



**Marine Conservation Area Study: Kauai**

A report submitted to the Marine  
Options Program and the Division of  
Land and Natural Resources

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## INTRODUCTION

Recently marine conservation has become an issue of concern in Kauai. Kauai is the first island in the state to establish a Marine Advisory Board. The Marine Advisory Board has the task of studying present and future uses of Kauai's shoreline areas. Such studies might aid city officials in planning for the future of the shoreline areas. There is some indication that Kauai's resident adult population share this concern for marine conservation. In 1974, adults thought that fishing should be protected by conservation laws; ranking this concern eighth among 15 problems (Anderson, 1975:91). The following paper discusses a research project directed at exploring the issue of marine conservation in Kauai in more detail.

The research project, the Marine Conservation Area Study, was one segment of an island wide project conducted by the Kauai Coastal Zone Resource Study. The Kauai Coastal Zone Resource Study was initiated for two general purposes; (1) to establish base line data on resources in Kauai's ocean waters, and (2) to determine what Kauai's adult residents thought of the issue of marine conservation. Similar studies have been conducted for the islands of Oahu and Hawaii (Kimmerrer, 1975).

The Marine Conservation Area Study focused on the latter objective. The study was designed to describe (a) the frequency of usage of various shoreline areas, (b) the frequency of performance of various water based activities, (c) the opinion of establishing marine conservation areas, (d) the form marine conservation areas should take, and (e) the preferred locations for marine conservation areas. This research project was designed as an exploratory study. It was hoped that as a result of this

project, future research needs could be determined.

For the purposes of this paper, a marine conservation area is defined as an area where the taking of marine plants and animals is managed. Management of marine life is conceptualized along a continuum of activities. On one end of the continuum, the observation of shoreline areas may take place. The purpose of such observations would be to note significant changes within the habitat of various areas. At this end of the continuum, nothing would be actively done to preserve the habitat in its original state. At the other end of the continuum, management would take the form of a marine park where full restrictions against the taking of marine plants and animals would be enforced. Hanauma Bay in Oahu and Kealekekua Bay in Hawaii are examples of marine parks. Variations of conservation areas fall anywhere along the continuum (i.e. the floating kapu system, regulation of various consumptive activities, the reservation of certain areas for specific activities).

#### DATA COLLECTION

The data for this paper are drawn from interviews conducted during the period of July 17, 1975 to July 29, 1975. A cluster method of sampling was used. A 6% sample of 500 households (N=8550) was selected. The sampling frame consisted of all households included in Anderson's 1974 survey. Excluded from the sampling frame were houses which weren't listed on available maps and houses which were inaccessible from existing roadways.

Interviewers were instructed to interview all persons 18 and over residing in the household. Only one call back was required because of the time constraints placed upon the project. Due to this constraint, all

eligible persons could not be contacted.

At least one interview from 482 households was obtained. From these 482 households, a total of 917 resident adults were interviewed. The total 917 represents an estimated sampling error of  $\pm 3.3\%$  for a 50-50 dichotomy. This sampling error serves as a rule of thumb method of estimating the parameters within a population. An example of the utility of the sampling error can be made. In the present study, males constituted 52% of the sample. Given the sampling error, we can be 95% confident that the percentage of males in the population lies between 55.3% and 48.7%.

Although all eligible adults were not contacted, a test for representativeness will give an idea as to how well the sample represents the population of Kauai. We will compare various demographic characteristics from the present study with characteristics obtained from Anderson's study. Anderson's survey represents the most recent estimates of Kauai's general adult population characteristics.

For all four variables listed in Table 1, the characteristics of

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Table 1 about here

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our sample approximate those found in Anderson's study. Our sample is slightly underrepresented in immigrants from the Phillipines. However, this does not seem to be a problem which would hinder analysis. We can be reasonably confident that the findings of this study can be generalized to the resident adult population in Kauai.

TABLE 1

## Test for Representativeness

	Anderson's Study (N=1834)	Conservation Study (N=917)
	<u>%</u>	<u>%</u>
<b>SEX:</b>		
Males	52	52
Females	48	48
<b>EDUCATION:</b>		
None	2	2
1 - 8 grade	25	20
9 - 11 grade	10	11
High school graduate	30	34
Some college	23	21
College graduate	10	11
<b>Ethnicity:</b>		
Hawaiian or Part Hawaiian	14	16
Filipino	22	16
Caucasian (including Portuguese)	24	26
Japanese	30	32
Other	9	10
<b>Birthplace:</b>		
Hawaii	66	71
Mainland	14	17
Philipines	15	9
Others	5	5

## USE OF SHORELINE AREAS

One objective of this study was to find out how often people went to various shoreline areas in Kauai. The areas in Kauai were divided into five general shoreline areas. Respondents were asked how frequently they went to each of these areas.

