



RESTORE AMERICA'S ESTUARIES

HUMAN DIMENSIONS

**A PILOT RESEARCH PROJECT EXPLORING
VOLUNTEERISM AND CONSERVATION BEHAVIOR**

CONTENTS

Executive Summary..... 2

Research Methods 3

Results..... 3

Tabulated Results 5

Recommendations..... 15

Tests of Difference..... 16

Prediction Analysis 19

Raw Data 22

EXECUTIVE SUMMARY

In February, 2006 Restore America’s Estuaries (RAE) and the National Oceanic & Atmospheric Administration (NOAA) commissioned a pilot study with volunteers from three environmental groups, Tampa Bay Watch (FL), Save San Francisco Bay (CA), and Galveston Bay Foundation (TX). The goal of the study was: **to begin to explore if or how volunteering in an environmental context relates to conservation behaviors when not engaged in volunteering.**

Estuaries in three large metropolitan statistical areas were targeted for this research—San Francisco, Tampa Bay and Galveston. All respondents were volunteers from local environmental groups, schools, corporations, community organizations and associations/social clubs and ranged in age from 10 to 82. While they do not constitute a scientifically representative sample of volunteers from Tampa Bay Watch, Save San Francisco Bay, and Galveston Bay Foundation (TBW/STB/GBF), they are an excellent cross-section of environmental volunteers from geographically distinct regions of the United States. As such, the data offer important insights into who environmental volunteers are, what they think and do, and what barriers exist for environmental volunteerism.

-
- *Respondents ranged from age 10-82 (avg. 38)*
- *Slightly more women, more than 60%, degreed.*
- *Most, 82%, are not members of their local group... nearly half have never volunteered before.*
-

RESEARCH METHODS

The questionnaire contained 63 quantitative and qualitative questions compiled by representatives from the three participating environmental groups (TBW/STB/GBF), and staff members from NOAA, RAE, the Environmental PR Group, University of Houston, Clearlake, and University of Massachusetts, Amherst, and Stanford University. The environmental groups (TBW/STB/GBF) coded the data in an Excel spreadsheet and compiled individual datasets. This report presents the results of the combined data from all three local participating organizations.

The questionnaire contained four different kinds of questions. First, it had demographic questions to help us group individuals into important demographic clusters. These questions were placed on ordered or nominal scales. Second, there were a series of questions about respondent attitudes toward the environment and environmental issues. These questions were placed on 5-point Likert scales ranging from “Extremely important” to “Not at all important.” Third, was a series of behavioral questions also on a 5-point Likert scale ranging from “Always” to “Never.” Fourth, there were questions about barriers to acting pro-environmentally and these were also placed on 5-point Likert scales ranging from “Strongly agree” to “Strongly disagree.” In addition, there were a number of questions about whether or not respondents participated in activities in or near their Bay and how many days in the last year they engaged in each activity.

RESULTS

The results of this survey clearly demonstrate that respondents, volunteers at local environmental restoration events in the San Francisco Bay, Tampa Bay and Galveston Bay areas, have strongly pro-environmental attitudes and behaviors and fairly low barriers to participation in environmental activities. Regarding attitudes about the environment, the most positive attitudes were the importance of returning the coast to its proper condition, to do something positive for future generations, and to improve the respective Bay areas for wildlife and other species. On the other hand, the least committed respondents were involved just to experience something new and making the area more useful for other human uses. These attitudes were three-quarters of a scaling point **less** important to respondents.

We asked respondents a second set of attitudinal questions specifically about their Bay environments. Like the results from the previous question, respondents clearly valued helping the environment for its own sake and not for any personal gain. They assigned greatest importance to humans having an obligation to leave coastal environments in a better condition for future generations and in the belief that protecting Bay habitats is as important as restoring them. Of least importance were the beliefs that the coastal environment is strong enough to cope with the impacts of modern society and that nature will restore our coastal environment so there is no need to do restoration work. These attitudes were more than 2.5 scaling points **lower** in importance.

Regarding respondent behaviors, the majority (61%) of respondents reported having recreated in or near their Bay in the past year. About one-third walk/run/bike on bayside trails an average of 22 days while one-fifth (21%) power boated and an equal number fished on their Bay an average of 18 and 12 days respectively in this time period. This high level of activity is all the more impressive because respondents lived on average nearly 36 miles from their Bay! Respondents reported that they also perform a variety of environmental acts very often. At the top of this pro-environmental behavior list was refraining from littering and adhering to fishing, boating and hunting laws. The mean scores for these two behaviors hovered around “always” being performed. Respondents were much less likely to participate as a volunteer in public meetings on environmental issues and to drive a hybrid/energy efficient car. These behaviors fell more than 2.25 scaling points below in the frequency with which they are performed--in the “almost never” range.

We also wanted to understand potential barriers to respondents acting in a pro-environmental way. Lack of concern about acting pro-environmentally and thinking that acting pro-environmentally cost too much had the lowest barrier threshold. Most respondents disagreed that these were actually barriers to acting pro-environmentally for them. Not knowing how to behave pro-environmentally had a three-quarter of a scaling point higher barrier threshold, but this was still in the disagreement side of the scale. In other words, our respondents didn't see any real barriers to acting in a pro-environmental manner.

These rather impressive pro-environmental attitudes and behaviors come from respondents, the vast majority of whom (82%) are not members of their local participating environmental group (TBW/STB/GBF). This said, more than half (51%) have volunteered for other environmental activities within the past year. Most of this environmental volunteerism comes from work with schools (24%), community organizations (19%), work (10%) and associations/social clubs (9%).

We also performed tests of difference on respondent demographics to see if demographic differences accounted for any statistically significant differences in pro-environmental attitudes, behaviors and barriers to acting pro-environmentally. Membership in the local participating group (TBW/STB/GBF) accounted for the largest number (13) of attitudinal and barrier differences. This was followed by gender which accounted for 5 behavioral and barrier differences. Education level accounted for 4 behavioral and barrier differences. Whether or not someone had recreated in or near their Bay in the past year produced 2 attitudinal and behavioral differences.

We asked respondents about ways residents can improve the quality of their local Bay via an open-ended question. Littering/picking up after yourself/disposing of things properly was cited by nearly one-third of respondents as a way to improve the quality of their Bay. The second most frequently mentioned improvement to their Bay was practicing responsible landscaping/limiting water run-off into the Bay. This was followed by supporting/volunteering for local environmental groups. Clearly, respondents got the pro-environmental messages the local environmental groups were promoting at their events.

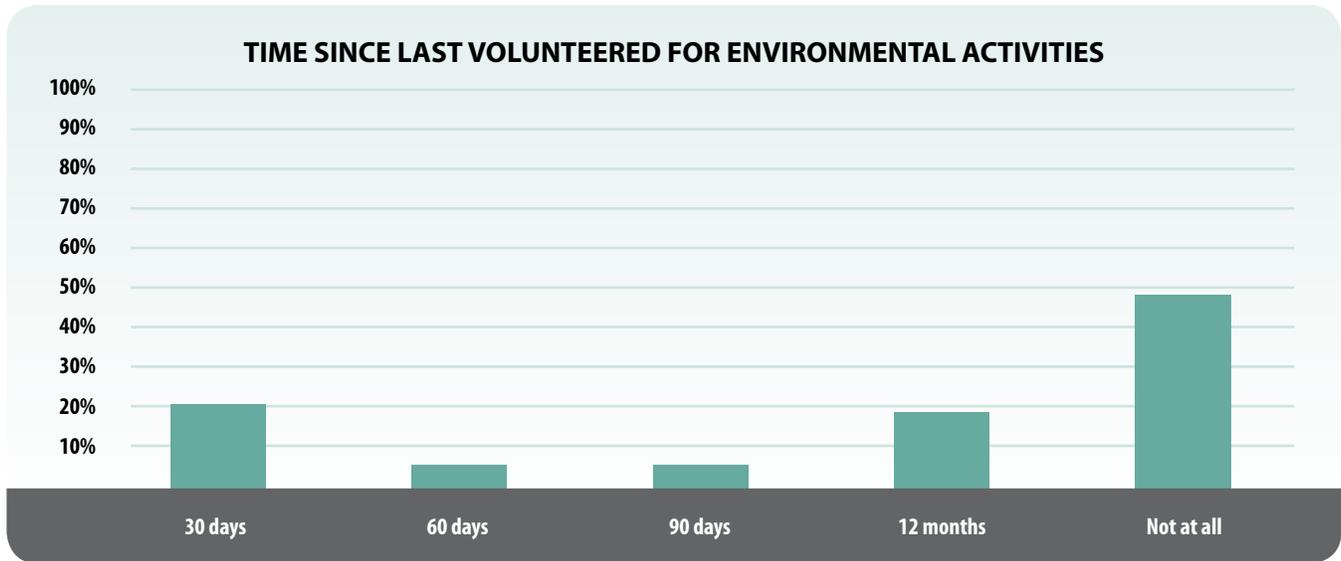
One of the most critical issues this study can provide insight to is the degree to which participating in volunteer environmental activity affects pro-environmental attitudes, behaviors and barriers for respondents. A special prediction analysis was performed, called a discriminant analysis. The purpose was to see if the list (or subset) of attitudes, behaviors and barriers could discriminate between environmental group members (TBW/STB/GBF) and non-members in a meaningful way. This analysis was performed and found that in fact, four attitudes, behaviors and barriers can discriminate between environmental group members and non-members between 75%-77% of the time and is statistically significant. More specifically, environmental group members are characterized by the fact that they contribute money to environmental causes and don't believe that acting pro-environmentally costs too much. Non-members are characterized by not knowing where to find information on pro-environmental behavior and not knowing how to behave in a pro-environmental way.

