

The Kailua Community Survey

Results and Implications for the Kailua Beach and Dune Management Plan



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Executive Summary

Residents in the Hawai‘i coastal community of Kailua, O‘ahu were surveyed for their attitudes, perceptions, preferences, and values towards a variety of socio-environmental topics of local interest. Fifteen hundred potential respondents were sampled at random from a database of addresses associated with Kailua’s zip code. Of these, 146 surveys were undeliverable and 699 were returned in usable form for analysis giving a response rate of 52%. This study was conducted in collaboration with the 2010 Kailua Beach and Dune Management Plan (Kailua Plan) and is intended to inform resource management, climate change adaptation, and other community planning efforts. The survey instrument was developed by staff and affiliates of the University of Hawai‘i Sea Grant College Program, with input for select community stakeholders. The final survey was 12 pages in length and formatted into an easily mailable booklet. It contained 27 questions, several of which included multiple response items. Results and some interpretation are presented.

Survey Results Selected Highlights

1. 65% of households earning over \$75K and 47.6% are over \$100K. Median household income in Hawai‘i is \$67K and in the nation \$53K.
2. 56% have lived in the Kailua for more than 24 years with 63% of respondents between 45 and 69 years old.
3. 79% were owners of the dwelling they lived in and only 2% were beachfront.
4. 57% felt that Kailua’s transportation infrastructure is unprepared coastal hazards and 76% of respondents agreed that public money should be spent on hardening local infrastructure.
5. Relatively high importance was placed on quality of life issues such as sewage management and condition of parks and recreational facilities with 84% and 76% respectively, who said it was either very or extremely important and lowest priority to affordable housing (30%).
6. Resource protection and conservation were important issues with the most agreement observed for reducing trash in storm drain water (91.9% agree), ensuring stream and ground water quality (91.5% and 95% respectively).
7. 91% felt that maintaining a sandy Kailua Beach was either very or extremely important.
8. 78% were opposed to developing Kailua hillside land.
9. 62% were not favorable to increasing visitor accommodation in Kailua.



10. 75% of respondents favored increasing coastal shoreline setbacks in Kailua.
11. 60% disagreed with the use of seawalls and revetments on public or private property in Kailua.
12. 82% opposed to allowing any fringe area development at Kawainui Marsh and 55% against it being turned into a nature sanctuary.
13. 82% and 73% support respectively for beach dune preservation based on ecological or economic grounds.
14. Respondents were asked to indicate their top three reasons, in order of importance, for valuing Kailua Beach. "Recreation" received the most number 1 responses with 36%.
15. Respondents were asked to indicate how they felt a sea-level rise of 3 feet would affect their daily life in Kailua with 60% responding there would "no or slight impact" to where they live and to their daily routine. Conversely 40% responded sea-level rise would result in "some to very high impact" to their daily life in Kailua.
16. 76% and 65% respectively felt there would be "some to very high impact" when asked about sea-level rise impacts to beach activities and ocean access.
17. Respondents were asked to indicate their willingness-to-pay (WTP) into a hypothetical Kailua Beach Protection Fund. Results suggest general support of a fund, with support for a fund up to about \$25 and a pronounced drop in support above that amount but still 51% support for up to a \$50 beach fund.

Connections to the Kailua Beach and Dune Management Plan

1. While respondents tended to envision only slight personal impacts from sea-level rise, they were supportive of earmarking public money (76% favored) to harden public infrastructure to better withstand coastal hazards.
2. Several items on the survey addressed aspects of setback and coastal development policy, as well as design planning. Results are somewhat mixed. While there was solid support for beach dune preservation, respondents were fairly neutral regarding the use of accepted erosion rates to determine where new coastal buildings and homes should be constructed.
3. Strong support was seen for building new construction farther inland.
4. Respondents disagreed with allowing private landowners to take any necessary step to protect their land from coastal erosion. This suggests community support for additional action by the state legislature, at least among Kailua area voters.
5. Solid support was seen for dune preservation in Kailua, both for ecological and economic reasons.
6. Support was observed for developing additional beach and dune management plans.
7. Results suggest that any action to fund land trust management of conservation easements should be well-articulated and bounded, as support was not seen for land trust purchase of coastal land.



Kailua Beach and Dune Management Plan







April 2010

Introduction and Project Purpose

In this project, we surveyed residents in the Hawai‘i coastal community of Kailua, on the island of O‘ahu. We sought to extend our understanding of residents’ attitudes, perceptions, preferences, and values towards a variety of socio-environmental topics. This study is part of a regional beach management and climate change adaptation planning effort, and will inform implementation and future modification of the 2010 Kailua Beach and Dune Management Plan (Kailua Plan). The plan was supported by the Hawai‘i Department of Land and Natural Resources’ Office of Conservation and Coastal Lands, in partnership with the University of Hawai‘i Sea Grant College Program (UH Sea Grant) and local planning consultants. The plan identifies a number of impactors that may affect the Kailua community, including long-term effects of sea-level rise, chronic coastal erosion, ineffective dune management practices, and insufficient shoreline construction setbacks. A series of land use and resource management recommendations are offered in the Kailua Plan which are intended to provide science-based options for decision-makers to consider for long-term conservation of the beach and dune system.

The values society holds with respect to natural resources are most directly responsible for how those resources should be managed. Therefore, natural resource managers, municipal planners, and elected officials stand much to gain from understanding certain attributes of the publics they serve. Information about residents’ attitudes towards their natural and built environment, as well as their satisfaction with recreation opportunities and aspects of community sustainability, assists with making informed decisions. This information can reduce conflicts between managers and the public by highlighting areas of potential disconnect between public officials and citizens. Such conflicts may result in feelings of distrust or opposition to rules and regulations, so it is best to mitigate them when possible.

In addition, community sustainability is now, more than ever, tied to the interaction between ecological and social systems. The effect on society’s use and appreciation of natural resources from predicted or sudden changes in coastal resource conditions, including from climate change, has become a topic of great interest among all types of stakeholders and government officials.





Study Area

The community of Kailua is a census-designated place in Honolulu County. It is 12 miles northeast of the city of Honolulu on the windward coast of the island of O‘ahu. It is fronted by Kailua Beach, nearly 3 miles of carbonate (marine) sand stretching between Kapoho Point to the north and Alala Point to the south. Adjacent to the community is Kawainui Marsh. Kailua Beach is well known for its scenic beauty and recreational value; it is amenable to a wide variety of age groups, users, and activities.

The population of Kailua was 38,635 at the 2010 census. Kailua is primarily a residential

Figure 1. Kailua-Lanikai 1950. (Source: UH Coastal Geology Group)

community, with a centralized commercial district along Kailua Road. It has a compact business district surrounded by mostly single-family homes.

Survey Methods

Overview

The population of interest was residents of Kailua. Overall, our goal was to obtain a representative and sufficiently large sample of these residents and send them a survey via mail. Questions included on the survey were designed to improve understanding of community perceptions regarding various socio-environmental topics, including development, conservation, infrastructure, and use of natural resources.

Sampling Method

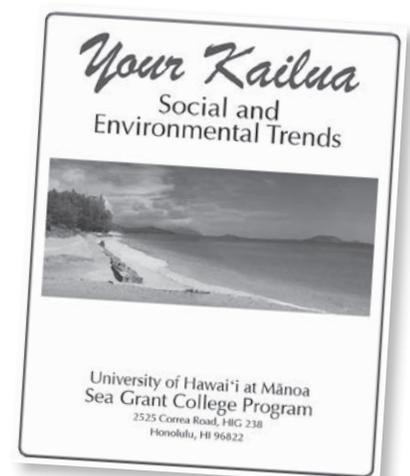
We obtained names and addresses of Kailua residents from Andrew Associates, a marketing firm in Enfield, Connecticut. This sample was randomly drawn from the firm’s comprehensive database of Kailua residential addresses.

Sample Size

The target sample size for this survey was 900. Having 900 returned surveys would result in a low margin of error (~3%) and would likely allow us to analyze sub-populations within the total pool of survey respondents, especially with respect to how demographic differences influenced responses to key questions. Assuming a 60% response rate, we requested 1,500 names and addresses from Andrew Associates.

Survey Design

The survey instrument was developed by staff and affiliates of the University of Hawai‘i Sea Grant College Program, including several knowledgeable individuals in other programs and departments at the university. In addition, an evening meeting was held in Kailua during which the survey questions were presented to a selected group of community residents. Based on feedback received at this meeting, the questionnaire was modified. The final survey was 12 pages in length and formatted into an easily mailable booklet by Sea Grant staff (Appendix B). It included cover art and space on the last page for respondents to handwrite additional information they wanted to share.



Survey Implementation

In an effort to maximize response rates for this project, the questionnaire was sent to participants using a modified Dillman Total Design Method (Dillman, 1978). This method uses personalization as well as repeated contacts to increase the likelihood that an individual will complete the questionnaire. Recipients received a survey packet, which included the questionnaire, a stamped and addressed reply envelope, and a cover letter. Approximately three weeks after the initial mailing, recipients who had not responded were sent an additional survey packet identical to the first, except the language in the cover letter was slightly altered to emphasize the importance of their participation to this research. About six weeks after the initial mailing was sent, all non-respondents were sent a third and final survey packet identical to the first two except that the cover letter further emphasized the importance of the survey.

