# Summary Report on Beach Activity by Wave 

A Report on Data Collected for The Southern California Beach Valuation Project

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Submitted to

Beach Project Funders

## REVISED

November 12, 2001

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## 1. Introduction

This report is one in a series of summary reports on data collected for the Southern California Beach Valuation Project. The Project has collected bi-monthly beach use data ${ }^{1}$ over a year for approximately six hundred respondents who live in the vicinity of Orange County and Los Angeles County Beaches. This report summarizes responses to questions regarding activities undertaken by respondents during beach visits. The report also looks at responses to a question on favorite beach activity that was asked during the recruitment survey.

## 2. Approach

We use two approaches to look at data on activities undertaking by respondents during their trips to the beach: (1) activities by trip, and (2) activities by respondent. Each approach tells us something about two different populations. The first addresses the population comprised of people that we would find were we to randomly select beach users while they were at the beach. The second addresses the population of beach users were we to randomly sample them in their homes.

The first approach, looking at activities by trip, is based on a raw accounting of all activities named by respondents. We simply tallied all the activities reported by respondents. To the extent that we have a representative sample of beach goers, the "by trip" approach gives us insight into what activities what would expect to see being undertaken at any particular time at the beach were we to randomly observe people at the beach. We would expect to observe most frequently the types of activities occurring that are reported by people who go to the beach most often.

The "by respondent" approach, in which we use the activities that people reported to determine their primary beach activity, gives a different perspective. The "by respondent" approach tells us about the preferences of beach users that we would expect to find were we to randomly sample them in their home, in which case the relative frequency of the respondent's trips to the beach would not affect their chance of being surveyed. See that if we want this perspective, the "by trip" approach could lead to an overstatement of preferences for activities chosen by people who are frequent beach users. As it turns out, there is no great differences in preferences of frequent vs. less frequent users. Results for the "by trip" and "by respondent" approaches are very similar. More on this below.

## 3. Method for Determining Preferred Beach Activity

For the "by respondent approach" we use revealed preference type reasoning to discern each respondent's main beach activity, that is we use the activities people reported to judge their primary beach activity. ${ }^{2}$ To do this, we inspected activities named by each for each beach trip that they took. For each trip, a respondent could have listed up to four activities performed. In

[^0]assessing primary activity, we gave the first activity listed the greatest weight. So if a respondent only took one beach trip during a wave, the first activity listed is assumed to be the primary activity. Similarly, if a respondent took multiple trips and the same activity was listed first for each trip, that activity is assumed to be the respondent's primary beach activity. When there is not a clear pattern of listing a particular activity first, the judgment of primary activity simply depends on how many times each activity was listed. The method is described in greater detail in Appendix 1.

## 4. Results on Beach Activity by Wave

### 4.1. Results Using "By Trip" Approach

Here are results for top activities reported by respondents for each wave. We list the top five activities unless one of these is "other" in which case we list the top six activities. Respondents could list up to four activities for each beach trip. Each of the activities listed is given equal weight. We combined all activities cited by each respondent in a wave and tabulated them in order to create the table below.

Table 1. Top Activities for Each Wave "By Trip"

| $\begin{aligned} & \hline \text { Diary 1 } \\ & \text { (Dec. 1, '99 - } \\ & \text { Jan. 31,'00) } \\ & \hline \end{aligned}$ | Diary 2 <br> (Feb. 1, '00 - <br> Mar. 31, '00) | Diary 3 <br> (Apr. 1, '00 - <br> May 31, '00) | Diary 4 (June 1, '00 July 31, ’00) | Diary 5 <br> (Aug. 1, '00 - <br> Sept. 30, '00) | Diary 6 (Oct. 1, ‘00 Nov. 30, '00) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1. Walking | 1. Walking | 1. Walking | 1. Walking | 1. Other | 1. Walking |
| 2. Other | 2. Biking | 2. Other | 2. Sunbathing | 2. Walking | 2. Jogging |
| 3. Biking | 3. Shopping / Dining | 3. Biking | 3. Swimming | 3. Sunbathing | 3. Shopping/ Dining |
| 4. Jogging | 4. Jogging | 4. Swimming | 4. Biking | 4. Biking | 4. Other |
| 5. Rollerblading/ Roller skating | 5. People watching | 5. Shopping/ Dining | 5. Boogie <br> Boarding/ Body Surfing/ Skimboarding | 5. Swimming | 5. Surfing |
| 6. Surfing |  | 6. Jogging |  | 6. Jogging | 6. (tie) Biking |
|  |  |  |  |  | 6. (tie) Enjoying the view |

The most popular activities across waves are recreational activities that do not directly depend on a beach setting. These activities include walking, biking, and jogging. Though, these activities may be practiced anywhere, presumably often at least in part for their health benefits, the beach likely increases the enjoyment of these opportunities for some people. Another group of popular activities are beach specific one such as swimming, sunbathing (though can be done anywhere, is often associated with the beach), and surfing. A third category of activities in evidence among the most popular might be called entertainment. The most prominent example is shopping/dining. Also in the entertainment category, "enjoying the view" and "people watching" both appear once. Looking at issues of seasonality, it makes sense that activities that are more appropriate to warm weather, such as sunbathing and swimming, are relatively more popular during warmer months that correspond to Diary 3 through Diary 5, and less popular during cooler months. We look at swimming and the special case of surfing more closely in Section 6 below.

Full tabulated results showing all responses listing activities can be found in Appendix 2. The full range of possible response options are given at the beginning of Appendix 2 and again at the beginning of Appendix 3.