Finally, we performed a more traditional prediction analysis (multiple regression) on what environmental attitudes, behaviors and barriers best predict whether or not someone has given money to an environmental group. In fact, five environmental attitudes and behaviors account for 55% of the variability in whether or not respondents give money to an environmental group. More specifically, it is possible to predict 55% of the time that a respondent gives money to an environmental group if the respondent **doesn't** believe the coastal environment is strong enough to cope with the impact of modern society, recycles newspapers/cans/bottles, volunteers in public meetings on environmental issues, **doesn't** believe nature will restore our coastal environment, and believes that when humans interfere with our coastal environment it often produces disastrous results.

TABULATED RESULTS

THE MAJORITY OF RESPONDENTS WERE NOT ACTIVE ENVIRONMENTAL VOLUNTEERS WITH NEARLY HALF HAVING NEVER VOLUNTEERED FOR AN ENVIRONMENTAL ACTIVITY AND NEARLY ONE IN FIVE NOT HAVING VOLUNTEERED IN THE PAST YEAR.

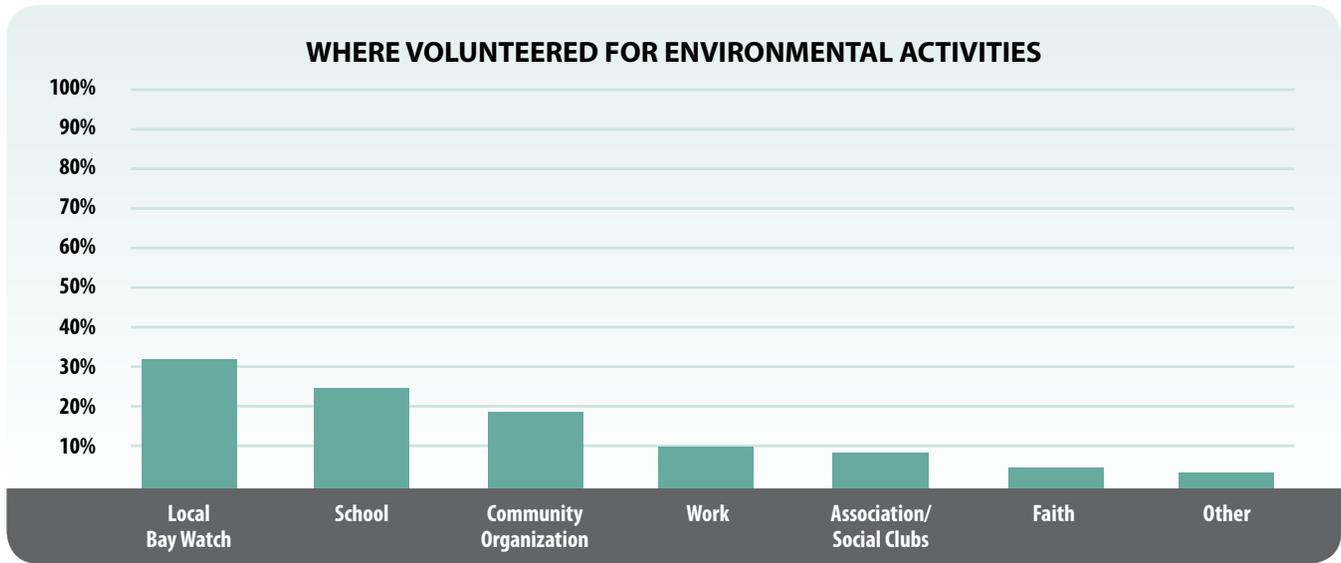
It is important to understand how active our respondents are as environmental volunteers. This was done in two ways to increase the validity of the data. First, we asked respondents to tell us when the last time was that they volunteered for an environmental activity. The largest single response by 49% of our sample was that they hadn't ever volunteered. On the other hand, nearly one-in-three had volunteered for an environmental activity within the past 90 days. Conservatively, approximately half our respondents were not active environmental volunteers and almost one-third are quite active. The data are presented in the table below.



A second way we measured environmental activism was to ask respondents whether or not they were members of the local participating environmental group (TBW/STB/GBF). Only 18% said they were local environmental group members while the remaining 82% were not.

OF THOSE WHO DID VOLUNTEER FOR AN ENVIRONMENTAL ACTIVITY, BAY WATCH, SCHOOLS, AND COMMUNITY ORGANIZATIONS WERE THE MOST FREQUENTLY MENTIONED SPONSORS.

To help further differentiate the nature of environmental volunteerism, we wanted to see how widely respondents' activities were spread. We discovered that slightly less than one-in-three volunteered for the local environmental group. The remainder of active environmental volunteers worked through school programs, community organizations, associations and social clubs, and through religious groups. The results to this question are listed in the table that follows.



OF THOSE WHO HAD VOLUNTEERED FOR ANOTHER NON-ENVIRONMENTAL COMMUNITY ACTIVITY OR PROJECT, A MAJORITY HADN'T DONE SO WITHIN THE PAST YEAR.

It was informative to measure the degree of non-environmental volunteer activity among respondents. In comparison to environmental activities, respondents were slightly more active in non-environmental work with more than two-in-five having volunteered within the past 90 days and only 35% saying they hadn't volunteered at all.

.....
Volunteers have strong pro-environmental attitudes and behaviors with low barriers.
.....

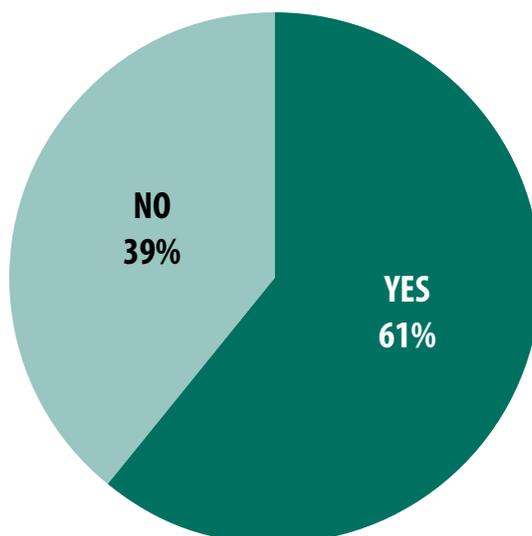
A MAJORITY OF RESPONDENTS REPORTED THAT THEY HAD RECREATED IN OR NEAR THE BAY DURING THE PAST YEAR.

A much larger percentage (61%) of respondents said they had recreated in or near their local bay during the past twelve months. This is made all the more important because we also discovered that the average distance respondents lived away from their local bay was almost 36 miles. Clearly recreation activities draw people from quite a distance away.

ON AVERAGE, PARTICIPANTS DID NOT LIVE VERY CLOSE (35.5 MILES) TO THEIR BAY.

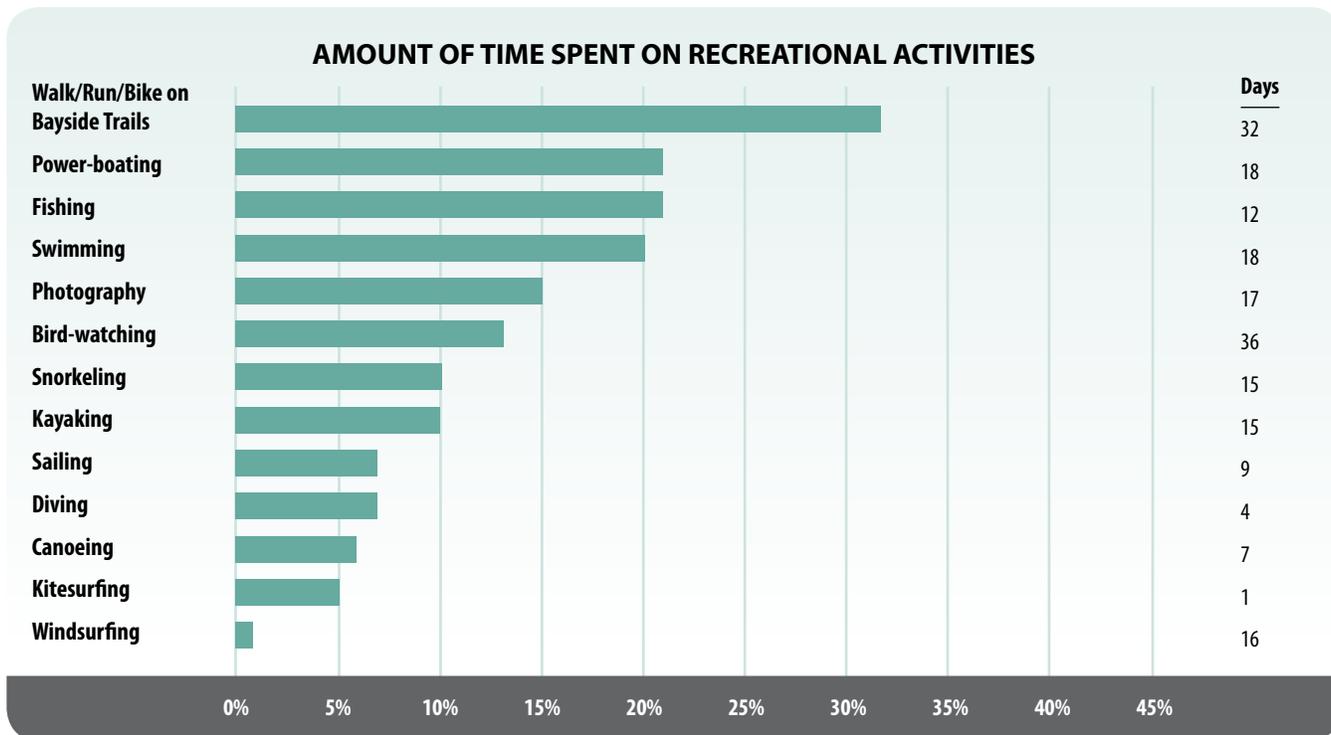
One of the most interesting and important findings is the fact that the average distance respondents lived away from the Bays in each of the three diverse regions of the country is 35.5 miles. Despite this being easily a 45 minute drive in all three urban areas, respondents spent their time and money to make this commitment to their respective Bays. This signals a real commitment to environmental work that the respective environmental groups can and should leverage to improve their Bays.