As mentioned earlier, personalization is key to the Dillman Total Design Method. In an effort to make each mailing personal, all envelopes were hand-addressed with blue ink and mailed using a first class, hand-affixed postage stamp, instead of electronic metering. Further, cover letters greeted the respondent by first name and were all hand-signed by the project investigator with blue ink.

The Dillman Total Design Method

The survey population is sent a questionnaire booklet containing as many as 12 pages. The booklet has an illustrated front cover and a specified instruction format, a means of identifying respondents to allow for removal of their names from the mailing list, and a return envelope.

The cover letter, which clearly describes the purpose of the study and explains why the respondent's opinion is being sought, must be signed by hand, in blue ink.

An optional return postcard contains the respondent's name and permits the questionnaire to be returned anonymously; alternatively, the questionnaires may be pre-numbered.

Follow-up must proceed according to a set pattern. One week after the initial mail-out a reminder postcard is sent; three weeks and seven weeks after the initial mail-out, non-responders are sent duplicate packets.

Dillman, D. (1978). Mail and telephone surveys: the total design method. New York John Wiley and Sons.

Descriptive Results

Response Rate

Of the 1,500 mail surveys initially sent, 146 proved to be non-deliverable due to irreconcilable problems with addresses or deceased addressees. Our effective sample size was therefore 1,354 individuals. We received 699 usable surveys back over the course of the three mailings for an overall response rate of 52% (Table 1). However, as in most mail surveys, respondents did not answer every question. This is reflected in the results presented throughout this report.

Personal Attributes

Demographic questions were asked to assist in interpreting the results. These questions included length of time the respondent has lived in the Kailua area, age, gender, income, neighborhood, and commute information.

Table 1. Survey response rate.

Initial sample	1,500
Non-deliverables	146
Effective sample	1,354
Completed surveys	699
Response rate	52%



Table 2. Length of residency in Kailua.

Years	N	Percent
Less than 1 year	0	0
1 to 6 years	90	13.0
7 to 12 years	96	13.9
13 to 18 years	65	9.4
19 to 24 years	53	7.1
More than 24 years	388	56.1

Table 3. Gender distribution.

Gender	N	Percent
Male	388	59.0
Female	270	41.0

N=Responses

Fifty-nine percent of the respondents were male (Table 3) and the survey response captured a wide age spread, from those in their teenage years to a few individuals above 90 years of age. The highest percentages of respondents were in their 50s and 60s (Table 4).

The results indicate high levels of income, with 65% of households earning over \$75,000 and almost half (47.6%) are over \$100,000. The income category with the most respondents (26%) was \$100,000-\$149,999 (Table 5).

In the questionnaire, residents were asked about their relationship to the dwelling they lived in. A large majority (79%) of those surveyed were owners of the dwelling, followed by renters (Table 6).

Since the research is interested in understanding differences in attitudes and perceptions according to where in Kailua a person lives, questions were asked about beachfront living and neighborhood of residency. Nearly all respondents lived in non-



A majority of respondents (56%) indicated they have lived in the Kailua for more than 24 years. In fact, that category contained more responses than all other categories combined, suggesting a high level of awareness about Kailua is captured in the results (Table 2).

Table 4. Age distribution.

Age Range	N	Percent
15-19	2	0.3
20-24	4	0.6
25-29	17	2.6
30-34	26	4.0
35-39	34	5.2
40-44	54	8.2
45-49	62	9.4
50-54	80	12.2
55-59	98	14.9
60-64	98	14.9
65-69	78	11.9
70-74	30	4.6
75-79	28	4.3
80-84	26	4.0
85-89	18	2.7
90+	3	0.5

Table 5. Income distribution.

Income Range	N	Percent
Under \$5,000	2	0.3
\$5,000-\$9,999	3	0.5
\$10,000-\$14,999	2	0.3
\$15,000-\$19,999	11	1.9
\$20,000-\$24,999	9	1.5
\$25,000-\$29,999	17	2.9
\$30,000-\$34,999	24	4.1
\$35,000-\$39,999	13	2.2
\$40,000-\$44,999	14	2.4
\$45,000-\$59,999	42	7.2
\$60,000-\$74,999	67	11.4
\$75,000-\$99,999	104	17.7
\$100,000-\$149,999	156	26.6
\$150,000+	123	21.0

Table 6. Relationship to dwelling.

Relationship	N	Percent
Owner	520	78.7
Renter	97	14.7
Living with family	40	6.1
Other	3	0.5

N=Responses

beachfront real estate (Table 7). Responses were obtained from all neighborhoods listed on the survey (Table 8).

Respondents were also asked to indicate how far they lived from their preferred beach access point. High percentages (~73%) of respondents live within 1.5 miles of that access point (Table 9).

The mean commuting distance for respondents was just over 10 miles (Table 10), which may suggest that many respondents travel to the leeward side of the island for work. However, the commute distance most often indicated was 2 miles, so a number of respondents appear to work in the Kailua area. A large majority of respondents drive to work (70%) and do so alone (59%) (Table 11).

Community Perceptions of Change

Two questions on the survey asked respondents to indicate their perceptions of changes to quality of life in Kailua. These questions were specific to outdoor and nature experiences in the Kailua area. Results suggest that respondents feel the quality and availability of outdoor/nature experiences 27% and 45% respectively have remained about the same during the time they have lived in Kailua (Tables 12 and 13, respectively).

Respondents were also asked to provide their perceptions of the preparedness of local public infrastructure, such as roads and bridges, in the face of natural hazards like hurricanes and heavy rainfall. As Table 14 shows, the majority of respondents (57.6%) felt that local infrastructure is unprepared for such events (19.4% thought it is very unprepared and 38.2% thought it is somewhat unprepared).

Preferences and Importance

A number of survey items inquired about the importance attached to various Kailua attributes, or similarly, the preferences residents have for certain approaches to addressing social and environmental issues at the community level.

Respondents were asked to think about and then evaluate the personal importance of a variety of community “livability” topics. Although these items are not as directly linked to condition of the natural environment as others on the survey (e.g., see Table 16), they all in some way contribute to the long-term sustainability of natural areas and resources. Respondents generally placed importance on these items, with issues such as sewage and the quality of parks and recreational facilities standing out (Table 15). Only one item, affordable housing (which scored an arithmetic mean of 2.7) was evaluated by respondents as being less than “somewhat important.”

When asked about traditional environmental concerns, respondents indicated that resource protection and conservation were important issues. As Table 16 shows, the most agreement was observed for

Table 7. Beachfront property.

Beachfront Property	N	Percent
Yes	18	2.7
No	642	97.3

Table 8. Respondents' neighborhood.

Neighborhood	N	Percent
Aikahi Park	22	3.4
Bluestone	7	1.1
Enchanted Lake	123	19.0
Kailua Estate	18	2.8
Kalaheo Hillside	20	3.1
Keolu Hills	55	8.5
Kuulei	25	3.9
Olomana	17	2.6
Aikahi Gardens	5	0.8
Country Club Knoll	4	0.6
Hillcrest	1	0.2
Kailua Town	52	8.0
Kalama	42	6.5
Koolaupoku	11	1.7
Lanikai	41	6.3
Pohakupu	22	3.4
Beachside	17	2.6
Kailua Bluff	78	12.1
Coconut Grove	16	2.5
Kaimalino	15	2.3
Kaopa	9	1.4
Kukilakila	4	0.6
Kukanono	6	0.9
Kawailoa	4	0.6
Maunawili	18	2.8
Maunawili Estates	12	1.9
Norfolk	2	0.3

N=Responses



reducing trash in storm drain water (91.9% agree), ensuring stream and ground water quality (91.5% and 95% respectively).

Since a prominent feature of the Kailua coast is its long and sandy beach, respondents were asked how important it is that Kailua Beach be comprised of sand. Nearly all respondents (91.3%) felt that a sandy Kailua Beach was either very or extremely important (Table 17).

Kailua is located on the windward side of the island. As such it receives more rainfall than the relatively drier leeward areas of O’ahu. However, much of Kailua’s drinking water comes from aquifers located outside of the community. In addition, potable water is often used to irrigate residential landscaping. With this in mind, respondents were asked to indicate how important water conservation is to them and, if so, why. Almost all (90.9%) respondents felt that water conservation is at least a moderate priority, and a majority (60.4%) believed that it is either a high or very high priority (Table 18). When asked why water should be conserved, the most commonly-selected reason was because future generations will need it (Figure 2).

The final question in this section had to do with potable water conservation in Kailua. Respondents were asked to indicate their preferences (in terms of support or opposition) for various conservation strategies. In general, both voluntary and regulatory strategies were deemed favorable by respondents (Table 19).

Community Attitudes

Several questions on the survey sought to elicit respondents’ attitudes towards environmental management strategies and potential development approaches.

