.4	0.8	0.6	6.7	0.41
<i>Pseudocheilinus octotaenia</i>	A	3.9	0.9	2.5	1.2	-35.1	0.56
<i>Pseudocheilinus tetrataenia</i>	A	1.2	0.6	1.2	0.9	-4.2	0.81
<i>Pseudojuloides cerasinus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Sargocentron tiere</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Scarus psittacus</i>		0.0	0.0	0.4	0.7	100.0	0.57
<i>Scarus rubroviolaceus</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Scarus sordidus</i>		2.3	1.8	2.9	2.0	28.9	0.67
<i>Stethojulis balteata</i>	A	0.2	0.2	0.2	0.3	33.3	0.50
<i>Sufflamen bursa</i>	A	0.2	0.2	0.0	0.0	-100.0	0.28
<i>Synodus spp.</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Synodus variegatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Thalassoma duperrey</i>	A	6.6	5.2	2.6	0.3	-60.6	0.25
<i>Zanclus cornutus</i>	A1	0.1	0.1	0.1	0.2	0.0	0.73
<i>Zebrasoma flavescens</i>	A1	23.7	8.1	19.3	10.5	-18.6	0.39

Ka'upulehu, Hawai'i (Site #7)

19° 50.7' N 155° 58.9' W

Depth: 10-13 m

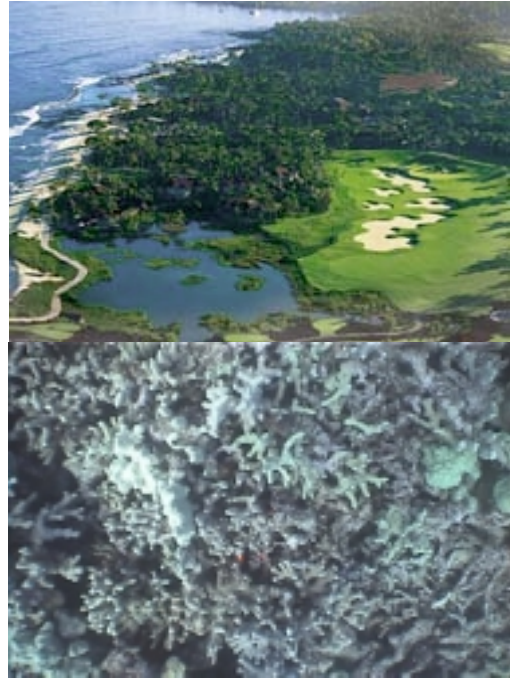
Management Status: Fishery Replenishment Area

Summary of findings: there were no significant changes

Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 142
 Number of quadrats analyzed = 80

Substrate	Mean % cover
Boulder	3.6
Flat	0.6
Macroalgae	0.1
<i>Montipora</i> spp	0.3
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	20.0
Old dead <i>P. lobata</i>	10.4
Old dead <i>P. meandrina</i>	0.1
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.5
<i>Porites compressa</i>	19.0
<i>Porites compressa</i> hole	0.5
<i>Porites lobata</i>	39.9
Rubble	2.4
Sand	2.2
Unknown coral	0.3



Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)		Mean density (no./100m ²)		% change	P
		Pre-closure	SD	Post-closure	SD		
<i>Abudefduf abdominalis</i>		1.6	2.6	0.0	0.0	-100.0	0.31
<i>Abudefduf sordidus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Acanthurus achilles</i>	A1	0.9	0.3	1.4	1.0	64.7	0.13
<i>Acanthurus leucopareius</i>	A	0.0	0.0	0.2	0.2	100.0	0.86
<i>Acanthurus nigricans</i>		0.2	0.2	0.2	0.2	0.0	0.67
<i>Acanthurus nigrofuscus</i>	A	9.1	1.5	7.0	2.4	-22.7	0.28
<i>Acanthurus nigroris</i>	A	0.2	0.3	0.1	0.1	-66.7	0.71
<i>Acanthurus olivaceus</i>	A	0.1	0.1	0.1	0.1	0.0	0.78
<i>Acanthurus thompsoni</i>		0.4	0.5	0.0	0.0	-100.0	0.17
<i>Acanthurus triostegus</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Apogon spp.</i>		0.0	0.0	0.1	0.1	#DIV/0!	0.24
<i>Apogon taeniopterus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Arothron meleagris</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Aulostomus chinensis</i>		0.2	0.3	0.2	0.2	-25.0	0.90
<i>Bodianus bilunulatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Cantherhines dumerilii</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Centropyge potteri</i>	A1	1.6	1.0	1.3	0.8	-21.9	0.33
<i>Cephalopholis argus</i>	A	0.5	0.2	0.3	0.1	-33.3	0.39
<i>Chaetodon auriga</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Chaetodon multicinctus</i>	A1	7.3	1.3	7.6	1.9	3.4	0.83
<i>Chaetodon ornatissimus</i>	A1	0.5	0.4	0.3	0.3	-40.0	0.86
<i>Chaetodon quadrimaculatus</i>	A1	0.2	0.3	0.2	0.1	-25.0	0.62
<i>Chromis agilis</i>		8.1	1.6	7.8	4.7	-3.1	0.55
<i>Chromis hanui</i>		4.6	1.9	3.3	1.0	-28.6	0.16
<i>Chromis ovalis</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Chromis vanderbilti</i>		0.1	0.1	0.1	0.1	-50.0	0.81
<i>Chromis verater</i>		6.2	7.3	1.9	3.7	-69.1	0.50
<i>Cirrhitus pinnulatus</i>	A	0.2	0.1	0.1	0.1	-66.7	0.04
<i>Cirripectes vanderbilti</i>		0.2	0.2	0.1	0.1	-33.3	0.39
<i>Coris gaimard</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Ctenochaetus hawaiiensis</i>	A	0.2	0.3	0.2	0.3	-25.0	0.92
<i>Ctenochaetus strigosus</i>	A1	35.8	3.5	33.7	9.7	-5.9	0.70
<i>Exallias brevis</i>		0.2	0.3	0.1	0.1	-66.7	0.31
<i>Fistularia commersonii</i>		0.0	0.0	0.2	0.4	100.0	0.24

<i>Forcipiger flavissimus</i>	A1	0.5	0.3	0.5	0.4	-10.0	0.78
<i>Forcipiger longirostris</i>	A1	0.2	0.2	0.1	0.1	-66.7	0.61
<i>Gomphosus varius</i>	A	0.7	0.5	0.3	0.3	-57.1	0.30
<i>Gymnothorax flavimarginatus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Gymnothorax meleagris</i>		0.0	0.0	0.2	0.2	100.0	0.86
<i>Halichoeres ornatissimus</i>	A	0.5	0.3	0.6	0.4	10.0	0.45
<i>Hemitaurichthys thompsoni</i>	A	0.4	0.5	0.1	0.1	-85.7	0.41
<i>Heteropriacanthus cruentatus</i>		0.0	0.0	0.1	0.1	100.0	0.06
<i>Labroides phthirophagus</i>	A	0.2	0.2	0.7	0.4	250.0	0.29
<i>Lutjanus fulvus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Lutjanus kasmira</i>		0.2	0.1	0.0	0.0	-100.0	0.11
<i>Melichthys niger</i>	A	1.4	1.5	0.9	0.4	-39.3	0.78
<i>Melichthys vidua</i>	A	0.2	0.2	0.2	0.2	0.0	0.36
<i>Myripristis berndti</i>		0.8	0.5	1.0	0.8	33.3	0.64
<i>Myripristis kuntee</i>		0.7	0.5	0.9	0.9	38.5	0.23
<i>Naso hexacanthus</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Naso lituratus</i>	A	0.5	0.2	0.5	0.8	0.0	0.61
<i>Neoniphon sammara</i>		0.2	0.1	0.1	0.1	-75.0	0.24
<i>Oxycheilinus unifasciatus</i>		0.5	0.3	0.3	0.5	-33.3	0.73
<i>Paracirrhites arcatus</i>	A	3.4	1.4	3.2	0.5	-4.5	0.95
<i>Paracirrhites forsteri</i>	A	0.4	0.3	0.2	0.2	-57.1	0.61
<i>Parupeneus bifasciatus</i>		0.1	0.1	0.1	0.1	100.0	0.31
<i>Parupeneus multifasciatus</i>	A	0.6	0.3	0.2	0.2	-72.7	0.23
<i>Pervagor aspricaudus</i>		0.1	0.1	0.2	0.2	300.0	1.00
<i>Plectroglyphidodon johnstonianus</i>		1.7	0.4	1.9	0.5	12.1	1.00
<i>Pseudocheilinus evanidus</i>		0.3	0.5	0.3	0.2	0.0	0.94
<i>Pseudocheilinus octotaenia</i>	A	0.7	0.5	0.5	0.4	-28.6	0.58
<i>Pseudocheilinus tetrataenia</i>	A	0.3	0.1	1.0	0.5	216.7	0.05
<i>Sargocentron spiniferum</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Sargocentron tiere</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Sargocentron xantherythrum</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Saurida gracilis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Scarus dubius</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus perspicillatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Scarus psittacus</i>		0.1	0.1	0.4	0.4	600.0	0.04
<i>Scarus rubroviolaceus</i>		0.2	0.2	0.3	0.3	66.7	0.29
<i>Scarus sordidus</i>		2.4	1.5	2.6	1.8	10.6	0.90
<i>Sphyrna lewini</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Stegastes fasciolatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Stethojulis balteata</i>	A	0.6	0.6	0.2	0.3	-63.6	0.55
<i>Sufflamen bursa</i>	A	0.3	0.3	0.5	0.4	66.7	0.79
<i>Synodus spp.</i>		0.1	0.1	0.1	0.1	-50.0	0.81
<i>Thalassoma ballieui</i>		0.1	0.1	0.1	0.1	0.0	0.24
<i>Thalassoma duperrey</i>	A	3.7	1.5	2.6	0.5	-28.8	0.15
<i>Xanthichthys auromarginatus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Zanclus cornutus</i>	A1	0.5	0.1	0.1	0.1	-77.8	0.00
<i>Zebrasoma flavescens</i>	A1	16.6	4.3	19.5	5.4	17.8	0.44

Makalawena, Hawai'i (Site #8)

19° 47.8' N 156° 01.7' W

Depth: 9-11 m

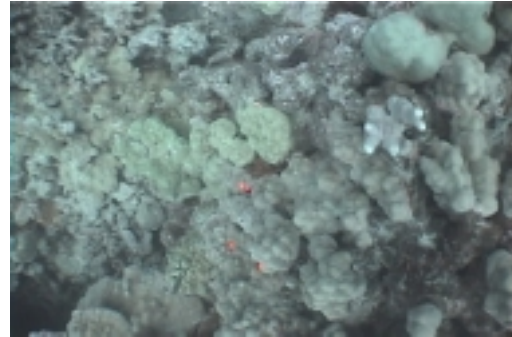
Management Status: none

Summary of findings: there were significant changes in *Ctenochaetus strigosus*



Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 139
 Number of quadrats analyzed = 80



Substrate	Mean % cover
Boulder	10.1
Flat	3.9
Macroalgae	0.0
<i>Montipora</i> spp	3.4
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.1
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	10.7
Old dead <i>P. lobata</i>	19.2
Old dead <i>P. meandrina</i>	0.1
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.1
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	1.2
<i>Porites compressa</i>	6.4
<i>Porites compressa</i> hole	0.0
<i>Porites lobata</i>	26.8
Rubble	15.8
Sand	1.6
Unknown coral	0.5

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)		Mean density (no./100m ²)		% change	P
		Pre-closure	SD	Post-closure	SD		
<i>Abudefduf abdominalis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Acanthurus achilles</i>	A1	0.5	0.8	0.0	0.0	-100.0	0.29
<i>Acanthurus leucopareius</i>	A	0.0	0.0	0.1	0.1	100.0	0.06
<i>Acanthurus nigrofuscus</i>	A	9.5	1.4	8.2	2.2	-13.2	0.10
<i>Acanthurus nigroris</i>	A	0.3	0.3	0.1	0.1	-66.7	0.43
<i>Acanthurus thompsoni</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Acanthurus triostegus</i>	A	0.4	0.9	0.3	0.6	-37.5	0.97
<i>Anampses chrysocephalus</i>	A	0.1	0.2	0.1	0.1	-50.0	0.86
<i>Aphareus furca</i>		0.2	0.4	0.0	0.0	-100.0	0.45
<i>Arothron meleagris</i>		0.1	0.1	0.1	0.1	100.0	0.81
<i>Bodianus bilunulatus</i>		0.1	0.1	0.1	0.1	0.0	0.65
<i>Calotomus carolinus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Cantherhines dumerilii</i>		0.2	0.2	0.3	0.3	66.7	0.29
<i>Canthigaster amboinensis</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Canthigaster jactator</i>		8.8	3.0	6.0	1.1	-32.0	0.07
<i>Centropyge fisheri</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Centropyge potteri</i>	A1	0.4	0.3	0.1	0.1	-71.4	0.09
<i>Cephalopholis argus</i>	A	1.8	1.4	1.5	1.0	-19.4	0.90
<i>Chaetodon multicinctus</i>	A1	2.3	0.7	1.7	0.7	-26.7	0.28
<i>Chaetodon ornatissimus</i>	A1	1.1	0.5	0.5	0.1	-57.1	0.20
<i>Chaetodon quadrimaculatus</i>	A1	0.8	0.6	0.7	0.4	-13.3	0.95
<i>Chaetodon unimaculatus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Chromis agilis</i>		3.3	0.6	1.9	0.6	-41.5	0.06
<i>Chromis hanui</i>		0.8	0.4	0.3	0.2	-62.5	0.12
<i>Chromis ovalis</i>		0.1	0.1	0.1	0.1	-50.0	0.81
<i>Chromis vanderbilii</i>		68.7	41.1	31.8	16.5	-53.7	0.10
<i>Cirrhitops fasciatus</i>		0.1	0.1	0.1	0.1	-50.0	0.81
<i>Cirrhitus pinnulatus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.24
<i>Cirripectes vanderbilii</i>		0.5	0.4	0.4	0.3	-11.1	0.72
<i>Coris gaimard</i>	A	0.4	0.4	0.3	0.4	-28.6	0.94
<i>Ctenochaetus hawaiiensis</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Ctenochaetus strigosus</i>	A1	19.2	1.9	11.1	2.5	-42.0	*0.01
<i>Exallias brevis</i>		0.1	0.1	0.1	0.1	0.0	0.49
<i>Forcipiger flavissimus</i>	A1	0.2	0.3	0.0	0.0	-100.0	0.31
<i>Forcipiger longirostris</i>	A1	0.1	0.2	0.2	0.3	50.0	0.58

<i>Gomphosus varius</i>	A	2.3	0.8	1.1	0.7	-51.1	0.19
<i>Gymnothorax meleagris</i>		0.0	0.0	0.3	0.2	100.0	0.24
<i>Halichoeres ornatissimus</i>	A	5.5	0.9	5.8	2.0	5.5	0.65
<i>Labroides phthirophagus</i>	A	0.9	0.5	0.5	0.8	-44.4	0.78
<i>Lutjanus fulvus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Lutjanus kasmira</i>		0.0	0.0	0.2	0.4	100.0	0.24
<i>Macropharyngodon geoffroyi</i>	A	0.1	0.1	0.1	0.1	100.0	0.81
<i>Melichthys niger</i>	A	0.4	0.5	0.7	0.4	62.5	0.34
<i>Mulloidichthys flavolineatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Myripristis berndti</i>		1.2	1.2	2.5	1.6	113.0	0.35
<i>Myripristis kuntee</i>		0.1	0.1	0.5	1.0	400.0	0.25
<i>Naso lituratus</i>	A	0.6	0.4	0.7	0.7	16.7	0.30
<i>Novaculichthys taeniourus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Ostracion meleagris</i>	A	0.2	0.3	0.1	0.1	-66.7	0.71
<i>Ostracion whitleyi</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Oxycheilinus unifasciatus</i>		0.1	0.1	0.2	0.2	200.0	0.21
<i>Paracirrhites arcatus</i>	A	6.9	1.9	7.0	2.3	1.4	0.67
<i>Paracirrhites forsteri</i>	A	1.4	0.9	1.1	0.3	-18.5	0.40
<i>Parupeneus bifasciatus</i>		0.2	0.2	0.0	0.0	-100.0	0.15
<i>Parupeneus multifasciatus</i>	A	0.8	0.4	0.9	0.5	6.2	0.79
<i>Pervagor aspricaudus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Plagiotremus ewaensis</i>		0.1	0.1	0.2	0.1	50.0	0.24
<i>Plagiotremus goslinei</i>		0.2	0.2	0.2	0.1	33.3	0.86
<i>Plectroglyphidodon imparipennis</i>		0.2	0.4	0.0	0.0	-100.0	0.45
<i>Plectroglyphidodon johnstonianus</i>		3.1	1.6	2.7	0.7	-12.9	0.76
<i>Pseudocheilinus evanidus</i>		0.7	0.9	0.8	0.7	7.1	0.76
<i>Pseudocheilinus octotaenia</i>	A	3.2	1.0	2.1	0.9	-34.4	0.44
<i>Pseudocheilinus tetrataenia</i>	A	2.1	1.4	1.6	0.5	-24.4	0.30
<i>Sargocentron diadema</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Sargocentron spp.</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Sargocentron tiere</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Sargocentron xantherythrum</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus dubius</i>		0.2	0.4	0.2	0.3	0.0	0.73
<i>Scarus perspicillatus</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Scarus psittacus</i>		0.4	0.4	0.2	0.2	-57.1	0.63
<i>Scarus rubroviolaceus</i>		0.5	0.5	0.4	0.4	-22.2	0.84
<i>Scarus sordidus</i>		3.9	2.8	2.4	1.9	-37.7	0.76
<i>Sebastapistes conioarta</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Stegastes fasciolatus</i>		7.6	0.7	6.4	1.0	-16.4	0.05
<i>Stethojulis balteata</i>	A	0.7	0.5	0.4	0.2	-42.9	0.31
<i>Sufflamen bursa</i>	A	0.6	0.4	0.5	0.4	-16.7	0.94
<i>Synodus binotatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Synodus spp.</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Synodus ulae</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Taenianotus triacanthus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Thalassoma duperrey</i>	A	9.4	3.1	6.9	2.5	-27.1	0.62
<i>Zanclus cornutus</i>	A1	0.4	0.3	0.2	0.2	-57.1	0.24

<i>Zebrasoma flavescens</i>	A1	15.2	2.0	12.9	1.5	-15.2	0.38
-----------------------------	----	------	-----	------	-----	-------	------

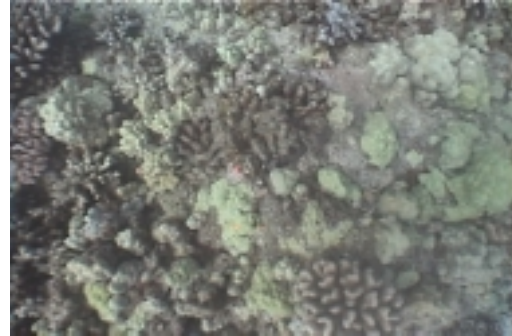
Wawaloli Beach, Hawai'i (Site #9)

19° 42.5' N 156° 03.0' W

Depth: 9-10 m

Management Status: none

Summary of findings: there were no significant changes



Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 116
 Number of quadrats analyzed = 80

Substrate	Mean % cover
Boulder	5.7
Flat	16.6
Macroalgae	0.1
<i>Montipora</i> spp	0.5
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	0.8
Old dead <i>P. lobata</i>	17.9
Old dead <i>P. meandrina</i>	1.5
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	4.7
<i>Porites compressa</i>	3.0
<i>Porites compressa</i> hole	0.0
<i>Porites lobata</i>	28.1
Rubble	14.3
Sand	6.2
Unknown coral	0.5