RECREATED IN OR NEAR THE BAY AT ANY TIME DURING THE PAST 12 MONTHS



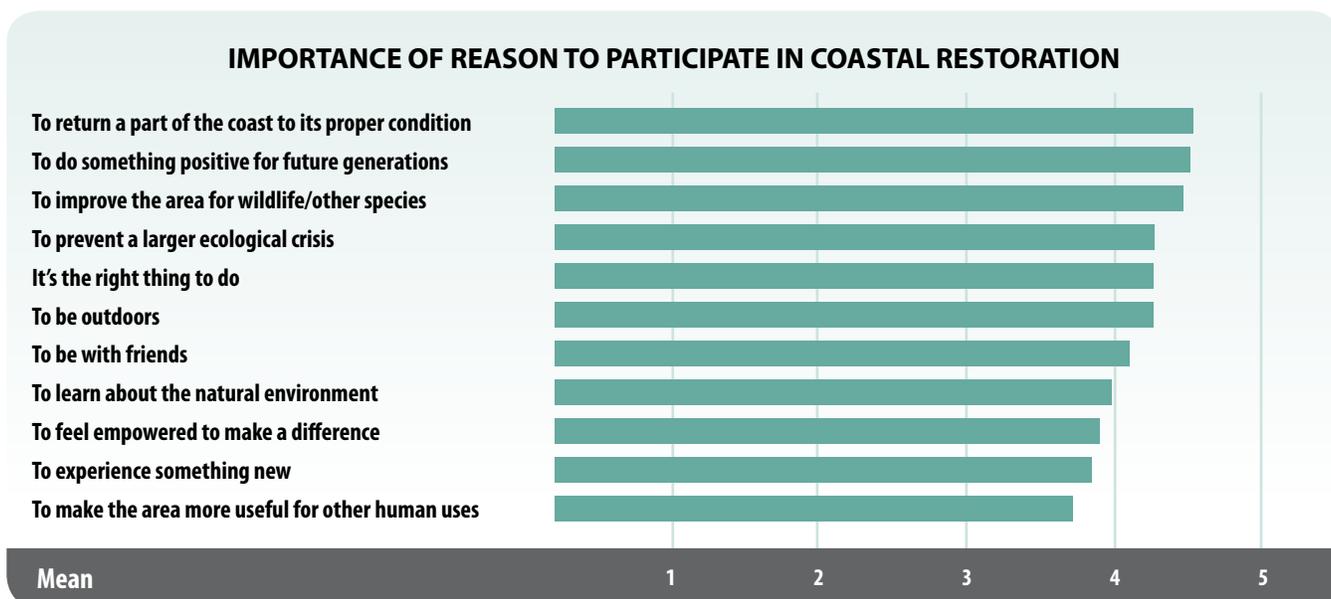
WALKING/RUNNING/BIKING ON BAYSIDE TRAILS WAS THE MOST FREQUENTLY MENTIONED BAY RECREATIONAL ACTIVITY BY RESPONDENTS FOLLOWED BY POWERBOATING, FISHING AND SWIMMING.

We followed up the question about recreating on their local bay by asking what activities they did. While walking/running/biking on bayside trails was the most frequently cited single activity, boating activity was cited more often when you combine both power boating and fishing which, of course, mostly demands being on a boat. Swimming followed close behind boating, and photography and bird-watching were next in activity frequency. The results of this question are presented in the following table. Beside each activity there is the average number of days respondents report doing that activity. These days are more an artifact of the activity than a measure of popularity. For example, while 21% of respondents fished, they did it an average of 12 days per year where 1% windsurfed but averaged 16 days doing it.



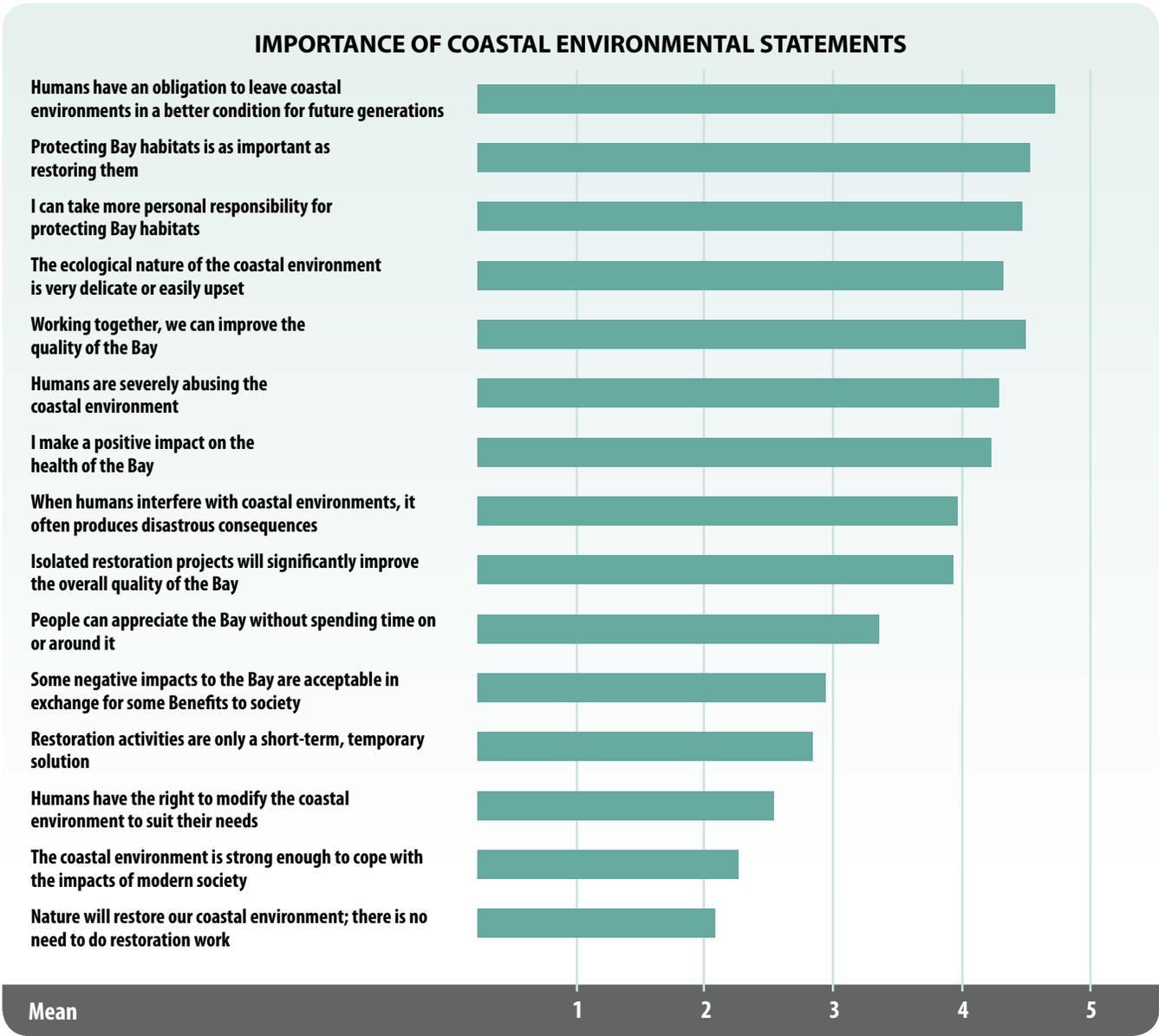
RETURNING A PART OF THE COAST TO ITS PROPER CONDITION AND DOING SOMETHING POSITIVE FOR FUTURE GENERATIONS WERE THE MOST FREQUENTLY CITED REASONS FOR PARTICIPATING IN COASTAL RESTORATION.