### 4.2. Results Using "By Respondent" Approach

After determining primary activity for each respondent, we tabulated the results. In Table 2 we list the top five primary activities (as before, we list the top six activities if one of the top five is "other").

Table 2. Top Activities for Each Wave "By Respondent"

| Diary 1 <br> (Dec. 1, '99 - <br> Jan. 31,‘00) | Diary 2 <br> (Feb. 1, '00 - <br> Mar. 31, '00) | Diary 3 <br> (Apr. 1, '00 - <br> May 31, '00) | $\begin{aligned} & \text { Diary } 4 \\ & \text { (June 1, '00- } \\ & \text { July 31, '00) } \end{aligned}$ | Diary 5 <br> (Aug. 1, '00 - <br> Sept. 30, '00) | Diary 6 <br> (Oct. 1, ‘00 - <br> Nov. 30, '00) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1. Walking | 1. Walking | 1. Walking | 1. Walking | 1. Walking | 1. Walking |
| 2. Biking | 2. Biking | 2. Swimming | 2. Swimming | 2. Sunbathing | 2. Shopping/ Dining |
| 3. Other | 3. Picnicking | 3. Sunbathing | 3. Sunbathing | 3. Other | 3. Surfing |
| 4. Shopping/ Dining | 4. Shopping/ Dining | 4. Biking | 4. Activities with children | 4. Biking | 4. Other |
| 5. Enjoying the view | 5. Enjoying the view | 5. Other | 5. (tie)Shopping /Dining | 5. Swimming | 5. Jogging |
| 6. Surfing |  | 6. Boogie Boarding/ Body Surfing/ Skimboarding | 5. (tie) Enjoying the view | 6. Surfing | 6. Biking |
|  |  |  | 5. (tie) Biking |  |  |

The continued importance of walking, and to a lesser extent biking, among top activities when using the primary beach activity approach is notable. Indeed, in general there is substantial correspondence between the results for the two approaches. At most, one or two of the top activities are different in each wave. Shopping/Dining and Enjoying the View have greater prominence in the results for the "by respondent" approach. This is may be because this is the primary activity for people who do not go to the beach very much. The preferences of such people are less evident in the "by trip" results. Again a look at seasonality trends suggests results are reasonable. Shopping/Dining and Enjoying the View are relatively less popular during warm weather months when activities such as Swimming and Sunbathing rise in prominence.

We list full tabulated results for the primary activities of respondents in each diary survey in Appendix 3.

## 5. Results for Direct Question on Favorite Activity

The previous results are all based on the results of diary surveys in which we asked people to name that activities that undertaken on beach trips. In the recruitment report, we also asked people to name their favorite beach activity. Rather than getting at the activity a respondent does most, what we have called primary activity above, this question addresses the activity that the respondent enjoys most. All responses on favorite beach activity are summarized below in Table 3.

Table 3. Favorite Beach Activities*

| Activity | Frequency | Percent |
| :--- | :---: | :---: |
| 1. Other | 237 | 22.85 |
| 2. Walking | 210 | 20.25 |
| 3. Swimming | 173 | 16.68 |
| 4. Sunbathing | 144 | 13.89 |
| 5. (tie) Volleyball | 60 | 5.79 |
| 5. (tie) Enjoying the view | 60 | 5.79 |
| 7. Body surfing, boogie boarding | 53 | 5.11 |
| 8. Surfing | 45 | 4.34 |
| 9. Sand sculpture | 16 | 1.54 |
| 10. Fishing. | 14 | 1.35 |
| 11. Picnicking | 11 | 1.06 |
| 12. Don't know | 9 | 0.87 |
| 13. (tie) Weight lifting | 2 | 0.19 |
| 13. (tie) Refused to answer | 2 | 0.19 |
| 15. Bird watching | 1 | 0.10 |
| TOTAL | 1037 | 100.00 |

*Favorite beach activities as named in the recruitment survey (Q3)
There were fewer responses defined for the question on favorite activity in the recruitment survey compared to response options that we eventually developed for reporting on activities on trips. The large number of "other" responses in the table probably reflects in part the absence of biking and jogging among allowable responses. We do see that walking, the most common activity across waves, comes in as the most frequently named favorite beach activity. Swimming and surfing, the focus of the next section, were respectively the $3^{\text {rd }}$ and $8^{\text {th }}$ ranked favorite beach activities. The following section, Section 7, looks at fishing and boating. Fishing was $10^{\text {th }}$ in our survey of favorite activities.

## 6. Focus on Swimming and Surfing

This section focuses on the archetypal California beach activities: surfing and swimming. We do this because we believe that these are likely to be distinctly more sensitive to both water quality and weather (seasonality) than many of the other activities. The data in the following tables support the hypothesis of a connection between weather and the popularity of surfing and swimming.

Table 4. Relative Popularity of Surfing

| Diary \# | Rank by Respondent | Rank by Trip |
| :--- | :---: | :---: |
| $\mathbf{1}$ (Dec. 1, ' 99 - Jan. 31, '00) | 6 | 6 |
| 2 (Feb. 1, '00 - Mar. 31, '00) | 8 (tie) | 14 |
| 3 (Apr. 1, '00 - May 31, '00) | 7 (tie) | 10 |
| 4 (June 1, '00 - July 31, '00) | 8 | 8 |
| 5 (Aug. 1, '00 - Sept. 30, '00) | 6 | 7 |
| $\mathbf{6}$ (Oct. 1, '00 - Nov. 30, '00) | 3 | 5 |

As expected, surfing is a relatively more important activity in the winter when surfers are drawn to good winter waves and others are less likely to go to the beach due to cloudy, cool, or rainy weather. Surfing's strongest showing as a primary activity comes in Diary 6 (October through November), when it is ranked third or fifth, depending on the approach to data aggregation that is used.