Respondents were asked about their attitudes towards expanding development upland. Much of the settled Kailua area is relatively flat land adjacent to the coast and a substantial amount of the available land has been developed. Some potentially developable

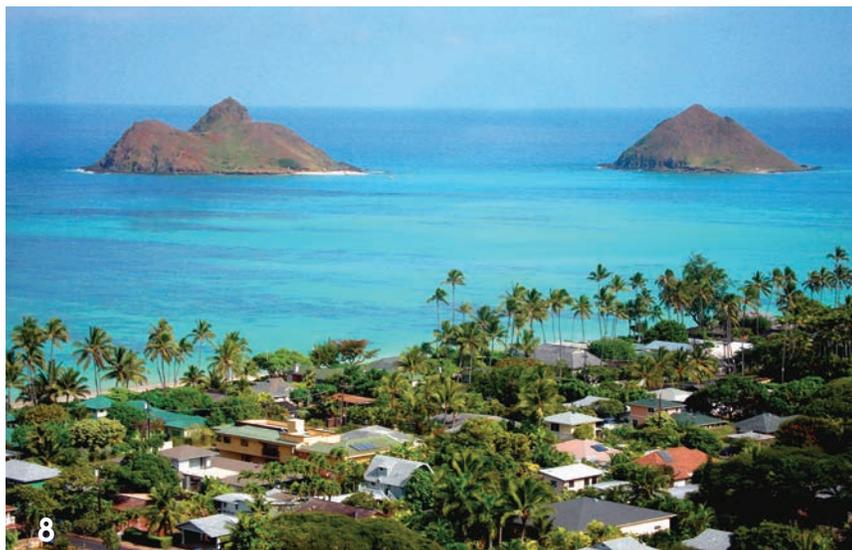


Table 9. Distance to favored Kailua beach access.

Distance	N	Percent
Less than 0.5 miles	198	28.7
0.5 to 1.0 mile	130	18.8
1 to 1.5 miles	176	25.5
1.5 to 2 miles	51	7.4
More than 2 miles	105	15.2
Not applicable	30	4.3

Table 10. Commute distance (miles).

Mean	10.8
Mode	2
Standard deviation	9.5
Minimum	0
Maximum	70

Table 11. Mode of commute.

Mode	N	Percent
Commute with others	76	11.5
Drive alone	387	58.6
Walk	32	4.8
Ride a bike	13	2.0
Use public transportation	17	2.6
Not applicable	135	20.5

A number of survey questions used a five-point scale to ask about respondents’ perceptions and preferences, as well as the level of importance they place on certain attributes. While the wording of the answer choices varies among the questions, all answer scales use the same pattern: 1 = most negative, 3 = neutral, and 5 = most positive. In the tables below, the arithmetic mean of each question’s answer scale is provided to give an indication of the average response.

Table 12. Overall quality of outdoors and nature experiences in Kailua.

Perception	N	Percent
Decreased significantly	64	9.3
Decreased somewhat	171	24.9
Remained the same	184	26.8
Improved somewhat	189	27.6
Improved significantly	38	5.5
Don't know	40	5.8

Decreased significantly = 1, Decreased somewhat = 2, Remained the same = 3, Improved somewhat = 4, and Improved significantly = 5, Arithmetic mean = 2.9

N=Responses

land exists on the hillsides mauka of Kailua. However, when asked, respondents were overwhelmingly opposed to developing hillside land with more than three-quarters (77.5%) against the idea (Table 20).

Although Kailua is a tourist destination because of its relatively calm and sandy beach, as well as its boutique shopping and dining opportunities, options for visitor lodging are limited. For example, there are no hotels in the Kailua area. Additional lodging may have positive and negative implications for the natural resources and areas of Kailua and so the survey asked about attitudes towards visitor numbers and accommodations. Overall, respondents were opposed to various approaches to increase visitor accommodation with 62% agreeing no additional lodging should be built (Table 21, Figure 3).

Two questions asked about policies and activities to address coastal erosion. Items ranged from the economics of mitigating coastal erosion to dealing with erosion on private land. Responses indicate a lack of support for Kailua residents having to pay for erosion mitigation, but a willingness to consider a stronger setback ordinance for new construction and limits on the actions private property owners can take to address erosion (Table 22 and Figure 4). Respondents are conflicted in terms of specific courses of action, however 75% of respondents favor increasing coastal construction setbacks in Kailua.

Table 15. Importance of community livability attributes in the Kailua area.

	Not important (1)	Slightly important (2)	Somewhat important (3)	Very important (4)	Extremely important (5)	
Item	Percent	Percent	Percent	Percent	Percent	Mean
Improving the walkability of neighborhood	4.5	6.7	18.3	35.3	35.1	3.9
Improving the bikeability of Kailua	5.0	9.4	19.0	33.6	32.9	3.8
Adding public transit options	11.4	18.5	33.6	24.2	12.3	3.1
Developing more hiking areas	10.6	18.4	33.0	24.7	13.3	3.1
Ensuring adequate public access	5.4	8.7	21.8	35.6	28.4	3.7
Improving sewage management	0.5	4.5	10.9	37.4	46.6	4.2
Incorporating public guidance to develop Kailua's business district	4.9	9.4	27.1	34.0	24.6	3.6
Investing local funds in Kailua area renewable energy projects	5.7	10.1	26.4	35.5	22.2	3.6
Tax credits for rainwater catchment systems	9.1	14.1	30.3	28.8	17.7	3.3
Improving park and recreation facilities	1.5	4.9	17.8	40.5	35.3	4.0
Increasing affordable housing	22.7	22.0	25.7	17.8	11.8	2.7
Improving storm water management	0.5	6.1	24.2	38.7	30.6	3.9

Decreased significantly = 1, Decreased somewhat = 2, Remained the same = 3, Increased somewhat = 4, and Increased significantly = 5

Table 13. Availability of opportunities to experience outdoors and nature in Kailua.

Perception	N	Percent
Decreased significantly	36	5.3
Decreased somewhat	114	16.7
Remained the same	308	45.0
Increased somewhat	158	23.1
Increased significantly	40	5.8
Don't know	28	4.1

Decreased significantly = 1, Decreased somewhat = 2, Remained the same = 3, Increased somewhat = 4, and Increased significantly = 5, Arithmetic mean = 3.1

Table 14. Respondents' perceptions of the adequacy of local infrastructure.

Perception	N	Percent
Very unprepared	128	19.4
Somewhat unprepared	252	38.2
Neutral	111	16.8
Somewhat prepared	155	23.5
Very prepared	13	2.0

Decreased significantly = 1, Decreased somewhat = 2, Remained the same = 3, Increased somewhat = 4, and Increased significantly = 5, Arithmetic mean = 2.5

N=Responses

Table 16. Importance of various natural resource attributes of the Kailua area.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Item	Percent	Percent	Percent	Percent	Percent	Mean
Creating more public natural areas	9.1	13.9	36.6	27.0	13.4	3.2
Protecting forest reserves from development	1.8	4.9	11.7	35.8	45.8	4.2
Protecting existing open space from being developed	2.0	5.8	14.2	32.9	45.2	4.1
Reducing the amount of trash that makes its way to the sea in the storm drain system	0.9	0.8	6.4	33.0	58.9	4.5
Creating safe and healthy stream waters	0.9	0.6	7.0	34.2	57.3	4.5
Protecting groundwater safety	0.5	0.9	3.6	28.5	66.5	4.6
Increasing local food production	4.4	7.5	22.8	31.2	34.1	3.8
Promoting the sustainability of local fishing	2.9	6.8	18.4	33.8	38.1	4.0
Creating community garden spaces	8.8	17.0	30.1	25.7	18.4	3.3
Eradicating problematic non-native plants and animals	2.4	7.5	23.8	37.3	29.0	3.8
Improving the quality of freshwater ecosystems in Kailua	1.4	1.4	14.6	39.8	42.9	4.2

While respondents generally did not favor hard engineering projects on private or public land (for example, 62.3% and 58.5% disagreed with building of seawalls of private or public land, respectively), and were neutral towards beach nourishment, only 27.9% supported allowing the beach to move naturally (Table 23).

Respondents were asked about the acceptability of allowing seawalls to be built on both public and private lands. Seawalls have been used to protect specific features, such as homes and beach frontage, for many years. While seawall engineering has advanced over the years, seawalls are known to influence nearby erosion patterns and their use has been curtailed in many areas. Public support was not observed for the use of seawalls and revetments on public or private property with approximately 60% disagreeing with allowing new seawalls in Kailua. (Figure 5).

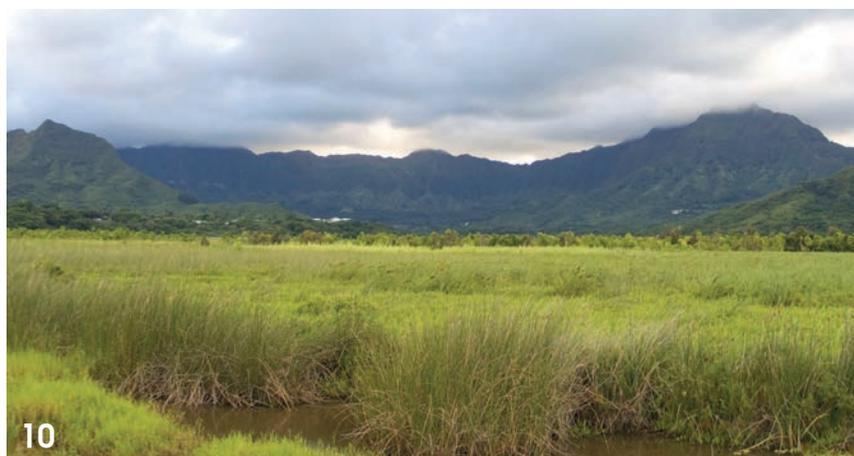


Table 17. Importance of sandy, rather than rocky, mud, etc., beaches at Kailua and Lanikai.

