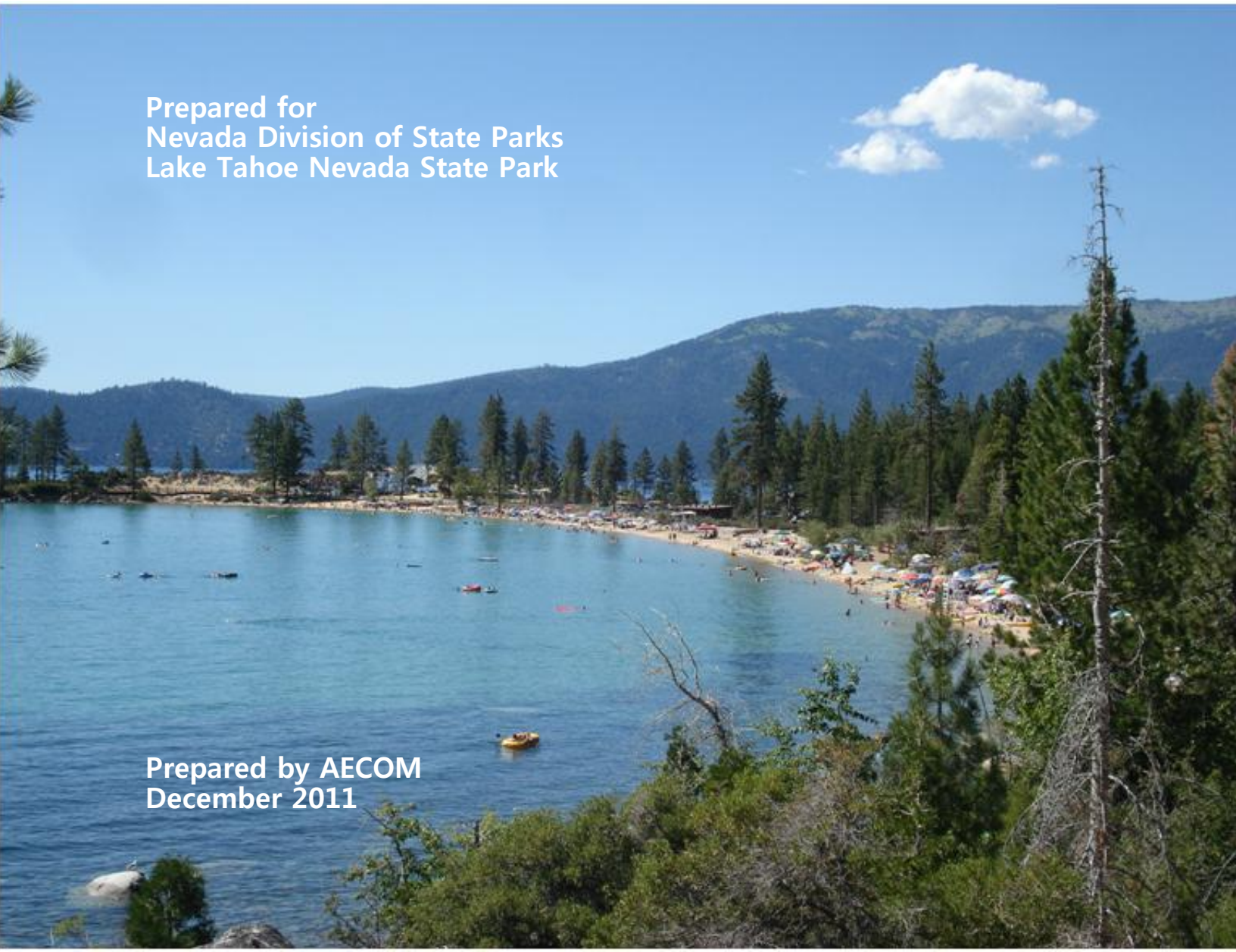
AECOM

Design + Planning

Lake Tahoe Nevada State Park

Sand Harbor Recreational Capacity Study

Appendices



Prepared for
Nevada Division of State Parks
Lake Tahoe Nevada State Park

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December 2011

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Appendices

Lake Tahoe Nevada State Park

Sand Harbor Recreational Capacity Study

Appendices

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Appendix A
Annotated Summary of Documents and Data Compiled

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I. Nevada Division of State Parks Documents and Data

Lake Tahoe Nevada State Park Plans

Land Use Plan for Lake Tahoe Nevada State Park
Wirth and Associates (1972)