Table 5. Relative Popularity of Swimming

| Diary \# | Rank by Respondent | Rank by Trip |
| :---: | :---: | :---: |
| 1 (Dec. 1, '99-Jan. 31, '00) | 21 (tie) | 14 |
| 2 (Feb. 1, '00 - Mar. 31, '00) | 11 (tie) | 15 |
| 3 (Apr. 1, '00-May 31, '00) | 2 | 4 |
| 4 (June 1, '00 -July 31, '00) | 2 | 3 |
| 5 (Aug. 1, '00-Sept. 30, '00) | 5 | 5 |
| 6 (Oct. 1, '00 - Nov. 30, '00) | 7 | 15 |

The tabulated data also expectedly show that more people go to the beach primarily to swim during the warmer months. Swimming has its strongest showing during Diary 3 (April through May) and Diary 4 (June through July). The relatively greater popularity of swimming during Diary 3 would not be expected based on temperature alone. The large number of people swimming during Diary 3 may reflect the desire of people to get out and enjoy the weather having just emerged from cooler months.

## 7. Focus on Boating and Fishing

Boating and fishing are two activities that have received much attention in the economic literature on recreation. In this section, we briefly profile survey results for these activities. Table 6, below, shows the number of times boating was cited as an activity undertaken during a trip to the beach as well as the number of times it was identified as a main activity for a respondent.

Table 6. Focus on Boating

| Diary \# | \# of Times Cited <br> as an Activity <br> (By Trip Approach) | \# of Times Identified <br> as Main Activity <br> (By Respondent Approach) |
| :--- | :---: | :---: |
| $\mathbf{1}$ (Dec. 1, '99 - Jan. 31,'00) | 7 | 3 |
| 2 (Feb. 1, '00 - Mar. 31, '00) | 2 | 1 |
| 3 (Apr. 1, '00 - May 31, '00) | 1 | 1 |
| 4 (June 1, '00-July 31, '00) | 26 | 5 |
| 5 (Aug. 1, '00 -Sept. 30, '00) | 2 | 0 |
| 6 (Oct. 1, '00 - Nov. 30, '00) | 28 | 1 |

The relatively large numbers in number of times cited as an activity for Diary 4 and Diary 6 largely reflect the activities of three particular respondents (CSID 13317 and CSID 13428 for Diary 4 and CSID 14884 for Diary 6). Two of these respondents completed all six waves and the other one completed five waves. So the spikes in boating activity largely reflect an evolution in preferred activities for these respondents, rather than the inclusion of respondents with
consistently boating interests that were only included for the Wave 4 or Wave 6 . In Wave 4, boating was tied for the $21^{\text {st }}$ most popular activity and it was tied for $9^{\text {th }}$ in Wave 6 (both using "by trip" approach).

In Table 7 we profile fishing responses to activity questions.
Table 7. Focus on Fishing

| Diary \# | \# of Times Cited <br> as an Activity <br> (By Trip Approach) | \# of Times Identified <br> as Main Activity <br> (By Respondent Approach) |
| :--- | :---: | :---: |
| 1 (Dec. 1, '99 - Jan. 31,'00) | 7 | 2 |
| 2 (Feb. 1, '00 - Mar. 31, '00) | 11 | 3 |
| 3 (Apr. 1, '00 - May 31, '00) | 24 | 6 |
| 4 (June 1, '00 -July 31, '00) | 21 | 6 |
| 5 (Aug. 1, '00 -Sept. 30, '00) | 23 | 7 |
| 6 (Oct. 1, '00 - Nov. 30, '00) | 12 | 5 |

In this table we see the prevalence of fishing increasing outside of colder months. Though fishing never comes close to being a top activity, its respective ranks in Wave 3, 4, and 5 are: $17^{\text {th }}, 24^{\text {th }}$ (tie), and $15^{\text {th }}$ (all rankings in terms of "by trip" approach).

## 8. Conclusion

This report paints a picture of activities undertaken by beachgoers in southern California. We have seen that the most popular activity is walking. Biking and jogging are also frequently named activities across waves. As expected, warm weather activities like swimming and sunbathing are more popular during waves that include warmer months. Activities more suited to cooler weather like shopping/dining are more popular during waves that include cooler months. Finally, due to seasonality in wave quality, though it involves water contact, surfing is actually more popular during cooler months. In addition to offering some insight into beach recreation patterns, this report provides some validation of our survey data since the results reported here conform largely to common sense expectation.

## APPENDIX 1

## Further explanation of how the primary activity was determined

As suggested in the body of this report, in many cases identifying the primary activity was easy. For example, a person goes to the beach eight times and lists only walking as their activity everyone time. That person's main activity is walking. In some cases their were ties that had to be broken. As mentioned above, the first activity listed by a respondent is given most weight in determining primary activity. There is no preference indicated by the formulation of the questions, but it is natural to think that the first response to the question, "what activities did you undertake?," is the main activity.

For an example, suppose respondent X listed their activities for two beach trips as:
walking enjoying the view
walking enjoying the view
When there is a tie such as this, We give greater weight to activities listed first, and so conclude this person's main beach activity is walking.