Importance	N	Percent
Not at all important	7	1.0
A little important	17	2.5
Neutral	36	5.2
Very important	204	29.5
Extremely important	428	61.8

Decreased significantly = 1, Decreased somewhat = 2, Remained the same = 3, Increased somewhat = 4, and Increased significantly = 5
Arithmetic mean = 3.1

Table 18. Importance of water conservation in the Kailua area.

Importance	N	Percent
Not a priority	13	1.9
A small priority	49	7.2
A moderate priority	208	30.5
A high priority	272	39.9
A very high priority	140	20.5

Not a priority = 1, A small priority = 2, A moderate priority = 3, A high priority = 4, and A very high priority = 5, Arithmetic mean = 3.7

N=Responses

Kawainui Marsh, a large freshwater ecosystem situated between Kailua and the Ko‘olau Mountains, is a prominent natural feature of the Kailua area. The marsh has been modified over the years, most notably to provide flood mitigation, and various uses for the site may be considered, so long as they continue to provide social acceptable levels of ecosystem services. Respondents found it acceptable to use the marsh as a site for formal environmental education programs (79% in favor), though they were less supportive of it being promoted as an ecotourism site (51.2% in favor). They were opposed to allowing any fringe area development (82.3% disagreed with this suggestion), nor did they wish to see it turned into a nature sanctuary (54.5% against). The response pattern suggests that respondents wish to see a balanced approach to conserving the marsh that includes appropriate use (Table 24).

Finally, respondents were asked for their attitudes towards beach dunes, seawalls, and public expenditures on infrastructure (e.g., roads, sewer systems, etc.). With respect to beach dunes,

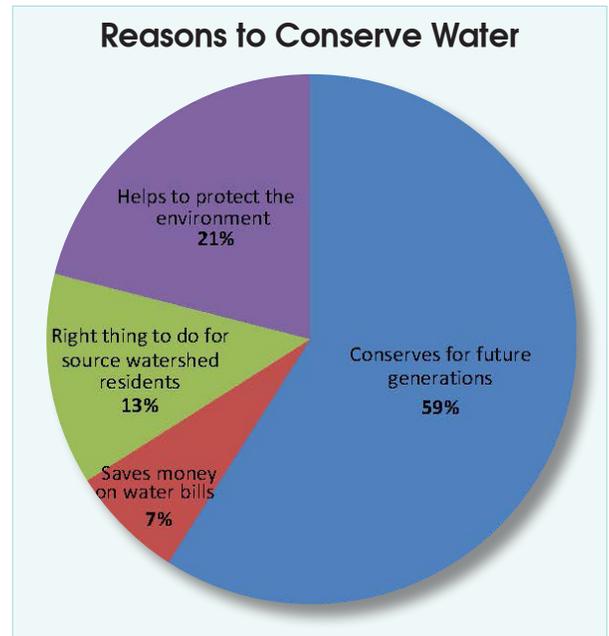


Figure 2. Reasons that respondents feel water conservation is important.

Table 19. Preferences for water conservation strategies in Kailua.

	Strongly oppose	Oppose	Neutral	Support	Strongly support	
Item	Percent	Percent	Percent	Percent	Percent	Mean
Programs to voluntarily increase residential rainwater catchment systems for landscaping use	0.8	2.2	20.0	48.8	28.3	4.0
Programs to voluntarily increase the use of local, native plants	0.6	0.9	20.3	50.9	27.2	4.0
Programs to voluntarily increase low-flow toilets and faucets	1.5	3.8	17.3	48.1	29.2	4.0
Regulations to require new development to use low-flow toilets and faucets	4.3	8.5	21.4	36.6	29.1	3.8
Programs to deliver water conservation education to students and adults in Kailua	0.9	1.1	19.3	49.8	28.9	4.0
Continued investment by the county to maintain and improve water delivery systems, such as continuing to find and fix leaks	0.3	0.2	4.9	45.8	48.8	4.4

Not a priority = 1, A small priority = 2, A moderate priority = 3, A high priority = 4, and A very high priority = 5



the project intent was to determine whether people were more likely to support beach dune preservation on ecological or economic grounds. We did not provide a forced-choice response format and it appears that both reasons enjoy about equal support with 82% and 73% respectively (Figure 6). 76% of respondents supported spending public monies on improving infrastructure in the face of coastal hazards (Table 25).

Values

People value resources for different reasons. Some of those reasons may be very personal, while others are more generic. It should not be assumed that people value a beach, view, lake, or field for the same reason. With this in mind, respondents were asked to state their top three reasons, in order of importance, for valuing Kailua Beach. “Recreation” received the most number 1 responses with 36%, followed by aesthetics (“scenery” 27%) (Table 26). “Ecological significance” placed fourth with 11%. Only a small percentage of respondents (<3%) stated that Kailua Beach was of no particular value to them.

Another way to look at relative importance of each value category is to examine them according to where each placed on

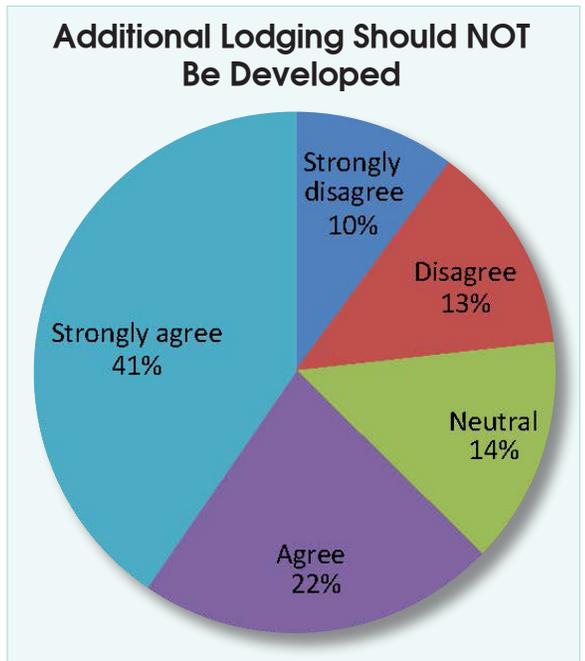


Figure 3. Attitudes regarding additional visitor lodging (Item 1, Table 21).

Table 20. Should Kailua’s hillsides be developed for homes or other buildings?

Attitude	N	Percent
Adamantly opposed	288	43.5
Likely to be opposed	225	34.0
Neutral	58	8.8
Willing to consider	78	11.8
Very supportive	13	2.0

N=Responses



Table 21. Respondent’s attitudes towards increasing visitor accommodation infrastructure.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Item	Percent	Percent	Percent	Percent	Percent	Mean
Additional lodging should not be developed	10.4	13.4	14.2	22.4	39.6	3.7
A few small hotels should be built in the Kailua area	53.1	21.0	10.4	11.4	4.0	1.9
One large hotel should be built in the Kailua area	67.8	19.3	6.4	3.0	3.6	1.6
More bed and breakfasts should be created in Kailua	37.9	19.8	22.0	15.0	5.5	2.3
Kailua should try to attract more visitors	26.2	25.4	26.9	16.2	5.3	2.5
Kailua should try to reduce the number of visitors	9.6	23.8	38.5	15.0	13.1	3.0

Not a priority = 1, A small priority = 2, A moderate priority = 3, A high priority = 4, and A very high priority = 5

respondent’s combined “top three” list. In other words, those values that were most often selected first, second, or third can be seen as relatively more important because they have more combined weight. When this analysis was performed, scenery was selected most often (n=491), followed by recreation (n=486), existence (n=292), ecological significance (n=281), heritage and culture (n=105), spirituality (n=89), and finally livelihood (n=39).

Impacts

Many scientific groups including the National Oceanic and Atmospheric Administration are currently predicting that sea level could rise by about three feet or more over the next 100 years. In Kailua, this would likely mean that the waterline along the beach, the water table in the low coastal plains, and the local surface waters will also rise by about three feet over the next 100 years. This would also result in a corresponding landward shift in the beach profile in Kailua with the sea-level rise forcing. Respondents were asked to indicate how they felt a sea level rise of 3 feet would affect their daily life in Kailua with 60% responding there would “no or slight impact” to where they live and to their daily routine (Table 27). Conversely 41% responded sea-level rise would result in “some to very high impact” to their daily life in Kailua. This is a very interesting result, which indicates a general lack of concern or understanding of the potential impacts of sea-level rise to the Kailua community. However, when asked about sea-level rise impacts to beach activities and ocean access, 76% and 65% respectively felt there would be “some to very high impact.” It should be noted, however, that no sea-level rise maps or images were provided for respondents to visualize what three feet of sea level rise might reasonably look like in Kailua.