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)		Mean density (no./100m ²)		% change	P
		Pre-closure	SD	Post-closure	SD		
<i>Acanthurus achilles</i>	A1	0.1	0.1	0.1	0.1	100.0	0.31
<i>Acanthurus nigrofuscus</i>	A	16.7	5.8	14.7	5.5	-12.3	0.12
<i>Acanthurus nigroris</i>	A	0.1	0.1	0.1	0.1	0.0	0.78
<i>Acanthurus olivaceus</i>	A	1.4	0.5	1.5	0.6	7.4	0.50
<i>Anampses chrysocephalus</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Aphareus furca</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Arothron meleagris</i>		0.5	0.7	0.1	0.1	-90.0	0.34
<i>Bodianus bilunulatus</i>		0.1	0.1	0.1	0.1	-50.0	0.81
<i>Calotomus carolinus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Cantherhines dumerilii</i>		0.3	0.3	0.5	0.7	80.0	0.44
<i>Canthigaster coronata</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Canthigaster jactator</i>		7.0	2.9	10.3	3.8	47.1	0.10
<i>Caracanthus typicus</i>		0.3	0.4	0.1	0.1	-83.3	0.38
<i>Centropyge potteri</i>	A1	0.2	0.1	0.0	0.0	-100.0	0.11
<i>Cephalopholis argus</i>	A	0.4	0.3	0.5	0.5	25.0	0.41
<i>Chaetodon citrinellus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Chaetodon lunula</i>	A	1.1	0.5	1.1	0.7	0.0	0.87
<i>Chaetodon miliaris</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Chaetodon multicinctus</i>	A1	3.5	1.9	2.8	2.1	-21.4	0.14
<i>Chaetodon ornatissimus</i>	A1	0.5	0.4	0.5	0.4	-10.0	0.30
<i>Chaetodon quadrimaculatus</i>	A1	0.9	0.3	1.1	0.6	22.2	0.51
<i>Chromis agilis</i>		2.2	1.1	0.9	0.4	-58.1	0.26
<i>Chromis hanui</i>		0.3	0.4	0.2	0.3	-33.3	0.36
<i>Chromis ovalis</i>		0.3	0.7	2.0	4.5	566.7	0.38
<i>Chromis vanderbilti</i>		61.4	38.4	98.0	44.3	59.7	0.15
<i>Cirrhitops fasciatus</i>		0.3	0.2	0.5	0.3	80.0	0.16
<i>Cirrhitus pinnulatus</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Coris flavovittata</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Coris gaimard</i>	A	0.4	0.5	0.3	0.3	-37.5	0.94
<i>Coris venusta</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Ctenochaetus hawaiiensis</i>	A	0.0	0.0	0.1	0.1	100.0	0.78
<i>Ctenochaetus strigosus</i>	A1	5.5	3.4	4.7	4.2	-14.5	0.11
<i>Dascyllus albisella</i>	A	0.3	0.2	0.1	0.2	-66.7	0.43
<i>Diodon holocanthus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Exallias brevis</i>		0.2	0.3	0.1	0.1	-66.7	0.31

<i>Forcipiger flavissimus</i>	A1	0.3	0.3	0.1	0.1	-80.0	0.06
<i>Gomphosus varius</i>	A	0.4	0.2	0.1	0.1	-75.0	0.18
<i>Gymnothorax meleagris</i>		0.0	0.0	0.1	0.1	100.0	0.06
<i>Halichoeres ornatissimus</i>	A	4.1	1.3	4.2	1.4	1.2	0.72
<i>Labroides phthirophagus</i>	A	0.5	0.3	0.3	0.2	-40.0	0.38
<i>Melichthys vidua</i>	A	0.2	0.1	0.5	0.4	150.0	0.08
<i>Monotaxis grandoculis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Naso lituratus</i>	A	1.9	1.2	1.2	0.4	-37.8	0.42
<i>Naso unicornis</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Novaculichthys taeniourus</i>		0.2	0.2	0.0	0.0	-100.0	0.28
<i>Ostracion meleagris</i>	A	0.1	0.1	0.4	0.5	700.0	0.87
<i>Oxycheilinus unifasciatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Paracirrhites arcatus</i>	A	18.5	2.4	19.4	2.5	5.1	0.96
<i>Paracirrhites forsteri</i>	A	0.6	0.4	0.6	0.5	0.0	0.94
<i>Parupeneus bifasciatus</i>		0.2	0.2	0.2	0.1	-25.0	0.86
<i>Parupeneus multifasciatus</i>	A	1.7	0.5	0.7	0.6	-58.8	0.13
<i>Plagiotremus goslinei</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Plectroglyphidodon imparipennis</i>		0.3	0.2	0.3	0.3	0.0	0.29
<i>Plectroglyphidodon johnstonianus</i>		4.0	0.7	4.7	0.8	16.3	0.36
<i>Pseudocheilinus evanidus</i>		1.2	0.7	0.9	0.3	-26.1	0.77
<i>Pseudocheilinus octotaenia</i>	A	5.9	1.8	5.5	1.6	-6.8	0.63
<i>Pseudocheilinus tetrataenia</i>	A	2.7	1.8	3.6	1.7	34.0	0.15
<i>Pseudojuloides cerasinus</i>	A	0.2	0.3	0.1	0.1	-75.0	0.48
<i>Saurida flamma</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Saurida gracilis</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus dubius</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Scarus psittacus</i>		0.2	0.3	0.5	0.4	125.0	0.75
<i>Scarus rubroviolaceus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Scarus sordidus</i>		0.2	0.3	0.8	0.4	300.0	0.10
<i>Sebastapistes conioarta</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Stegastes fasciolatus</i>		0.1	0.1	0.1	0.1	-50.0	0.81
<i>Stethojulis balteata</i>	A	0.3	0.2	0.1	0.1	-60.0	0.08
<i>Sufflamen bursa</i>	A	1.4	0.5	1.5	0.9	11.1	0.64
<i>Synodus spp.</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Synodus variegatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Thalassoma duperrey</i>	A	12.4	2.9	11.9	1.8	-4.4	0.61
<i>Xanthichthys auromarginatus</i>	A	0.6	0.8	0.7	0.3	8.3	1.00
<i>Zanclus cornutus</i>	A1	0.2	0.2	0.2	0.3	33.3	0.50
<i>Zebrasoma flavescens</i>	A1	4.2	1.3	3.3	1.3	-20.5	0.07

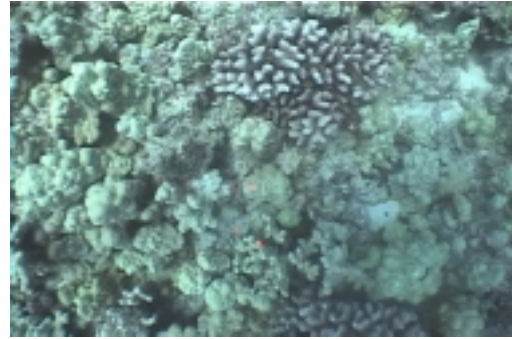
Wawaloli, Hawai'i (Site #10)

19° 42.0' N 156° 03.0' W

Depth: 12-15 m

Management Status: Fishery Management Area

Summary of findings: there were significant changes in *Halichoeres ornatissimus*



Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 142
 Number of quadrats analyzed = 79

Substrate	Mean % cover
Boulder	3.0
Flat	3.4
Macroalgae	0.0
<i>Montipora</i> spp	0.0
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.1
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	0.6
Old dead <i>P. lobata</i>	32.9
Old dead <i>P. meandrina</i>	4.3
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	11.4
<i>Porites compressa</i>	3.7
<i>Porites compressa</i> hole	0.0
<i>Porites lobata</i>	32.8
Rubble	6.3
Sand	1.0
Unknown coral	0.4

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at $P < 0.05$ and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)		Mean density (no./100m ²)		% change	P
		Pre-closure	SD	Post-closure	SD		
<i>Acanthurus leucopareius</i>	A	0.0	0.0	0.1	0.2	100.0	0.24
<i>Acanthurus nigrofuscus</i>	A	18.2	4.0	15.1	4.2	-17.0	0.11
<i>Acanthurus nigroris</i>	A	0.1	0.1	0.1	0.1	0.0	0.24
<i>Acanthurus olivaceus</i>	A	0.8	0.2	1.1	0.9	31.3	0.21
<i>Acanthurus thompsoni</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Aluterus scriptus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Anampses chrysocephalus</i>	A	0.0	0.0	0.1	0.2	100.0	0.45
<i>Anampses cuvier</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Aphareus furca</i>		0.0	0.0	0.2	0.1	100.0	0.31
<i>Arothron meleagris</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Aulostomus chinensis</i>		0.0	0.0	0.1	0.2	100.0	0.45
<i>Calotomus carolinus</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Cantherhines dumerilii</i>		1.1	0.9	0.1	0.1	-90.9	0.08
<i>Canthigaster coronata</i>		0.1	0.2	0.1	0.1	-50.0	0.86
<i>Canthigaster jactator</i>		6.7	1.9	4.2	1.7	-37.6	0.04
<i>Caracanthus typicus</i>		0.3	0.4	0.0	0.0	-100.0	0.24
<i>Centropyge potteri</i>	A1	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Cephalopholis argus</i>	A	1.2	0.4	1.5	0.8	30.4	0.51
<i>Chaetodon auriga</i>	A	0.0	0.0	0.1	0.1	100.0	0.78
<i>Chaetodon citrinellus</i>		0.0	0.0	0.2	0.3	100.0	0.24
<i>Chaetodon lunula</i>	A	0.6	0.6	0.4	0.4	-36.4	0.33
<i>Chaetodon miliaris</i>	A	0.2	0.4	1.0	0.9	400.0	0.22
<i>Chaetodon multicinctus</i>	A1	7.2	1.5	6.5	1.3	-9.8	0.15
<i>Chaetodon ornatissimus</i>	A1	0.5	0.3	0.3	0.3	-40.0	0.20
<i>Chaetodon quadrimaculatus</i>	A1	0.6	0.5	1.1	0.7	75.0	0.08
<i>Chaetodon reticulatus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Chromis agilis</i>		1.5	2.7	0.1	0.1	-93.1	0.37
<i>Chromis hanui</i>		0.1	0.1	0.1	0.1	100.0	0.31
<i>Chromis vanderbilii</i>		146.2	49.2	228.0	56.0	55.9	0.02
<i>Cirrhitops fasciatus</i>		0.2	0.1	0.4	0.4	133.3	0.13
<i>Cirrhitus pinnulatus</i>	A	0.2	0.2	0.0	0.0	-100.0	0.28
<i>Cirripectes vanderbilii</i>		0.1	0.1	0.1	0.1	-50.0	0.81
<i>Coris gaimard</i>	A	0.4	0.1	0.4	0.3	14.3	0.54
<i>Ctenochaetus hawaiiensis</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Ctenochaetus strigosus</i>	A1	1.9	1.1	1.8	1.9	-5.4	0.18

<i>Exallias brevis</i>		0.1	0.1	0.2	0.3	200.0	0.38
<i>Forcipiger flavissimus</i>	A1	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Gomphosus varius</i>	A	0.6	0.2	0.3	0.3	-54.5	0.03
<i>Gymnothorax flavimarginatus</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Gymnothorax meleagris</i>		0.4	0.4	0.2	0.2	-50.0	0.18
<i>Gymnothorax spp.</i>		0.1	0.2	0.2	0.3	50.0	0.58
<i>Halichoeres ornatissimus</i>	A	2.3	0.4	3.3	1.5	46.7	*0.01
<i>Heniochus diphreutes</i>		0.0	0.0	0.2	0.3	100.0	0.11
<i>Labroides phthirophagus</i>	A	0.6	0.8	0.8	0.5	36.4	0.41
<i>Macropharyngodon geoffroyi</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Melichthys niger</i>	A	0.4	0.9	0.2	0.3	-50.0	0.85
<i>Melichthys vidua</i>	A	0.1	0.1	0.6	0.5	1000.0	0.67
<i>Mulloidichthys flavolineatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Naso hexacanthus</i>		0.2	0.3	0.3	0.6	25.0	0.19
<i>Naso lituratus</i>	A	1.4	0.5	1.7	0.8	21.4	0.19
<i>Nemateleotris magnifica</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Ostracion meleagris</i>	A	0.2	0.1	0.0	0.0	-100.0	0.11
<i>Oxycheilinus unifasciatus</i>		0.0	0.0	0.1	0.1	100.0	0.78
<i>Paracirrhites arcatus</i>	A	29.0	6.1	23.4	3.4	-19.3	0.09
<i>Paracirrhites forsteri</i>	A	0.4	0.2	1.3	1.7	212.5	0.53
<i>Parupeneus bifasciatus</i>		0.2	0.3	0.1	0.1	-66.7	0.71
<i>Parupeneus cyclostomus</i>		0.1	0.1	0.3	0.7	500.0	0.37
<i>Parupeneus multifasciatus</i>	A	0.6	0.3	0.8	0.4	33.3	0.72
<i>Pervagor aspricaudus</i>		1.8	1.1	0.8	0.3	-54.3	0.29
<i>Pervagor spilosoma</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Plagiotremus ewaensis</i>		0.0	0.0	0.2	0.4	100.0	0.24
<i>Plagiotremus goslinei</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Plectroglyphidodon johnstonianus</i>		4.5	0.4	6.2	1.7	36.7	0.12
<i>Pseudocheilinus evanidus</i>		2.1	1.0	2.6	1.3	21.4	0.52
<i>Pseudocheilinus octotaenia</i>	A	8.7	1.7	7.5	1.1	-13.8	0.51
<i>Pseudocheilinus tetrataenia</i>	A	9.3	6.1	13.0	4.5	40.5	0.23
<i>Scarus dubius</i>		0.0	0.0	0.2	0.2	100.0	0.48
<i>Scarus perspicillatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus psittacus</i>		0.3	0.4	0.1	0.1	-80.0	0.51
<i>Scarus rubroviolaceus</i>		0.1	0.1	0.1	0.2	100.0	0.28
<i>Scarus sordidus</i>		0.3	0.4	0.1	0.1	-66.7	0.59
<i>Sebastapistes coniora</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Stegastes fasciolatus</i>		0.2	0.1	0.0	0.0	-100.0	0.04
<i>Stethojulis balteata</i>	A	0.3	0.2	0.4	0.5	33.3	0.33
<i>Sufflamen bursa</i>	A	1.6	0.1	1.2	0.7	-28.1	0.27
<i>Thalassoma duperrey</i>	A	8.3	2.3	7.3	1.9	-12.1	0.83
<i>Xanthichthys auromarginatus</i>	A	5.1	1.7	5.2	2.7	1.0	0.36
<i>Zanclus cornutus</i>	A1	0.2	0.2	0.3	0.3	100.0	0.12
<i>Zebrasoma flavescens</i>	A1	3.5	0.6	4.0	1.1	14.5	0.11

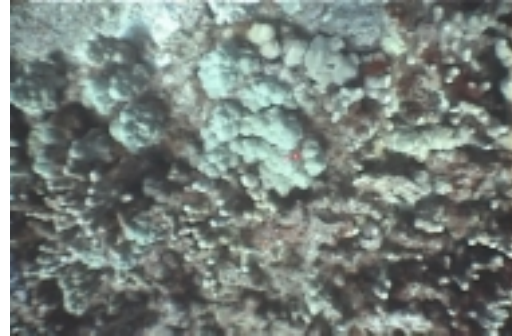
Honokohau, Hawai'i (Site #11)

19° 40.3' N 156° 03.0' W

Depth: 11-14 m

Management Status: Fishery Replenishment Area

Summary of findings: there were significant changes in *Acanthurus nigrofuscus*, *Halichoeres ornatus* and *Parupeneus multifasciatus*



Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 136
 Number of quadrats analyzed = 71

Substrate	Mean % cover
Boulder	2.6
Flat	3.7
Macroalgae	0.2
<i>Montipora</i> spp	0.1
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	7.8
Old dead <i>P. lobata</i>	21.5
Old dead <i>P. meandrina</i>	0.0
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.3
<i>Porites compressa</i>	14.1
<i>Porites compressa</i> hole	0.5
<i>Porites lobata</i>	34.5
Rubble	11.8
Sand	2.5
Unknown coral	0.4

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)		Mean density (no./100m ²)		% change	P
		Pre-closure	SD	Post-closure	SD		
<i>Abudefduf abdominalis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Acanthurus blochii</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Acanthurus leucopareius</i>	A	0.0	0.0	0.2	0.2	100.0	0.48
<i>Acanthurus nigrofuscus</i>	A	9.9	2.6	6.8	2.7	-31.0	*0.02
<i>Acanthurus nigroris</i>	A	1.0	2.0	0.5	1.0	-55.0	0.80
<i>Acanthurus olivaceus</i>	A	0.0	0.0	0.1	0.2	100.0	0.24
<i>Acanthurus thompsoni</i>		1.9	1.3	0.6	1.2	-67.6	0.40
<i>Aluterus scriptus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Anampses cuvier</i>	A	0.1	0.2	0.0	0.0	-100.0	0.45
<i>Aphareus furca</i>		0.1	0.1	0.1	0.1	100.0	0.31
<i>Apogon kallopterus</i>		0.3	0.3	0.6	0.3	120.0	0.08
<i>Apogon spp.</i>		0.1	0.1	0.2	0.3	50.0	0.54
<i>Apogon taeniopterus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Arothron meleagris</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Aulostomus chinensis</i>		0.1	0.2	0.2	0.3	100.0	0.43
<i>Bodianus bilunulatus</i>		0.0	0.0	0.5	0.6	100.0	0.04
<i>Cantherhines dumerilii</i>		0.1	0.1	0.1	0.1	100.0	0.81
<i>Canthigaster jactator</i>		2.6	1.3	3.4	1.9	28.8	0.27
<i>Centropyge potteri</i>	A1	2.3	1.4	2.1	1.3	-8.9	0.31
<i>Cephalopholis argus</i>	A	1.5	0.7	1.3	1.0	-13.8	0.39
<i>Chaetodon auriga</i>	A	0.2	0.3	0.1	0.1	-75.0	0.48
<i>Chaetodon lunula</i>	A	0.1	0.1	0.1	0.1	100.0	0.81
<i>Chaetodon multicinctus</i>	A1	7.2	1.2	7.2	1.3	0.7	0.55
<i>Chaetodon ornatissimus</i>	A1	0.8	0.8	1.5	0.9	81.3	0.86
<i>Chromis agilis</i>		22.0	3.3	34.8	11.5	58.0	0.20
<i>Chromis hanui</i>		8.2	2.3	8.0	2.8	-2.4	0.93
<i>Chromis ovalis</i>		5.5	6.1	1.1	2.3	-79.8	0.33
<i>Chromis vanderbilti</i>		0.4	0.3	3.1	3.1	662.5	0.09
<i>Chromis verater</i>		0.2	0.2	0.1	0.1	-33.3	0.39
<i>Cirrhitops fasciatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Cirrhitus pinnulatus</i>	A	0.1	0.1	0.1	0.2	100.0	0.48
<i>Coris flavovittata</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Coris gaimard</i>	A	0.5	0.4	0.1	0.1	-88.9	0.16
<i>Ctenochaetus hawaiiensis</i>	A	0.2	0.3	0.1	0.1	-75.0	0.48
<i>Ctenochaetus strigosus</i>	A1	29.0	8.3	35.5	3.7	22.2	0.54