Early in the park's development, this plan analyzed the historical, physical, ecological, and recreational use characteristics of the designated park *area and made recommendations for future land acquisition, facility development, and management with the overriding goal of balancing preservation and public use. The plan concluded that "…potential demand easily lies beyond the viable carrying capacities of any facilities that might be developed on the lakeshore portion of the park" (no page number; see "Visitation" section of "Master Plan insert").*

Lake Tahoe Nevada State Park Master Development Plan (Master Plan)
State Parks (1990)

This comprehensive general management and development plan (GMP) for the park serves as the guidance document for the management of the park. The document analyzes regional influences and park resources, and provides a recreational use history. In addition, it includes a park development plan, park management plan, and plan for general operational procedures based on that analysis. Several subsections address recreational management, and several facility improvement were proposed for Sand Harbor and Memorial Point. Some of these improvements have since been implemented, including a new visitor center/concession building at Sand Harbor, and restroom upgrades. The plan does not specifically address capacity concerns, but justified some recommended improvements as a means to reduce congestion. An update of the plan is expected to be completed in 2012.

Lake Tahoe Nevada State Park Interpretive Plan
Julie Stone, Nevada Conservation Corps (2003)

The primary purpose of this plan is to provide an analysis of existing facilities and resources as related to potential interpretive themes, introduce interpretive opportunities, and make recommendations for interpretive development and programs for the various units of the park. The plan also provides a detailed discussion of park usage and recreation management challenges, particularly at Sand Harbor.

Lake Tahoe Nevada State Park Water Conservation Plan
Joe Fontaine, State Parks (2009)

This plan, prepared by the Facility Supervisor for the park, describes the permitted public water systems at Sand Harbor and Memorial Point, and the capacity and average annual usage of those system, both which are supplied by single groundwater wells. The Sand Harbor system has a total of 16 service connections supplying the multiple restrooms/showers, the visitor center/concession building, water fountains and the shop/office complex. Several water conservation measures that have been implemented are described.

Lake Tahoe Nevada State Park Resource Management Plan
State Parks (2010)

This recently completed element of the park General Management Plan guides the programs to protect, restore, and perpetuate the natural and cultural resources of the park. Its primary goal is enhancement of outdoor recreation while protecting and enhancing the park's natural resources. Of specific relevance to recreational capacity is Objective 5 for the Park Development management zones of the park: "Evaluate the capacities of day use areas and facilities to determine the quality of the visitor experience. Determine if management plans or visitor capacity limits for any of the facilities are needed to maintain a quality experience for the visitors and maintain the natural character of the Park." In addition to carrying capacity, primary resource issues identified that are of particular relevance to Sand Harbor include maintenance of forest habitats (including management of bark beetle infested areas), management of roads and trails to protect streams and water quality, management of invasive species, and hazard trees.

Statewide Recreation Survey Reports

On-Site Survey of State Park Visitors, 1987-88
Market Systems Research, Inc. (1988)

This report provides the results of a statewide survey of Nevada State Park visitors focusing on assessing park visitor's activities, needs, origin, level of satisfaction, and several additional visitor and visit characteristics. Results are presented specifically for the Sand Harbor and SR 28 units of the park, where 213 visitors were surveyed (but only 97, or 46 percent, during the summer). Several of the survey questions were duplicated, or similar questions were asked, during the surveys conducted for this study, providing the opportunity to compare results and gauge changes over the past 23 years. Some key results of interest include:

- *The most common activities were relaxing (90%), swimming (51%), family picnicking (44%), and hiking/walking (34%).*
- *About 89% were "very satisfied" with their visit.*
- *About 85% considered the adequacy of park facilities to be "above average" or "excellent."*
- *About 90% considered the cleanliness of park facilities to be "above average" or "excellent."*
- *77% were repeat visitors, and nearly half of those visited the park from two to five times in the past year.*
- *About 73% of visitors arrived at the park with two to four people in their vehicle, and about 96% arrived in a car/pickup/van.*
- *About 53% said they would be "very likely" to use a bike trail along SR 28 from Incline Village to US 50.*
- *About 39% said they would be "very likely" to use off-road parking along SR 28 to eliminate shoulder parking.*
- *About 78% rated the value they received for the fee paid as "excellent" or "above average."*

2009 Visitor Survey Special Report (L&WCF 32-00279)
Jenny Scanland, State Parks (2009)

This report provides results of a statewide survey of Nevada State Park visitors conducted in 2005-06. A brief summary of statewide results is provided. AECOM was provided the data files and conducted a basic analysis of the results for Lake Tahoe Nevada State Park, where 213 visitors were surveyed. The survey questions did not duplicate all of the 1987-88 survey questions. Also, the location within the park where the survey was conducted was not recorded, thus it is not known which respondents were visiting Sand Harbor or other areas of the park when surveyed. Never-the-less, some opportunity for comparison of select survey results exists, including comparison with similar survey items contained in this study's survey.