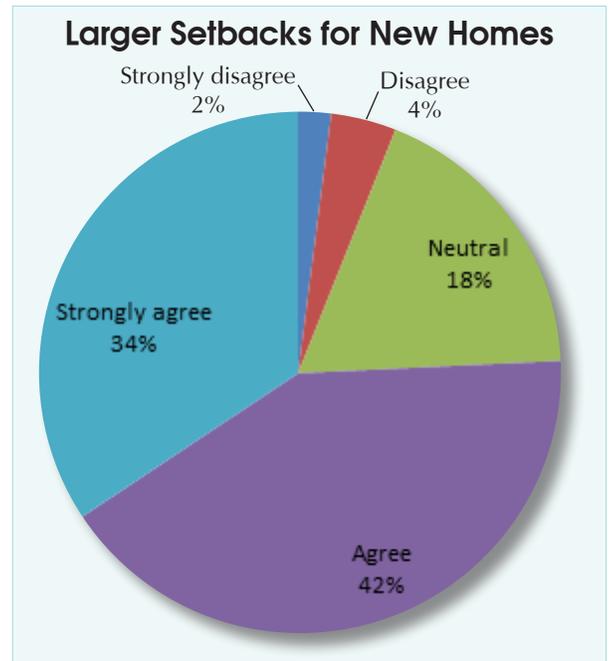


Figure 4. Attitudes towards more restrictive construction setbacks for new homes (second item, Table 22).



Table 22. Respondent’s attitudes towards various general coastal erosion mitigation approaches.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Item	Percent	Percent	Percent	Percent	Percent	Mean
Efforts to deal with coastal erosion in Kailua should be paid for in part by Kailua residents	33.9	24.5	24.8	13.8	3.0	2.3
New development should be built farther inland than currently required	2.0	4.3	18.0	41.4	34.3	4.0
The government should always allow private property owners to take whatever steps they feel are necessary to protect their land from coastal erosion	27.3	29.9	22.0	15.2	5.6	2.4
Efforts to deal with coastal erosion in Kailua should be paid for in part by tourists and the tourist industry	9.3	9.5	26.5	36.9	17.8	3.4
Setbacks should be based only on environmental factors (such as updated erosion rates)	5.4	13.8	22.6	38.3	19.8	3.5

Not a priority = 1, A small priority = 2, A moderate priority = 3, A high priority = 4, and A very high priority = 5

Table 23. Respondents' attitudes towards various general coastal erosion mitigation approaches (b).

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Item	Percent	Percent	Percent	Percent	Percent	Mean
Using accepted erosion rates to determine where new buildings and homes can be constructed	18.7	10.2	19.6	28.1	23.4	3.3
Developing beach and dune management plans	4.9	6.4	14.5	32.6	41.5	4.0
Do not interfere with coastal processes. Allow the beach to move as it wants	22.6	19.1	30.4	15.1	12.8	2.8
Periodically adding sand to the beach	8.7	11.9	29.6	31.5	18.3	3.4
Building walls and revetments on public property	37.9	20.6	24.2	10.9	6.4	2.3
Allowing seawalls and revetments to be built on private property	40.6	21.7	23.0	10.2	4.5	2.2
Building structures into or in the water to help the beach retain sand	28.5	17.0	29.1	17.0	8.5	2.6
Government purchase of coastal land for public benefit	17.4	12.6	21.5	24.3	24.2	3.3
Local land trust purchase of coastal land	23.8	13.0	27.7	18.5	17.0	2.9

Not a priority = 1, A small priority = 2, A moderate priority = 3, A high priority = 4, and A very high priority = 5

Table 24. Attitudes towards management alternatives regarding Kawainui Marsh.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Item	Percent	Percent	Percent	Percent	Percent	Mean
It is important that Kawainui Marsh remain healthy	1.1	0.3	3.8	28.6	66.2	4.6
Kawainui Marsh should be a site for formal education programs	0.9	2.4	17.7	43.0	36.0	4.1
Kawainui Marsh should be promoted as an ecotourism site	5.7	15.2	28.0	28.9	22.3	3.5
Kawainui Marsh should be managed for multiple uses, such as hazard mitigation, resource protection, tourism, and education	3.8	10.7	24.2	39.8	21.5	3.6
The levee at Kawainui Marsh should be removed to reconnect it with other inland waters in Kailua	17.9	26.7	43.4	6.6	5.4	2.5
Several culverts or pipes should be inserted through the levee to allow controlled water flow	4.2	5.6	51.1	29.7	9.3	3.3
It is alright if some fringe areas of the marsh are filled in for development	53.3	29.0	11.1	4.3	2.2	1.7
Kawainui Marsh should be turned into a nature sanctuary and closed to all uses	19.0	35.5	23.3	11.4	10.8	2.6
Remove levees and other man-made infrastructure in order to restore the Kailua wetland system to how it looked 100 years ago	16.5	34.3	36.2	7.1	5.9	2.5

Not a priority = 1, A small priority = 2, A moderate priority = 3, A high priority = 4, and A very high priority = 5

Table 25. Respondents' evaluations of beach dune importance and coastal infrastructure.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Item	Percent	Percent	Percent	Percent	Percent	Mean
Beach dunes should be protected because they are an important component of shoreline ecosystems	1.4	1.4	15.9	48.6	32.6	4.1
Beach dunes should be protected because they protect property from the effects of storms	1.8	1.6	23.6	49.0	24.1	3.9
If need be, I would spend money to build a seawall or similar structure to protect my property	20.1	14.0	36.4	21.5	8.0	2.8
Public money should be earmarked to make infrastructure better able to withstand coastal hazards	2.7	2.2	19.3	48.6	27.1	4.0

Not a priority = 1, A small priority = 2, A moderate priority = 3, A high priority = 4, and A very high priority = 5

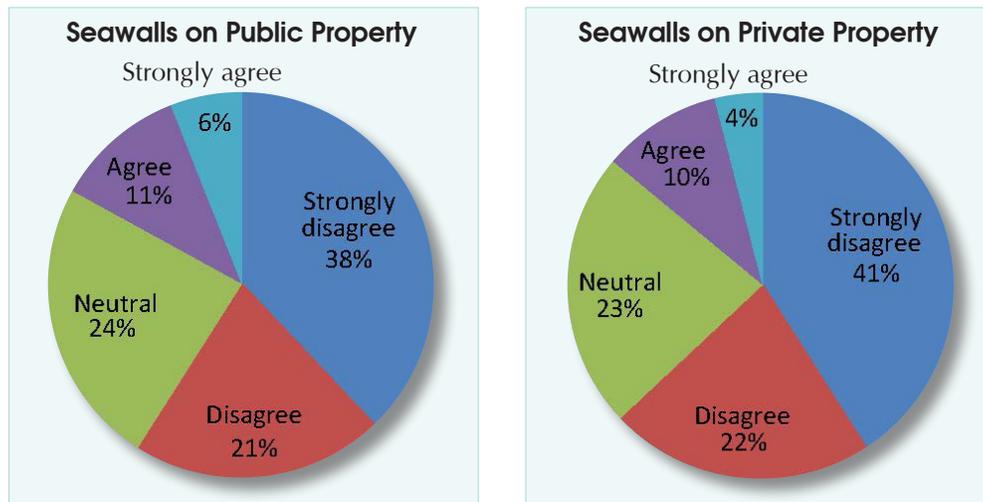


Figure 5. Attitudes towards seawalls and revetments on public and private property (5th and 6th item Table 23).

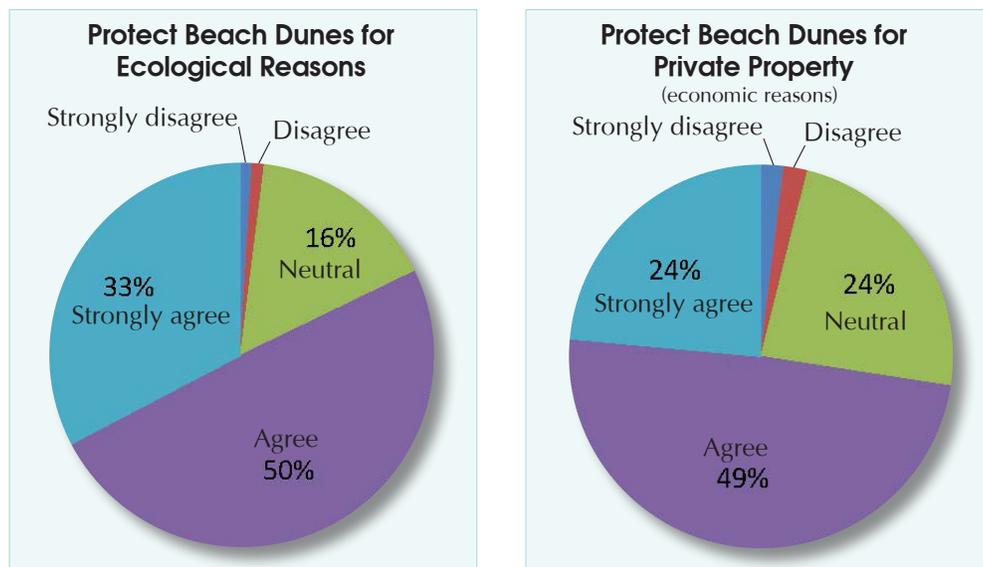


Figure 6. Protecting beach dunes on the basis of ecology and economics.