<i>Dascyllus albisella</i>	A	0.2	0.2	0.0	0.0	-100.0	0.28
<i>Exallias brevis</i>		0.5	0.5	0.1	0.1	-88.9	0.10
<i>Fistularia commersonii</i>		0.0	0.0	0.2	0.2	100.0	0.08
<i>Forcipiger flavissimus</i>	A1	0.5	0.3	0.4	0.2	-22.2	0.38
<i>Forcipiger longirostris</i>	A1	0.4	0.4	0.3	0.3	-14.3	0.59
<i>Gomphosus varius</i>	A	1.5	0.9	1.2	1.0	-20.0	0.28
<i>Gymnothorax flavimarginatus</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Gymnothorax meleagris</i>		0.3	0.2	0.2	0.2	-33.3	1.00
<i>Gymnothorax spp.</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Halichoeres ornatissimus</i>	A	2.1	0.7	3.3	0.5	61.0	*0.01
<i>Hemitaenichthys thompsoni</i>	A	0.0	0.0	0.2	0.4	100.0	0.24
<i>Labroides phthirophagus</i>	A	2.0	1.0	2.0	0.6	0.0	0.85
<i>Macropharyngodon geoffroyi</i>	A	0.1	0.1	0.1	0.1	0.0	0.78
<i>Melichthys vidua</i>	A	0.2	0.2	0.5	0.7	125.0	0.36
<i>Myripristis berndti</i>		1.0	1.0	0.6	1.1	-36.8	0.95
<i>Myripristis kuntzei</i>		10.9	10.2	7.5	3.5	-31.7	0.48
<i>Naso lituratus</i>	A	1.0	0.6	1.6	1.3	55.0	0.22
<i>Naso unicornis</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Neoniphon sammara</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Ostracion meleagris</i>	A	0.4	0.3	0.1	0.2	-75.0	0.33
<i>Ostracion whitleyi</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Oxycheilinus unifasciatus</i>		0.3	0.3	0.3	0.2	20.0	0.72
<i>Paracirrhites arcatus</i>	A	2.0	0.8	2.1	0.5	2.5	0.92
<i>Paracirrhites forsteri</i>	A	0.5	0.4	0.9	0.1	70.0	0.15
<i>Parupeneus bifasciatus</i>		0.1	0.1	0.2	0.2	200.0	0.21
<i>Parupeneus cyclostomus</i>		0.2	0.3	0.0	0.0	-100.0	0.45
<i>Parupeneus multifasciatus</i>	A	1.0	0.6	0.3	0.4	-68.4	*0.02
<i>Pervagor aspricaudus</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Pervagor spilosoma</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Plectroglyphidodon imparipennis</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Plectroglyphidodon johnstonianus</i>		2.8	0.7	3.7	1.4	32.7	0.98
<i>Pseudocheilinus evanidus</i>		5.0	1.7	4.5	0.4	-10.0	0.62
<i>Pseudocheilinus octotaenia</i>	A	2.8	2.2	2.6	0.8	-5.5	0.69
<i>Pseudocheilinus tetrataenia</i>	A	0.8	0.3	2.3	1.3	187.5	0.00
<i>Pseudojuloides cerasinus</i>	A	0.4	0.8	0.4	0.5	14.3	0.62
<i>Scarus psittacus</i>		0.3	0.5	0.1	0.1	-83.3	0.49
<i>Scarus sordidus</i>		0.2	0.2	0.3	0.4	66.7	0.41
<i>Scorpaenopsis diabolus</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Stegastes fasciolatus</i>		3.5	0.8	3.2	0.6	-10.0	0.49
<i>Stethojulis balteata</i>	A	0.8	0.8	1.9	1.1	137.5	0.04
<i>Sufflamen bursa</i>	A	0.7	0.2	1.3	1.3	100.0	0.38
<i>Synodus spp.</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Synodus ulae</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Thalassoma duperrey</i>	A	6.2	3.9	4.2	1.1	-32.3	0.44
<i>Zanclus cornutus</i>	A1	0.4	0.2	0.2	0.3	-42.9	0.81
<i>Zebrasoma flavescens</i>	A1	18.6	5.2	20.7	3.5	11.3	0.98

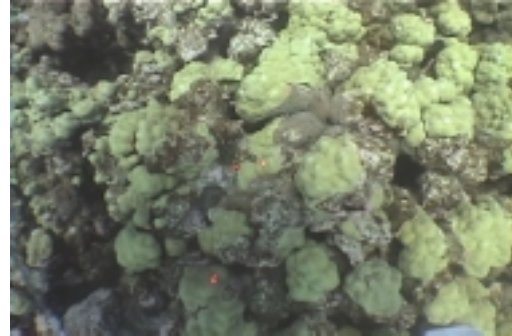
Papawai, Hawai'i (Site #13)

19° 38.8' N 156° 01.4' W

Depth: 9-13 m

Management Status: Fishery Management Area

Summary of findings: there were significant changes in *Lutjanus kasmira*, *Pseudocheilinus octotaenia* and *P. tetrataenia*



Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 130
 Number of quadrats analyzed = 80

Substrate	Mean % cover
Boulder	4.1
Flat	2.1
Macroalgae	0.0
<i>Montipora</i> spp	0.2
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	1.3
Old dead <i>P. lobata</i>	42.1
Old dead <i>P. meandrina</i>	0.3
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.6
<i>Porites compressa</i>	3.4
<i>Porites compressa</i> hole	0.1
<i>Porites lobata</i>	33.8
Rubble	11.0
Sand	0.8
Unknown coral	0.1

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)		Mean density (no./100m ²)		% change	P
		Pre-closure	SD	Post-closure	SD		
<i>Abudefduf abdominalis</i>		12.4	13.5	7.8	7.5	-37.1	0.87
<i>Acanthurus achilles</i>	A1	0.5	0.5	1.4	1.4	180.0	0.15
<i>Acanthurus nigricans</i>		0.3	0.2	0.2	0.2	-33.3	0.12
<i>Acanthurus nigrofuscus</i>	A	17.0	4.6	16.2	4.0	-5.0	0.24
<i>Acanthurus nigroris</i>	A	0.9	0.7	0.9	0.5	-5.6	0.43
<i>Acanthurus olivaceus</i>	A	0.2	0.2	0.3	0.3	66.7	0.23
<i>Acanthurus thompsoni</i>		1.3	1.6	3.7	4.3	196.0	0.09
<i>Acanthurus triostegus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Aluterus scriptus</i>		0.0	0.0	0.2	0.2	100.0	0.08
<i>Anampses chrysocephalus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Aphareus furca</i>		0.1	0.2	0.2	0.1	50.0	1.00
<i>Arothron meleagris</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Aulostomus chinensis</i>		0.7	0.6	0.5	0.3	-30.8	0.80
<i>Bodianus bilunulatus</i>		0.1	0.2	0.2	0.4	100.0	0.48
<i>Calotomus carolinus</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Cantherhines dumerilii</i>		0.2	0.3	0.2	0.3	0.0	0.70
<i>Cantherhines sandwichiensis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Canthigaster amboinensis</i>		0.1	0.1	0.1	0.2	0.0	0.73
<i>Canthigaster jactator</i>		4.2	2.8	6.9	3.8	65.1	0.08
<i>Caranx melampygus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Centropyge potteri</i>	A1	3.4	0.9	3.7	1.5	8.8	0.23
<i>Cephalopholis argus</i>	A	1.1	0.5	1.2	1.2	9.1	0.44
<i>Chaetodon auriga</i>	A	0.1	0.1	0.1	0.1	100.0	0.31
<i>Chaetodon kleinii</i>	A	0.2	0.2	0.1	0.1	-66.7	0.61
<i>Chaetodon lineolatus</i>		0.3	0.3	0.5	0.7	100.0	0.39
<i>Chaetodon lunula</i>	A	0.7	0.4	2.7	4.0	315.4	0.17
<i>Chaetodon miliaris</i>	A	2.1	1.7	1.3	1.1	-39.0	0.88
<i>Chaetodon multicinctus</i>	A1	6.7	1.4	7.2	1.5	7.5	0.90
<i>Chaetodon ornatissimus</i>	A1	0.9	0.8	0.8	0.5	-5.9	0.62
<i>Chaetodon quadrimaculatus</i>	A1	0.1	0.1	0.1	0.1	0.0	0.78
<i>Chaetodon unimaculatus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Chromis agilis</i>		36.4	12.2	36.2	11.2	-0.6	0.82
<i>Chromis hanui</i>		4.4	0.7	6.4	2.7	46.0	0.71
<i>Chromis ovalis</i>		24.6	33.2	20.6	27.0	-16.3	0.99
<i>Chromis vanderbilti</i>		18.2	9.7	13.1	5.7	-28.3	0.81

<i>Chromis verater</i>		4.7	5.7	2.7	0.8	-43.0	0.56
<i>Cirrhitus pinnulatus</i>	A	0.2	0.4	0.1	0.1	-75.0	0.64
<i>Cirripectes vanderbilti</i>		0.2	0.2	0.3	0.2	25.0	0.63
<i>Coris gaimard</i>	A	0.5	0.3	0.7	0.6	40.0	0.65
<i>Ctenochaetus hawaiiensis</i>	A	0.7	0.6	0.2	0.2	-69.2	0.38
<i>Ctenochaetus strigosus</i>	A1	35.6	13.8	38.2	6.4	7.3	0.89
<i>Dascyllus albisella</i>	A	0.7	0.5	0.6	0.4	-21.4	0.28
<i>Exallias brevis</i>		0.1	0.1	0.2	0.2	200.0	0.61
<i>Fistularia commersonii</i>		0.1	0.1	0.4	0.4	600.0	0.18
<i>Forcipiger flavissimus</i>	A1	1.9	0.6	2.1	1.0	10.5	0.85
<i>Forcipiger longirostris</i>	A1	0.5	0.3	0.6	0.8	33.3	0.52
<i>Gomphosus varius</i>	A	1.3	0.5	2.1	0.3	64.0	0.06
<i>Gymnothorax meleagris</i>		0.1	0.1	0.1	0.1	0.0	0.65
<i>Gymnothorax spp.</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Halichoeres ornatissimus</i>	A	1.6	0.5	2.5	0.8	61.3	0.02
<i>Hemitaurichthys polylepis</i>	A	3.7	6.1	2.3	2.0	-37.8	0.92
<i>Hemitaurichthys thompsoni</i>	A	3.3	6.5	0.3	0.7	-90.9	0.46
<i>Kyphosus bigibbus</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Labroides phthirophagus</i>	A	1.3	0.6	1.1	0.5	-15.4	0.37
<i>Lutjanus kasmira</i>		0.2	0.2	0.5	0.4	150.0	*0.01
<i>Macropharyngodon geoffroyi</i>	A	0.0	0.0	0.1	0.1	100.0	0.06
<i>Melichthys niger</i>	A	0.0	0.0	0.1	0.2	100.0	0.24
<i>Melichthys vidua</i>	A	0.2	0.1	0.1	0.1	-50.0	0.08
<i>Monotaxis grandoculis</i>		0.3	0.3	0.1	0.1	-60.0	0.62
<i>Mulloidichthys flavolineatus</i>		1.3	2.1	4.0	5.5	207.7	0.93
<i>Mulloidichthys vanicolensis</i>	A	20.7	15.5	23.6	25.9	14.0	0.78
<i>Myripristis amaena</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Myripristis berndti</i>		1.1	1.9	1.1	0.9	-4.5	0.98
<i>Myripristis kuntee</i>		7.3	5.5	6.1	4.5	-16.4	0.88
<i>Naso hexacanthus</i>		0.2	0.2	0.0	0.0	-100.0	0.28
<i>Naso lituratus</i>	A	0.8	0.4	1.8	1.0	140.0	0.44
<i>Naso unicornis</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Neoniphon sammara</i>		0.7	0.7	0.9	0.5	30.8	1.00
<i>Novaculichthys taeniourus</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Ostracion meleagris</i>	A	0.0	0.0	0.2	0.2	100.0	0.21
<i>Oxycheilinus unifasciatus</i>		0.4	0.3	0.3	0.3	-37.5	0.91
<i>Paracirrhites arcatus</i>	A	4.9	1.7	6.4	1.6	32.0	0.12
<i>Paracirrhites forsteri</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Parupeneus bifasciatus</i>		0.4	0.1	0.2	0.2	-50.0	0.15
<i>Parupeneus multifasciatus</i>	A	1.0	0.5	1.2	1.1	20.0	0.53
<i>Pervagor aspricaudus</i>		0.2	0.2	0.2	0.3	33.3	0.50
<i>Plagiotremus ewaensis</i>		0.0	0.0	0.2	0.2	100.0	0.01
<i>Plectroglyphidodon imparipennis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Plectroglyphidodon johnstonianus</i>		3.8	1.1	4.9	2.3	29.3	0.57
<i>Pseudocheilinus evanidus</i>		0.7	0.4	0.8	0.9	15.4	0.39
<i>Pseudocheilinus octotaenia</i>	A	1.6	0.8	2.4	1.3	54.8	*0.04
<i>Pseudocheilinus tetrataenia</i>	A	0.6	0.6	1.6	1.0	181.8	*0.03

<i>Pseudojuloides cerasinus</i>	A	0.1	0.1	0.1	0.1	0.0	0.78
<i>Sargocentron xantherythrum</i>		0.2	0.2	0.0	0.0	-100.0	0.28
<i>Scarus dubius</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Scarus perspicillatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus psittacus</i>		0.6	1.0	0.4	0.5	-27.3	0.94
<i>Scarus rubroviolaceus</i>		0.2	0.2	0.3	0.3	66.7	0.60
<i>Scarus sordidus</i>		0.8	0.7	2.4	1.4	213.3	0.57
<i>Sebastapistes conioarta</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Stegastes fasciolatus</i>		1.3	0.1	1.5	0.5	15.4	0.11
<i>Stethojulis balteata</i>	A	0.5	0.7	0.7	0.5	44.4	0.27
<i>Sufflamen bursa</i>	A	0.2	0.2	0.6	0.3	300.0	0.16
<i>Synodus binotatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Synodus dermatogenys</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Synodus spp.</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Thalassoma duperrey</i>	A	9.0	2.7	6.6	2.6	-26.7	0.68
<i>Xanthichthys auromarginatus</i>	A	0.5	0.4	0.4	0.6	-11.1	0.71
<i>Zanclus cornutus</i>	A1	0.8	0.3	0.8	0.4	-6.3	0.86
<i>Zebrasoma flavescens</i>	A1	14.3	1.8	15.8	4.6	10.1	0.50

South Oneo Bay, Hawai'i (Site #14)

19° 59.7' N 155° 50.6' W

Depth: 10-14 m

Management Status: Fishery Replenishment Area

Summary of findings: there were no significant changes



Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 155
 Number of quadrats analyzed = 77

Substrate	Mean % cover
Boulder	0.1
Flat	0.6
Macroalgae	0.0
<i>Montipora</i> spp	0.2
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	13.5
Old dead <i>P. lobata</i>	5.1
Old dead <i>P. meandrina</i>	0.0
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.0
<i>Porites compressa</i>	40.8
<i>Porites compressa</i> hole	1.7
<i>Porites lobata</i>	32.0
Rubble	4.9
Sand	0.6
Unknown coral	0.5

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)		Mean density (no./100m ²)		% change	P
		Pre-closure	SD	Post-closure	SD		
<i>Abudefduf abdominalis</i>		0.4	0.9	0.3	0.3	-37.5	0.96
<i>Acanthurus achilles</i>	A1	0.0	0.0	0.1	0.1	100.0	0.24
<i>Acanthurus nigrofuscus</i>	A	3.2	1.3	3.3	0.8	4.8	0.73
<i>Acanthurus nigroris</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Acanthurus olivaceus</i>	A	0.2	0.1	0.4	0.4	133.3	0.63
<i>Apogon kallopterus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Arothron meleagris</i>		0.0	0.0	0.1	0.1	100.0	0.78
<i>Aulostomus chinensis</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Bodianus bilunulatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Calotomus carolinus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Cantherhines dumerilii</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Canthigaster jactator</i>		2.0	1.6	2.3	1.5	15.4	0.59
<i>Centropyge potteri</i>	A1	1.3	0.3	0.9	0.6	-32.0	0.38
<i>Cephalopholis argus</i>	A	0.6	0.4	0.9	0.4	50.0	0.04
<i>Chaetodon auriga</i>	A	0.1	0.2	0.0	0.0	-100.0	0.45
<i>Chaetodon lunula</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Chaetodon multicinctus</i>	A1	3.6	0.9	3.7	1.0	2.8	0.69
<i>Chaetodon ornatissimus</i>	A1	0.2	0.2	0.4	0.4	133.3	1.00
<i>Chromis agilis</i>		13.1	5.0	13.2	5.2	1.1	0.95
<i>Chromis hanui</i>		2.4	0.4	2.3	0.9	-2.1	0.34
<i>Chromis ovalis</i>		2.2	0.9	6.4	7.3	190.9	0.07
<i>Chromis vanderbilti</i>		5.7	4.2	6.0	4.1	6.2	0.66
<i>Chromis verater</i>		1.1	1.5	0.0	0.0	-100.0	0.25
<i>Cirrhitops fasciatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Cirrhitus pinnulatus</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Cirripectes vanderbilti</i>		0.2	0.3	0.5	0.2	125.0	0.35
<i>Coris gaimard</i>	A	0.2	0.2	0.0	0.0	-100.0	0.15
<i>Ctenochaetus strigosus</i>	A1	27.0	4.4	26.9	6.1	-0.4	0.50
<i>Exallias brevis</i>		0.1	0.1	0.2	0.1	300.0	0.24
<i>Fistularia commersonii</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Forcipiger flavissimus</i>	A1	0.4	0.3	0.6	0.4	71.4	0.56
<i>Forcipiger longirostris</i>	A1	0.1	0.2	0.2	0.3	50.0	0.58
<i>Gomphosus varius</i>	A	0.5	0.7	0.7	0.3	30.0	0.82
<i>Gymnothorax eurostus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Gymnothorax meleagris</i>		0.0	0.0	0.1	0.1	100.0	0.24

<i>Gymnothorax spp.</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Halichoeres ornatus</i>	A	1.0	0.6	1.3	0.5	31.6	0.13
<i>Labroides phthirophagus</i>	A	0.9	0.6	1.2	0.6	41.2	0.23
<i>Lutjanus fulvus</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Lutjanus kasmira</i>		0.3	0.3	0.3	0.2	0.0	1.00
<i>Melichthys vidua</i>	A	0.1	0.2	0.2	0.2	50.0	1.00
<i>Mulloidichthys flavolineatus</i>		1.1	2.2	2.5	4.9	122.7	0.40
<i>Mulloidichthys vanicolensis</i>	A	2.4	2.0	2.4	3.9	-2.1	0.65
<i>Myripristis berndti</i>		0.1	0.1	0.1	0.1	100.0	0.81
<i>Myripristis kuntee</i>		0.3	0.4	0.1	0.1	-80.0	0.43
<i>Naso lituratus</i>	A	0.2	0.2	0.4	0.4	75.0	0.84
<i>Neoniphon sammara</i>		1.1	0.4	0.5	0.7	-54.5	0.51
<i>Novaculichthys taeniourus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Ostracion whitleyi</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Oxycheilinus unifasciatus</i>		0.1	0.1	0.3	0.4	500.0	0.13
<i>Paracirrhites arcatus</i>	A	0.9	0.4	0.8	0.4	-11.8	0.93
<i>Paracirrhites forsteri</i>	A	0.7	0.4	0.5	0.3	-23.1	0.59
<i>Parupeneus cyclostomus</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Parupeneus multifasciatus</i>	A	0.3	0.3	0.2	0.2	-50.0	0.75
<i>Pervagor aspricaudus</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Plectroglyphidodon johnstonianus</i>		2.1	0.6	3.2	0.9	52.4	0.55
<i>Pseudocheilinus evanidus</i>		2.4	1.1	2.6	0.5	8.3	0.46
<i>Pseudocheilinus octotaenia</i>	A	1.9	1.1	1.4	0.9	-24.3	0.64
<i>Pseudocheilinus tetrataenia</i>	A	1.2	1.0	1.6	0.7	34.8	0.68
<i>Pseudojuloides cerasinus</i>	A	0.3	0.3	0.2	0.3	-40.0	0.92
<i>Sargocentron spp.</i>		0.2	0.3	0.0	0.0	-100.0	0.45
<i>Scarus sordidus</i>		0.2	0.1	0.1	0.1	-66.7	0.49
<i>Stethojulis balteata</i>	A	0.1	0.2	0.1	0.1	-50.0	0.86
<i>Sufflamen bursa</i>	A	0.4	0.3	0.2	0.2	-62.5	0.17
<i>Synodus variegatus</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Thalassoma duperrey</i>	A	5.7	1.9	6.8	2.3	19.5	0.31
<i>Zebrasoma flavescens</i>	A1	15.3	5.5	11.1	3.6	-27.5	0.09

North Keauhou, Hawai'i (Site #15)

19° 34.1' N 155° 58.2' W

Depth: 9-14 m

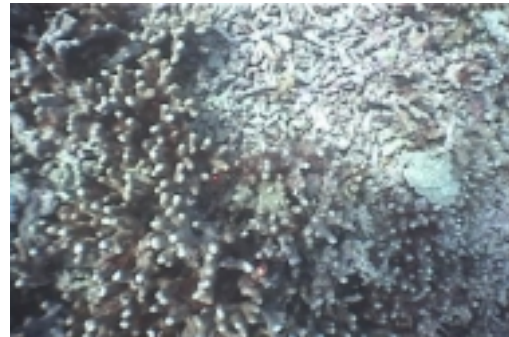
Management Status: Fishery Replenishment Area

Summary of findings: there were significant changes in *Acanthurus olivaceus*, *Cephalopholis argus*, *Chaetodon ornatissimus* and *Gomphosus varius*



Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 158
 Number of quadrats analyzed = 800



Substrate	Mean % cover
Boulder	0.5
Flat	0.0
Macroalgae	0.1
<i>Montipora</i> spp	0.1
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	15.6
Old dead <i>P. lobata</i>	4.5
Old dead <i>P. meandrina</i>	0.0
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.0
<i>Porites compressa</i>	39.5
<i>Porites compressa</i> hole	1.5
<i>Porites lobata</i>	13.4
Rubble	23.9
Sand	0.7
Unknown coral	0.3