Respondents engaged in this environmental activity for all the right reasons. We asked our sample to tell us how important each attitudinal item was to them as a reason to participate in coastal restoration. The reasons with the greatest importance were all very selfless and clearly placed the environment ahead of personal needs and interests. For example, returning part of the coast to its proper condition and doing something positive for future generations were cited as the most important reasons. Making the area more useful for other human use came in dead last in importance. The results using average scores on a 5-point Likert scale are presented in the following table.



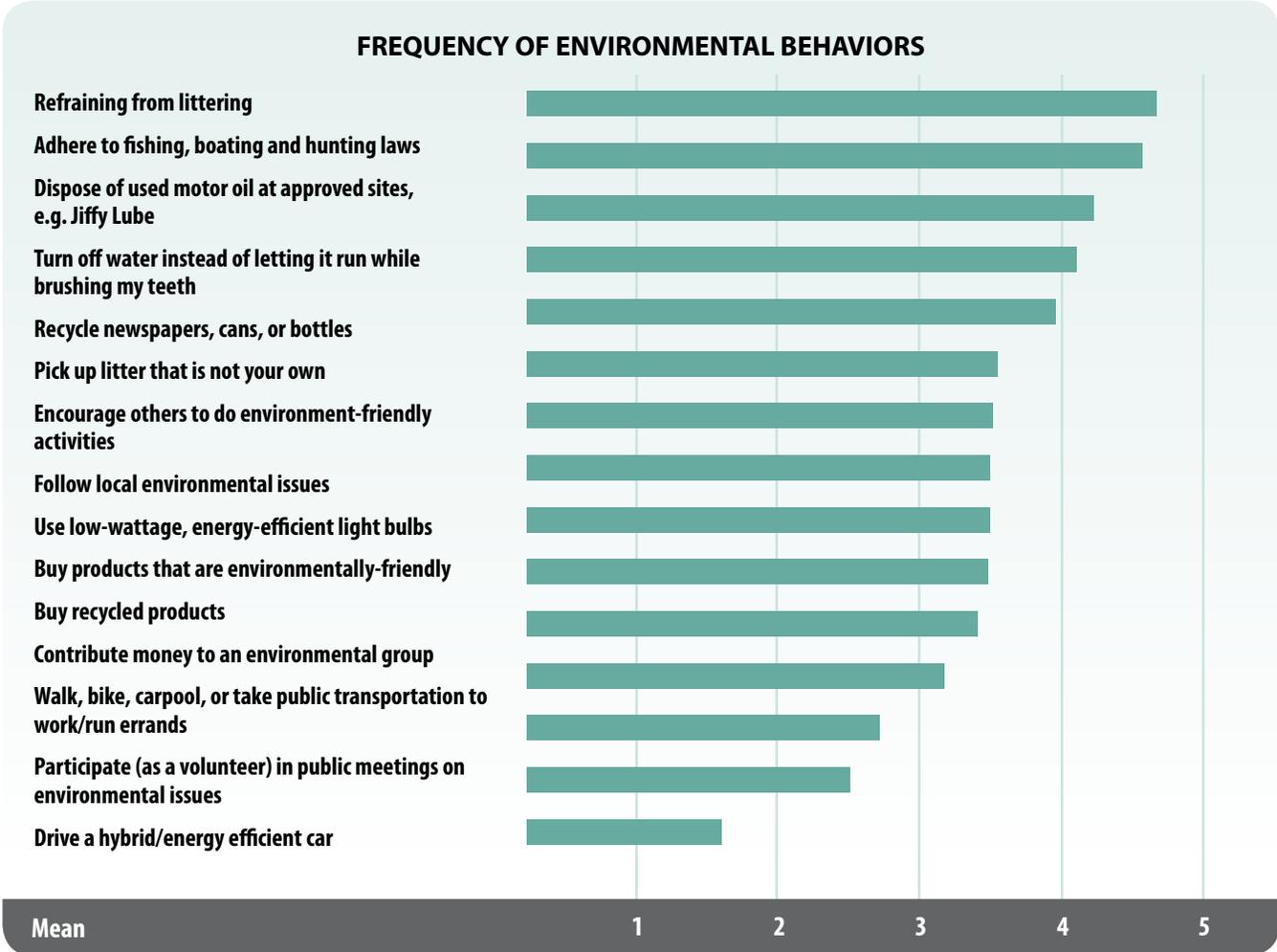
HAVING AN OBLIGATION TO LEAVE COASTAL COMMUNITIES IN BETTER SHAPE FOR FUTURE GENERATIONS AND BELIEVING THAT PROTECTING BAY HABITATS IS AS IMPORTANT AS RESTORING THEM WERE SEEN BY PARTICIPANTS AS THE MOST IMPORTANT REASONS TO PARTICIPATE IN COASTAL RESTORATION.

Respondents placed the greatest importance on two environmental attitudinal statements. The first was that humans have an obligation to leave coastal environments in a better condition for future generations. The second was that protecting Bay habitats is as important as restoring them. Importantly, both of these statements are proactive where value is placed on **preservation** and not remediating coastal environments. As important is the fact that the **least** importance is given to two other environmental attitudinal statements: 1) The coastal environment is strong enough to cope with the impacts of modern society; 2) Nature will restore our coastal environment; there is no need to do restoration work. These two liaise faire environmental statements were more than 2.5 scaling points **below** the first two proactive statements, decidedly in the “slightly important” as opposed to the “very important” end of the scale. The results for all environmental attitudinal statements are presented in the following table. A 5-point Likert scale was used on these attitudinal statements as well.



REFRAINING FROM LITTERING AND ADHERING TO FISHING/BOATING/HUNTING LAWS WERE THE MOST FREQUENTLY CITED ENVIRONMENTAL BEHAVIORS BY PARTICIPANTS.

We wanted to know more about the pro-environmental behaviors respondents engaged in. To do this, we asked them to tell us how often they engaged in a variety of pro-environmental behaviors. The behaviors they engage in most often are refraining from littering and adhering to boating/fishing/hunting laws. The scores on these behaviors indicate that respondents engage in these behaviors almost always. The behavior respondents engage in least often is driving a hybrid/energy efficient car and the mean score indicated this behavior happens almost never. The results are presented below.



.....

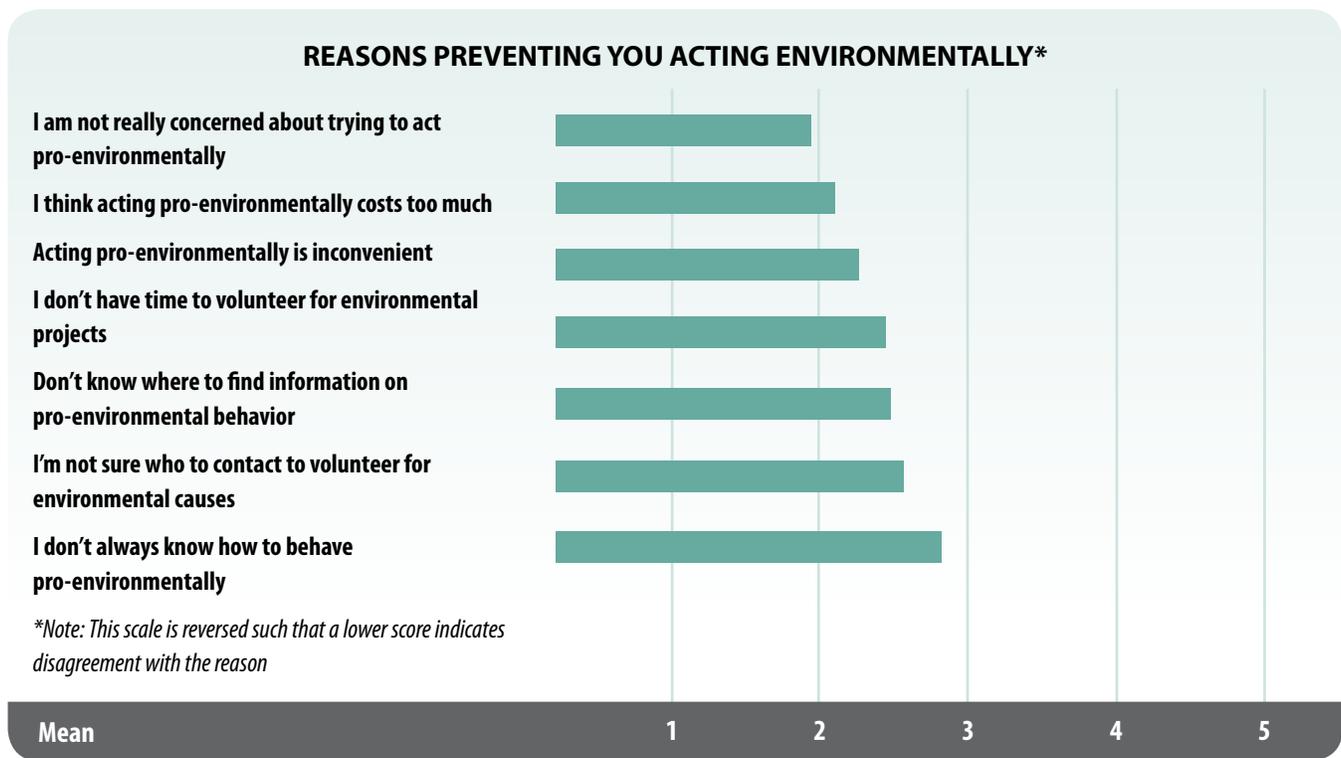
Volunteers have some lofty goals...