Willingness to Pay

Respondents were asked to indicate their willingness to pay (WTP) into a hypothetical Kailua Beach Protection Fund. To better understand WTP trends, the survey was separated into four versions – each with a different dollar amount (\$5, \$10, \$25, \$50). This was the only question that differed among the four versions. As one might expect, as the dollar amount increased the percentage of respondents who strongly agreed with paying that amount into such a fund dropped substantially (by approximately 30 percentage points). Other response categories showed similar, though less pronounced, trends (Figure 7). However, the results suggest that such a fund would not be greeted unfavorably, as the percentage of response in the “disagree” and “strongly disagree” categories were relatively low through the \$25 amount and majority (51%) still supported creation of a fund even at \$50. Grayscale graphs further exploring these data are provided in Appendix A.

Table 26. Tally of rank order number 1 responses to common values of Kailua Beach.

Value	N	Percent
Recreation	221	36.1
Scenery	166	27.1
Existence	72	11.7
Ecological significance	67	10.9
Heritage/culture	57	9.3
Spiritual	18	2.9
Livelihood	12	2.0

N=Responses

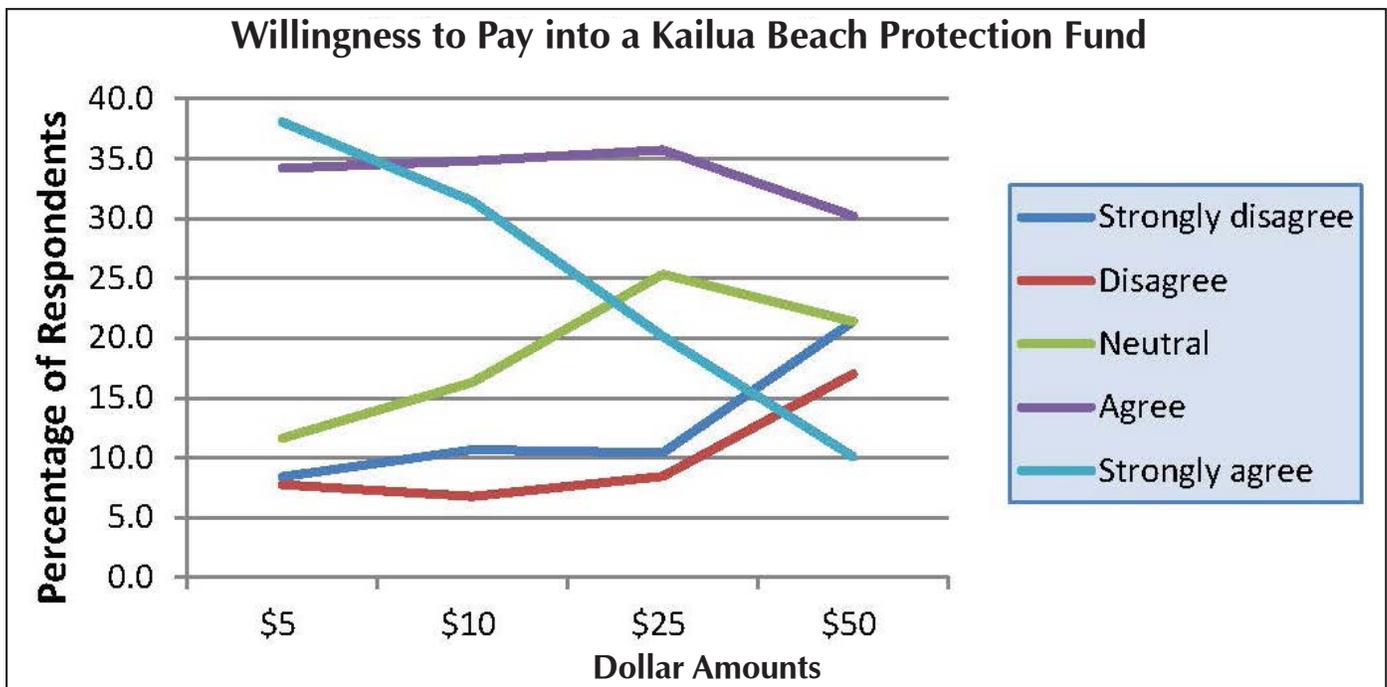


Figure 7. Trends in willingness to pay across the four dollar amounts.

Table 27. Respondents’ evaluations of potential personal impacts from projected sea-level rise.

	No impact	Slight impact	Some impact	High impact	Very high impact	
Item	Percent	Percent	Percent	Percent	Percent	Mean
Where you currently live	43.9	16.1	19.6	10.7	9.7	2.3
Where your friends/family live	22.7	18.1	26.7	19.3	13.1	2.8
Your beach use and activities	13.2	10.8	28.2	25.9	22.0	3.3
Your access to the ocean	21.6	12.2	26.4	23.4	16.4	3.0
Your access to Kawainui Marsh	36.6	20.3	23.9	13.5	5.7	2.3
Your business or employment	76.3	8.4	8.1	4.3	3.0	1.5
Your daily routine	43.5	15.4	20.5	12.9	7.8	2.3

No Impact = 1, Slight Impact = 2, Some Impact = 3, High Impact = 4, and Very High Impact = 5

Connections to the Kailua Beach and Dune Management Plan

The Kailua Plan was being finalized at approximately the same time as this survey was being developed. Therefore, the survey effort provided an opportunity to evaluate the social acceptability of several issues identified in the Kailua Plan process, and these are presented below. However, because of the timing and the variety of additional topics we sought to explore, we were not able to address all of the Kailua Plan's recommendations in the survey. Here we offer some connections between results of this survey and seven selected recommendations set forth in the Kailua Plan.

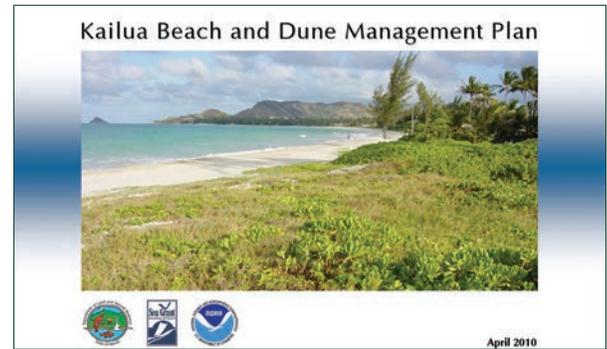


Table 28. Summary of respondent support of Kailua plan recommendations.

Kailua Plan Recommendation	Respondent Inferred Level of Support
1a. Identify critical infrastructure at risk of sea-level rise inundation	Generally high: 76% support of earmarking public money for infrastructure.
1b. Shoreline setback and coastal development policies	Mixed: 52% for use of erosion rate-based setback and 76% requiring increased shoreline setbacks.
2a. Dune restoration efforts	Strong: 81% support for dune preservation in Kailua, and 74% for developing beach and dune management plans.
3a. Kailua Coastal Construction Control Line	Generally high: 76% increasing shoreline setbacks. 57% disagreed with allowing new shoreline structures such as seawalls.
4a. Natural resource funds for beach maintenance, shoreline access, and beach and dune restoration projects in Kailua.	Mixed: 50% support for beach nourishment. Only 17% supporting locally-derived funds to pay for erosion-control. Visitor-fees for erosion control were more (although not overwhelmingly) supportive with 55% supporting the concept.
4a. Willingness to Pay into a beach fund.	Mixed: The percentage of response in the “disagree” and “strongly disagree” categories were relatively low through the \$25 amount, indicating general support and majority (51%) still supported creation of a fund even at \$50.
4b. Conservation easements and Land Trust purchases.	Low: There was little support (36%) among respondents for land trust purchase of coastal land.



1. KAILUA PLAN Recommendation: Timely Response to Sea-Level Rise

1a. Sub-recommendation: Identify critical infrastructure at risk of sea-level rise inundation

Survey Indications: While respondents generally did not believe their own lives would be too badly disrupted by sea-level rise (see Table 27), a majority (76%) were supportive of earmarking public moneys to enable infrastructure

to better withstand coastal hazards. Since this is one step beyond simply identifying infrastructure at risk, we can conclude there is support for an inventory of critical infrastructure.

1b. Sub-recommendations: Amend shoreline setback and coastal development policies; incorporate projected future shoreline locations due to sea-level rise into long-range design plans and controls on coastal development.

Survey Indications: Several items on the survey addressed aspects of setback and coastal development policy, as well as design planning. Results are somewhat mixed. While there was solid support for beach dune preservation, only half of the respondents (52%) agreed with the use of accepted erosion rates to determine where new coastal buildings and homes should be constructed. However, there was more support for requiring new homes/construction to be built farther inland than is presently allowed, with 76% agreeing with this idea.