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)				% change	P
		Pre-closure		Post-closure			
		Mean	SD	Mean	SD		
<i>Acanthurus achilles</i>	A1	0.0	0.0	0.5	0.4	100.0	0.31
<i>Acanthurus nigricans</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Acanthurus nigrofuscus</i>	A	10.8	1.4	10.0	4.9	-7.4	0.21
<i>Acanthurus nigroris</i>	A	0.1	0.2	0.0	0.0	-100.0	0.45
<i>Acanthurus olivaceus</i>	A	0.0	0.0	0.8	0.6	100.0	*0.04
<i>Aetobatus narinari</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Aluterus scriptus</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Amblycirrhitus bimacula</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Anampses chrysocephalus</i>	A	0.0	0.0	0.1	0.2	100.0	0.24
<i>Arothron meleagris</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Aulostomus chinensis</i>		0.1	0.1	0.5	0.7	800.0	0.25
<i>Bodianus bilunulatus</i>		0.1	0.2	0.1	0.1	-50.0	0.86
<i>Canthigaster jactator</i>		0.7	0.4	0.5	0.4	-35.7	0.65
<i>Centropyge potteri</i>	A1	0.6	0.5	0.6	0.7	0.0	0.73
<i>Cephalopholis argus</i>	A	0.0	0.0	0.2	0.1	100.0	*0.01
<i>Chaetodon multicinctus</i>	A1	5.4	1.2	4.6	0.7	-14.0	0.32
<i>Chaetodon ornatissimus</i>	A1	1.0	0.4	0.6	0.5	-40.0	*0.01
<i>Chaetodon reticulatus</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Chromis agilis</i>		19.8	5.0	17.9	7.3	-9.6	0.70
<i>Chromis hanui</i>		1.1	0.4	0.8	0.4	-27.3	0.67
<i>Chromis ovalis</i>		0.3	0.6	2.9	5.2	1060.0	0.17
<i>Chromis vanderbilti</i>		0.7	0.5	0.6	1.2	-14.3	0.79
<i>Chromis verater</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Cirrhitus pinnulatus</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Cirripectes vanderbilti</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Coris flavovittata</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Coris gaimard</i>	A	0.2	0.4	0.3	0.4	25.0	0.62
<i>Coris venusta</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Ctenochaetus hawaiiensis</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Ctenochaetus strigosus</i>	A1	28.5	5.2	25.3	8.7	-11.1	0.37
<i>Exallias brevis</i>		0.3	0.2	0.5	0.7	50.0	0.56
<i>Fistularia commersonii</i>		0.0	0.0	0.1	0.1	100.0	0.78
<i>Forcipiger flavissimus</i>	A1	0.1	0.1	0.1	0.2	100.0	0.28
<i>Forcipiger longirostris</i>	A1	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Gomphosus varius</i>	A	0.8	0.2	0.5	0.4	-43.8	*0.01

<i>Gymnothorax flavimarginatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Gymnothorax meleagris</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Halichoeres ornatissimus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.24
<i>Labroides phthirophagus</i>	A	0.5	0.4	0.6	0.3	20.0	0.93
<i>Melichthys niger</i>	A	0.2	0.2	0.5	1.0	200.0	0.30
<i>Monotaxis grandoculis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Myripristis berndti</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Myripristis kuntee</i>		0.4	0.8	0.1	0.1	-85.7	0.55
<i>Naso lituratus</i>	A	0.2	0.3	0.6	0.8	175.0	0.22
<i>Neoniphon sammara</i>		0.1	0.2	0.1	0.1	-50.0	0.28
<i>Ostracion meleagris</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Oxycheilinus unifasciatus</i>		0.4	0.2	0.7	0.9	100.0	0.17
<i>Paracirrhites arcatus</i>	A	0.9	0.5	1.1	0.6	16.7	0.48
<i>Paracirrhites forsteri</i>	A	0.3	0.2	0.1	0.1	-80.0	0.21
<i>Parupeneus bifasciatus</i>		0.2	0.2	0.3	0.4	66.7	0.33
<i>Parupeneus multifasciatus</i>	A	0.3	0.3	0.4	0.2	60.0	0.90
<i>Plectroglyphidodon johnstonianus</i>		1.5	0.8	2.2	0.7	43.3	0.35
<i>Pseudocheilinus evanidus</i>		0.8	1.0	0.8	0.4	0.0	0.97
<i>Pseudocheilinus octotaenia</i>	A	2.2	0.6	1.4	0.5	-38.6	0.15
<i>Pseudocheilinus tetrataenia</i>	A	1.5	1.4	1.1	0.9	-24.1	0.96
<i>Pseudojuloides cerasinus</i>	A	0.2	0.4	0.1	0.1	-75.0	0.64
<i>Scarus rubroviolaceus</i>		0.2	0.2	0.1	0.1	-75.0	0.06
<i>Scarus sordidus</i>		0.4	0.4	1.3	1.0	257.1	0.06
<i>Stethojulis balteata</i>	A	0.2	0.2	0.8	0.4	300.0	0.07
<i>Sufflamen bursa</i>	A	0.3	0.4	0.2	0.2	-40.0	0.93
<i>Synodus variegatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Thalassoma duperrey</i>	A	5.5	0.6	5.3	1.6	-3.7	0.49
<i>Zanclus cornutus</i>	A1	0.0	0.0	0.2	0.2	100.0	0.73
<i>Zebrasoma flavescens</i>	A1	7.5	2.3	8.6	3.7	14.7	0.70

Kualanui Point, Hawai'i (Site #16)

19° 32.9' N 155° 57.7' W

Depth: 9-12 m

Management Status: none

Summary of findings: there were significant changes in *Gomphosus varius* and *Halichoeres ornatissimus*



Benthic habitat summary:

Survey conducted Spring 2000

Number of quadrats archived = 153

Number of quadrats analyzed = 80

Substrate	Mean % cover
Boulder	0.8
Flat	0.2
Macroalgae	0.0
<i>Montipora</i> spp	0.2
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	1.2
Old dead <i>P. lobata</i>	30.6
Old dead <i>P. meandrina</i>	0.0
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.1
<i>Porites compressa</i>	3.2
<i>Porites compressa</i> hole	0.3
<i>Porites lobata</i>	59.5
Rubble	3.2
Sand	0.5
Unknown coral	0.2

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)		Mean density (no./100m ²)		% change	P
		Pre-closure	SD	Post-closure	SD		
<i>Acanthurus achilles</i>	A1	0.1	0.1	0.1	0.1	0.0	0.24
<i>Acanthurus leucopareius</i>	A	0.1	0.2	0.0	0.0	-100.0	0.45
<i>Acanthurus nigrofuscus</i>	A	28.3	8.3	25.3	6.1	-10.6	0.56
<i>Acanthurus nigroris</i>	A	0.7	0.4	0.2	0.2	-71.4	0.09
<i>Acanthurus olivaceus</i>	A	0.4	0.2	0.5	0.5	42.9	0.94
<i>Acanthurus thompsoni</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Arothron meleagris</i>		0.1	0.1	0.2	0.1	50.0	1.00
<i>Aulostomus chinensis</i>		0.1	0.1	0.1	0.2	100.0	0.48
<i>Bodianus bilunulatus</i>		0.0	0.0	0.7	1.3	100.0	0.27
<i>Cantherhines dumerilii</i>		0.2	0.2	0.2	0.2	0.0	0.67
<i>Canthigaster jactator</i>		1.2	0.8	1.8	1.9	52.2	0.53
<i>Caranx melampygus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Centropyge potteri</i>	A1	0.7	0.3	0.6	0.7	-15.4	0.70
<i>Cephalopholis argus</i>	A	0.8	0.6	0.8	0.6	0.0	1.00
<i>Chaetodon auriga</i>	A	0.2	0.1	0.0	0.0	-100.0	0.11
<i>Chaetodon lunula</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Chaetodon multicinctus</i>	A1	4.7	1.3	5.1	1.0	7.4	0.60
<i>Chaetodon ornatissimus</i>	A1	0.6	0.5	0.5	0.5	-18.2	0.20
<i>Chaetodon quadrimaculatus</i>	A1	0.1	0.1	0.3	0.4	400.0	0.12
<i>Chromis agilis</i>		12.3	1.9	8.8	2.9	-28.5	0.24
<i>Chromis hanui</i>		0.8	0.6	0.5	0.3	-37.5	0.42
<i>Chromis ovalis</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Chromis vanderbilti</i>		34.4	19.2	50.8	17.7	47.9	0.38
<i>Cirrhitops fasciatus</i>		0.0	0.0	0.1	0.1	100.0	0.06
<i>Cirrhitus pinnulatus</i>	A	0.1	0.1	0.2	0.1	200.0	0.65
<i>Cirripectes vanderbilti</i>		0.7	0.7	0.9	0.7	28.6	0.21
<i>Coris gaimard</i>	A	0.0	0.0	0.1	0.1	100.0	0.06
<i>Coris venusta</i>		0.1	0.1	0.2	0.3	200.0	0.38
<i>Ctenochaetus hawaiiensis</i>	A	0.1	0.1	0.0	0.0	-100.0	0.24
<i>Ctenochaetus strigosus</i>	A1	25.6	4.9	24.0	4.6	-6.1	0.62
<i>Exallias brevis</i>		0.3	0.3	0.4	0.7	60.0	0.32
<i>Fistularia commersonii</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Forcipiger flavissimus</i>	A1	0.0	0.0	0.1	0.2	100.0	0.24
<i>Forcipiger longirostris</i>	A1	0.1	0.2	0.4	0.3	250.0	0.84
<i>Gomphosus varius</i>	A	1.6	0.8	0.3	0.3	-81.3	*0.01

<i>Gymnomuraena zebra</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Gymnothorax meleagris</i>		0.1	0.1	0.1	0.1	-50.0	0.81
<i>Halichoeres ornatissimus</i>	A	2.7	1.1	3.9	1.4	42.6	*0.03
<i>Labroides phthirophagus</i>	A	1.0	0.4	1.0	0.3	0.0	0.46
<i>Lutjanus kasmira</i>		0.3	0.4	0.2	0.3	-20.0	0.27
<i>Macropharyngodon geoffroyi</i>	A	0.2	0.2	0.1	0.1	-66.7	0.15
<i>Melichthys niger</i>	A	0.2	0.2	0.3	0.3	66.7	0.90
<i>Melichthys vidua</i>	A	0.1	0.2	0.2	0.2	50.0	0.48
<i>Monotaxis grandoculis</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Mulloidichthys flavolineatus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Myripristis berndti</i>		0.2	0.2	0.3	0.3	66.7	0.23
<i>Myripristis kuntee</i>		0.1	0.1	0.2	0.2	200.0	0.61
<i>Naso hexacanthus</i>		0.0	0.0	0.2	0.4	100.0	0.45
<i>Naso lituratus</i>	A	0.4	0.3	0.4	0.3	0.0	0.74
<i>Naso unicornis</i>	A	0.0	0.0	0.1	0.1	100.0	0.45
<i>Ostracion meleagris</i>	A	0.0	0.0	0.1	0.1	100.0	0.06
<i>Oxycheilinus bimaculatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Oxycheilinus unifasciatus</i>		0.3	0.3	0.0	0.0	-100.0	0.14
<i>Paracirrhites arcatus</i>	A	4.3	0.8	4.0	1.3	-8.1	0.56
<i>Paracirrhites forsteri</i>	A	0.4	0.1	0.2	0.3	-42.9	0.81
<i>Parupeneus bifasciatus</i>		0.1	0.1	0.1	0.1	100.0	0.81
<i>Parupeneus multifasciatus</i>	A	0.4	0.3	0.3	0.4	-28.6	0.93
<i>Pervagor aspricaudus</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Plagiotremus ewaensis</i>		0.0	0.0	0.1	0.1	100.0	0.06
<i>Plectroglyphidodon imparipennis</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Plectroglyphidodon johnstonianus</i>		2.3	0.5	2.6	0.5	13.0	0.57
<i>Pseudocheilinus evanidus</i>		0.4	0.3	0.3	0.2	-14.3	0.62
<i>Pseudocheilinus octotaenia</i>	A	1.6	0.8	1.4	1.0	-12.9	0.64
<i>Pseudocheilinus tetrataenia</i>	A	1.1	0.8	1.7	1.1	57.1	0.12
<i>Saurida gracilis</i>		0.2	0.1	0.0	0.0	-100.0	0.11
<i>Scarus dubius</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus perspicillatus</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Scarus psittacus</i>		0.0	0.0	0.2	0.3	100.0	0.45
<i>Scarus rubroviolaceus</i>		0.2	0.1	0.4	0.8	166.7	0.30
<i>Scarus sordidus</i>		1.3	0.6	1.7	0.8	26.9	0.47
<i>Stegastes fasciolatus</i>		0.3	0.2	0.6	0.1	100.0	0.04
<i>Stethojulis balteata</i>	A	0.2	0.3	0.2	0.3	0.0	0.27
<i>Sufflamen bursa</i>	A	0.4	0.3	0.6	0.3	57.1	0.38
<i>Synodus spp.</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Thalassoma duperrey</i>	A	10.4	2.2	9.5	2.0	-8.7	0.90
<i>Zanclus cornutus</i>	A1	0.0	0.0	0.2	0.2	100.0	0.08
<i>Zebrasoma flavescens</i>	A1	10.2	1.9	9.2	1.6	-9.4	0.51
<i>Zebrasoma veliferum</i>		0.1	0.2	0.0	0.0	-100.0	0.45

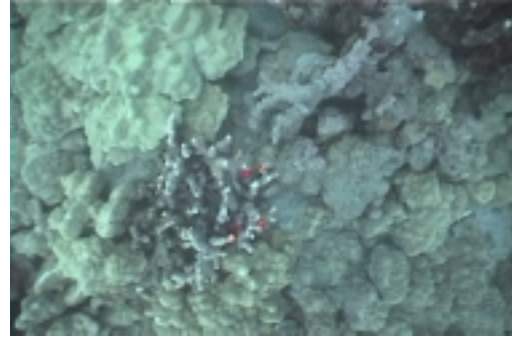
Red Hill, Hawai'i (Site #17)

19° 30.3' N 155° 57.2' W

Depth: 13-15 m

Management Status: Fishery Management Area

Summary of findings: there were significant changes in *Ctenochaetus hawaiiensis*



Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 142
 Number of quadrats analyzed = 80

Substrate	Mean % cover
Boulder	0.0
Flat	3.8
Macroalgae	0.0
<i>Montipora</i> spp	0.1
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	10.7
Old dead <i>P. lobata</i>	15.7
Old dead <i>P. meandrina</i>	0.0
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.2
<i>Porites compressa</i>	12.4
<i>Porites compressa</i> hole	0.5
<i>Porites lobata</i>	20.7
Rubble	32.8
Sand	3.0
Unknown coral	0.2

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Pre-closure		Post-closure		% change	P
		Mean	SD	Mean	SD		
<i>Acanthurus achilles</i>	A1	1.5	0.6	0.9	0.5	-40.0	0.06
<i>Acanthurus nigricans</i>		0.2	0.2	0.3	0.3	100.0	0.75
<i>Acanthurus nigrofuscus</i>	A	4.8	0.7	5.1	1.7	5.2	0.70
<i>Acanthurus nigroris</i>	A	0.7	0.4	0.7	0.7	-7.1	0.75
<i>Acanthurus olivaceus</i>	A	1.3	0.8	1.0	0.9	-26.9	0.07
<i>Acanthurus thompsoni</i>		0.1	0.2	0.2	0.4	100.0	0.48
<i>Aluterus scriptus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Aphareus furca</i>		0.3	0.3	0.0	0.0	-100.0	0.14
<i>Apogon kallopterus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Apogon spp.</i>		0.1	0.2	0.1	0.1	-50.0	0.86
<i>Arothron meleagris</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Aulostomus chinensis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Blenniidae</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Bodianus bilunulatus</i>		0.1	0.1	0.2	0.3	100.0	0.38
<i>Calotomus carolinus</i>		0.2	0.3	0.3	0.4	66.7	0.93
<i>Cantherhines dumerilii</i>		0.2	0.2	0.1	0.1	-66.7	0.61
<i>Canthigaster jactator</i>		0.4	0.4	0.2	0.3	-57.1	0.69
<i>Centropyge potteri</i>	A1	3.1	1.5	1.7	0.7	-45.9	0.18
<i>Cephalopholis argus</i>	A	0.7	0.5	0.5	0.2	-23.1	0.59
<i>Chaetodon auriga</i>	A	0.1	0.2	0.1	0.2	0.0	0.24
<i>Chaetodon lunula</i>	A	0.3	0.4	0.7	1.2	160.0	0.51
<i>Chaetodon multicolor</i>	A1	6.9	0.8	4.9	2.0	-29.7	0.23
<i>Chaetodon ornatissimus</i>	A1	1.0	0.6	0.5	0.3	-50.0	0.38
<i>Chaetodon quadrimaculatus</i>	A1	0.7	0.5	0.6	0.6	-15.4	0.70
<i>Chromis agilis</i>		24.9	2.6	28.3	7.2	13.7	0.30
<i>Chromis hanui</i>		5.1	1.3	4.6	1.0	-10.8	0.77
<i>Chromis vanderbilti</i>		4.2	4.6	3.4	3.7	-19.0	0.96
<i>Chromis verater</i>		0.3	0.4	0.9	1.9	260.0	0.31
<i>Cirrhilabrus jordani</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Cirrhites fasciatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Cirrhites pinnulatus</i>	A	0.0	0.0	0.1	0.1	100.0	0.45
<i>Cirripectes vanderbilti</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Coris gaimard</i>	A	0.7	0.4	0.3	0.3	-64.3	0.17
<i>Coris venusta</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Ctenochaetus hawaiiensis</i>	A	2.0	0.6	1.3	1.0	-35.9	*0.02

<i>Ctenochaetus strigosus</i>	A1	42.1	8.6	34.5	10.0	-18.1	0.28
<i>Exallias brevis</i>		0.1	0.1	0.1	0.1	100.0	0.81
<i>Fistularia commersonii</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Forcipiger flavissimus</i>	A1	0.4	0.5	0.3	0.4	-37.5	0.94
<i>Forcipiger longirostris</i>	A1	0.3	0.2	0.5	0.3	80.0	0.43
<i>Gomphosus varius</i>	A	1.1	0.5	0.5	0.3	-52.4	0.07
<i>Gymnothorax meleagris</i>		0.1	0.1	0.1	0.1	100.0	0.31
<i>Halichoeres ornatissimus</i>	A	1.0	0.6	1.3	0.7	30.0	0.11
<i>Hemitaurichthys thompsoni</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Labroides phthirophagus</i>	A	0.6	0.3	0.6	0.1	0.0	0.67
<i>Lutjanus kasmira</i>		0.2	0.2	0.9	0.8	466.7	1.00
<i>Melichthys niger</i>	A	0.2	0.2	0.4	0.7	133.3	0.33
<i>Melichthys vidua</i>	A	0.6	0.4	0.4	0.5	-36.4	0.95
<i>Monotaxis grandoculis</i>		0.5	0.6	0.4	0.2	-22.2	0.42
<i>Mulloidichthys flavolineatus</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Mulloidichthys vanicolensis</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Myripristis berndti</i>		0.4	0.7	0.4	0.4	14.3	0.56
<i>Myripristis kuntee</i>		1.2	1.0	0.7	0.4	-39.1	0.33
<i>Naso hexacanthus</i>		0.0	0.0	0.2	0.3	100.0	0.45
<i>Naso lituratus</i>	A	2.1	0.9	2.0	0.8	-2.4	0.30
<i>Nemateleotris magnifica</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Novaculichthys taeniourus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Oxycheilinus unifasciatus</i>		0.6	0.3	0.3	0.2	-58.3	0.12
<i>Paracirrhites arcatus</i>	A	5.8	1.4	5.6	1.0	-2.6	0.59
<i>Paracirrhites forsteri</i>	A	0.3	0.3	0.1	0.1	-60.0	0.17
<i>Parupeneus bifasciatus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Parupeneus cyclostomus</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Parupeneus multifasciatus</i>	A	0.9	0.5	0.8	0.4	-11.8	0.29
<i>Pervagor aspricaudus</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Plagiotremus ewaensis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Plectroglyphidodon imparipennis</i>		0.3	0.6	0.0	0.0	-100.0	0.45
<i>Plectroglyphidodon johnstonianus</i>		2.5	0.5	2.7	0.4	8.0	0.84
<i>Pseudocheilinus evanidus</i>		6.1	1.5	6.2	2.9	1.7	0.25
<i>Pseudocheilinus octotaenia</i>	A	3.6	2.1	2.7	1.4	-25.0	0.89
<i>Pseudocheilinus tetrataenia</i>	A	1.3	0.9	1.3	0.4	0.0	0.79
<i>Pseudojuloides cerasinus</i>	A	0.1	0.2	0.3	0.3	150.0	0.14
<i>Sargocentron spp.</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus psittacus</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Scarus rubroviolaceus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Scarus sordidus</i>		2.2	3.8	2.0	2.5	-7.0	0.74
<i>Scorpaenopsis diabolus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Sebastapistes coniora</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Stegastes fasciolatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Stethojulis balteata</i>	A	0.1	0.1	0.1	0.1	0.0	0.65
<i>Sufflamen bursa</i>	A	0.4	0.4	1.0	0.5	171.4	0.45
<i>Synodus spp.</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Synodus variegatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45