The Economic Value of Nevada State Parks
Jeffrey Englin, et al., University of Nevada, Reno (2009)

This report, provided as an enclosure to the above report and utilizing the same survey data, provides an analysis of recreation demand and visitor's willingness-to-pay per trip (WTP, a commonly used measure of economic value for parks) for 7 Nevada State Parks, including Lake Tahoe-Nevada State Park. The analysis was based on responses from 148 LTNSP visitors. The park was found to have a per-trip WTP value of about $300, behind only two parks in the Las Vegas area. Total WTP for the park for 2007 was estimated to be about $239 million, second only to one other State Park.

Lake Tahoe Nevada State Park (LTNSP) Data

LTNSP Annual Visitation Statistics
(1 Excel file)

This file provides summary tables containing annual visitation statistics for the park, by unit, for 2000-2009; annual fees collected statistics for the park, by unit, for 2005-2009; total annual park visitation statistics for 1980-2000; seasonal breakdown of park visitation statistics for 2007, by unit; and park closure data for 2008-2010. These data provide a valuable long-term record of visitor use pressures on the park.

State Parks Monthly Park Visitor Reports (ADM-2): 2008, 2009, 2010
(12 Excel files)

Each file contains monthly park visitor reports for the entire year, using an official State Parks form, with separate reports for 4 park locations: Sand Harbor Main Entrance, Sand Harbor Boat Ramp, Memorial Point, and Hidden Beach. The form includes daily road counter or visual count data, with monthly visitor totals based on the counts and a vehicle occupancy factor. Comparisons with visitation during the same period of the previous year are provided. The breakdowns by subunit and by month contained in these data provide a more detailed picture of park use for the most recent past than the annual summaries above.

State Parks Monthly Statistical Reports for Sand Harbor (ADM 27): 2008, 2009, 2010
(3 Excel files)

Each file contains monthly Sand Harbor statistical reports for the entire year, and biannual summaries, using an official State Parks form addressing for 10 park operations elements. Period and year-to-date totals are compared with the prior year. Report elements include:

Personnel (labor hours), Law Enforcement (arrests, citations, incidents, etc.), Interpretation (programs, personnel, etc.), Visitation (total, fee/non-fee, boats launched, day use), Revenues (user fees and other sources), Gift Shop sales, Housing (permanent staff residences), Services From Others (hours worked by inmates, NSPCA workers, and others), Visitor Questionnaires (comment cards distributed), and Volunteers (hours worked). These data provide details and a useful historical record of important aspects of park management and staffing.

State Parks Boating Data: 2010
(1 Excel file)

This file provides data gathered at the Sand Harbor boat ramp during required Aquatic Invasive Species boat inspections. Data include the number of boats launched, by month and day of week, as well as details about boat inspected, such as vessel size and horsepower.

II. State Route 28 Corridor Studies

Nevada State Route 28 Recreational Traffic Management Study
LSC, Inc. (1996)

This study examined 10 miles of the SR 28 corridor, between Incline Village and Highway 50, noted serious soil erosion problems "in unpaved shoulder areas where parking continually encroaches", and highlighted water quality concerns associated with this erosion. The report inventoried highway shoulder parking in 11 separate study segments, two of which cover the area between Memorial Point and the south end of Sand Harbor and another which covers several additional miles of the corridor to the south. A total of 138 illegal parking spaces were identified in the two segments nearest Memorial Point and Sand Harbor, nearly all on the east side of the highway, plus 16 legal spaces (based on adequate available shoulder width). The segment south of Sand Harbor was found to provide 122 legal and 76 illegal spaces, but it was not identified how many of those spaces were within a reasonable walking distance of Sand Harbor. Nearly 450 vehicles were observed parked on the road shoulders in the study corridor during the peak period. The study also noted that "pedestrian activity along SR 28 is heavy and very dangerous during the summer" and further noted that "no sidewalks, crosswalks, or signs exist to protect pedestrians or warn motorists." Conclusions were provided related to transit needs and potential transit design, and recommendations were made for parking lot expansion, a free shuttle system with two new shuttle parking lots south of Sand Harbor, and shuttle stop modifications at Sand Harbor. The study recommended elimination of all shoulder parking.