If there is a tie with "other," we chose the activity that is named, since "other" provides no information.

In some cases there is no clear indication of how to break a tie, such as a respondent Y that lists their activities for two beach trips as:

| walking | enjoying the view <br> enjoying the view <br> walking |
| :--- | :--- |

In such situations, we alternate between picking the first and then the second activity listed.

## APPENDIX 2

## Tabulated responses to questions on beach activities

Responses on activities undertaken during beach visits are tabulated here. The respondent could list up to four activities for each beach trip (responses are variables Q4C, SUM1, SUM2, SUM3). These are treated equally here, that is responses to the four questions on beach activities have been combined.

```
Activity Codes
<1> Bicycling
<2> Body Boarding/Body surfing
        /skimboarding
<3> Boating
<4> Canoeing
<5> Fishing (shore or pier)
<6> Frisbee
<7> Jet boating/Jet skiing
    personal water craft
<8> Jogging
<9> Kayaking
<10> Kite Flying
<11> Picknicing
<12> People watching
<13> Rollerblading/roller skates
<29> Splashing in water
<31> Reading
<33> Bar-B-Q
<35> Beachcombing
<37> Watched Fireworks
<39> Sleeping
<41> Bonfire
<43> Relaxing
<0> Other
<77> Nothing else
<88888> Don't Know
<99999> Refused
```

```
<14> Sailing
```

<14> Sailing

```
<14> Sailing
<15> Scuba diving
<15> Scuba diving
<15> Scuba diving
<16> Shopping/dining
<16> Shopping/dining
<16> Shopping/dining
<17> Snorkeling
<17> Snorkeling
<17> Snorkeling
<18> Sand football/soccer
<18> Sand football/soccer
<18> Sand football/soccer
<19> Sunbathing
<19> Sunbathing
<19> Sunbathing
<20> Surfing
<20> Surfing
<20> Surfing
<21> Swimming
<21> Swimming
<21> Swimming
<22> Volleyball
<22> Volleyball
<22> Volleyball
<23> Wading
<23> Wading
<23> Wading
<24> Walking
<24> Walking
<24> Walking
<25> Water skiing
<25> Water skiing
<25> Water skiing
<26> Windsurfing / boardsailing
<26> Windsurfing / boardsailing
<26> Windsurfing / boardsailing
<27> Enjoying the view
<27> Enjoying the view
<27> Enjoying the view
<28> Activities with children
<28> Activities with children
<28> Activities with children
<30> Walking the dog
<30> Walking the dog
<30> Walking the dog
<32> Hiking
<32> Hiking
<32> Hiking
<34> Amusement park/ arcade
<34> Amusement park/ arcade
<34> Amusement park/ arcade
<36> Eating/ drinking
<36> Eating/ drinking
<36> Eating/ drinking
<38> Played in the sand
<38> Played in the sand
<38> Played in the sand
<40> Camping
<40> Camping
<40> Camping
<42> Skateboarding
```

<42> Skateboarding

```
<42> Skateboarding
```

Diary 1.

| diary 1 | Freq. | Percent | Cum. |
| :---: | :---: | :---: | :---: |
| 0 | 259 | 10.66 | 10.66 |
| 1 | 236 | 9.71 | 20.37 |
| 2 | 5 | 0.21 | 20.58 |
| 3 | 7 | 0.29 | 20.86 |
| 4 | 5 | 0.21 | 21.07 |
| 5 | 7 | 0.29 | 21.36 |
| 6 | 9 | 0.37 | 21.73 |
| 7 | 8 | 0.33 | 22.06 |
| 8 | 144 | 5.93 | 27.98 |
| 9 | 8 | 0.33 | 28.31 |
| 10 | 6 | 0.25 | 28.56 |
| 11 | 37 | 1.52 | 30.08 |
| 12 | 38 | 1.56 | 31.65 |
| 13 | 136 | 5.60 | 37.24 |
| 15 | 1 | 0.04 | 37.28 |
| 16 | 95 | 3.91 | 41.19 |
| 17 | 1 | 0.04 | 41.23 |
| 18 | 2 | 0.08 | 41.32 |
| 19 | 10 | 0.41 | 41.73 |
| 20 | 113 | 4.65 | 46.38 |
| 21 | 12 | 0.49 | 46.87 |
| 22 | 57 | 2.35 | 49.22 |
| 23 | 48 | 1.98 | 51.19 |
| 24 | 673 | 27.70 | 78.89 |
| 27 | 67 | 2.76 | 81.65 |
| 28 | 29 | 1.19 | 82.84 |
| 30 | 2 | 0.08 | 82.92 |
| 77 | 414 | 17.04 | 99.96 |
| 88888 | 1 | 0.04 | 100.00 |
| Total | 2430 | 100.00 |  |

Diary 2.