- *Return the coast to proper condition*
- *Preserve the coast for future generations*
- *Restore the environment for wildlife*

.....

NOT BEING CONCERNED ABOUT ACTING ENVIRONMENTALLY AND THE BELIEF THAT ACTING ENVIRONMENTALLY COSTS TOO MUCH WERE THE SMALLEST BARRIERS FOR RESPONDENTS.

We wanted to assess the relative impact of barriers to respondents acting environmentally. To do this, we gave them a series of “reasons” for not acting in a pro-environmental way and asked them the extent to which they agreed or disagreed with each reason. The scaling was reversed in such a way that the lower the score, the greater the disagreement with the reason—the less it was seen as a barrier. In the table below you will see that respondents disagree most with two reasons--“I am not really concerned about trying to act pro-environmentally” and “I think acting pro-environmentally costs too much.” In other words, the vast majority of respondents do act in a pro-environmental way. The two reasons receiving the most agreement are: “Not always knowing how to behave pro-environmentally” and “Not sure who to contact to volunteer for environmental causes.” Respondents strongly disagree with anti-environmental activity statements as barriers for not acting pro-environmentally and agree much more with barriers that involve their own lack of personal knowledge.



THE AVERAGE AGE OF RESPONDENTS WAS 38.5 YEARS OLD, WITH THE YOUNGEST BEING 10 AND THE OLDEST BEING 82 YEARS OF AGE.

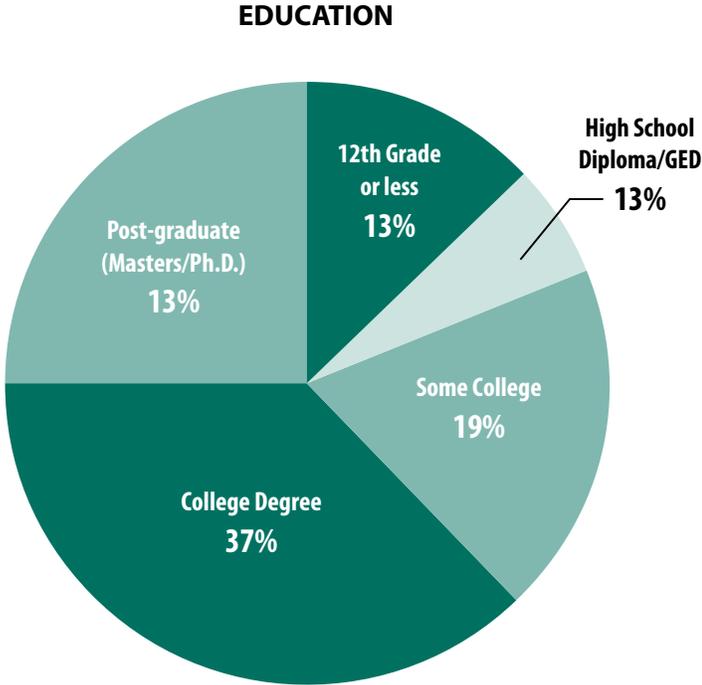
Our respondents were in the early middle age category with the average age being just under 39 years old. We had a very broad age range, however, with the youngest respondent being 10 years old and the oldest being 82. Clearly most were in their early family stages of life which suggests that their environmental commitment can also be passed on to their children.

SLIGHTLY MORE THAN HALF (55%) OF THE RESPONDENTS WERE WOMEN.

A clear majority of respondents were women. As we will see later in this report where tests of difference are presented and discussed, women have very different attitudes and enact different behaviors toward the environment than do men.

OUR RESPONDENTS WERE HIGHLY EDUCATED WITH LESS THAN ONE-IN-FIVE NOT HAVING ANY COLLEGE EDUCATION AND 25% HAVING A POST-GRADUATE DEGREE (MASTERS OR DOCTORATE).

Respondents in this study were more highly educated than the general population. Sixty-two percent had at least a college degree with one-in-four having a postgraduate degree, and another 19% had some college. Thirteen percent did not have a high school diploma or GED and 6% had a high school diploma/GED.



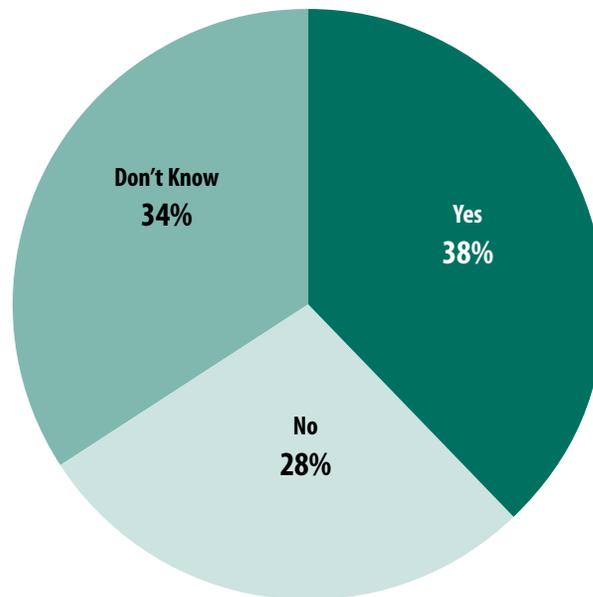
Barriers

- *Based on aggregate data, our respondents don't have many barriers to environmental behavior.*
- *There are differences between local groups and aggregate data.*
- *However, when tested for demographics, "membership" (13/attitude and barrier) and "gender" (5/behavioral and barrier) differences were found.*

MORE THAN ONE-IN-THREE RESPONDENTS SAID THEY LIVED IN A WATERSHED AREA WHILE SLIGHTLY MORE THAN ONE-IN-FIVE SAID THEY DIDN'T.

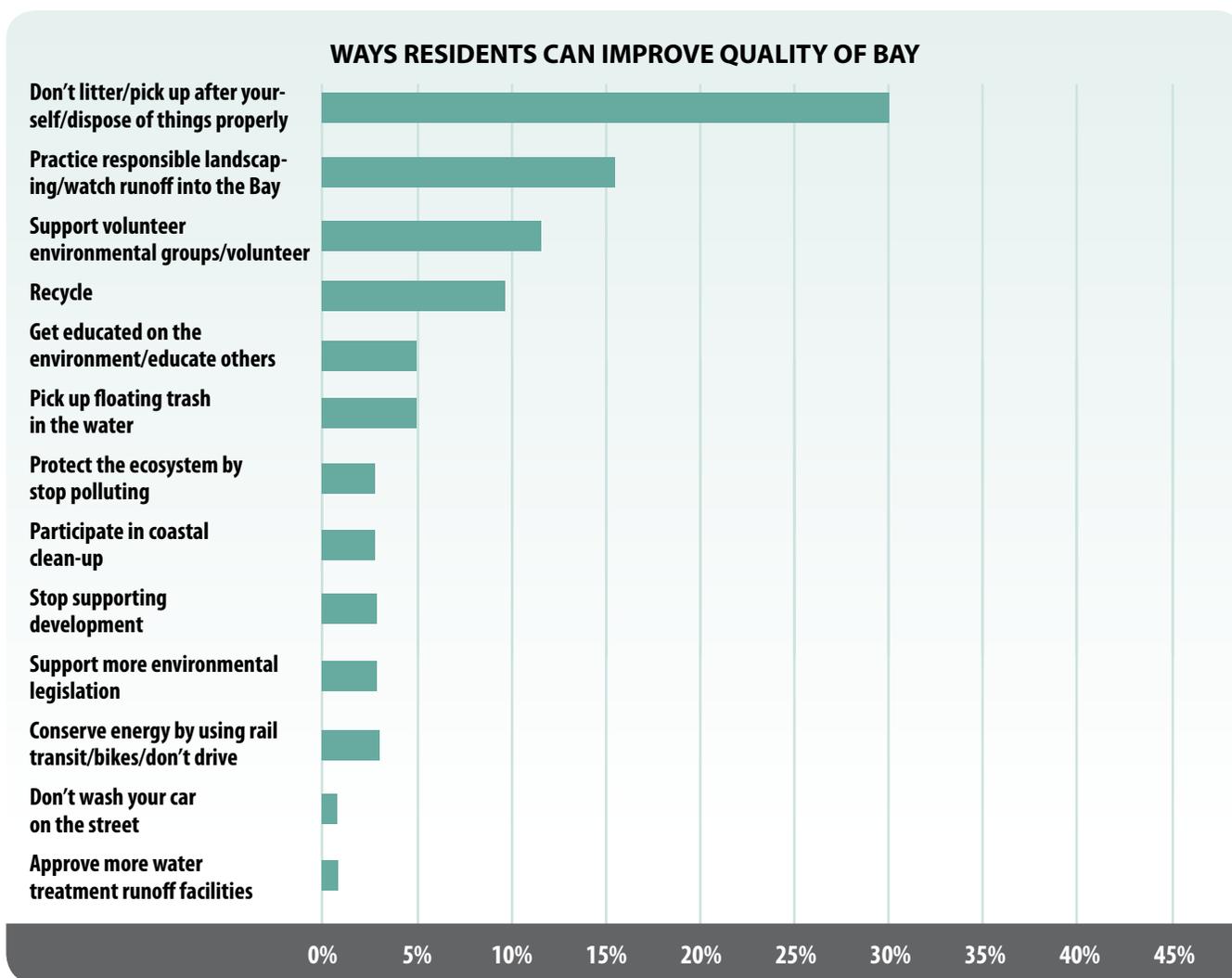
Despite the fact that respondents were volunteering for an environmental project, slightly more than one-in-three (34%) were unsure whether or not they lived in a watershed area while 38% said they did live in a watershed area. It's clear that their participation in a volunteer effort does not necessarily indicate a larger understanding or where their activity fits into a larger environmental context. Twenty-eight percent of respondents said they didn't live in a watershed area.