<i>Thalassoma duperrey</i>	A	3.4	0.9	3.8	0.8	10.3	0.27
<i>Xanthichthys auromarginatus</i>	A	0.6	0.4	1.0	1.1	72.7	0.85
<i>Zanclus cornutus</i>	A1	0.3	0.3	0.1	0.1	-80.0	0.31
<i>Zebrasoma flavescens</i>	A1	38.6	5.0	38.6	5.4	0.0	0.91

Keopuka, Hawai'i (Site #18)

19° 29.0' N 155° 56.8' W

Depth: 9-14 m

Management Status: none

Summary of findings: there were significant changes in *Chromis verater* and *Ctenochaetus hawaiiensis*

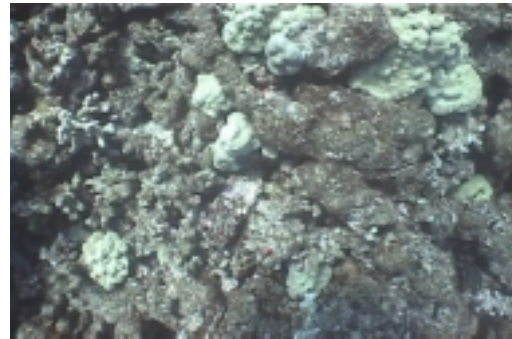


Benthic habitat summary:

Survey conducted Spring 2000

Number of quadrats archived = 141

Number of quadrats analyzed = 80



Substrate	Mean % cover
Boulder	0.8
Flat	10.8
Macroalgae	0.0
<i>Montipora</i> spp	0.0
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.1
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	2.1
Old dead <i>P. lobata</i>	42.2
Old dead <i>P. meandrina</i>	0.3
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	7.7
<i>Porites compressa</i>	2.6
<i>Porites compressa</i> hole	0.0
<i>Porites lobata</i>	13.7
Rubble	18.3
Sand	1.0
Unknown coral	0.4

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Mean density (no./100m ²)		Mean density (no./100m ²)		% change	P
		Pre-closure	SD	Post-closure	SD		
<i>Abudefduf abdominalis</i>		0.2	0.3	0.0	0.0	-100.0	0.45
<i>Acanthurus achilles</i>	A1	1.7	0.7	1.1	0.5	-38.2	0.16
<i>Acanthurus dussumieri</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Acanthurus guttatus</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Acanthurus leucopareius</i>	A	0.8	1.4	0.2	0.3	-75.0	0.56
<i>Acanthurus nigrofuscus</i>	A	9.2	4.0	10.9	2.0	18.5	0.41
<i>Acanthurus nigroris</i>	A	1.4	0.7	1.3	1.1	-10.7	0.62
<i>Acanthurus olivaceus</i>	A	1.1	1.4	0.3	0.3	-71.4	0.33
<i>Acanthurus thompsoni</i>		1.1	0.9	1.0	1.1	-9.5	0.63
<i>Aphareus furca</i>		0.1	0.1	0.1	0.1	0.0	0.65
<i>Apogon kallopterus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Arothron meleagris</i>		0.1	0.1	0.1	0.1	-50.0	0.81
<i>Aulostomus chinensis</i>		0.3	0.2	0.6	0.4	120.0	0.87
<i>Cantherhines dumerilii</i>		0.2	0.2	0.2	0.2	-25.0	0.89
<i>Canthigaster amboinensis</i>		0.2	0.2	0.0	0.0	-100.0	0.28
<i>Canthigaster jactator</i>		2.1	0.8	3.1	1.7	51.2	0.06
<i>Centropyge potteri</i>	A1	4.5	1.8	6.2	3.9	37.8	0.38
<i>Cephalopholis argus</i>	A	0.5	0.5	0.1	0.1	-90.0	0.07
<i>Chaetodon auriga</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Chaetodon lunula</i>	A	0.5	0.5	0.7	0.7	40.0	0.24
<i>Chaetodon multicinctus</i>	A1	4.3	0.4	4.1	1.6	-4.7	0.64
<i>Chaetodon ornatissimus</i>	A1	0.5	0.5	0.6	0.2	10.0	0.80
<i>Chaetodon quadrimaculatus</i>	A1	0.6	1.0	0.5	0.3	-25.0	0.93
<i>Chaetodon reticulatus</i>	A	0.0	0.0	0.1	0.1	100.0	0.45
<i>Chromis agilis</i>		35.9	11.8	52.2	21.2	45.3	0.93
<i>Chromis hanui</i>		6.5	1.6	6.9	1.7	7.0	0.91
<i>Chromis ovalis</i>		8.0	11.8	4.6	7.4	-43.1	0.88
<i>Chromis vanderbilti</i>		8.8	5.8	7.1	5.9	-19.4	0.88
<i>Chromis verater</i>		3.0	1.8	6.8	4.6	125.0	*0.01
<i>Cirrhitops fasciatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Cirrhitus pinnulatus</i>	A	0.2	0.1	0.2	0.1	0.0	0.65
<i>Cirripectes vanderbilti</i>		0.1	0.1	0.1	0.1	100.0	0.31
<i>Coris flavovittata</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Coris gaimard</i>	A	0.2	0.2	0.1	0.1	-75.0	0.39
<i>Coris venusta</i>		0.1	0.1	0.1	0.1	100.0	0.31

<i>Ctenochaetus hawaiiensis</i>	A	0.4	0.3	0.2	0.2	-62.5	*0.04
<i>Ctenochaetus strigosus</i>	A1	29.2	13.1	42.7	6.1	46.3	0.14
<i>Exallias brevis</i>		0.1	0.1	0.2	0.2	200.0	0.21
<i>Fistularia commersonii</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Forcipiger flavissimus</i>	A1	1.5	1.0	0.8	0.4	-48.3	0.40
<i>Forcipiger longirostris</i>	A1	0.7	0.4	0.2	0.2	-78.6	0.05
<i>Gomphosus varius</i>	A	0.9	0.9	1.0	0.7	11.1	0.45
<i>Gymnomuraena zebra</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Gymnothorax flavimarginatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Gymnothorax meleagris</i>		0.1	0.1	0.2	0.2	50.0	0.39
<i>Halichoeres ornatissimus</i>	A	1.0	0.4	1.2	0.3	15.0	0.19
<i>Hemitaurichthys polylepis</i>	A	2.3	1.3	2.0	1.7	-13.0	0.79
<i>Hemitaurichthys thompsoni</i>	A	2.7	4.4	3.3	4.1	20.4	0.35
<i>Labroides phthirophagus</i>	A	0.9	0.3	0.8	0.3	-11.8	0.33
<i>Lutjanus kasmira</i>		0.2	0.3	0.7	0.4	333.3	0.08
<i>Macropharyngodon geoffroyi</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Melichthys niger</i>	A	0.1	0.1	0.3	0.5	500.0	0.49
<i>Melichthys vidua</i>	A	0.4	0.2	0.5	0.4	25.0	0.92
<i>Mulloidichthys vanicolensis</i>	A	7.3	6.1	6.9	4.6	-5.5	0.41
<i>Myrichthys magnificus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Myripristis berndti</i>		7.9	9.0	0.2	0.2	-98.1	0.19
<i>Myripristis kuntee</i>		5.6	2.4	10.3	2.5	83.9	0.14
<i>Myripristis spp.</i>		0.4	0.8	0.0	0.0	-100.0	0.45
<i>Naso hexacanthus</i>		0.8	0.6	0.0	0.0	-100.0	0.08
<i>Naso lituratus</i>	A	2.3	1.3	2.0	1.3	-15.2	0.46
<i>Naso unicornis</i>	A	0.0	0.0	0.2	0.3	100.0	0.24
<i>Neoniphon sammara</i>		0.1	0.1	0.2	0.2	100.0	0.73
<i>Novaculichthys taeniourus</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Ostracion meleagris</i>	A	0.3	0.4	0.2	0.3	-33.3	1.00
<i>Ostracion whitleyi</i>	A	0.0	0.0	0.1	0.1	100.0	0.45
<i>Oxycheilinus unifasciatus</i>		0.1	0.1	0.2	0.2	300.0	0.39
<i>Paracirrhites arcatus</i>	A	10.7	4.7	10.0	0.9	-6.6	0.97
<i>Paracirrhites forsteri</i>	A	0.3	0.2	0.2	0.1	-20.0	0.53
<i>Parupeneus bifasciatus</i>		0.2	0.2	0.2	0.2	0.0	0.67
<i>Parupeneus cyclostomus</i>		0.1	0.2	0.1	0.1	0.0	0.73
<i>Parupeneus multifasciatus</i>	A	0.7	0.5	0.6	0.5	-14.3	0.90
<i>Pervagor aspricaudus</i>		0.1	0.1	0.1	0.1	100.0	0.31
<i>Plectroglyphidodon imparipennis</i>		0.5	0.5	0.0	0.0	-100.0	0.19
<i>Plectroglyphidodon johnstonianus</i>		3.5	0.6	4.5	1.2	27.1	0.21
<i>Pseudocheilinus evanidus</i>		1.6	1.1	1.3	0.8	-21.9	0.64
<i>Pseudocheilinus octotaenia</i>	A	2.6	1.3	2.3	1.3	-11.8	0.67
<i>Pseudocheilinus tetrataenia</i>	A	0.9	1.5	1.7	1.1	83.3	0.20
<i>Sargocentron spiniferum</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Scarus dubius</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus perspicillatus</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Scarus rubroviolaceus</i>		0.3	0.4	0.4	0.4	16.7	0.75
<i>Scarus sordidus</i>		4.0	1.5	2.8	1.0	-30.4	0.23

<i>Scorpaenopsis diabolus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Stethojulis balteata</i>	A	0.2	0.2	0.1	0.1	-75.0	0.39
<i>Sufflamen bursa</i>	A	1.2	0.5	1.1	0.5	-8.7	0.62
<i>Synodus spp.</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Synodus variegatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Thalassoma duperrey</i>	A	5.6	1.5	6.1	1.5	9.0	0.11
<i>Xanthichthys auromarginatus</i>	A	0.2	0.2	0.6	0.7	266.7	0.67
<i>Zanclus cornutus</i>	A1	1.3	0.4	0.8	0.5	-42.3	0.68
<i>Zebrasoma flavescens</i>	A1	16.5	2.0	17.1	2.4	3.6	0.94

Kealakekua Bay, Hawai'i (Site #19)

19° 28.8' N 155° 56.0' W

Depth: 6-11 m

Management Status: Marine Life Conservation District

Summary of findings: there were significant changes in *Acanthurus thompsoni*, *Chromis verater*, *Ctenochaetus hawaiiensis* and *Zanclus cornutus*



Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 149
 Number of quadrats analyzed = 80



Substrate	Mean % cover
Boulder	0.0
Flat	0.2
Macroalgae	0.0
<i>Montipora</i> spp	0.9
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	29.0
Old dead <i>P. lobata</i>	27.0
Old dead <i>P. meandrina</i>	0.0
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.5
<i>Porites compressa</i>	14.0
<i>Porites compressa</i> hole	0.2
<i>Porites lobata</i>	22.5
Rubble	5.5
Sand	0.0
Unknown coral	0.3

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Pre-closure		Post-closure		% change	P
		Mean	SD	Mean	SD		
<i>Abudefduf abdominalis</i>		12.4	9.1	14.1	4.3	13.7	0.76
<i>Acanthurus achilles</i>	A1	0.2	0.2	0.3	0.3	25.0	0.39
<i>Acanthurus leucopareius</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Acanthurus nigrofuscus</i>	A	1.6	0.4	1.3	0.7	-16.1	0.82
<i>Acanthurus nigroris</i>	A	1.3	1.3	0.6	0.4	-56.0	0.60
<i>Acanthurus olivaceus</i>	A	0.6	1.3	0.2	0.3	-66.7	0.39
<i>Acanthurus thompsoni</i>		0.1	0.1	1.3	1.4	1200.0	*0.02
<i>Apogon kallopterus</i>		0.2	0.3	0.2	0.2	0.0	0.74
<i>Apogon menesemus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Apogon spp.</i>		0.1	0.2	0.1	0.1	-50.0	0.86
<i>Arothron meleagris</i>		0.2	0.1	0.2	0.2	33.3	0.86
<i>Aulostomus chinensis</i>		0.9	0.5	1.0	0.6	11.1	0.35
<i>Bodianus bilunulatus</i>		0.1	0.1	0.1	0.1	0.0	0.24
<i>Calotomus carolinus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Cantherhines dumerilii</i>		0.6	0.4	0.1	0.1	-81.8	0.15
<i>Canthigaster amboinensis</i>		0.2	0.3	0.2	0.3	0.0	0.78
<i>Canthigaster jactator</i>		4.7	1.4	2.9	1.8	-37.6	0.47
<i>Centropyge potteri</i>	A1	1.4	0.8	2.0	0.8	48.1	0.25
<i>Cephalopholis argus</i>	A	0.7	0.6	1.0	0.7	46.2	0.45
<i>Chaetodon auriga</i>	A	0.0	0.0	0.1	0.2	100.0	0.24
<i>Chaetodon fremblii</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Chaetodon lineolatus</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Chaetodon lunula</i>	A	1.5	0.8	1.1	1.2	-30.0	0.84
<i>Chaetodon miliaris</i>	A	0.2	0.2	0.0	0.0	-100.0	0.15
<i>Chaetodon multicinctus</i>	A1	3.5	0.4	3.0	1.2	-14.3	0.62
<i>Chaetodon ornatissimus</i>	A1	2.7	1.5	2.0	0.6	-24.5	0.58
<i>Chaetodon quadrimaculatus</i>	A1	0.7	0.5	0.4	0.4	-42.9	0.54
<i>Chromis agilis</i>		30.3	6.4	33.4	12.0	10.4	0.95
<i>Chromis hanui</i>		1.1	1.8	1.5	1.1	31.8	0.48
<i>Chromis ovalis</i>		2.9	6.3	2.4	3.9	-19.0	0.93
<i>Chromis vanderbilti</i>		3.7	6.1	3.0	2.6	-17.8	0.91
<i>Chromis verater</i>		0.0	0.0	0.3	0.3	100.0	*0.04
<i>Cirrhitus pinnulatus</i>	A	0.1	0.2	0.0	0.0	-100.0	0.45
<i>Cirripectes vanderbilti</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Coris gaimard</i>	A	0.4	0.5	0.3	0.2	-37.5	0.32

<i>Ctenochaetus hawaiiensis</i>	A	1.4	0.5	0.4	0.1	-75.0	*0.04
<i>Ctenochaetus strigosus</i>	A1	43.8	3.2	48.2	9.0	9.9	0.46
<i>Exallias brevis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Forcipiger flavissimus</i>	A1	1.5	0.8	1.5	0.9	-3.3	0.28
<i>Forcipiger longirostris</i>	A1	1.4	0.9	0.9	0.5	-39.3	0.70
<i>Gomphosus varius</i>	A	2.7	2.7	1.4	1.1	-47.2	0.70
<i>Gymnothorax flavimarginatus</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Gymnothorax meleagris</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Gymnothorax spp.</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Halichoeres ornatissimus</i>	A	0.7	0.3	0.7	0.7	7.7	0.51
<i>Hemitaenichthys thompsoni</i>	A	0.1	0.2	0.0	0.0	-100.0	0.45
<i>Heteropriacanthus cruentatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Kyphosus bigibbus</i>		0.2	0.3	0.1	0.2	-50.0	0.83
<i>Labroides phthirophagus</i>	A	2.7	1.1	2.2	1.1	-17.0	0.91
<i>Lutjanus kasmira</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Melichthys niger</i>	A	3.0	1.6	6.2	2.2	105.0	0.07
<i>Melichthys vidua</i>	A	0.8	0.5	0.6	0.2	-20.0	0.75
<i>Monotaxis grandoculis</i>		0.2	0.4	0.1	0.1	-75.0	0.64
<i>Mulloidichthys flavolineatus</i>		0.2	0.3	0.1	0.1	-66.7	0.31
<i>Mulloidichthys vanicolensis</i>	A	0.6	0.7	4.5	7.5	641.7	0.16
<i>Myripristis berndti</i>		7.3	11.5	1.4	0.9	-80.8	0.42
<i>Myripristis kuntee</i>		16.3	11.2	12.2	5.0	-25.2	0.40
<i>Naso hexacanthus</i>		0.4	0.5	0.0	0.0	-100.0	0.24
<i>Naso lituratus</i>	A	2.4	1.0	2.5	0.5	6.4	0.88
<i>Naso unicornis</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Neoniphon sammara</i>		1.0	1.1	0.5	0.8	-55.0	0.67
<i>Ostracion meleagris</i>	A	0.4	0.5	0.2	0.2	-50.0	0.49
<i>Ostracion whitleyi</i>	A	0.1	0.1	0.1	0.1	0.0	0.78
<i>Oxycheilinus unifasciatus</i>		0.5	0.2	0.3	0.3	-33.3	1.00
<i>Paracirrhites arcatus</i>	A	2.3	1.0	1.8	0.4	-22.2	0.20
<i>Paracirrhites forsteri</i>	A	0.1	0.1	0.1	0.2	100.0	0.48
<i>Parupeneus bifasciatus</i>		0.2	0.2	0.1	0.1	-33.3	1.00
<i>Parupeneus multifasciatus</i>	A	0.6	0.7	0.5	0.3	-9.1	0.86
<i>Parupeneus porphyreus</i>		0.0	0.0	0.1	0.1	100.0	0.06
<i>Pervagor aspricaudus</i>		0.3	0.2	0.1	0.1	-80.0	0.21
<i>Plectroglyphidodon imparipennis</i>		0.4	0.7	0.0	0.0	-100.0	0.37
<i>Plectroglyphidodon johnstonianus</i>		1.6	0.3	1.6	1.0	3.2	0.54
<i>Priacanthus meeki</i>		0.2	0.3	0.0	0.0	-100.0	0.31
<i>Pseudocheilinus evanidus</i>		1.0	1.2	0.2	0.3	-78.9	0.41
<i>Pseudocheilinus octotaenia</i>	A	1.3	0.9	0.6	0.4	-56.0	0.50
<i>Pseudocheilinus tetrataenia</i>	A	0.9	0.7	0.6	0.2	-29.4	0.63
<i>Pseudojuloides cerasinus</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Sargocentron spiniferum</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Sargocentron spp.</i>		0.2	0.4	0.0	0.0	-100.0	0.45
<i>Sargocentron tiere</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Scarus dubius</i>		0.5	0.9	0.0	0.0	-100.0	0.39
<i>Scarus perspicillatus</i>		0.2	0.3	0.0	0.0	-100.0	0.45

<i>Scarus psittacus</i>		0.2	0.2	0.1	0.2	-33.3	1.00
<i>Scarus rubroviolaceus</i>		0.3	0.3	0.2	0.3	-40.0	0.09
<i>Scarus sordidus</i>		2.9	1.0	1.9	0.8	-36.2	0.47
<i>Stegastes fasciolatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Stethojulis balteata</i>	A	0.1	0.1	0.4	0.4	300.0	0.03
<i>Sufflamen bursa</i>	A	0.2	0.2	0.2	0.1	0.0	0.73
<i>Synodus ulae</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Thalassoma duperrey</i>	A	8.3	3.3	6.7	1.9	-19.9	0.84
<i>Xanthichthys auromarginatus</i>	A	0.1	0.1	0.2	0.2	200.0	0.21
<i>Zanclus cornutus</i>	A1	1.3	0.2	0.1	0.1	-92.0	*0.00
<i>Zebrasoma flavescens</i>	A1	36.8	6.0	34.6	5.3	-6.0	0.64