| diary2 | Freq. | Percent | Cum. |
| :---: | :---: | :---: | :---: |
| 0 | 49 | 1.79 | 1.79 |
| 1 | 174 | 6.34 | 8.13 |
| 2 | 13 | 0.47 | 8.60 |
| 3 | 2 | 0.07 | 8.68 |
| 4 | 6 | 0.22 | 8.90 |
| 5 | 11 | 0.40 | 9.30 |
| 6 | 17 | 0.62 | 9.92 |
| 7 | 3 | 0.11 | 10.03 |
| 8 | 144 | 5.25 | 15.28 |
| 10 | 6 | 0.22 | 15.49 |
| 11 | 69 | 2.52 | 18.01 |
| 12 | 115 | 4.19 | 22.20 |
| 13 | 79 | 2.88 | 25.08 |
| 15 | 2 | 0.07 | 25.15 |
| 16 | 164 | 5.98 | 31.13 |
| 18 | 23 | 0.84 | 31.97 |
| 19 | 67 | 2.44 | 34.41 |
| 20 | 34 | 1.24 | 35.65 |
| 21 | 30 | 1.09 | 36.75 |
| 22 | 53 | 1.93 | 38.68 |
| 23 | 8 | 0.29 | 38.97 |
| 24 | 473 | 17.24 | 56.22 |
| 27 | 112 | 4.08 | 60.30 |
| 28 | 46 | 1.68 | 61.98 |
| 29 | 6 | 0.22 | 62.19 |
| 30 | 38 | 1.39 | 63.58 |
| 31 | 9 | 0.33 | 63.91 |
| 32 | 3 | 0.11 | 64.02 |
| 33 | 3 | 0.11 | 64.13 |
| 34 | 3 | 0.11 | 64.24 |
| 35 | 19 | 0.69 | 64.93 |
| 36 | 14 | 0.51 | 65.44 |
| 37 | 3 | 0.11 | 65.55 |
| 77 | 930 | 33.90 | 99.45 |
| 88888 | 11 | 0.40 | 99.85 |
| 99999 | 4 | 0.15 | 100.00 |
| Total | 2743 | 100.00 |  |

Diary 3

| diary 3 | Freq. | Percent | Cum. |
| :---: | :---: | :---: | :---: |
| 0 | 123 | 6.15 | 6.15 |
| 1 | 115 | 5.75 | 11.89 |
| 2 | 78 | 3.90 | 15.79 |
| 3 | 1 | 0.05 | 15.84 |
| 4 | 1 | 0.05 | 15.89 |
| 5 | 24 | 1.20 | 17.09 |
| 6 | 19 | 0.95 | 18.04 |
| 7 | 3 | 0.15 | 18.19 |
| 8 | 81 | 4.05 | 22.24 |
| 9 | 6 | 0.30 | 22.54 |
| 10 | 2 | 0.10 | 22.64 |
| 11 | 42 | 2.10 | 24.74 |
| 12 | 28 | 1.40 | 26.14 |
| 13 | 17 | 0.85 | 26.99 |
| 16 | 87 | 4.35 | 31.33 |
| 18 | 37 | 1.85 | 33.18 |
| 19 | 43 | 2.15 | 35.33 |
| 20 | 40 | 2.00 | 37.33 |
| 21 | 97 | 4.85 | 42.18 |
| 22 | 10 | 0.50 | 42.68 |
| 23 | 35 | 1.75 | 44.43 |
| 24 | 252 | 12.59 | 57.02 |
| 26 | 1 | 0.05 | 57.07 |
| 27 | 30 | 1.50 | 58.57 |
| 28 | 28 | 1.40 | 59.97 |
| 29 | 31 | 1.55 | 61.52 |
| 31 | 7 | 0.35 | 61.87 |
| 32 | 3 | 0.15 | 62.02 |
| 33 | 7 | 0.35 | 62.37 |
| 34 | 1 | 0.05 | 62.42 |
| 35 | 2 | 0.10 | 62.52 |
| 36 | 22 | 1.10 | 63.62 |
| 37 | 17 | 0.85 | 64.47 |
| 38 | 20 | 1.00 | 65.47 |
| 39 | 1 | 0.05 | 65.52 |
| 40 | 15 | 0.75 | 66.27 |
| 42 | 2 | 0.10 | 66.37 |
| 77 | 663 | 33.13 | 99.50 |
| 88888 | 9 | 0.45 | 99.95 |
| 99999 | 1 | 0.05 | 100.00 |
| Total | 2001 | 100.00 |  |

Diary 4

| diary 4 | Freq. | Percent | Cum. |
| :---: | :---: | :---: | :---: |
| 0 | 126 | 4.21 | 4.21 |
| 1 | 137 | 4.57 | 8.78 |
| 2 | 105 | 3.51 | 12.29 |
| 3 | 26 | 0.87 | 13.16 |
| 5 | 21 | 0.70 | 13.86 |
| 6 | 28 | 0.93 | 14.79 |
| 7 | 4 | 0.13 | 14.92 |
| 8 | 57 | 1.90 | 16.83 |
| 9 | 5 | 0.17 | 16.99 |
| 10 | 1 | 0.03 | 17.03 |
| 11 | 44 | 1.47 | 18.50 |
| 12 | 50 | 1.67 | 20.17 |
| 13 | 25 | 0.83 | 21.00 |
| 14 | 1 | 0.03 | 21.04 |
| 16 | 104 | 3.47 | 24.51 |
| 17 | 1 | 0.03 | 24.54 |
| 18 | 26 | 0.87 | 25.41 |
| 19 | 165 | 5.51 | 30.92 |
| 20 | 92 | 3.07 | 33.99 |
| 21 | 151 | 5.04 | 39.03 |
| 22 | 86 | 2.87 | 41.90 |
| 23 | 40 | 1.34 | 43.24 |
| 24 | 305 | 10.18 | 53.42 |
| 27 | 114 | 3.81 | 57.23 |
| 28 | 85 | 2.84 | 60.07 |
| 29 | 37 | 1.24 | 61.30 |
| 30 | 9 | 0.30 | 61.60 |
| 31 | 16 | 0.53 | 62.14 |
| 32 | 11 | 0.37 | 62.50 |
| 33 | 21 | 0.70 | 63.21 |
| 34 | 2 | 0.07 | 63.27 |
| 35 | 28 | 0.93 | 64.21 |
| 36 | 60 | 2.00 | 66.21 |
| 37 | 15 | 0.50 | 66.71 |
| 38 | 45 | 1.50 | 68.21 |
| 77 | 946 | 31.59 | 99.80 |
| 88888 | 5 | 0.17 | 99.97 |
| 99999 | 1 | 0.03 | 100.00 |
| Total | 2995 | 100.00 |  |