2. KAILUA PLAN Recommendation: Preservation and Restoration of Primary Coastal Dunes

2a. Sub-recommendation: Encourage and support dune restoration efforts (dune fencing, re-vegetation, sand nourishment, etc.) with incentives such as grants or a conservation easement program managed by a non-profit land trust to manage the dune system and provide participating private landowners with tax relief or credits.

Survey Indications: Solid support was seen for dune preservation in Kailua, both for ecological (81%) and economic (73%) reasons. We did not ask specifically about conservation easements, though support was not seen for land trust purchase of coastal land (which is a somewhat different question). Support was seen for developing beach and dune management plans (74% in favor).

3. Recommendation: Proactive Development Standards for New Construction

3a. Sub-recommendations: Adopt the concept of a Coastal Construction Control Line (CCCL) in the state statutes (Chapter 205-A, HRS) and define it at Kailua Beach as the seaward edge of existing major structures - i.e., those that would require a variance under present Shoreline Setback Area Rules and Regulations - and update the CCCL alignment periodically.

Survey Indications: Respondents on average were fairly neutral (mean = 3.3) on the use of accepted erosion rates to determine where new coastal buildings and homes should be constructed. However, over three-quarters of respondents (76%) agreed with building new construction farther inland. In addition, a majority of respondents (57%) disagreed with allowing private landowners to take any necessary step to protect their land from coastal erosion. This may suggest support for additional action by the state legislature, at least among Kailua area voters.

4. KAILUA PLAN Recommendation: Establish Reliable Funding and Support Mechanisms

4a. Sub-recommendations: Direct a portion of annual allocations from the applicable county and state natural resource funds for beach maintenance, shoreline access, and beach and dune restoration projects in Kailua. Kailua-specific coastal land use fines and penalties could also be allocated to such a fund. Seek to match or augment these resources with funds from state and federal grant programs and private organizations.

Survey Indications: This survey did not ask about diverting state and county funds, or local fines, to beach maintenance, shoreline access, and beach and dune restoration projects in Kailua. Again, however, support was seen for dune preservation. Less support existed for beach re-nourishment with just half of the respondents (50%) supporting periodically adding sand to Kailua beach. When asked if efforts to address coastal erosion should be paid for by Kailua residents, respondents reacted very unfavorably with only 17% supporting the idea. On the issue of whether funding for same should come from tourists, respondents were more (although not overwhelmingly) supportive with 55% supporting the concept. Respondents were asked to indicate their willingness to pay into a hypothetical Kailua Beach Protection Fund. The results suggest that such a fund would not be greeted unfavorably,

as the percentage of response in the “disagree” and “strongly disagree” categories were relatively low through the \$25 amount and majority (51%) still supported creation of a fund even at \$50.

4b. Sub-recommendations: Provide start-up funding and enabling legislation for real property, state income and inheritance tax deductions or credits for a conservation easement program, managed by a non-profit land trust that negotiates and receives conservation easements on dune areas owned by private beachfront landowners and enters into management contracts and projects with state and county agencies.

Survey Indications: Results suggest that any action to fund land trust management of conservation easements should be well-articulated and bounded, as there was little support (36%) among respondents for land trust purchase of coastal land. Although the two issues/actions are not the same, they could be confused by some residents.



Next Steps

We recommend several next steps to capitalize on and extend the progress made with this project. These are discussed below.

First, as mentioned previously, this survey contains many relationships, most of which were not analyzed above. However, such information is undoubtedly of use in various current and future planning and management decisions. Decisions-makers are encouraged to contact UH Sea Grant to discuss these needs.

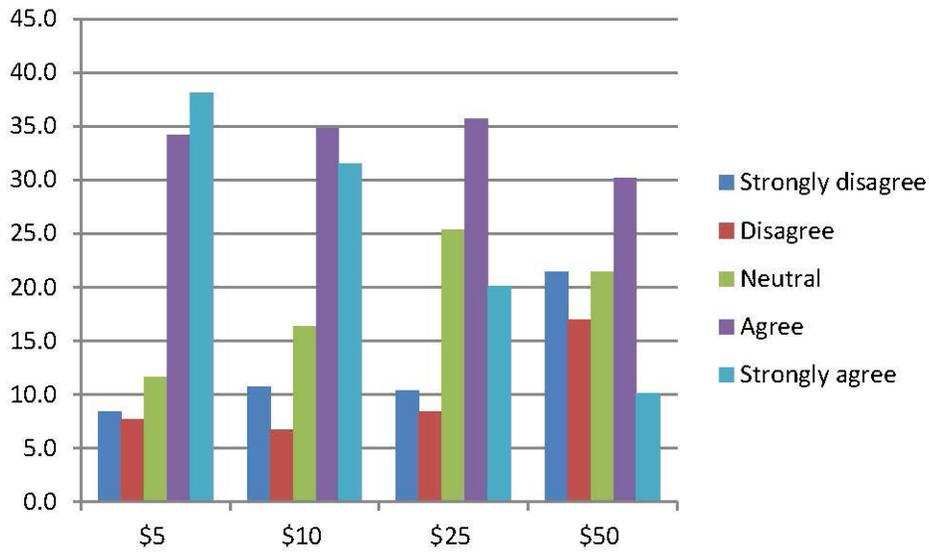
Second, this survey is reflective of a traditional social science research design that elicits background information related to management options by seeking respondent support or opposition to questions and statements. While this design is useful in identifying and narrowing management alternatives, it remains a static tool in that it only allows managers to examine singular attitudes or preferences in general. It does not provide any insight into how people would likely choose from among multiple competing objectives or the social, ecological, and economic trade-offs they are willing to make in order to achieve desired management objectives.

When the data were analyzed, it was clear that many items were evaluated by respondents as high priorities. However, limited funding exists to address all of these issues, so follow-up research is in order to rank these priorities and understand the acceptability of certain trade-offs to achieve various social objectives. One approach to accomplishing this is the use of a stated preference choice model (SPCM) as a joint evaluation tool. The basic premise of the SPCM is to generate hypothetical scenarios by simulating choice sets and elicit individuals' preferences for multiple attributes considered simultaneously. As the SPCM enables researchers to identify the relative importance of decision attributes and the trade-offs that individuals are willing to make between these attributes, it is seen as an improved method for understanding user preferences.

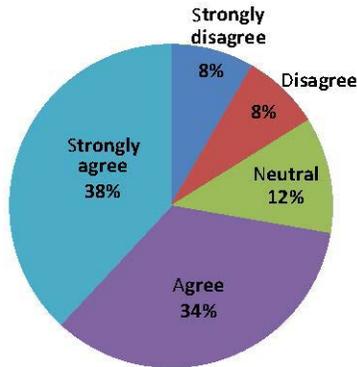
Lastly, and similarly, because this was a general survey that collected basic attitude and preference data, it did not contain many forcing questions that required respondents to make thoughtful choices. For example, while respondents generally do not favor hard coastal engineering projects on private or public land (such as seawalls), they are only neutral towards beach nourishment, and do not favor allowing the beach to move naturally. These apparent contradictions should be explored further in order to understand socially-viable options for dealing with erosion and other issues.

Appendix A

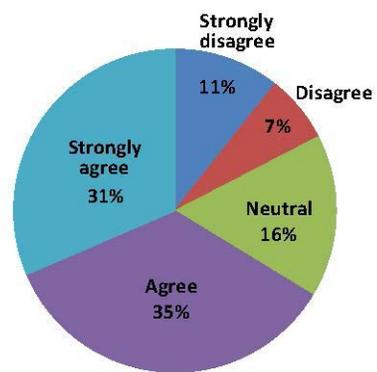
Willingness to Pay into a Beach Protection Fund



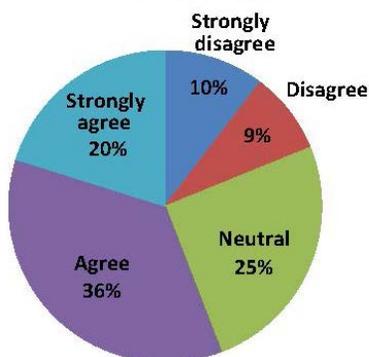
Would Pay \$5 into a Kailua Beach Protection Fund



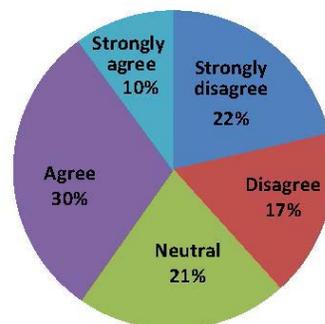
Would Pay \$10 into a Kailua Beach Protection Fund



Would Pay \$25 into a Kailua Beach Protection Fund



Would Pay \$50 into a Kailua Beach Protection Fund



Your Kailua

Social and Environmental Trends



University of Hawai'i at Mānoa
Sea Grant College Program
2525 Correa Road, HIG 238
Honolulu, HI 96822

Both Lanikai Beach and the south part of Kailua Beach (near the boat ramp) have been affected by coastal erosion. Both beaches are near residential areas.

5. There are some things that can be done to manage coastal erosion in the Kailua/Lanikai area. Please indicate how acceptable each of the following options is to you.