Among the five general shoreline areas, the frequencies of usage were quite similar. The most frequented area is the Kukuiula to Wailua

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Table 2 about here

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shoreline. Forty-eight percent reported going to that shoreline area at least once a month. The Wailua to Kilauea area was next in terms of frequency of usage (43%), followed by Kekaha to Kukuiula (42%), Kekaha to Haena (38%), and Haena to Kekaha (37%) areas.

## SHORELINE ACTIVITIES

Respondents were asked how often they engaged in nine different water based activities (see Table 3 for the list). Among these nine

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Table 3 about here

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activities, adults engaged in swimming and recreational fishing most often; 48% and 47% reporting engaging in these activities at least once a month, respectively. Tropical fish collecting (3%) and commercial fishing (4%) were lowest in terms of persons performing activities at least once a month. In general, adults in Kauai engage in a wide base of water activities.

TABLE 2

Beach Areas Attended at least Once a Month

(Q: WE HAVE DIVIDED THE ISLAND OF KAUAI INTO 5 BEACH AREAS. IN GENERAL, HOW OFTEN DO YOU GO TO EACH AREA: DAILY, ONCE OR TWICE A WEEK, ONCE OR TWICE A MONTH, OR YOU HAVE NEVER BEEN THERE.)

<u>Beach area visited</u>	<u>% (N=917)</u>
Haena to Kekaha	37
Kekaha to Kukuiula	42
Kukuiula to Wailua	48
Wailua to Kiluaea	43
Kilauea to Haena	38

TABLE 3

Activities Engaged in at least Once a Month

(Q: PLEASE TELL ME HOW OFTEN YOU ENGAGE IN THE FOLLOWING ACTIVITIES IN KAUAI.)

<u>Activites engaged in</u>	<u>% (N=917)</u>
Swimming	48
Recreational fishing	47
Taking of shrimp, shells or limu	30
Camping	25
Skin and Scuba diving	20
Motorboating, canoeing, and sailboating	15
Surfing	13
Commercial fishing	4
Tropical fish collecting	3



## OPINION ON CONSERVATION AREAS

All participants in this survey were asked for their opinion on the establishment of marine conservation areas. Sixty-six percent favored the establishment of marine conservation areas, 15% opposed the idea and 17% were unsure. The notion of marine conservation is a favorable one. A majority of nearly all groups favor some form of conservation. However, there are some groups that favor marine conservation more than others. When regions of origin were compared, adults born in the mainland were more likely to favor marine conservation than adults born in Hawaii or immigrants from a foreign country. Adults who

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Table 4 about here

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have lived in Hawaii for less than 10 years tend to favor marine conservation more than persons who have lived in Hawaii for a longer period of time. When income groups were considered, persons with higher incomes favored marine conservation more than lower income groups. Persons with some college experience were more likely to favor marine conservation than adults with no collegiate experience.

Adults who favored marine conservation were also asked two other questions; their opinions on the form of marine conservation areas and their opinions on the preferred locations for marine conservation areas. To determine what form marine conservation areas should take, the respondent was presented with a list of six activities. The respondent was then

TABLE 4

Percentage distribution of adults who favor marine conservation ( by various demographic variables)

<u>Variable</u>	<u>%</u>	<u>N</u>
<u>Place of birth</u>		
Hawaii	67	652
Mainland	86	136
Philippines	41	83
<u>Length of residence</u>		
Less than 10 years	76	177
10 years to less than lifetime	60	171
Lifetime	66	550
<u>Educational background</u>		
Less than 8 years	55	191
1 to 3 years high school	65	98
High school graduate	62	310
Some college	78	196
4 years of college	86	97
<u>Sex</u>		
Male	70	475
Female	64	430
<u>Marital status</u>		
Single	67	475
Married	70	193
<u>Income</u>		
0 - 2,000	64	217
2,000 - 4,999	58	107
5,000 - 9,999	67	217
10,000 - 14,999	76	129
15,000 and over	70	105

asked whether he thought each activity should be prohibited, regulated, or have no restrictions at all. For the most part, some form of

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Table 5 about here

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regulation of the six activities were preferred. Not many adults preferred the prohibition of any of the six mentioned activities.

Adults who favored some form of marine conservation were asked if they could think of areas where some form of marine conservation should be established and other areas where it should not be established. Nine sites were listed (but not read) and, if other sites were mentioned, the interviewer recorded it on the interview guide. Of the nine sites,

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Table 6 about here

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five were mentioned as possible conservation areas at least twice more often than mentioned as an area where conservation should not be established. These five areas were Anini Beach, Haena, Poipu Beach, Hanalei Bay, and Polihale.