Diary 5

| diary5 | Freq. | Percent | Cum. |
| :---: | :---: | :---: | :---: |
| 0 | 480 | 15.26 | 15.26 |
| 1 | 120 | 3.81 | 19.07 |
| 11 | 51 | 1.62 | 20.69 |
| 12 | 15 | 0.48 | 21.17 |
| 13 | 13 | 0.41 | 21.58 |
| 14 | 3 | 0.10 | 21.68 |
| 16 | 88 | 2.80 | 24.48 |
| 18 | 5 | 0.16 | 24.63 |
| 19 | 131 | 4.16 | 28.80 |
| 2 | 67 | 2.13 | 30.93 |
| 20 | 104 | 3.31 | 34.23 |
| 21 | 116 | 3.69 | 37.92 |
| 22 | 48 | 1.53 | 39.45 |
| 23 | 47 | 1.49 | 40.94 |
| 24 | 413 | 13.13 | 54.07 |
| 25 | 1 | 0.03 | 54.10 |
| 26 | 1 | 0.03 | 54.13 |
| 27 | 37 | 1.18 | 55.31 |
| 28 | 52 | 1.65 | 56.96 |
| 29 | 45 | 1.43 | 58.39 |
| 3 | 2 | 0.06 | 58.46 |
| 30 | 21 | 0.67 | 59.12 |
| 38 | 1 | 0.03 | 59.15 |
| 4 | 1 | 0.03 | 59.19 |
| 5 | 23 | 0.73 | 59.92 |
| 6 | 6 | 0.19 | 60.11 |
| 7 | 26 | 0.83 | 60.93 |
| 77 | 1112 | 35.35 | 96.28 |
| 8 | 113 | 3.59 | 99.87 |
| 88888 | 1 | 0.03 | 99.90 |
| 9 | 3 | 0.10 | 100.00 |
| Total | 3146 | 100.00 |  |

Diary 6

| diary6 | Freq. | Percent | Cum. |
| :---: | :---: | :---: | :---: |
| 0 | 99 | 5.91 | 5.91 |
| 1 | 35 | 2.09 | 8.00 |
| 2 | 27 | 1.61 | 9.62 |
| 3 | 28 | 1.67 | 11.29 |
| 5 | 12 | 0.72 | 12.01 |
| 6 | 4 | 0.24 | 12.25 |
| 7 | 1 | 0.06 | 12.31 |
| 8 | 126 | 7.53 | 19.83 |
| 9 | 3 | 0.18 | 20.01 |
| 10 | 2 | 0.12 | 20.13 |
| 11 | 28 | 1.67 | 21.80 |
| 12 | 28 | 1.67 | 23.48 |
| 13 | 15 | 0.90 | 24.37 |
| 14 | 1 | 0.06 | 24.43 |
| 16 | 103 | 6.15 | 30.59 |
| 18 | 1 | 0.06 | 30.65 |
| 19 | 10 | 0.60 | 31.24 |
| 20 | 72 | 4.30 | 35.54 |
| 21 | 22 | 1.31 | 36.86 |
| 22 | 30 | 1.79 | 38.65 |
| 23 | 25 | 1.49 | 40.14 |
| 24 | 309 | 18.46 | 58.60 |
| 25 | 2 | 0.12 | 58.72 |
| 27 | 35 | 2.09 | 60.81 |
| 28 | 18 | 1.08 | 61.89 |
| 29 | 3 | 0.18 | 62.07 |
| 30 | 9 | 0.54 | 62.60 |
| 31 | 24 | 1.43 | 64.04 |
| 32 | 1 | 0.06 | 64.10 |
| 34 | 5 | 0.30 | 64.40 |
| 35 | 1 | 0.06 | 64.46 |
| 36 | 8 | 0.48 | 64.93 |
| 38 | 5 | 0.30 | 65.23 |
| 40 | 8 | 0.48 | 65.71 |
| 41 | 3 | 0.18 | 65.89 |
| 43 | 3 | 0.18 | 66.07 |
| 77 | 568 | 33.93 | 100.00 |
| Total | 1674 | 100.00 |  |

## APPENDIX 3

## Tabulated results for primary activity diary 1 - diary 6

The results for primary activity (as defined in Appendix 1) are tabulated here. In each case, the particular variable being addressed is defined before results are given. Note that the activity codes are the same as give previously. These codes are reprinted for the readers convenience.

```
Activity Codes
<1> Bicycling
<2> Body Boarding/Body surfing
        /skimboarding
<3> Boating
<4> Canoeing
<5> Fishing (shore or pier)
<6> Frisbee
<7> Jet boating/Jet skiing
        personal water craft
<8> Jogging
<9> Kayaking
<10> Kite Flying
<11> Picknicing
<12> People watching
<13> Rollerblading/roller skates
<29> Splashing in water
<31> Reading
<33> Bar-B-Q
<35> Beachcombing
<37> Watched Fireworks
<39> Sleeping
<41> Bonfire
<43> Relaxing
<0> Other
<77> Nothing else
<88888> Don't Know
<99999> Refused
```

```
<14> Sailing
<15> Scuba diving
<16> Shopping/dining
<17> Snorkeling
<18> Sand football/soccer
<19> Sunbathing
<20> Surfing
<21> Swimming
<22> Volleyball
<23> Wading
<24> Walking
<25> Water skiing
<26> Windsurfing / boardsailing
<27> Enjoying the view
<28> Activities with children
<30> Walking the dog
<32> Hiking
<34> Amusement park/ arcade
<36> Eating/ drinking
<38> Played in the sand
<40> Camping
<42> Skateboarding
```