Ke'ei, Hawai'i (Site #20)

19° 27.7' N 155° 55.6' W

Depth: 9-15 m

Management Status: Fishery Replenishment Area

Summary of findings: there were significant changes in *Forcipiger flavissimus* and *Paracirrhites forsteri*

Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 145
 Number of quadrats analyzed = 81



Substrate	Mean % cover
Boulder	0.0
Flat	2.5
Macroalgae	0.0
<i>Montipora</i> spp	0.0
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	30.1
Old dead <i>P. lobata</i>	6.4
Old dead <i>P. meandrina</i>	0.0
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.3
<i>Porites compressa</i>	33.1
<i>Porites compressa</i> hole	1.4
<i>Porites lobata</i>	11.9
Rubble	13.7
Sand	0.2
Unknown coral	0.3

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Pre-closure		Post-closure		% change	P
		Mean	SD	Mean	SD		
<i>Abudefduf abdominalis</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Acanthurus achilles</i>	A1	0.5	0.4	0.6	0.5	33.3	0.89
<i>Acanthurus nigrofuscus</i>	A	9.6	1.7	7.8	2.3	-18.3	0.12
<i>Acanthurus nigroris</i>	A	0.1	0.1	0.0	0.0	-100.0	0.24
<i>Acanthurus olivaceus</i>	A	0.0	0.0	0.1	0.1	100.0	0.45
<i>Acanthurus thompsoni</i>		0.6	1.3	2.7	2.8	350.0	0.05
<i>Acanthurus triostegus</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Anampses chrysocephalus</i>	A	0.1	0.2	0.0	0.0	-100.0	0.45
<i>Aphareus furca</i>		0.0	0.0	0.2	0.2	100.0	0.08
<i>Apogon kallopterus</i>		0.6	0.5	0.5	0.4	-25.0	0.83
<i>Apogon spp.</i>		0.1	0.2	0.2	0.4	100.0	0.48
<i>Aulostomus chinensis</i>		0.1	0.1	0.1	0.1	-50.0	0.81
<i>Bodianus bilunulatus</i>		0.2	0.3	0.1	0.1	-75.0	0.54
<i>Calotomus carolinus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Cantherhines dumerilii</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Canthigaster amboinensis</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Canthigaster jactator</i>		0.3	0.3	0.4	0.5	33.3	0.60
<i>Centropyge loriculus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Centropyge potteri</i>	A1	1.2	0.6	1.3	0.6	8.3	0.80
<i>Cephalopholis argus</i>	A	0.4	0.3	0.2	0.3	-50.0	0.72
<i>Chaetodon multicinctus</i>	A1	3.7	1.3	3.4	1.0	-9.5	0.66
<i>Chaetodon ornatissimus</i>	A1	0.7	0.4	0.5	0.5	-30.8	0.95
<i>Chromis agilis</i>		45.3	21.5	34.5	7.7	-24.0	0.30
<i>Chromis hanui</i>		2.0	0.9	1.4	0.9	-30.8	0.56
<i>Chromis ovalis</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Chromis vanderbilii</i>		0.6	0.7	0.5	0.3	-25.0	0.46
<i>Chromis verater</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Coris gaimard</i>	A	0.3	0.3	0.6	0.7	83.3	0.23
<i>Coris venusta</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Ctenochaetus hawaiiensis</i>	A	0.1	0.1	0.2	0.2	100.0	0.61
<i>Ctenochaetus strigosus</i>	A1	29.7	7.8	26.7	8.2	-9.9	0.62
<i>Exallias brevis</i>		0.1	0.1	0.2	0.1	200.0	0.65
<i>Fistularia commersonii</i>		0.3	0.4	0.2	0.3	-40.0	0.93
<i>Forcipiger flavissimus</i>	A1	0.6	0.2	0.3	0.3	-58.3	*0.02
<i>Forcipiger longirostris</i>	A1	0.1	0.2	0.1	0.1	-50.0	0.86

<i>Gomphosus varius</i>	A	0.7	0.3	0.9	0.5	28.6	0.51
<i>Gymnothorax flavimarginatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Gymnothorax meleagris</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Gymnothorax spp.</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Halichoeres ornatissimus</i>	A	0.1	0.1	0.4	0.4	300.0	0.13
<i>Labroides phthirophagus</i>	A	0.7	0.6	0.9	0.3	21.4	0.84
<i>Macropharyngodon geoffroyi</i>	A	0.0	0.0	0.1	0.2	100.0	0.24
<i>Melichthys niger</i>	A	0.8	0.5	0.8	1.5	0.0	0.10
<i>Melichthys vidua</i>	A	0.5	0.4	0.5	0.3	0.0	0.33
<i>Mulloidichthys vanicolensis</i>	A	0.0	0.0	0.1	0.2	100.0	0.24
<i>Myripristis berndti</i>		0.4	0.7	0.1	0.1	-85.7	0.30
<i>Myripristis kuntee</i>		1.5	1.0	1.0	0.9	-31.0	0.67
<i>Myripristis spp.</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Naso hexacanthus</i>		0.3	0.4	0.0	0.0	-100.0	0.25
<i>Naso lituratus</i>	A	1.1	0.6	1.3	0.7	23.8	0.10
<i>Naso unicornis</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Neoniphon sammara</i>		0.5	0.5	0.5	0.5	0.0	0.81
<i>Ostracion meleagris</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Ostracion whitleyi</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Oxycheilinus unifasciatus</i>		0.6	0.4	0.3	0.3	-54.5	0.54
<i>Paracirrhites arcatus</i>	A	0.4	0.2	0.6	0.3	37.5	0.83
<i>Paracirrhites forsteri</i>	A	0.5	0.3	0.1	0.1	-90.0	*0.02
<i>Parupeneus bifasciatus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Parupeneus cyclostomus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Parupeneus multifasciatus</i>	A	0.1	0.2	0.3	0.4	150.0	0.42
<i>Pervagor aspricaudus</i>		0.3	0.4	0.0	0.0	-100.0	0.25
<i>Plagiotremus goslinei</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Plectroglyphidodon imparipennis</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Plectroglyphidodon johnstonianus</i>		0.6	0.2	0.5	0.2	-25.0	0.79
<i>Pseudocheilinus evanidus</i>		1.3	0.6	0.8	0.5	-36.0	0.38
<i>Pseudocheilinus octotaenia</i>	A	3.0	0.8	1.2	0.7	-61.0	0.08
<i>Pseudocheilinus tetrataenia</i>	A	1.2	0.8	1.3	1.2	8.3	0.45
<i>Pseudojuloides cerasinus</i>	A	0.1	0.1	0.6	0.7	1100.0	0.09
<i>Sargocentron ensiferum</i>		0.2	0.4	0.0	0.0	-100.0	0.45
<i>Sargocentron spp.</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Sargocentron xantherythrum</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Scarus dubius</i>		0.2	0.2	0.0	0.0	-100.0	0.28
<i>Scarus perspicillatus</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Scarus psittacus</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Scarus rubroviolaceus</i>		0.1	0.2	0.3	0.4	200.0	0.59
<i>Scarus sordidus</i>		2.0	1.3	1.6	0.9	-22.5	0.96
<i>Seriola dumerili</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Stegastes fasciolatus</i>		1.1	0.5	1.3	0.5	19.0	0.11
<i>Stethojulis balteata</i>	A	1.0	1.2	0.6	0.4	-45.0	0.55
<i>Sufflamen bursa</i>	A	0.4	0.2	0.1	0.1	-87.5	0.09
<i>Synodus spp.</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Thalassoma ballieui</i>		0.1	0.1	0.0	0.0	-100.0	0.45

<i>Thalassoma duperrey</i>	A	6.7	1.4	4.6	0.5	-32.1	0.07
<i>Xanthichthys auromarginatus</i>	A	0.2	0.2	0.2	0.1	0.0	0.85
<i>Zebrasoma flavescens</i>	A1	10.8	4.6	15.0	3.3	39.5	0.43

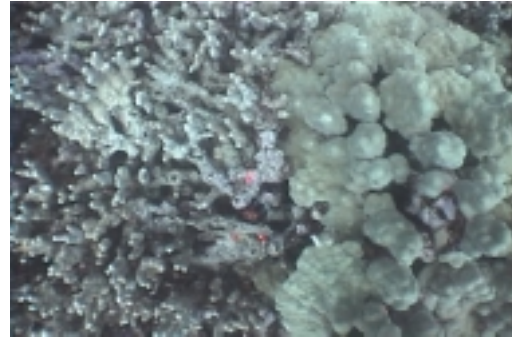
Kalahiki Beach, Hawai'i (Site #21)

19° 22.1' N 155° 53.8' W

Depth: 9-12 m

Management Status: Fishery Replenishment Area

Summary of findings: there were significant changes in *Acanthurus nigrofuscus* and *Zebrasoma flavescens*



Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 149
 Number of quadrats analyzed = 80

Substrate	Mean % cover
Boulder	0.1
Flat	0.7
Macroalgae	0.0
<i>Montipora</i> spp	0.2
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	14.7
Old dead <i>P. lobata</i>	19.2
Old dead <i>P. meandrina</i>	0.0
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.1
<i>Porites compressa</i>	14.5
<i>Porites compressa</i> hole	0.5
<i>Porites lobata</i>	31.1
Rubble	16.4
Sand	2.2
Unknown coral	0.3

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Pre-closure		Post-closure		% change	P
		Mean	SD	Mean	SD		
<i>Acanthurus achilles</i>	A1	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Acanthurus nigrofuscus</i>	A	20.4	5.9	12.9	3.0	-36.9	*0.02
<i>Acanthurus nigroris</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Acanthurus olivaceus</i>	A	0.4	0.9	0.0	0.0	-100.0	0.45
<i>Acanthurus thompsoni</i>		0.2	0.2	0.0	0.0	-100.0	0.28
<i>Anampses chrysocephalus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Anampses cuvier</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Apogon kallopterus</i>		0.5	0.4	0.7	0.8	55.6	0.44
<i>Aulostomus chinensis</i>		0.3	0.3	0.1	0.1	-80.0	0.38
<i>Bodianus bilunulatus</i>		0.1	0.1	0.1	0.2	100.0	0.48
<i>Calotomus carolinus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Cantherhines dumerilii</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Canthigaster jactator</i>		2.1	1.3	1.6	1.4	-24.4	0.98
<i>Centropyge potteri</i>	A1	2.9	1.3	2.4	1.4	-15.8	1.00
<i>Cephalopholis argus</i>	A	0.3	0.3	0.3	0.3	-16.7	0.83
<i>Chaetodon multicinctus</i>	A1	9.0	1.4	9.6	1.1	6.1	0.50
<i>Chaetodon ornatissimus</i>	A1	1.4	0.6	0.6	0.3	-60.7	0.01
<i>Chaetodon quadrimaculatus</i>	A1	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Chromis agilis</i>		10.0	2.6	14.1	5.2	41.0	0.06
<i>Chromis hanui</i>		3.6	0.9	3.4	0.9	-5.6	0.86
<i>Chromis ovalis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Chromis vanderbilti</i>		0.6	0.5	0.3	0.5	-50.0	0.72
<i>Chromis verater</i>		0.2	0.3	0.2	0.2	0.0	0.74
<i>Cirrhilabrus jordani</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Cirrhitops fasciatus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Cirrhitus pinnulatus</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Cirripectes vanderbilti</i>		0.0	0.0	0.1	0.1	100.0	0.06
<i>Coris gaimard</i>	A	0.3	0.3	0.2	0.2	-40.0	0.90
<i>Coris venusta</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Ctenochaetus hawaiiensis</i>	A	0.9	0.7	1.1	0.5	22.2	0.63
<i>Ctenochaetus strigosus</i>	A1	45.8	14.7	38.8	1.9	-15.3	0.40
<i>Echidna nebulosa</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Exallias brevis</i>		0.2	0.1	0.1	0.1	-66.7	0.49
<i>Fistularia commersonii</i>		0.2	0.4	0.0	0.0	-100.0	0.45
<i>Forcipiger flavissimus</i>	A1	0.2	0.3	0.2	0.1	-25.0	0.56

<i>Forcipiger longirostris</i>	A1	0.0	0.0	0.6	1.1	100.0	0.60
<i>Gomphosus varius</i>	A	0.4	0.2	0.5	0.6	42.9	0.44
<i>Gymnothorax eurostus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Gymnothorax flavimarginatus</i>		0.1	0.1	0.1	0.1	0.0	0.24
<i>Gymnothorax meleagris</i>		0.2	0.2	0.2	0.2	0.0	0.36
<i>Gymnothorax undulatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Halichoeres ornatissimus</i>	A	0.7	0.5	2.1	0.5	200.0	0.02
<i>Labroides phthirophagus</i>	A	0.6	0.4	1.0	0.3	58.3	0.27
<i>Macropharyngodon geoffroyi</i>	A	0.2	0.2	0.0	0.0	-100.0	0.28
<i>Melichthys niger</i>	A	3.9	4.0	0.8	0.9	-80.8	0.23
<i>Melichthys vidua</i>	A	0.3	0.3	0.3	0.4	0.0	0.29
<i>Mulloidichthys vanicolensis</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Myripristis berndti</i>		0.9	1.0	0.3	0.7	-66.7	0.06
<i>Myripristis kuntee</i>		6.1	3.8	5.1	2.1	-17.2	0.95
<i>Naso lituratus</i>	A	1.8	1.1	1.5	0.8	-19.4	0.51
<i>Naso unicornis</i>	A	0.1	0.1	0.1	0.1	0.0	0.65
<i>Nemateleotris magnifica</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Neoniphon sammara</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Ostracion meleagris</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Ostracion whitleyi</i>	A	0.1	0.1	0.1	0.2	0.0	0.15
<i>Oxycheilinus unifasciatus</i>		0.3	0.3	0.2	0.1	-40.0	0.43
<i>Paracirrhites arcatus</i>	A	3.7	1.1	2.7	0.8	-27.0	0.45
<i>Paracirrhites forsteri</i>	A	0.5	0.2	0.4	0.3	-20.0	0.18
<i>Parupeneus bifasciatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Parupeneus multifasciatus</i>	A	1.1	0.7	1.2	0.9	9.1	0.94
<i>Parupeneus porphyreus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Pervagor aspricaudus</i>		0.3	0.3	0.2	0.1	-40.0	0.43
<i>Pervagor spilosoma</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Plectroglyphidodon imparipennis</i>		0.3	0.6	0.0	0.0	-100.0	0.45
<i>Plectroglyphidodon johnstonianus</i>		1.9	0.8	2.5	0.5	28.9	0.35
<i>Pseudocheilinus evanidus</i>		7.9	3.0	5.4	2.0	-31.8	0.30
<i>Pseudocheilinus octotaenia</i>	A	6.2	2.8	4.3	2.0	-30.1	0.56
<i>Pseudocheilinus tetrataenia</i>	A	1.6	0.8	3.0	2.2	84.4	0.07
<i>Pseudojuloides cerasinus</i>	A	0.7	0.4	0.6	0.7	-7.7	0.77
<i>Sargocentron diadema</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Sargocentron xantherythrum</i>		0.1	0.2	0.1	0.1	-50.0	0.86
<i>Scarus rubroviolaceus</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Scarus sordidus</i>		0.3	0.2	0.5	0.5	66.7	0.50
<i>Stegastes fasciolatus</i>		0.4	0.3	0.2	0.1	-57.1	0.18
<i>Stethojulis balteata</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Sufflamen bursa</i>	A	1.2	1.1	0.6	0.6	-54.2	0.10
<i>Synodus spp.</i>		0.0	0.0	0.1	0.2	100.0	0.24
<i>Thalassoma duperrey</i>	A	5.4	1.5	6.0	2.8	12.1	0.27
<i>Xanthichthys auromarginatus</i>	A	0.6	0.3	0.5	0.4	-16.7	0.44
<i>Zanclus cornutus</i>	A1	0.1	0.1	0.2	0.3	200.0	0.31
<i>Zebrasoma flavescens</i>	A1	19.3	3.3	11.7	3.0	-39.5	*0.00

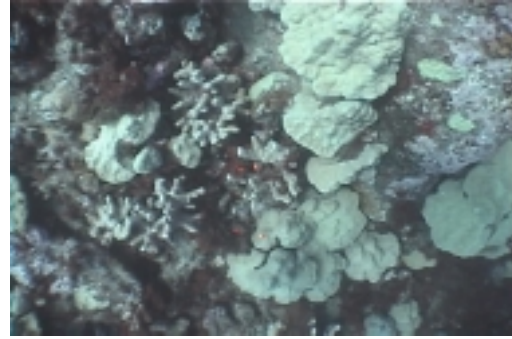
Ho'okena, Hawai'i (Site #22)

19° 17.9' N 155° 53.4' W

Depth: 11-15 m

Management Status: none

Summary of findings: there were significant changes in *Halichoeres ornatissimus* and *Zanclus cornutus*



Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 127
 Number of quadrats analyzed = 80

Substrate	Mean % cover
Boulder	9.1
Flat	25.0
Macroalgae	1.9
<i>Montipora</i> spp	2.6
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.1
Old dead <i>P. compressa</i>	0.9
Old dead <i>P. lobata</i>	20.2
Old dead <i>P. meandrina</i>	1.3
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	4.7
<i>Porites compressa</i>	3.5
<i>Porites compressa</i> hole	0.1
<i>Porites lobata</i>	22.6
Rubble	4.7
Sand	2.4
Unknown coral	1.0

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Pre-closure		Post-closure		% change	P
		Mean	SD	Mean	SD		
<i>Abudefduf abdominalis</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Acanthurus achilles</i>	A1	0.1	0.1	0.3	0.2	400.0	0.15
<i>Acanthurus blochii</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Acanthurus dussumieri</i>	A	0.2	0.3	0.1	0.1	-66.7	0.71
<i>Acanthurus nigrofuscus</i>	A	23.3	6.9	16.6	1.1	-28.8	0.16
<i>Acanthurus nigroris</i>	A	0.7	0.5	0.4	0.2	-38.5	0.14
<i>Acanthurus olivaceus</i>	A	0.0	0.0	0.1	0.1	100.0	0.78
<i>Acanthurus thompsoni</i>		1.2	1.4	0.0	0.0	-100.0	0.18
<i>Acanthurus triostegus</i>	A	0.3	0.6	0.0	0.0	-100.0	0.45
<i>Aluterus scriptus</i>		0.0	0.0	0.2	0.3	100.0	0.24
<i>Antennarius commersoni</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Aphareus furca</i>		0.1	0.1	0.2	0.4	100.0	0.45
<i>Apogon kallopterus</i>		0.8	0.5	0.9	0.9	20.0	0.70
<i>Apogon taeniopterus</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Arothron meleagris</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Aulostomus chinensis</i>		0.3	0.3	0.6	0.5	140.0	0.13
<i>Bodianus bilunulatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Cantherhines dumerilii</i>		0.1	0.2	0.1	0.2	0.0	0.78
<i>Canthigaster amboinensis</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Canthigaster jactator</i>		7.2	3.4	7.3	2.4	0.7	0.86
<i>Centropyge potteri</i>	A1	0.8	0.6	1.1	1.1	37.5	0.38
<i>Cephalopholis argus</i>	A	0.5	0.2	0.5	0.3	11.1	0.33
<i>Chaetodon lunula</i>	A	0.5	0.4	0.4	0.3	-20.0	0.93
<i>Chaetodon multicoloratus</i>	A1	5.2	1.5	4.5	1.7	-12.6	0.50
<i>Chaetodon ornatissimus</i>	A1	1.0	0.4	1.0	0.8	0.0	0.63
<i>Chaetodon quadrimaculatus</i>	A1	0.7	0.3	0.9	0.9	30.8	0.82
<i>Chaetodon unimaculatus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.24
<i>Chromis agilis</i>		47.9	9.6	47.3	15.9	-1.4	0.79
<i>Chromis hanui</i>		2.1	1.0	1.3	0.6	-40.5	0.18
<i>Chromis vanderbilti</i>		6.7	4.5	5.6	4.8	-17.2	0.15
<i>Cirrhitops fasciatus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Cirrhitus pinnulatus</i>	A	0.0	0.0	0.1	0.1	100.0	0.24
<i>Cirripectes vanderbilti</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Coris flavovittata</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Coris gaimard</i>	A	0.1	0.1	0.1	0.1	0.0	0.78