DO YOU LIVE IN A WATERSHED AREA?



DON'T LITTER/PICK UP AFTER YOURSELF WAS BY FAR THE MOST FREQUENTLY MENTIONED WAY RESIDENTS COULD HELP IMPROVE THE QUALITY OF THEIR BAY.

We asked respondents what one thing local residents can do to help improve the quality of their Bay. This was an open-ended question and we content analyzed the results and computed the frequency with which each major response was offered. The most frequently cited way local residents could improve the quality of their Bay is “Not to litter/pick up after themselves/dispose of things properly” with 30% of respondents offering this answer. The second suggestion was to “Practice responsible landscaping/watch runoff into the Bay” and was offered by 16% of our respondents. Clearly, efforts by environmental groups to get this message across, is paying off. The third most frequently mentioned suggestion is to “Volunteer/support volunteer environmental groups.” These verbatim suggestions indicate that respondents are definitely singing from a common environmental hymnal.



MORE THAN TWO-IN-THREE (68%) RESPONDENTS SAID THE ENVIRONMENTAL GROUP COULD CONTACT THEM FOR A BRIEF FOLLOW-UP ABOUT THEIR EXPERIENCE.

In this political season, and with so many consumers signing up for “no call lists,” it was refreshing to see that more than two-in-three respondents said that it would be alright for the environmental group to call them and follow-up on their volunteer experience.

RECOMMENDATIONS

- Local Restore America’s Estuaries events are an excellent way to raise membership and also promote giving programs. This is because the local programs have been able to assemble a very environmentally-committed group of volunteers at its Bay watch events who have the characteristics of people who give money to environmental causes. It’s important, though, that the local event include a directed education component so that participants make the connection between their activities on site, at home, and in daily lives.
- Within reason, distance away from local Bays does not appear to be a barrier to participation. The average distance from their local Bay that our respondents lived was nearly 36 miles, or a 45-minute drive. Many lived even farther away. Obviously a commitment to restoring one’s local Bay trumps most distance barriers for respondents. Local programs should cast their event invitations to people within a 100-mile radius.
- While each respondent had their own idea about how residents can improve the quality of their respective Bays, there is considerable consensus around not littering/picking up after yourself/disposing of things properly. Local programs might rally around this issue and create local community awareness programs with the help of local and State governments designed to address the littering issue. Or better still, partner with the Keep Beautiful program.
- Local programs should leverage respondents’ willingness to be contacted about a brief RAE follow-up with offers of membership and participation in future events. In fact, sending an executive summary of both the local and national research might be an excellent way to engage in constant meaningful contact with like-minded environmentalists and cement a foundation for an effective, long-term relationship with them.
- Since such a large proportion of respondents frequently boat and fish on their Bay, and since participation in events tend to be via social or business networks, programs to educate and engage people should leverage this opportunity for maximum local benefit.
- It would be an easy move from offering a “RAE Know Your Boating/Fishing Laws” focus to informing participants about the fragility of their Bay and the fact that they can’t depend upon nature to fix the damage to the estuary system once it is harmed. Getting this point across to more people is also a step toward getting them to join the larger effort to protect the bay and how it such activity begins at home or work.



TESTS OF DIFFERENCE

We conducted a limited number of tests of difference on the impact respondent demographics had on the “reasons to participate in coastal restoration,” “beliefs about the coastal environment,” “frequency of engaging in environmental acts,” and “reasons preventing respondents from acting environmentally.” Because of the large number of tests of difference performed, it was critical to compensate for the fact that out of every nine tests of difference, one will be significant by chance alone. To guard against this, we used Dunn’s Multiple Comparison Criteria which divides the probability level ($p < .05$) by the number of tests performed. The more tests that are performed, the lower the probability threshold must be to ensure true significance. In this research, we performed 75 tests of difference and any given test would have to reach a probability level of $p < .0007$ to be truly significant at the $p < .05$ probability level. What follows are differences that meet this more rigorous significance level.

WHETHER OR NOT A RESPONDENT WAS A MEMBER OF THE LOCAL ENVIRONMENTAL GROUP (TBW/STB/GBF) HAD A SIGNIFICANT EFFECT ON THE GREATEST NUMBER OF ENVIRONMENTAL ISSUES MEASURED.

In some ways this is a validity check since we would expect that TBW/STB/GBF members vs. non-members would have significantly more pro-environmental attitudes and behaviors and fewer barriers to acting in an environmental way. The results of these tests are presented below.

- Respondents who were members of the TBW/STB/GBF believed that it was significantly **more** important than non-members to improve the area for wildlife and other species.
- Respondents who were members of the TBW/STB/GBF believed that it was significantly **more** important than non-members to do the right thing [for ecology].
- Respondents who were members of the TBW/STB/GBF were significantly **more** likely than non-members to refrain from littering.
- Respondents who were members of the TBW/STB/GBF were significantly **more** likely than non-members to pick up litter that is not their own.
- Respondents who were members of the TBW/STB/GBF were significantly **more** likely than non-members to encourage others to do environmentally-friendly activities.
- Respondents who were members of the TBW/STB/GBF were significantly **more** likely than non-members to contribute money to an environmental group.
- Respondents who were members of the TBW/STB/GBF were significantly **more** likely than non-members to participate (as a volunteer) in public meetings on environmental issues.
- Respondents who were members of the TBW/STB/GBF were significantly **more** likely than non-members to follow local environmental issues.
- Respondents who were members of the TBW/STB/GBF were significantly **less** likely than non-members to think acting environmentally costs too much.
- Respondents who were members of the TBW/STB/GBF were significantly **less** likely than non-members to not be concerned about acting environmentally.
- Respondents who were members of the TBW/STB/GBF were significantly **less** likely than non-members to not have the time to act pro-environmentally.

- Respondents who were members of the TBW/STB/GBF were significantly **less** likely than non-members to say they weren't sure who to contact to volunteer for environmental causes.
- Respondents who were members of the TBW/STB/GBF were significantly **less** likely than non-members to say they didn't know where to find information about how to behave pro-environmentally.

The number of differences is a powerful indicator that membership in TBW/STB/GBF, and perhaps other environmental organizations as well, strongly reinforce pro-environmental attitudes and behaviors, and reduce personal barriers. TBW/STB/GBF members have more pro-environmental attitudes, act more pro-environmentally and know where to get environmental information. TBW/STB/GBF members were significantly more likely not to litter, pick up litter that is not their own. They believe it is more important to improve their Bays for wildlife and other species, and do the right thing for the environment. They are also significantly more likely to participate in public meetings on environmental issues and to follow local environmental issues. Finally, TBW/STB/GBF members were significantly **less** likely than non-TBW/STB/GBF members to think acting pro-environmentally costs too much, report not having the time to act pro-environmentally, not being sure who to contact to volunteer for environmental causes or to know where to find information about how to behave pro-environmentally.

GENDER HAD THE SECOND LARGEST STATISTICAL IMPACT ON RESPONDENTS' ENVIRONMENTAL BELIEFS AND BEHAVIORS.

- Female respondents believed it was significantly **more** important than males to feel empowered to make a difference.
- Female respondents expressed significantly **more** disagreement than males that some negative impacts to the Bay are acceptable in exchange for some benefits to society.
- Female respondents expressed significantly **more** agreement than males that protecting Bay habitats is as important as restoring them.
- Female respondents expressed significantly **more** disagreement than males about not being really concerned about trying to act pro-environmentally.
- Female respondents expressed significantly **more** disagreement than males about not being sure to contact to volunteer for environmental causes.

Women express significantly more pro-environmental attitudes and behaviors than do men among our respondent group. Women believe negative impacts to their respective Bays are less acceptable, that protecting their Bays are as important as restoring them. They are also significantly more concerned about acting pro-environmentally and are significantly surer of whom to contact to volunteer for environmental causes. Independent of their larger numbers, the women in our sample are simply more pro-environmental.