DIARY 1

| d1_ma | Freq. | Percent | Cum. |
| :---: | :---: | :---: | :---: |
| 0 | 24 | 9.27 | 9.27 |
| 1 | 24 | 9.27 | 18.53 |
| 2 | 1 | 0.39 | 18.92 |
| 3 | 3 | 1.16 | 20.08 |
| 4 | 3 | 1.16 | 21.24 |
| 5 | 2 | 0.77 | 22.01 |
| 6 | 2 | 0.77 | 22.78 |
| 8 | 10 | 3.86 | 26.64 |
| 9 | 1 | 0.39 | 27.03 |
| 10 | 1 | 0.39 | 27.41 |
| 11 | 9 | 3.47 | 30.89 |
| 12 | 7 | 2.70 | 33.59 |
| 13 | 9 | 3.47 | 37.07 |
| 16 | 21 | 8.11 | 45.17 |
| 19 | 3 | 1.16 | 46.33 |
| 20 | 11 | 4.25 | 50.58 |
| 21 | 1 | 0.39 | 50.97 |
| 22 | 3 | 1.16 | 52.12 |
| 23 | 3 | 1.16 | 53.28 |
| 24 | 105 | 40.54 | 93.82 |
| 27 | 13 | 5.02 | 98.84 |
| 28 | 2 | 0.77 | 99.61 |
| 30 | 1 | 0.39 | 100.00 |
| Total | 259 | 100.00 |  |

DIARY 2

| d2_ma | Freq. | Percent | Cum. |
| :---: | :---: | :---: | :---: |
| 0 | 12 | 4.41 | 4.41 |
| 1 | 22 | 8.09 | 12.50 |
| 2 | 2 | 0.74 | 13.24 |
| 3 | 1 | 0.37 | 13.60 |
| 4 | 3 | 1.10 | 14.71 |
| 5 | 3 | 1.10 | 15.81 |
| 6 | 1 | 0.37 | 16.18 |
| 8 | 6 | 2.21 | 18.38 |
| 10 | 1 | 0.37 | 18.75 |
| 11 | 17 | 6.25 | 25.00 |
| 12 | 5 | 1.84 | 26.84 |
| 13 | 7 | 2.57 | 29.41 |
| 16 | 14 | 5.15 | 34.56 |
| 18 | 2 | 0.74 | 35.29 |
| 19 | 10 | 3.68 | 38.97 |
| 20 | 9 | 3.31 | 42.28 |
| 21 | 6 | 2.21 | 44.49 |
| 22 | 3 | 1.10 | 45.59 |
| 23 | 3 | 1.10 | 46.69 |
| 24 | 109 | 40.07 | 86.76 |
| 27 | 13 | 4.78 | 91.54 |
| 28 | 9 | 3.31 | 94.85 |
| 30 | 3 | 1.10 | 95.96 |
| 31 | 1 | 0.37 | 96.32 |
| 32 | 2 | 0.74 | 97.06 |
| 33 | 2 | 0.74 | 97.79 |
| 34 | 1 | 0.37 | 98.16 |
| 35 | 3 | 1.10 | 99.26 |
| 36 | 1 | 0.37 | 99.63 |
| 88888 | 1 | 0.37 | 100.00 |
| Total | 272 | 100.00 |  |

DIARY 3

| d3_ma | Freq. | Percent | Cum. |
| :---: | :---: | :---: | :---: |
| 0 | 11 | 5.24 | 5.24 |
| 1 | 11 | 5.24 | 10.48 |
| 2 | 9 | 4.29 | 14.76 |
| 3 | 1 | 0.48 | 15.24 |
| 4 | 1 | 0.48 | 15.71 |
| 5 | 6 | 2.86 | 18.57 |
| 6 | 3 | 1.43 | 20.00 |
| 8 | 8 | 3.81 | 23.81 |
| 9 | 1 | 0.48 | 24.29 |
| 11 | 4 | 1.90 | 26.19 |
| 12 | 3 | 1.43 | 27.62 |
| 13 | 3 | 1.43 | 29.05 |
| 16 | 8 | 3.81 | 32.86 |
| 18 | 1 | 0.48 | 33.33 |
| 19 | 19 | 9.05 | 42.38 |
| 20 | 8 | 3.81 | 46.19 |
| 21 | 22 | 10.48 | 56.67 |
| 22 | 1 | 0.48 | 57.14 |
| 23 | 2 | 0.95 | 58.10 |
| 24 | 60 | 28.57 | 86.67 |
| 27 | 1 | 0.48 | 87.14 |
| 28 | 6 | 2.86 | 90.00 |
| 29 | 5 | 2.38 | 92.38 |
| 31 | 1 | 0.48 | 92.86 |
| 32 | 1 | 0.48 | 93.33 |
| 36 | 4 | 1.90 | 95.24 |
| 37 | 2 | 0.95 | 96.19 |
| 38 | 1 | 0.48 | 96.67 |
| 40 | 5 | 2.38 | 99.05 |
| 42 | 1 | 0.48 | 99.52 |
| 88888 | 1 | 0.48 | 100.00 |
| Total | 210 | 100.00 |  |