<i>Coris venusta</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Ctenochaetus hawaiiensis</i>	A	0.9	0.6	0.4	0.2	-55.6	0.32
<i>Ctenochaetus strigosus</i>	A1	17.1	5.9	15.2	2.0	-11.1	0.56
<i>Fistularia commersonii</i>		0.0	0.0	0.2	0.3	100.0	0.45
<i>Forcipiger flavissimus</i>	A1	0.6	0.5	0.5	0.6	-25.0	0.86
<i>Forcipiger longirostris</i>	A1	0.1	0.1	0.2	0.1	50.0	0.24
<i>Gomphosus varius</i>	A	0.6	0.3	0.5	0.4	-25.0	0.85
<i>Gymnothorax meleagris</i>		0.2	0.2	0.1	0.1	-50.0	0.21
<i>Gymnothorax spp.</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Gymnothorax undulatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Halichoeres ornatissimus</i>	A	1.8	0.9	2.7	1.1	51.4	*0.04
<i>Hemitaenichthys thompsoni</i>	A	0.0	0.0	0.3	0.6	100.0	0.24
<i>Labroides phthirophagus</i>	A	1.4	0.5	1.7	1.0	21.4	0.28
<i>Lutjanus kasmira</i>		0.2	0.3	0.2	0.2	-25.0	0.90
<i>Macropharyngodon geoffroyi</i>	A	0.1	0.1	0.1	0.1	0.0	0.24
<i>Melichthys niger</i>	A	0.3	0.5	0.2	0.3	-33.3	1.00
<i>Melichthys vidua</i>	A	0.4	0.4	0.3	0.3	-14.3	0.70
<i>Monotaxis grandoculis</i>		0.3	0.5	0.1	0.1	-83.3	0.49
<i>Mulloidichthys vanicolensis</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Myripristis berndti</i>		1.1	0.7	0.2	0.1	-85.7	0.13
<i>Myripristis kuntee</i>		1.8	1.4	2.5	0.5	40.0	0.54
<i>Naso brevirostris</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Naso hexacanthus</i>		0.5	0.5	0.0	0.0	-100.0	0.15
<i>Naso lituratus</i>	A	1.5	0.7	1.3	0.8	-13.8	0.33
<i>Neoniphon sammara</i>		0.2	0.3	0.0	0.0	-100.0	0.31
<i>Ostracion meleagris</i>	A	0.2	0.3	0.0	0.0	-100.0	0.45
<i>Oxycheilinus unifasciatus</i>		0.1	0.1	0.2	0.2	300.0	1.00
<i>Paracirrhites arcatus</i>	A	18.0	1.0	12.9	4.0	-28.4	0.16
<i>Paracirrhites forsteri</i>	A	0.5	0.3	0.4	0.2	-11.1	0.91
<i>Parupeneus bifasciatus</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Parupeneus multifasciatus</i>	A	0.8	1.1	0.9	0.5	6.2	0.74
<i>Pervagor aspricaudus</i>		0.3	0.3	0.4	0.4	40.0	0.56
<i>Pervagor spilosoma</i>		0.2	0.4	0.0	0.0	-100.0	0.45
<i>Plectroglyphidodon imparipennis</i>		0.1	0.1	0.1	0.1	0.0	0.24
<i>Plectroglyphidodon johnstonianus</i>		2.9	0.7	2.8	1.0	-5.2	0.88
<i>Pseudocheilinus evanidus</i>		2.1	0.6	1.0	0.8	-53.7	0.30
<i>Pseudocheilinus octotaenia</i>	A	6.9	2.4	6.0	2.0	-13.0	0.82
<i>Pseudocheilinus tetrataenia</i>	A	1.9	0.9	3.0	2.4	57.9	0.11
<i>Sargocentron diadema</i>		0.2	0.3	0.0	0.0	-100.0	0.45
<i>Sargocentron spp.</i>		0.1	0.2	0.1	0.2	0.0	0.24
<i>Sargocentron tiere</i>		0.3	0.3	0.1	0.1	-60.0	0.56
<i>Sargocentron xantherythrum</i>		0.4	0.4	0.5	0.7	42.9	0.39
<i>Scarus rubroviolaceus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scorpaenopsis cacopsis</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Sebastapistes coniora</i>		0.2	0.2	0.1	0.1	-66.7	0.61
<i>Stegastes fasciolatus</i>		1.8	0.8	2.1	0.8	17.1	0.36
<i>Stethojulis balteata</i>	A	0.2	0.2	0.0	0.0	-100.0	0.28

<i>Sufflamen bursa</i>	A	1.5	0.6	1.2	0.7	-23.3	0.78
<i>Thalassoma ballieui</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Thalassoma duperrey</i>	A	11.0	1.6	9.7	1.8	-11.8	0.26
<i>Xanthichthys auromarginatus</i>	A	2.4	1.2	1.2	1.2	-50.0	0.43
<i>Zanclus cornutus</i>	A1	0.6	0.3	0.1	0.1	-81.8	*0.03
<i>Zebrasoma flavescens</i>	A1	12.6	3.3	12.0	1.7	-4.8	0.90

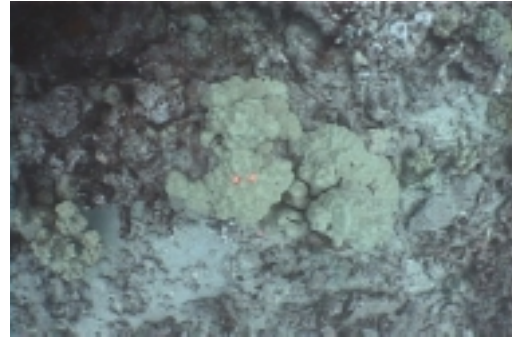
Omaka'a, Hawai'i (Site #23)

19° 10.0' N 155° 54.8' W

Depth: 10-15 m

Management Status: Fishery Replenishment Area

Summary of findings: there were significant changes in *Acanthurus thompsoni* and *Pseudocheilinus octotaenia*



Benthic habitat summary:

Survey conducted Spring 2000
 Number of quadrats archived = 137
 Number of quadrats analyzed = 80

Substrate	Mean % cover
Boulder	1.0
Flat	7.1
Macroalgae	0.1
<i>Montipora</i> spp	0.4
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	4.8
Old dead <i>P. lobata</i>	24.2
Old dead <i>P. meandrina</i>	0.3
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	1.2
<i>Porites compressa</i>	9.5
<i>Porites compressa</i> hole	0.7
<i>Porites lobata</i>	21.9
Rubble	21.4
Sand	7.2
Unknown coral	0.2

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Pre-closure		Post-closure		% change	P
		Mean	SD	Mean	SD		
<i>Acanthurus achilles</i>	A1	0.2	0.2	0.0	0.0	-100.0	0.15
<i>Acanthurus nigrofuscus</i>	A	18.2	4.8	20.8	11.0	14.6	0.89
<i>Acanthurus nigroris</i>	A	0.5	0.4	0.2	0.2	-60.0	0.08
<i>Acanthurus olivaceus</i>	A	0.2	0.2	0.2	0.3	0.0	0.60
<i>Acanthurus thompsoni</i>		0.2	0.3	1.4	1.5	575.0	*0.04
<i>Aphareus furca</i>		0.2	0.2	0.2	0.2	33.3	0.89
<i>Apogon kallopterus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Arothron meleagris</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Aulostomus chinensis</i>		0.2	0.3	0.1	0.1	-66.7	0.71
<i>Bodianus bilunulatus</i>		0.1	0.2	0.3	0.3	150.0	0.20
<i>Calotomus carolinus</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Cantherhines dumerilii</i>		0.0	0.0	0.2	0.2	100.0	0.08
<i>Canthigaster jactator</i>		1.9	1.1	2.4	0.8	23.7	0.87
<i>Caracanthus typicus</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Centropyge loriculus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Centropyge potteri</i>	A1	2.4	1.4	2.0	1.3	-16.7	0.55
<i>Cephalopholis argus</i>	A	0.2	0.2	0.3	0.3	66.7	0.60
<i>Chaetodon multicolor</i>	A1	7.3	1.3	5.6	1.7	-23.4	0.31
<i>Chaetodon ornatissimus</i>	A1	1.1	0.3	1.1	0.1	4.8	0.90
<i>Chaetodon quadrimaculatus</i>	A1	0.0	0.0	0.3	0.3	100.0	0.04
<i>Chaetodon unimaculatus</i>	A	0.1	0.1	0.1	0.1	0.0	0.78
<i>Chromis agilis</i>		71.2	17.4	58.8	12.4	-17.5	0.06
<i>Chromis hanui</i>		3.8	1.4	2.1	0.4	-44.0	0.20
<i>Chromis ovalis</i>		0.1	0.1	1.4	3.0	2600.0	0.25
<i>Chromis vanderbilii</i>		7.5	6.4	9.7	11.3	29.3	0.63
<i>Chromis verater</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Cirrhitops fasciatus</i>		0.3	0.4	0.2	0.3	-20.0	0.86
<i>Cirrhites pinnulatus</i>	A	0.2	0.2	0.0	0.0	-100.0	0.28
<i>Cirripectes vanderbilii</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Coris gaimard</i>	A	0.3	0.2	0.2	0.2	-20.0	0.17
<i>Coris venusta</i>		0.1	0.2	0.1	0.1	-50.0	0.28
<i>Ctenochaetus hawaiiensis</i>	A	0.4	0.1	0.8	0.9	100.0	0.18
<i>Ctenochaetus strigosus</i>	A1	29.2	9.7	27.3	4.9	-6.5	0.31
<i>Exallias brevis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Fistularia commersonii</i>		0.0	0.0	0.1	0.1	100.0	0.45

<i>Forcipiger flavissimus</i>	A1	0.5	0.5	0.3	0.3	-40.0	0.15
<i>Forcipiger longirostris</i>	A1	0.2	0.2	0.3	0.3	66.7	0.90
<i>Gomphosus varius</i>	A	0.7	0.4	0.6	0.4	-15.4	0.88
<i>Gymnothorax eurostus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Halichoeres ornatissimus</i>	A	2.3	0.8	2.3	1.1	2.2	0.21
<i>Labroides phthirophagus</i>	A	1.1	0.5	1.7	0.8	50.0	0.83
<i>Lutjanus kasmira</i>		0.0	0.0	0.1	0.1	100.0	0.78
<i>Macropharyngodon geoffroyi</i>	A	0.2	0.1	0.0	0.0	-100.0	0.11
<i>Melichthys niger</i>	A	0.4	0.5	0.4	0.4	0.0	0.64
<i>Melichthys vidua</i>	A	0.2	0.2	0.1	0.1	-66.7	0.15
<i>Monotaxis grandoculis</i>		1.6	1.0	1.1	0.7	-29.0	0.69
<i>Myripristis kuntee</i>		0.1	0.1	0.2	0.2	200.0	0.73
<i>Naso brevirostris</i>		1.3	2.8	0.1	0.1	-96.0	0.47
<i>Naso lituratus</i>	A	0.8	0.4	1.0	0.6	18.8	0.76
<i>Naso unicornis</i>	A	0.8	1.7	0.1	0.2	-86.7	0.54
<i>Neoniphon sammara</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Ostracion meleagris</i>	A	0.0	0.0	0.1	0.2	100.0	0.24
<i>Oxycheilinus unifasciatus</i>		0.5	0.5	0.3	0.2	-40.0	0.56
<i>Paracirrhites arcatus</i>	A	7.9	0.7	6.2	1.4	-21.5	0.07
<i>Paracirrhites forsteri</i>	A	0.8	1.0	0.2	0.2	-75.0	0.41
<i>Parupeneus bifasciatus</i>		0.3	0.3	0.1	0.1	-83.3	0.24
<i>Parupeneus cyclostomus</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Parupeneus multifasciatus</i>	A	1.1	0.3	0.8	0.6	-31.8	0.21
<i>Pervagor aspricaudus</i>		0.1	0.1	0.0	0.0	-100.0	0.24
<i>Plagiotremus goslinei</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Plectroglyphidodon imparipennis</i>		0.1	0.1	0.1	0.2	100.0	0.28
<i>Plectroglyphidodon johnstonianus</i>		2.9	1.0	1.9	0.7	-35.1	0.29
<i>Pseudocheilinus evanidus</i>		4.2	2.1	3.8	2.4	-8.4	0.81
<i>Pseudocheilinus octotaenia</i>	A	4.5	1.4	2.6	1.3	-41.6	*0.02
<i>Pseudocheilinus tetrataenia</i>	A	1.9	0.6	1.4	1.1	-24.3	0.87
<i>Pseudojuloides cerasinus</i>	A	0.3	0.6	0.1	0.1	-80.0	0.60
<i>Sargocentron ensiferum</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Sargocentron spiniferum</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Sargocentron tiere</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus dubius</i>		0.1	0.1	0.1	0.2	100.0	0.28
<i>Scarus perspicillatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus psittacus</i>		0.1	0.1	0.1	0.1	0.0	0.49
<i>Scarus rubroviolaceus</i>		0.2	0.3	0.4	0.5	75.0	0.30
<i>Scarus sordidus</i>		1.3	0.8	0.8	0.6	-38.5	0.43
<i>Stethojulis balteata</i>	A	0.4	0.2	0.3	0.3	-14.3	0.62
<i>Sufflamen bursa</i>	A	1.2	0.5	0.9	0.2	-29.2	0.63
<i>Thalassoma duperrey</i>	A	5.0	0.6	3.8	1.8	-23.2	0.92
<i>Xanthichthys auromarginatus</i>	A	0.2	0.1	0.3	0.3	66.7	0.60
<i>Zanclus cornutus</i>	A1	0.4	0.5	0.4	0.3	-12.5	1.00
<i>Zebrasoma flavescens</i>	A1	10.5	1.8	9.3	2.1	-11.9	0.13

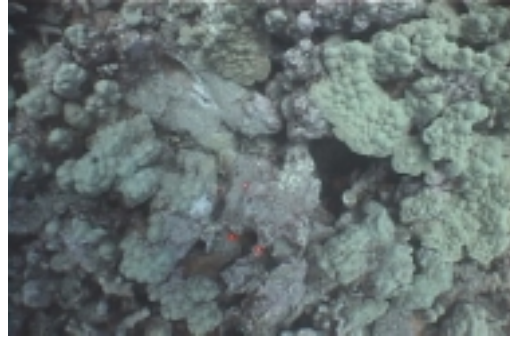
Manuka, Hawai'i (Site #24)

19° 04.6' N 155° 54.24' W

Depth: 10-15 m

Management Status: none

Summary of findings: there were significant changes in *Chaetodon multicinctus* and *Parupeneus bifasciatus*



Benthic habitat summary:

Survey conducted Spring 2000

Number of quadrats archived = 138

Number of quadrats analyzed = 80

Substrate	Mean % cover
Boulder	4.0
Flat	10.3
Macroalgae	0.0
<i>Montipora</i> spp	0.1
Newly dead <i>P. compressa</i>	0.0
Newly dead <i>P. lobata</i>	0.0
Newly dead <i>P. meandrina</i>	0.0
Old dead <i>Montipora</i> spp.	0.0
Old dead <i>P. compressa</i>	7.3
Old dead <i>P. lobata</i>	30.0
Old dead <i>P. meandrina</i>	0.1
<i>Palythoa tuberculosa</i>	0.0
<i>Pavona varians</i>	0.0
<i>Pocillopora eydouxi</i>	0.0
<i>Pocillopora meandrina</i>	0.2
<i>Porites compressa</i>	8.2
<i>Porites compressa</i> hole	0.1
<i>Porites lobata</i>	25.5
Rubble	9.7
Sand	4.5
Unknown coral	0.1

Fish community summary:

Surveys conducted = 10 (six pre-reserve closure in 1999, five post-reserve closure in 2000)

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

P: Is the P-value is for two-sample T-test of differences between pre- and post-reserve closure densities. P-values with an * are significant at P < 0.05 and indicate significant changes.

Species name	AQ	Pre-closure		Post-closure		% change	P
		Mean	SD	Mean	SD		
<i>Abudefduf abdominalis</i>		0.5	0.7	0.0	0.0	-100.0	0.25
<i>Acanthurus achilles</i>	A1	1.0	0.3	0.3	0.4	-68.4	0.10
<i>Acanthurus leucopareius</i>	A	0.1	0.1	0.2	0.2	200.0	0.61
<i>Acanthurus nigricans</i>		0.0	0.0	0.1	0.1	100.0	0.06
<i>Acanthurus nigrofuscus</i>	A	12.7	4.9	7.5	2.6	-40.7	0.18
<i>Acanthurus nigroris</i>	A	0.3	0.2	0.3	0.3	0.0	0.49
<i>Acanthurus olivaceus</i>	A	0.1	0.1	0.1	0.1	0.0	0.78
<i>Acanthurus thompsoni</i>		1.5	1.1	2.1	2.9	44.8	0.32
<i>Acanthurus triostegus</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Aluterus scriptus</i>		0.0	0.0	0.5	1.1	100.0	0.24
<i>Aphareus furca</i>		0.2	0.1	0.3	0.3	100.0	0.12
<i>Apogon kallopterus</i>		0.4	0.5	1.3	1.1	225.0	0.95
<i>Apogon taeniopterus</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Arothron meleagris</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Aulostomus chinensis</i>		0.2	0.2	0.1	0.1	-66.7	0.61
<i>Balistes polylepis</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Cantherhines dumerilii</i>		0.1	0.1	0.4	0.7	600.0	0.36
<i>Canthigaster amboinensis</i>		0.0	0.0	0.1	0.1	100.0	0.24
<i>Canthigaster jactator</i>		2.6	0.7	1.2	1.3	-54.9	0.05
<i>Centropyge potteri</i>	A1	3.2	1.0	3.0	1.0	-6.3	0.66
<i>Cephalopholis argus</i>	A	0.7	0.3	0.3	0.4	-53.8	0.32
<i>Chaetodon auriga</i>	A	0.1	0.1	0.0	0.0	-100.0	0.45
<i>Chaetodon multicinctus</i>	A1	7.1	1.5	4.3	1.4	-39.7	*0.01
<i>Chaetodon ornatissimus</i>	A1	0.6	0.4	0.7	0.4	18.2	0.58
<i>Chaetodon quadrimaculatus</i>	A1	2.1	0.8	1.1	0.9	-48.8	0.06
<i>Chromis agilis</i>		82.1	32.5	62.5	17.9	-23.9	0.62
<i>Chromis hanui</i>		3.3	1.5	5.4	3.4	64.6	0.14
<i>Chromis ovalis</i>		2.0	1.9	1.7	1.6	-15.4	0.44
<i>Chromis vanderbilii</i>		4.4	2.7	1.8	2.0	-59.8	0.25
<i>Chromis verater</i>		1.6	3.5	1.5	0.9	-6.5	0.95
<i>Cirrhitops fasciatus</i>		0.2	0.3	0.2	0.3	0.0	0.78
<i>Cirrhitus pinnulatus</i>	A	0.1	0.1	0.1	0.1	0.0	0.78
<i>Cirripectes vanderbilii</i>		1.3	2.8	0.1	0.1	-96.0	0.47
<i>Coris gaimard</i>	A	0.2	0.1	0.2	0.2	-25.0	0.86
<i>Coris venusta</i>		0.1	0.1	0.0	0.0	-100.0	0.24