EDUCATION LEVEL HAD A STATISTICAL IMPACT ON FOUR OF RESPONDENTS' ENVIRONMENTAL BELIEFS AND BEHAVIORS.

- The higher respondents' education level, the **more** often they reported refraining from littering.
- The higher respondents' education level, the **more** often they reported picking up litter that was not their own.
- The higher respondents' education level, the **more** often they reported following local environmental issues.

- The higher respondents' education level, the **more** disagreement they had with not being able to find information about how to behave pro-environmentally.

While our sample of respondents was more highly educated than the population in general, there was a lot of educational diversity within our respondent group. It was not surprising to find that respondents within the highest educational levels had more pro-environmental attitudes and behaviors. When compared to respondents with lower education levels, more highly educated respondents refrained from littering more, more often picked up litter that was not their own, reported following local environmental issues and were better able to find information about how to behave pro-environmentally.

WHETHER OR NOT RESPONDENTS HAD RECREATED IN OR NEAR THE BAY IN THE LAST 12 MONTHS PRODUCED TWO SIGNIFICANT DIFFERENCES ON ENVIRONMENTAL BELIEFS AND BEHAVIORS.

Whether or not respondents had recreated in or near their respective Bays in the last year had a significant effect on one pro-environmental attitude and one behavior. Specifically, respondents who had recreated in or near their Bay in the last twelve months littered less often and disagreed with the notion that the coastal environment is strong enough to cope with the impacts of modern society when compared with respondents who hadn't recreated on their respective Bays.

- Those who recreated in or near the Bay in the last 12 months reported refraining from littering at significantly higher levels.
- Those who recreated in or near the Bay in the last 12 months had significantly higher disagreement that the coastal environment is strong enough to cope with the impacts of modern society.

Gender Based Differences. Not too surprising....

- *Women believed it was significantly more important than men to feel empowered to make a difference.*
- *Women do not agree that some negative impacts to the Bay are acceptable in exchange for some benefits to society.*
- *Women said that protecting Bay habitats is as important as restoring them.*
- *Women said they are concerned about trying to act pro-environmentally... and they said they know who to contact for information*

PREDICTION ANALYSIS

TBW/STB/GBF Membership. The RAE and NOAA are extremely interested in finding out whether or not participation in volunteer environmental activity affects other decision making. We already saw that membership in the local environmental group created the greatest number (compared to other demographic variables) of differences in respondents' environmental attitudes, behaviors and barriers. We now wanted to create a prediction model to more directly test the thesis that participation in environmental activity affects in a significant way respondents' other environmental decision making. To do this, we performed a discriminant analysis. This is the correct analysis to use when the dependent variable (that being predicted) is nominally scaled. In this case it was self-reported membership in the local environmental survey (yes or no). We used all the intervally scaled environmental beliefs and behaviors to predict whether or not a respondent would be a local TBW/STB/GBF member.

Discriminant analysis divides a data set into two or more groups of people and then tests whether a subset of questions can effectively differentiate between the groups beyond chance. In this analysis there is a highly significant difference ($p > .000$) between the TBW/STB/GBF group members and non-members that are accounted for by a sub-set of the questions in the discriminant analysis.

There are several aspects of this analysis that are informative. The first is which environmental attitudes, behaviors and barriers that best demonstrate differences between the RAE and the non-RAE member groups. The environmental attitudes, behaviors and barriers that best account for differences between the two groups is called the discriminant function. Each question included in the discriminant function also has a mathematical weight that is an indication of its relative importance to the function. Questions that don't discriminate between the groups are excluded. Each weight also carries either a positive or negative value associated with one of the two groups.

To us assess how different each group in the analysis is, both groups are mapped in a two dimensional plot. The further they are away the more different they are according to environmental attitudes, behaviors and barriers. Very different groups will be placed on opposite sides of the zero point of the plot (with plus and minus values). The RAE members' group value was -1.17, while the median value for the non-RAE group is +1.29. This means two things. First, the two groups are placed far apart in the plot indicating they are very different from one another. Median values on the same side of the plot and less than a distance of .30 apart are not statistically different while ours are a 2.46 distance apart from the center point. Second, the negative weights are associated with the "RAE members" and the positive weights with the non-RAE member group. By using these weights, we can get a clearer understanding of which questions most accurately characterize each group of respondents. The results of this Discriminant Analysis are presented in the following table.

.....

Respondents who volunteer get the message. The survey said respondents... pick up litter, properly dispose of materials, use responsible landscaping, and reduce runoff.

.....

BEING A MEMBER OF TBW/STB/GBF IS STRONGLY ASSOCIATED WITH PRO-ENVIRONMENTAL BEHAVIORS AND BARRIERS.

This analysis clearly shows that you can predict whether or not someone is a member of a local environmental group by virtue of four environmental beliefs and behaviors. Specifically, 75% of the time you can correctly classify whether someone is a member of a local environmental group by knowing whether they contribute money to local environmental groups and not believing that acting pro-environmentally costs too much. Likewise, you can correctly classify people 77% of the time as **not** belonging to a local environmental group if they don't know where to find information on pro-environmental behavior and if they don't know how to behave pro-environmentally. Being a member of an environmental group is strongly associated with pro-environmental behaviors and low environmental barriers while not belonging to a local environmental group is strongly associated with high environmental barriers.

ENVIRONMENTAL BELIEFS & BEHAVIORS	Canonical Discriminant Coefficients**
I don't know where to find information on pro-environmental behavior*	.62
Contribute money to an environmental group	-.61
Acting pro-environmentally costs too much*	.48
I don't always know how to behave pro-environmentally*	-.44
Canonical correlation =	.51
Significance =	p<.000
Group centroids =	-1.17 (TBW/STB/GBF members)
	1.29 (non-TBW/STB/GBF members)

*Note: This scale is worded in reverse such that a lower score indicates disagreement with the reason or the belief in acting pro-environmentally.

**Note: Wilks' Lambda was used to determine the statistical significance of the discriminant function. Wilks' Lambda is the proportion of the predictor variables (questions in the discriminant function) that are not accounted for by the groups. In cases where the value of Wilks' Lambda is high (approaches 1.0), this means that most of the variance in the discriminant function is accounted for by the grouping of membership or non-membership in an environmental group. The Wilks' Lambda was .84. The chi-square test of difference was 52.28 whose statistical significance is $p < .000$. In other words, the questions in the discriminant function are able to differentiate between the two groups at a 999.9 times out of 1000, an extremely large difference that is way beyond chance.

***Note: The environmental beliefs and behaviors are ordered by their discriminant weights from greatest to least. Those with negative weights are what distinguish the TBW/STB/GBF members in our sample while the positive weights are what characterize the non-TBW/STB/GBF member group.

Giving Money to Environmental Groups. As a value-added feature, we performed another prediction analysis. This time we used "Contribute money to an environmental group" as the dependent variable and the entire list of environmental beliefs, behaviors and barriers as predictors. We found that 5 factors are statistically significant predictors of whether or not someone gives money to environmental groups and together, they account for 55% of the variance in giving. This analysis is presented in the following table.

YOU CAN PREDICT WHETHER SOMEONE CONTRIBUTES TO ENVIRONMENTAL GROUPS BY KNOWING WHETHER OR NOT THEY EMBRACE KEY ENVIRONMENTAL ATTITUDES AND BEHAVIORS.

This prediction analysis used multiple regression. This was because, unlike the previous discriminant analysis, the question we were trying to predict was intervally scaled. This analysis shows that you can predict whether or not our participants contribute to environmental groups by knowing certain environmental attitudes and behaviors. Specifically, you can predict 55% of the time that they will give money to environmental groups if they **don't** believe the coastal environment is strong enough to cope with the impacts of modern society, they recycle newspapers, cans and bottles, volunteer at public meetings on environmental issues, **don't** believe nature will restore our coastal environment and believe that when humans interfere with our coastal environment, it often produces disastrous results.

PREDICTORS OF GIVING MONEY TO ENVIRON. GROUPS	Beta Weights
The coastal environment is strong enough to cope with the impacts of modern society*	-.31
Recycling newspapers, cans and bottles*	.20
Volunteering in public meetings on environmental issues*	.19
Believing nature will restore our coastal environment*	-.19
Believing when humans interfere with our coastal environment it often produces disastrous results*	.14

**All significantly enter the regression equation at a p<.05 level*

R-squared (total variance in dependent variable by predictors) = 55%

-
- Membership has meaning***
- *Members are more likely to contribute money to environmental causes*
 - *They think it doesn't cost much to behave in environmentally sound ways*
 - *Non-members say they don't know what to do, and don't know where to find the information*
-

RAW DATA

RESTORE AMERICA'S ESTUARIES REGIONAL SURVEY RESULTS

Thank you for taking the time to complete this quick survey. By doing so, you are helping us to understand our volunteers better and to improve our restoration programs. You will be asked about your thoughts on the Bay in general, what inspired you to come to this restoration event, what you do to help the Bay, and potential challenges you may experience to participating in eco-friendly activities. The survey results will be used by Restore America's Estuaries and Tampa Bay Watch for human dimensions research in ecological restoration. Your responses are voluntary, confidential, and maintained as anonymous unless you volunteer to provide us with your contact information.