DIARY 4

| d4_ma | Freq. | Percent | Cum. |
| :---: | :---: | :---: | :---: |
| 0 | 5 | 1.71 | 1.71 |
| 1 | 12 | 4.10 | 5.80 |
| 2 | 7 | 2.39 | 8.19 |
| 3 | 5 | 1.71 | 9.90 |
| 5 | 6 | 2.05 | 11.95 |
| 6 | 3 | 1.02 | 12.97 |
| 8 | 4 | 1.37 | 14.33 |
| 9 | 2 | 0.68 | 15.02 |
| 11 | 10 | 3.41 | 18.43 |
| 12 | 3 | 1.02 | 19.45 |
| 13 | 3 | 1.02 | 20.48 |
| 16 | 12 | 4.10 | 24.57 |
| 18 | 2 | 0.68 | 25.26 |
| 19 | 27 | 9.22 | 34.47 |
| 20 | 11 | 3.75 | 38.23 |
| 21 | 29 | 9.90 | 48.12 |
| 22 | 9 | 3.07 | 51.19 |
| 23 | 10 | 3.41 | 54.61 |
| 24 | 73 | 24.91 | 79.52 |
| 27 | 12 | 4.10 | 83.62 |
| 28 | 15 | 5.12 | 88.74 |
| 29 | 8 | 2.73 | 91.47 |
| 30 | 5 | 1.71 | 93.17 |
| 31 | 1 | 0.34 | 93.52 |
| 32 | 1 | 0.34 | 93.86 |
| 33 | 1 | 0.34 | 94.20 |
| 35 | 1 | 0.34 | 94.54 |
| 36 | 8 | 2.73 | 97.27 |
| 37 | 5 | 1.71 | 98.98 |
| 38 | 3 | 1.02 | 100.00 |
| Total | 293 | 100.00 |  |

DIARY 5

| d5_ma | Freq. | Percent | Cum. |
| :---: | :---: | :---: | :---: |
| 0 | 56 | 17.55 | 17.55 |
| 1 | 22 | 6.90 | 24.45 |
| 2 | 8 | 2.51 | 26.96 |
| 5 | 7 | 2.19 | 29.15 |
| 8 | 10 | 3.13 | 32.29 |
| 9 | 1 | 0.31 | 32.60 |
| 11 | 6 | 1.88 | 34.48 |
| 12 | 3 | 0.94 | 35.42 |
| 13 | 1 | 0.31 | 35.74 |
| 14 | 1 | 0.31 | 36.05 |
| 16 | 11 | 3.45 | 39.50 |
| 18 | 2 | 0.63 | 40.13 |
| 19 | 34 | 10.66 | 50.78 |
| 20 | 12 | 3.76 | 54.55 |
| 21 | 20 | 6.27 | 60.82 |
| 22 | 5 | 1.57 | 62.38 |
| 23 | 5 | 1.57 | 63.95 |
| 24 | 94 | 29.47 | 93.42 |
| 27 | 6 | 1.88 | 95.30 |
| 28 | 10 | 3.13 | 98.43 |
| 29 | 3 | 0.94 | 99.37 |
| 30 | 2 | 0.63 | 100.00 |
| Total | 319 | 100.00 |  |

DIARY 6

| d6_ma | Freq. | Percent | Cum. |
| :---: | :---: | :---: | :---: |
| 0 | 11 | 5.79 | 5.79 |
| 1 | 9 | 4.74 | 10.53 |
| 2 | 2 | 1.05 | 11.58 |
| 3 | 1 | 0.53 | 12.11 |
| 5 | 5 | 2.63 | 14.74 |
| 8 | 10 | 5.26 | 20.00 |
| 11 | 2 | 1.05 | 21.05 |
| 12 | 4 | 2.11 | 23.16 |
| 13 | 6 | 3.16 | 26.32 |
| 16 | 27 | 14.21 | 40.53 |
| 18 | 1 | 0.53 | 41.05 |
| 19 | 2 | 1.05 | 42.11 |
| 20 | 15 | 7.89 | 50.00 |
| 21 | 8 | 4.21 | 54.21 |
| 22 | 2 | 1.05 | 55.26 |
| 23 | 1 | 0.53 | 55.79 |
| 24 | 63 | 33.16 | 88.95 |
| 25 | 1 | 0.53 | 89.47 |
| 27 | 7 | 3.68 | 93.16 |
| 28 | 3 | 1.58 | 94.74 |
| 29 | 1 | 0.53 | 95.26 |
| 31 | 2 | 1.05 | 96.32 |
| 34 | 2 | 1.05 | 97.37 |
| 36 | 2 | 1.05 | 98.42 |
| 38 | 1 | 0.53 | 98.95 |
| 40 | 2 | 1.05 | 100.00 |
| Total | 190 | 100.00 |  |


[^0]:    ${ }^{1}$ Note that diary survey and wave are used interchangeably to refer to each bi-monthly data collection exercise.
    ${ }^{2}$ While an argument can be made otherwise, it can be asserted that such a revealed preference approach using observations on actual behavior will have advantages over responses to hypothetical questions about primary beach activity.