#### DISCUSSION

The residents of Kauai perform a wide variety of water based activities at various shoreline areas. A number of adults engage in some form of consumptive activity (the taking of marine plants and/or animals). It would be safe to say, then, that the establishment of a marine conservation area, whatever the form, would affect some adults. How serious these adults would be affected was not determined by the present survey. Perhaps to determine how adults would be affected by

TABLE 5

## Type of Management of Water Activities

(Q: HOW DO YOU THINK A MARINE CONSERVATION AREA SHOULD BE MANAGED; DO YOU THINK THE FOLLOWING ACTIVITIES SHOULD BE PROHIBITED, REGULATED OR HAVE NO RESTRICTIONS?)

For those who favored marine conservation areas

<u>Activity</u>	<u>Type of Management</u> (N=608)			<u>Na*</u>
	<u>Prohibited</u>	<u>Regulated</u>	<u>No Restrictions</u>	
	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>
Commerical fishing	21	61	11	7
Recreational fishing	7	52	38	3
Collecting shells	9	44	41	6
Collecting coral	15	56	22	7
Picking limu	8	48	36	8
Catching shellfish	10	62	22	4

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\*Na - No answer given

TABLE 6

Favorability of Various Locations as Marine Conservation Areas

(Q: WITHIN KAUAI, ARE THERE ANY BEACHES YOU WOULD LIKE TO SEE MARINE CONSERVATION AREAS ESTABLISHED, AND ARE THERE ANY BEACHES YOU WOULD NOT LIKE TO SEE MARINE CONSERVATION AREAS ESTABLISHED?)

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For those who favored marine conservation areas

<u>Location</u>	<u>Favorability (N=608)</u>		<u>Not Mentioned</u>
	<u>Favorable</u> <u>%</u>	<u>Unfavorable</u> <u>%</u>	
Anini Beach	39	14	47
Kalihiwai Beach	23	15	62
Kilauea Bay	21	15	64
Haena	37	13	50
Poipu Beach	36	14	50
Polihale	30	13	57
Hanalei Bay	32	15	53
Nualolo Landing	19	12	69
Moloaa Bay	25	13	62

the establishment of conservation areas would be to conduct a survey of shoreline areas. Such a survey might best serve to answer a few more questions that the present study could not obtain.

The establishment of marine conservation areas were favored by a majority of the adults in our study. These adults preferred the regulation of various activities rather than the prohibition of these activities. Few adults seem to prefer the prohibition of different water based activities. This seems to suggest that the establishment of marine parks per se is not a very popular idea. The specific form of regulated marine conservation areas was not determined. This specific form might best be determined by the opinions of the users of the site, the biological habitat of the shoreline area, the history of the site and the general public opinion to the specific site as a conservation area.

Due to the time constraints on this project adequate time was not spent pre testing the questionnaire in Kauai. While this did not seem to hinder the project much, it did prevent the incorporation of local input into the study. Such local input might have prevented the omission of subsistence fishing from the list of activities performed. Future research efforts would have to pay greater attention to the notion of subsistence fishing and other forms of subsistence consumptive activities. This would give us a better idea as to how many persons rely upon the ocean for their food supply. We might also learn how the establishment of marine conservation areas might affect these people.

Although most people favor the idea of marine conservation, the form and place can, in some way, affect a number of beach users. Several

activities can be initiated to give an even broader perspective of the effects of marine conservation areas. Interviews could be conducted of persons who engage in subsistence fishing and in commercial fishing. These persons might be able to suggest the kinds of conservation areas that would be most beneficial to them. Another activity which might be worthwhile would be the establishment of an experimental marine conservation area. The form and site of the experimental program might best be determined by the incorporation of all the data from the present study. From such an experimental program, county officials might best determine the effects of marine conservation areas and its general utility.

In the final outcome, the decision to establish or not to establish marine conservation areas are to be made by county officials and residents in Kauai. A large amount of studies cannot initiate decision making processes. The longer the delay in this decision making process, however, only serves to make the issue more critical. Residents in Kauai might best be served by initiating this decision making process as quickly as possible.

### Footnotes

<sup>1</sup>  
The Marine Advisory Board is not connected with this study.



### Selected Works

Anderson, R. N., et. al. Kauai: Socio Economic Profile. University  
1975 of Hawaii: Tropical Agriculture Publications: # 135.

Durbin, Woodrow and William Kimmerer. The Potential of Marine Parks on  
1975 Oahu and Hawaii. University of Hawaii: Sea Grant Publications.