	Not at all acceptable	Slightly acceptable	Somewhat acceptable	Very acceptable	Extremely acceptable
a. Using appropriate/accepted erosion rates to determine where new buildings and homes can be constructed	1	2	3	4	5
b. Developing beach and dune management plans	1	2	3	4	5
c. Do not interfere with coastal processes. Allow the beach to move as it wants to.....	1	2	3	4	5
d. Periodically adding sand to the beach	1	2	3	4	5
e. Building seawalls and revetments on public property.....	1	2	3	4	5
f. Allowing seawalls and revetments to be built on private property.....	1	2	3	4	5
g. Building structures into or in the water to help the beach retain sand	1	2	3	4	5
h. Government purchase of coastal land for public benefit	1	2	3	4	5
i. Local land trust purchase of coastal land	1	2	3	4	5
j. Other.....	1	2	3	4	5

6. Please indicate the extent to which you disagree or agree with the following statements.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. Efforts to deal with coastal erosion (such as sand nourishment of beaches) in Kailua should be paid for in part by Kailua area residents.....	1	2	3	4	5
b. New homes or reconstruction should be built farther inland than currently required.....	1	2	3	4	5
c. The government should always allow private property owners to take whatever steps they feel are necessary to protect their land from coastal erosion.....	1	2	3	4	5
d. Efforts to deal with coastal erosion in Kailua should be paid for in part by tourists and the tourist industry..	1	2	3	4	5
e. Setbacks (the distance from the shoreline that a structure can be built) should be based only on environmental factors (such as updated erosion rates)	1	2	3	4	5

The information you provide us will remain strictly confidential and your name will never be associated with your answers.

1. During the time you have lived in Kailua, how would you say the overall **quality** of outdoors and nature experiences/facilities/services have changed (for example, nature trails, hikes, public recreation areas and beaches)?

- 1 Decreased significantly
- 2 Decreased somewhat
- 3 Remained about the same
- 4 Improved somewhat
- 5 Improved significantly

dk Don't know/Not sure

2. During the time you have lived in Kailua, how would you say that the **availability of opportunities** to experience the outdoors and nature in the Kailua area have changed?

- 1 Decreased significantly
- 2 Decreased somewhat
- 3 Remained about the same
- 4 Increased somewhat
- 5 Increased significantly

dk Don't know/not sure

3. Depending on location, Hawai'i's coastal areas may be: rocky bluffs and cliffs, clay banks, sandy beaches, boulder slopes, mud flats, tidal wetlands, and even built shorelines such as seawalls and revetments. How important is it to you that Kailua and Lanikai beaches remain sandy beaches, as they are now?

- 1 Not at all important
- 2 A little important
- 3 Neutral
- 4 Very important
- 5 Extremely important

4. Some of the hillsides surrounding Kailua do not have houses or other buildings on them. How would you feel if homes were to be built on hillsides that could feasibly accommodate them?

- 1 I would be adamantly opposed to any such development
- 2 I would more than likely be opposed to such development
- 3 I would be neither opposed nor supportive of such development
- 4 I would be willing to consider some development
- 5 I would be very supportive of developing these hillsides

dk Don't know/Not sure

7. Kawainui Marsh is the largest wetland in the state of Hawai'i. Please indicate the extent to which you disagree or agree with the following statements.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. It is important that Kawainui Marsh remain healthy.....	1	2	3	4	5
b. Kawainui Marsh should be a site for formal environmental education programs.....	1	2	3	4	5
c. Kawainui Marsh should be promoted as an ecotourism site	1	2	3	4	5
d. Kawainui Marsh should be managed for multiple uses, such as hazard mitigation, resource protection, tourism, and education	1	2	3	4	5
e. The levee at Kawainui Marsh should be removed to reconnect it with other inland waters in Kailua	1	2	3	4	5
f. Several culverts or pipes should be inserted through the levee to allow controlled water flow	1	2	3	4	5
g. It is alright if some fringe areas of the marsh are filled in for residential or commercial development..	1	2	3	4	5
h. Kawainui Marsh should be turned into a nature sanctuary and closed off to all uses.....	1	2	3	4	5
i. We should remove levees and other man-made infrastructure in order to restore the Kailua wetland system to how it looked 100 years ago, when all of the major wetlands in Kailua were connected	1	2	3	4	5

Some of the following items may be important for the quality of life for residents of coastal communities like Kailua. What do you think?

8. Please tell us how important each item is to you when considering the future of Kailua. Please think critically about each item so that we know exactly how important each item is to you.

	Not at all important	Slightly important	Somewhat important	Very important	Extremely important
a. Improving the walk-ability of your neighborhood1	2	3	4	5	
b. Improving the bike-ability of all Kailua1	2	3	4	5	
c. Adding public transportation options1	2	3	4	5	
d. Developing more areas in which to hike1	2	3	4	5	
e. Ensuring that there is adequate public access1	2	3	4	5	
f. Improving sewage management in the Kailua area1	2	3	4	5	
g. Using public guidance to develop Kailua's central business district1	2	3	4	5	
h. Investing local funds in Kailua area renewable energy projects1	2	3	4	5	
i. Instituting tax credits for rainwater catchment systems1	2	3	4	5	
j. Improving Kailua's parks and recreation facilities1	2	3	4	5	
k. Increasing the amount of affordable housing developments1	2	3	4	5	
l. Improving storm-water management1	2	3	4	5	
m. Other1	2	3	4	5	

9. Currently, Kailua is primarily residential, with limited infrastructure to enable visitors to stay in the area. Please indicate the extent to which you disagree or agree with the following statements.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. Additional lodging should not be developed1	2	3	4	5	
b. A few small hotels should be built in the Kailua area1	2	3	4	5	
c. One large hotel should be built in the Kailua area1	2	3	4	5	
d. More bed and breakfasts should be created in the Kailua area1	2	3	4	5	
e. Kailua should try to attract more visitors1	2	3	4	5	
f. Kailua should try to reduce the number of visitors1	2	3	4	5	
g. Other1	2	3	4	5	

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10. Please indicate the extent to which you disagree or agree with each of the following statements.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. Beach dunes should be protected because they are important components of shoreline ecosystems1	2	3	4	5	
b. Beach dunes should be protected because they help to protect property from the effects of storms1	2	3	4	5	
c. I am willing to pay 5 dollars per year into a Kailua Beach Protection Fund1	2	3	4	5	
d. If need be, I would incur the expense of building a seawall or similar structure to protect my property1	2	3	4	5	
e. Public money should be earmarked to make current infrastructure (roads, public buildings, water treatment facilities, etc.) better able to withstand coastal hazards1	2	3	4	5	

11. Please rank order your top 3 choices by how important each of the following values of Kailua Beach are to you. For example, if "d" is most important to you, please place a number one on the line to the left of "d."

If Kailua Beach has no particular value to you, you do not need to rank order these items; please circle the letter "i."

- _____ a. I value Kailua Beach as a part of my heritage and cultural practices
- _____ b. I value Kailua Beach for some form of spiritual activity or importance
- _____ c. I value the scenery of Kailua Beach
- _____ d. I value Kailua Beach because some part of my livelihood is dependent on it
- _____ e. Just knowing Kailua Beach is there is of value to me
- _____ f. I value Kailua Beach for recreation
- _____ g. I value Kailua Beach for its coastal ecological significance
- _____ h. Other _____
- _____ i. Kailua Beach is of no particular value to me

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Some of the following may be important for the coastal environment in communities like Kailua. What do you think?

12. Please tell us how important each item is to you when considering the future of Kailua's environment. Please think critically about each item so that we know exactly how important each item is to you.

	Not at all important	Slightly important	Somewhat important	Very important	Extremely important
a. Creating more public natural areas1	2	3	4	5	
b. Protecting forest reserves from development1	2	3	4	5	
c. Protecting existing open space from being developed1	2	3	4	5	
d. Reducing the amount of trash that makes its way to the sea in the storm drain system1	2	3	4	5	
e. Creating safe/healthy stream waters1	2	3	4	5	
f. Protecting the safety of ground water1	2	3	4	5	
g. Increasing local food production1	2	3	4	5	
h. Promoting the sustainability of local fishing1	2	3	4	5	
i. Creating community garden spaces1	2	3	4	5	
j. Eradicating problematic non-native plants and animals1	2	3	4	5	
k. Improving the quality of freshwater ecosystems in Kailua (streams, lakes, etc.)1	2	3	4	5	
l. Other1	2	3	4	5	

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The National Oceanic and Atmospheric Administration is currently predicting sea level could rise by about three feet over the next 100 years. In Kailua, this would likely mean that the waterline along the beach, the water table in the low coastal plains, and the local surface waters will also rise by about 3 feet over the next 100 years.

With this in mind, please answer Question 13.

13. Please indicate how three feet of sea-level rise would impact your daily life in Kailua.

	No impact	Slight impact	Some impact	High impact	Very high impact
a. Where you currently live1	2	3	4	5	
b. Where your friends/family currently live1	2	3	4	5	
c. Your beach use/activities1	2	3	4	5	
d. Your access to the ocean1	2	3	4	5	
e. Your access to Kawaiui Marsh1	2	3	4	5	
f. Your business or employment1	2	3	4	5	
g. Your daily routine1	2	3	4	5	
g. Other1	2	3	4	5	

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