If you are interested in the survey results, the findings will be made public on the Restore America's Estuaries (RAE) website in early 2007: <http://www.estuaries.org>

In the following questions we would like to learn more about your background and interests in environmental activities in general.

1. Are you a member of Tampa Bay/Galveston/San Francisco Watch?

18% 1 YES If YES, for how many years? M=3.5 YEARS

82% 2 NO

2. Have you volunteered for other environmental activities during the past: (please circle only one answer)

20%	6%	6%	19%	49%
30 DAYS	60 DAYS	90 DAYS	12 MONTHS	NOT AT
All				

If YES, what type of group have you volunteered with? (circle all those that apply, or leave blank if none apply)

- 31% Local RAE Watch
- 10% Work
- 9% Association/Social Club
- 19% Community Organization
- 24% School
- 4% Faith
- 3% Other (please specify) _____

3. Have you volunteered for another community activity or project (non-environmental) during the past: (please circle only one answer)

28%	8%	6%	23%	35%
30 DAYS All	60 DAYS	90 DAYS	12 MONTHS	NOT AT

4. Have you recreated on the Bay at any time during the past 12 months?

61% YES

39% NO

If YES, approximately how many days did you participate in each of the following activities during the past 12 months?

21% Power Boating <u>18</u> Days	15% Photography <u>17</u> Days	7% Diving <u>4</u> Days
5% Kite Surfing <u>1</u> Days	20% Swimming <u>18</u> Days	21% Fishing <u>12</u> Days
6% Canoeing <u>7</u> Days	13% Bird-Watching <u>36</u> Days	7% Sailing <u>9</u> Days
1% Windsurfing <u>16</u> Days	10% Snorkeling <u>15</u> Days	10% Kayaking <u>15</u> Days
32% Walk/Run/Bike on Bay-side trails <u>22</u> Days		
0% Other activities (please specify) _____		

5. In the following questions, please indicate how important each item is to you as a reason to participate in coastal restoration. (please circle one answer per item)

a) To be outdoors **M=4.20**

3%	6%	24%	30%	37%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

b) To be with friends **M=4.07**

7%	11%	29%	27%	25%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

c) To return a part of the coast to its proper condition **M=4.56**

1%	2%	15%	33%	50%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

d) To improve the area for wildlife/other species **M=4.41**

0%	3%	11%	29%	57%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

e) To do something positive for future generations **M=4.50**

1%	4%	10%	29%	57%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

f) To learn about the natural environment **M=3.96**

1%	9%	20%	33%	37%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

g) To experience something new **M=3.77**

4%	9%	27%	31%	30%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

h) To prevent a larger ecological crisis **M=4.21**

2%	5%	14%	28%	50%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

i) To feel empowered to make a difference **M=3.80**

4%	10%	24%	28%	34%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

j) To make the area more useful for other human uses **M=3.74**

6%	9%	23%	30%	32%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

k) It's the right thing to do **M=4.21**

1%	7%	14%	28%	50%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

6. In the following questions, please indicate the extent to which you agree or disagree with the following statements about the coastal environment. (please circle one answer per item)

a) Humans have the right to modify the coastal environment to suit their needs **M=2.57**

17%	38%	26%	14%	5%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

b) When humans interfere with coastal environments, it often produces disastrous consequences **M=3.99**

3%	8%	15%	42%	32%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

c) The coastal environment is strong enough to cope with the impacts of modern society **M=2.18**

28%	49%	14%	6%	3%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

d) Some negative impacts to the Bay are acceptable in exchange for some benefits to society **M=2.92**

9%	28%	34%	27%	2%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

e) Isolated restoration projects will significantly improve the overall quality of the Bay **M=3.92**

1%	13%	23%	43%	20%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

f) The ecological nature of the coastal environment is very delicate or easily upset **M=4.27**

1%	4%	11%	44%	34%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

g) Humans are severely abusing the coastal environment **M=4.23**

2%	4%	16%	42%	37%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

h) Nature will restore our coastal environment; there is no need to do restoration work **M=2.04**

44%	46%	5%	4%	1%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

i) Restoration activities are only a short-term, temporary solution **M=2.86**

12%	40%	24%	17%	7%
Not at all important	Slightly important	Moderately important	Very important	Extremely important

j) Protecting Bay habitats is as important as restoring them **M=4.53**

1%	1%	6%	35%	57%	
Not at all important	Slightly important	Moderately important	Very important	Extremely important	

k) Humans have an obligation to leave coastal environments in a better condition for future generations **M=4.73**

1%	1%	8%	36%	51%	
Not at all important	Slightly important	Moderately important	Very important	Extremely important	

l) People can appreciate the Bay without spending time on or around it **M=3.31**

5%	26%	24%	31%	14%	
Not at all important	Slightly important	Moderately important	Very important	Extremely important	

m) Working together, we can improve the quality of the Bay **M=4.46**

1%	0%	6%	40%	52%	
Not at all important	Slightly important	Moderately important	Very important	Extremely important	

n) I make a positive impact on the health of the Bay **M=4.17**

0%	3%	19%	49%	27%	
Not at all important	Slightly important	Moderately important	Very important	Extremely important	

o) I can take more personal responsibility for protecting Bay habitats **M=4.37**

0%	2%	14%	54%	30%	
Not at all important	Slightly important	Moderately important	Very important	Extremely important	

7. How close do you live to the Bay?

35.5 MILES AWAY

8. In the following items, please indicate how often you do each of the following. (please circle one answer per item)

a) Recycle newspapers, cans, or bottles **M=3.98**

3%	8%	22%	25%	43%	
Never	Almost Never	Sometimes	Almost Always	Always	N/A

b) Refrain from littering **M=4.72**

1%	1%	4%	16%	79%	
Never	Almost Never	Sometimes	Almost Always	Always	N/A

c) Pick up litter that is not your own **M=3.59**

1%	6%	47%	27%	20%	
Never	Almost Never	Sometimes	Almost Always	Always	N/A

d) Encourage others to do environment-friendly activities **M=3.56**

2%	9%	42%	25%	22%	
Never	Almost Never	Sometimes	Almost Always	Always	N/A

e) Walk, bike, carpool, or take public transportation to work or to run errands **M=2.78**

11%	27%	42%	13%	7%	
Never	Almost Never	Sometimes	Almost Always	Always	N/A

f) Drive a hybrid/energy efficient car **M=1.68**

71%	12%	5%	5%	8%	
Never	Almost Never	Sometimes	Almost Always	Always	N/A

g) Dispose of used motor oil at approved sites, e.g. Jiffy Lube **M=4.17**

11%	4%	7%	11%	66%	
Never	Almost Never	Sometimes	Almost Always	Always	N/A

h) Turn off water instead of letting it run while brushing my teeth **M=4.04**

4%	6%	19%	28%	45%	
Never	Almost Never	Sometimes	Almost Always	Always	N/A

i) Buy products that are environmentally-friendly **M=3.50**

1%	6%	50%	31%	13%	
Never	Almost Never	Sometimes	Almost Always	Always	N/A

j) Buy recycled products **M=3.36**

1%	6%	60%	22%	12%	
Never	Almost Never	Sometimes	Almost Always	Always	N/A

k) Use low-wattage, energy-efficient light bulbs **M=3.51**

5%	7%	38%	30%	19%	
Never	Almost Never	Sometimes	Almost Always	Always	N/A

l) Adhere to fishing, boating and hunting laws **M=4.65**

3%	1%	7%	9%	81%	
Never	Almost Never	Sometimes	Almost Always	Always	N/A

m) Contribute money to an environmental group **M=3.12**

13%	18%	37%	9%	23%	
Never	Almost Never	Sometimes	Almost Always	Always	N/A

n) Participate (as a volunteer) in public meetings on environmental issues **M=2.53**

22%	28%	36%	4%	10%	
Never	Almost Never	Sometimes	Almost Always	Always	N/A

o) Follow local environmental issues **M=3.51**

5%	11%	38%	23%	24%	
Never	Almost Never	Sometimes	Almost Always	Always	N/A

9. Thinking about the activities listed above, to what extent do you agree or disagree with each of the following as reasons for preventing you from acting pro-environmentally? (please circle one answer per item)

a) I think acting pro-environmentally costs too much **M=2.10**

23%	50%	22%	4%	1%
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

b) I don't always know how to behave pro-environmentally **M=2.87**

8%	28%	33%	29%	1%
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

c) I am not really concerned about trying to act pro-environmentally **M=1.98**

30%	51%	13%	6%	1%
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

d) Acting pro-environmentally is inconvenient **M=2.26**

20%	44%	26%	10%	0%
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

e) I don't have time to volunteer for environmental projects **M=2.43**

15%	44%	24%	15%	1%
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

f) I'm not sure who to contact to volunteer for environmental causes **M=2.68**

14%	36%	24%	24%	3%
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

g) I don't know where to find information about how to behave pro-environmentally **M=2.46**

16%	42%	26%	15%	2%
Strongly disagree	Disagree	Neutral	Agree	Strongly agree