<i>Ctenochaetus hawaiiensis</i>	A	0.3	0.4	0.5	0.3	80.0	0.11
<i>Ctenochaetus strigosus</i>	A1	40.3	15.2	41.5	10.1	3.0	0.83
<i>Dascyllus albisella</i>	A	1.9	1.5	1.8	1.5	-2.7	0.27
<i>Exallias brevis</i>		0.2	0.2	0.2	0.2	0.0	0.78
<i>Fistularia commersonii</i>		0.0	0.0	0.2	0.4	100.0	0.24
<i>Forcipiger flavissimus</i>	A1	0.7	0.5	0.5	0.4	-30.8	0.77
<i>Forcipiger longirostris</i>	A1	0.4	0.7	0.3	0.4	-14.3	0.82
<i>Gomphosus varius</i>	A	1.4	0.7	0.9	0.4	-37.0	0.68
<i>Gymnothorax eurostus</i>		0.1	0.1	0.1	0.1	0.0	0.24
<i>Gymnothorax flavimarginatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Gymnothorax meleagris</i>		0.2	0.2	0.2	0.3	0.0	0.43
<i>Gymnothorax spp.</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Halichoeres ornatissimus</i>	A	1.4	1.0	1.9	1.3	32.1	0.28
<i>Hemitaurichthys polylepis</i>	A	0.7	0.8	0.0	0.0	-100.0	0.21
<i>Hemitaurichthys thompsoni</i>	A	5.7	3.4	1.2	1.0	-79.8	0.07
<i>Labroides phthirophagus</i>	A	2.2	0.8	2.0	0.5	-11.4	0.60
<i>Lutjanus kasmira</i>		0.1	0.2	0.4	0.4	250.0	0.11
<i>Macropharyngodon geoffroyi</i>	A	0.1	0.1	0.1	0.1	0.0	0.78
<i>Melichthys niger</i>	A	4.2	6.8	2.2	1.4	-47.6	0.77
<i>Melichthys vidua</i>	A	0.8	0.5	0.5	0.4	-33.3	0.72
<i>Monotaxis grandoculis</i>		0.2	0.4	0.1	0.1	-75.0	0.64
<i>Mulloidichthys flavolineatus</i>		0.3	0.6	0.0	0.0	-100.0	0.45
<i>Mulloidichthys vanicolensis</i>	A	0.8	1.0	1.7	1.7	126.7	0.43
<i>Myripristis berndti</i>		2.2	3.1	1.0	1.7	-55.8	0.72
<i>Myripristis kuntee</i>		16.6	10.4	13.1	5.5	-21.1	0.25
<i>Naso hexacanthus</i>		0.2	0.2	0.0	0.0	-100.0	0.28
<i>Naso lituratus</i>	A	1.9	0.6	1.4	0.7	-27.0	0.10
<i>Neoniphon sammara</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Ostracion meleagris</i>	A	0.0	0.0	0.2	0.2	100.0	0.08
<i>Oxycheilinus unifasciatus</i>		0.2	0.3	0.1	0.2	-50.0	0.83
<i>Paracirrhites arcatus</i>	A	4.3	1.4	3.4	0.6	-21.2	0.29
<i>Paracirrhites forsteri</i>	A	0.7	0.8	0.2	0.1	-76.9	0.27
<i>Parupeneus bifasciatus</i>		0.2	0.1	0.1	0.1	-66.7	*0.04
<i>Parupeneus cyclostomus</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Parupeneus multifasciatus</i>	A	0.5	0.4	0.4	0.3	-20.0	0.70
<i>Pervagor aspricaudus</i>		0.0	0.0	0.1	0.2	100.0	0.45
<i>Pervagor spilosoma</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Plagiotremus ewaensis</i>		0.1	0.2	0.1	0.1	0.0	0.73
<i>Plagiotremus goslinei</i>		0.2	0.2	0.0	0.0	-100.0	0.28
<i>Plectroglyphidodon imparipennis</i>		0.2	0.2	0.1	0.1	-66.7	0.15
<i>Plectroglyphidodon johnstonianus</i>		4.6	1.4	3.9	0.9	-16.3	0.56
<i>Pseudocheilinus evanidus</i>		3.2	1.2	1.8	1.1	-42.9	0.31
<i>Pseudocheilinus octotaenia</i>	A	5.3	1.2	2.3	1.3	-56.6	0.02
<i>Pseudocheilinus tetrataenia</i>	A	0.8	0.3	1.4	0.8	75.0	0.43
<i>Pseudojuloides cerasinus</i>	A	0.2	0.3	0.1	0.1	-66.7	0.71
<i>Sargocentron diadema</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Sargocentron spiniferum</i>		0.1	0.1	0.1	0.1	100.0	0.31

<i>Sargocentron spp.</i>		0.1	0.2	0.0	0.0	-100.0	0.45
<i>Sargocentron tiere</i>		0.3	0.4	0.3	0.3	0.0	0.66
<i>Saurida gracilis</i>		0.0	0.0	0.1	0.1	100.0	0.45
<i>Scarus dubius</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Scarus perspicillatus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Scarus psittacus</i>		0.1	0.1	0.1	0.1	0.0	0.78
<i>Scarus rubroviolaceus</i>		0.3	0.4	0.2	0.2	-20.0	0.45
<i>Scarus sordidus</i>		0.3	0.3	0.7	0.2	160.0	0.38
<i>Stegastes fasciolatus</i>		4.1	1.3	3.4	1.9	-17.1	0.71
<i>Stethojulis balteata</i>	A	0.3	0.2	0.4	0.3	60.0	0.62
<i>Sufflamen bursa</i>	A	1.2	0.8	1.0	0.6	-13.0	0.79
<i>Synodus variegatus</i>		0.1	0.1	0.0	0.0	-100.0	0.45
<i>Thalassoma ballieui</i>		0.2	0.2	0.1	0.2	-50.0	0.06
<i>Thalassoma duperrey</i>	A	7.7	2.8	5.5	2.2	-28.1	0.42
<i>Xanthichthys auromarginatus</i>	A	0.2	0.2	0.1	0.1	-33.3	0.39
<i>Zanclus cornutus</i>	A1	0.2	0.2	0.1	0.2	-33.3	1.00
<i>Zebrasoma flavescens</i>	A1	10.7	4.3	5.8	2.4	-45.5	0.03
<i>Zebrasoma veliferum</i>		0.0	0.0	0.1	0.1	100.0	0.24

Kapoho, Hawai'i (Site #25)

19° 51.4' N 154° 81.0' W

Depth: 1-6 m

Management Status: none

Summary of findings: this site is not currently being monitored for changes



Benthic habitat summary:

Survey conducted Summer 1999

Number of quadrats archived = video only

Number of quadrats analyzed = none

Fish community summary:

Surveys conducted = 10

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

Species name	AQ	Mean density (no./100m ²)	
		Mean	SD
<i>Abudefduf abdominalis</i>		0.7	2.0
<i>Acanthurus nigrofuscus</i>	A	16.4	13.9
<i>Acanthurus nigroris</i>	A	0.1	0.1
<i>Acanthurus triostegus</i>	A	0.6	1.0
<i>Anampses chrysocephalus</i>	A	0.1	0.1
<i>Arothron meleagris</i>		0.5	1.0
<i>Aulostomus chinensis</i>		0.2	0.6
<i>Bodianus bilunulatus</i>		0.1	0.4
<i>Canthigaster amboinensis</i>		0.5	0.5
<i>Canthigaster jactator</i>		7.6	4.1
<i>Cephalopholis argus</i>	A	0.1	0.1
<i>Chaetodon auriga</i>	A	0.1	0.2
<i>Chaetodon lunula</i>	A	1.4	0.9
<i>Chaetodon miliaris</i>	A	0.0	0.1
<i>Chaetodon multicinctus</i>	A1	0.0	0.1
<i>Chaetodon ornatissimus</i>	A1	0.0	0.1
<i>Chaetodon quadrimaculatus</i>	A1	0.9	1.2
<i>Chaetodon unimaculatus</i>	A	0.3	0.4
<i>Chromis agilis</i>		1.0	1.9
<i>Chromis ovalis</i>		0.1	0.3
<i>Chromis vanderbilti</i>		10.7	14.3

<i>Cirrhitops fasciatus</i>		0.0	0.1
<i>Cirrhitus pinnulatus</i>	A	0.1	0.1
<i>Cirripectes vanderbilti</i>		0.2	0.3
<i>Coris gaimard</i>	A	0.7	0.6
<i>Ctenochaetus strigosus</i>	A1	0.1	0.1
<i>Dascyllus albisella</i>	A	0.9	1.1
<i>Exallias brevis</i>		0.1	0.3
<i>Fistularia commersonii</i>		0.7	0.8
<i>Forcipiger longirostris</i>	A1	0.0	0.1
<i>Gomphosus varius</i>	A	3.6	4.2
<i>Gymnothorax meleagris</i>		0.0	0.1
<i>Gymnothorax spp.</i>		0.1	0.1
<i>Gymnothorax undulatus</i>		0.0	0.1
<i>Halichoeres ornatissimus</i>	A	0.1	0.2
<i>Labroides phthirophagus</i>	A	2.2	1.8
<i>Lutjanus kasmira</i>		0.0	0.1
<i>Naso lituratus</i>	A	0.1	0.3
<i>Paracirrhites arcatus</i>	A	0.1	0.2
<i>Parupeneus multifasciatus</i>	A	0.2	0.3
<i>Parupeneus porphyreus</i>		0.0	0.1
<i>Plagiotremus ewaensis</i>		0.1	0.3
<i>Plagiotremus goslinei</i>		0.8	1.2
<i>Plectroglyphidodon imparipennis</i>		1.8	2.0
<i>Plectroglyphidodon johnstonianus</i>		1.9	2.0
<i>Pseudocheilinus evanidus</i>		0.0	0.1
<i>Pseudocheilinus octotaenia</i>	A	0.4	0.4
<i>Pseudocheilinus tetrataenia</i>	A	0.1	0.1
<i>Sargocentron xantherythrum</i>		0.0	0.1
<i>Scarus dubius</i>		0.5	1.0
<i>Scarus psittacus</i>		21.6	17.4
<i>Scarus rubroviolaceus</i>		0.5	0.9
<i>Scarus sordidus</i>		28.4	28.0
<i>Stegastes fasciolatus</i>		5.6	4.6
<i>Stethojulis balteata</i>	A	15.1	14.3
<i>Synodus spp.</i>		0.0	0.1
<i>Synodus variegatus</i>		0.1	0.3
<i>Taenianotus triacanthus</i>		0.0	0.1
<i>Thalassoma ballieui</i>		0.1	0.2
<i>Thalassoma duperrey</i>	A	64.4	43.3
<i>Thalassoma trilobatum</i>		0.0	0.1
<i>Zanclus cornutus</i>	A1	0.1	0.1
<i>Neoniphon sammara</i>		0.0	0.1
<i>Ostracion meleagris</i>	A	0.1	0.2
<i>Oxycheilinus unifasciatus</i>		0.2	0.3
<i>Paracirrhites arcatus</i>	A	3.8	1.2
<i>Paracirrhites forsteri</i>	A	0.4	0.6
<i>Parupeneus bifasciatus</i>		0.1	0.1

<i>Parupeneus cyclostomus</i>		0.0	0.1
<i>Parupeneus multifasciatus</i>	A	0.5	0.3
<i>Pervagor aspricaudus</i>		0.1	0.2
<i>Pervagor spilosoma</i>		0.0	0.1
<i>Plagiotremus ewaensis</i>		0.1	0.2
<i>Plagiotremus goslinei</i>		0.1	0.2
<i>Plectroglyphidodon imparipennis</i>		0.1	0.2
<i>Plectroglyphidodon johnstonianus</i>		4.2	1.3
<i>Pseudocheilinus evanidus</i>		2.4	1.3
<i>Pseudocheilinus octotaenia</i>	A	3.8	2.1
<i>Pseudocheilinus tetrataenia</i>	A	1.0	0.6
<i>Pseudojuloides cerasinus</i>	A	0.1	0.3
<i>Sargocentron diadema</i>		0.1	0.2
<i>Sargocentron spiniferum</i>		0.1	0.1
<i>Sargocentron spp.</i>		0.1	0.2
<i>Sargocentron tiere</i>		0.3	0.4
<i>Saurida gracilis</i>		0.0	0.1
<i>Scarus dubius</i>		0.0	0.1
<i>Scarus perspicillatus</i>		0.1	0.1
<i>Scarus psittacus</i>		0.1	0.1
<i>Scarus rubroviolaceus</i>		0.3	0.3
<i>Scarus sordidus</i>		0.4	0.3
<i>Stegastes fasciolatus</i>		3.5	1.4
<i>Stethojulis balteata</i>	A	0.3	0.2
<i>Sufflamen bursa</i>	A	1.1	0.7
<i>Synodus variegatus</i>		0.0	0.1
<i>Thalassoma ballieui</i>		0.2	0.2
<i>Thalassoma duperrey</i>	A	6.5	2.8
<i>Xanthichthys auromarginatus</i>	A	0.1	0.2
<i>Zanclus cornutus</i>	A1	0.1	0.2
<i>Zebraosoma flavescens</i>	A1	8.5	4.3
<i>Zebraosoma veliferum</i>		0.0	0.1

Kapoho Gardens, Hawai'i (Site #26)

19° 51.4' N 154° 81.0' W

Depth: 1-6 m

Management Status: none (potential Fishery Management Area)

Summary of findings: this site is not currently being monitored for changes



Benthic habitat summary:

Survey conducted Summer 1999
 Number of quadrats archived = video only
 Number of quadrats analyzed = none

Fish community summary:

Surveys conducted = 10

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

Species name	Mean density (no./100m ²)		
	AQ	Mean	SD
<i>Abudefduf abdominalis</i>		2.3	3.0
<i>Abudefduf sordidus</i>		0.2	0.3
<i>Acanthurus blochii</i>		0.0	0.1
<i>Acanthurus leucopareius</i>	A	0.0	0.1
<i>Acanthurus nigrofuscus</i>	A	5.1	4.5
<i>Acanthurus triostegus</i>	A	2.2	2.2
<i>Anampses chrysocephalus</i>	A	0.0	0.1
<i>Arothron meleagris</i>		0.6	0.8
<i>Blenniidae</i>		0.0	0.1
<i>Canthigaster amboinensis</i>		1.6	0.9
<i>Canthigaster jactator</i>		7.4	3.6
<i>Cephalopholis argus</i>	A	0.4	0.3
<i>Chaetodon auriga</i>	A	0.0	0.1
<i>Chaetodon lunula</i>	A	3.3	3.7
<i>Chaetodon ornatissimus</i>	A1	0.3	0.4
<i>Chaetodon quadrimaculatus</i>	A1	0.4	0.5
<i>Chaetodon unimaculatus</i>	A	0.0	0.1
<i>Chromis agilis</i>		0.1	0.3
<i>Chromis ovalis</i>		0.1	0.2
<i>Chromis vanderbilti</i>		9.4	6.2

<i>Cirrhitops fasciatus</i>		0.2	0.3
<i>Cirrhitus pinnulatus</i>	A	0.3	0.3
<i>Cirripectes vanderbilti</i>		0.3	0.3
<i>Coris gaimard</i>	A	0.6	0.8
<i>Coris venusta</i>		0.1	0.3
<i>Ctenochaetus strigosus</i>	A1	0.1	0.2
<i>Dascyllus albisella</i>	A	0.2	0.3
<i>Diodon hystrix</i>		0.0	0.1
<i>Exallias brevis</i>		0.1	0.3
<i>Fistularia commersonii</i>		0.3	0.6
<i>Forcipiger flavissimus</i>	A1	0.0	0.1
<i>Forcipiger longirostris</i>	A1	0.0	0.1
<i>Gomphosus varius</i>	A	5.5	3.1
<i>Gymnothorax eurostus</i>		0.0	0.1
<i>Gymnothorax flavimarginatus</i>		0.0	0.1
<i>Gymnothorax meleagris</i>		0.2	0.2
<i>Gymnothorax spp.</i>		0.1	0.1
<i>Halichoeres ornatissimus</i>	A	0.8	0.5
<i>Labroides phthirophagus</i>	A	1.3	1.1
<i>Macropharyngodon geoffroyi</i>	A	0.2	0.3
<i>Mulloidichthys flavolineatus</i>		0.1	0.3
<i>Myrichthys magnificus</i>		0.0	0.1
<i>Ostracion meleagris</i>	A	0.4	0.4
<i>Paracirrhites arcatus</i>	A	0.4	0.3
<i>Plagiotremus ewaensis</i>		0.1	0.3
<i>Plagiotremus goslinei</i>		0.5	0.4
<i>Plectroglyphidodon imparipennis</i>		2.9	1.7
<i>Plectroglyphidodon johnstonianus</i>		3.7	2.3
<i>Pseudocheilinus evanidus</i>		0.1	0.3
<i>Pseudocheilinus octotaenia</i>	A	0.0	0.1
<i>Pseudocheilinus tetrataenia</i>	A	0.0	0.1
<i>Scarus perspicillatus</i>		0.0	0.1
<i>Scarus psittacus</i>		3.3	2.9
<i>Scarus sordidus</i>		2.1	2.1
<i>Sebastapistes coniora</i>		0.0	0.1
<i>Stegastes fasciolatus</i>		24.3	15.8
<i>Stethojulis balteata</i>	A	18.4	10.8
<i>Synodus spp.</i>		0.1	0.1
<i>Thalassoma ballieui</i>		0.1	0.2
<i>Thalassoma duperrey</i>	A	73.7	46.0
<i>Zanclus cornutus</i>	A1	0.1	0.1

Richardson's Ocean Park, Hawai'i
(Site #27)

19° 45.0' N 155° 03.0' W

Depth: 1-4 m

Management Status: none

Summary of findings: this site is not currently being monitored for changes



Benthic habitat summary:

Survey conducted Summer 1999
Number of quadrats archived = none
Number of quadrats analyzed = none

Fish community summary:

Surveys conducted = 10

AQ: Fish collected by the aquarium trade are indicated with a "A." Species with an "A1" designation are among the top ten species targeted by collectors and account for >90% of the annual catch .

Species name	AQ	Mean density (no./100m ²)	
		Mean	SD
<i>Abudefduf abdominalis</i>		4.9	6.3
<i>Acanthurus leucopareius</i>	A	0.1	0.3
<i>Acanthurus nigrofuscus</i>	A	7.2	7.3
<i>Acanthurus triostegus</i>	A	3.0	2.8
<i>Arothron hispidus</i>		0.1	0.1
<i>Arothron meleagris</i>		0.1	0.2
<i>Aulostomus chinensis</i>		0.0	0.1
<i>Canthigaster amboinensis</i>		2.4	3.0
<i>Canthigaster jactator</i>		2.0	1.9
<i>Caracanthus typicus</i>		0.1	0.1
<i>Cephalopholis argus</i>	A	0.0	0.1
<i>Chaetodon auriga</i>	A	0.0	0.1
<i>Chaetodon lineolatus</i>		0.0	0.1
<i>Chaetodon lunula</i>	A	1.0	1.1
<i>Chaetodon ornatissimus</i>	A1	0.1	0.2
<i>Chaetodon quadrimaculatus</i>	A1	0.3	0.4
<i>Chaetodon unimaculatus</i>	A	0.0	0.1
<i>Chromis agilis</i>		0.2	0.3
<i>Chromis vanderbilti</i>		1.8	2.1
<i>Cirrhitops fasciatus</i>		1.5	1.5

<i>Cirrhitus pinnulatus</i>	A	0.3	0.5
<i>Coris flavovittata</i>		0.1	0.1
<i>Coris gaimard</i>	A	0.7	0.6
<i>Coris venusta</i>		0.5	0.9
<i>Dendrochirus barberi</i>		0.0	0.1
<i>Echidna nebulosa</i>		0.0	0.1
<i>Exallias brevis</i>		0.0	0.1
<i>Fistularia commersonii</i>		0.1	0.2
<i>Gomphosus varius</i>	A	1.1	1.5
<i>Gymnomuraena zebra</i>		0.1	0.1
<i>Gymnothorax eurostus</i>		0.1	0.2
<i>Gymnothorax flavimarginatus</i>		0.1	0.2
<i>Gymnothorax meleagris</i>		0.1	0.1
<i>Gymnothorax spp.</i>		0.1	0.1
<i>Halichoeres ornatissimus</i>	A	1.5	1.5
<i>Naso lituratus</i>	A	0.1	0.1
<i>Naso unicornis</i>	A	0.0	0.1
<i>Paracirrhites arcatus</i>	A	0.4	0.4
<i>Paracirrhites forsteri</i>	A	0.0	0.1
<i>Parupeneus multifasciatus</i>	A	0.0	0.1
<i>Plagiotremus ewaensis</i>		0.4	1.0
<i>Platybelone argalus</i>		0.3	0.8
<i>Plectroglyphidodon imparipennis</i>		8.1	7.1
<i>Plectroglyphidodon johnstonianus</i>		1.3	1.0
<i>Rhinecanthus rectangulus</i>		0.2	0.3
<i>Scarus psittacus</i>		2.9	3.9
<i>Scarus sordidus</i>		0.4	0.7
<i>Sebastapistes coniora</i>		0.1	0.3
<i>Stegastes fasciolatus</i>		20.8	18.0
<i>Stethojulis balteata</i>	A	24.8	19.8
<i>Synodus spp.</i>		0.0	0.1
<i>Synodus ulae</i>		0.0	0.1
<i>Thalassoma ballieui</i>		0.1	0.3
<i>Thalassoma duperrey</i>	A	31.1	28.1
<i>Thalassoma trilobatum</i>		0.2	0.3
<i>Zanclus cornutus</i>	A1	0.1	0.2
<i>Zebrasoma flavescens</i>	A1	0.1	0.1