Eastshore Drive National Scenic Byway, Incline Village to US 50, Corridor Management Plan
EDAW, Inc. (1997)

This plan was required by the designation of the SR 28 corridor as a National Scenic Byway and sought to provide an overall management framework that met the goals and needs of all of the agencies with jurisdiction along the corridor. The plan described the issues affecting the corridor (roadside parking and associated safety problems chief among them), recommended a prioritized set of actions delegated to the various jurisdictional agencies to resolve those issues, and established a structure for continued integrated management of the corridor.

Recommended actions related to parking and transit, in particular, included further study of options to manage parking and recreational capacity of shoreline use areas, implementation of parking and transit measures described in the 1996 study based on the results of the new studies (including replacement of all shoulder parking with off-highway parking), and increased and more coordinated enforcement of parking restrictions in the corridor.

Draft Environmental Assessment, Nevada State Route 28 Off-Highway Parking Areas, Eastern Shore of Lake Tahoe
Harding Lawson Associates (1999)

This assessment examined the environmental consequences of construction of off-highway parking facilities and designated trails along SR 28 to serve the USFS beaches along the corridor between Sand Harbor and Spooner Junction. This was among the recommended actions contained in the 1997 Corridor Management Plan. The total amount of parking proposed was less than 100 spaces, divided among 4 locations. Consideration of transit service was not part of the assessment, but such service was acknowledged as a potential future component of a comprehensive public access program for the east shore.

Draft East Shore Access Plan
Harding ESE (2001)

This plan, prepared for TRPA, took into account the analysis and recommendations contained in preceding SR 28 corridor studies and plans, and developed several assumptions that altered the direction of the corridor management discussion. These included setting agreed upon capacity of State Parks and USFS managed shoreline areas to be accommodated by the access plan (including Sand Harbor and Memorial Point), putting aside parking enforcement as a primary mechanism to control roadside parking, moving away from consideration of any new parking areas, and moving away from consideration of removing all roadside parking. The plan recommended expansion of existing USFS parking lots, implementation of a weekend and holiday transit system, formalizing of some shoulder parking, and use of physical barriers (preferably short posts) in some portions of the SR 28 corridor, in combination with a parking enforcement program, to restrict parking in unauthorized areas. Only eight potential shoulder parking spaces were identified within about half a mile of Sand Harbor or Memorial Point (at two locations to the north of Sand Harbor); seven were located at a location about three-quarters of a mile to the south of Sand Harbor. The plan also recommended the blocking of 28 existing spaces in the same general area with physical barriers.

III. Regional Recreation and Natural Resource Planning Documents

TRPA Plans and Regulations

Lake Tahoe Regional Plan Goals and Policies (1987, last updated Oct 2006) and Regulatory Code

This document presents an overall approach to meeting environmental thresholds (described below) set by TRPA for the Tahoe Basin. TRPA's founding Bi-state Compact requires a Recreation Plan for which recreation goals and policies are found in the Recreation Element of the Goals and Policies document. The Recreation Element contains three subelements: Urban

Recreation, Developed Recreation (most relevant to this study), and Dispersed Recreation. New subelements have been proposed during the ongoing Regional Plan Update process: General Recreation and Recreation Education.

The Regional Plan uses the concept of persons-at-one-time (PAOT) as a means of measuring the supply of recreation opportunities provided by developed facilities, and sets a target of 6,761 summer day-use PAOT, less than 1,100 of which have been allocated to-date. Goals related to developed recreation have been fourfold: maintaining a fair share of total basin capacity for outdoor recreation, providing for appropriate type, location, and rate of development of outdoor recreation uses, protecting natural resources from overuse and separating incompatible uses, and maintaining the efficient use of outdoor recreation resources. Various policies have been developed to support these goals.

The Regulatory Code (Code of Ordinances) contains the many regulations that are required to implement the policies set forth in the Goals and Policies of the Plan, along with other regulatory documents that direct how the regulations are implemented.

Environmental Threshold Carrying Capacities (R-1 and R-2)

Within the Regional Plan, TRPA has established environmental goals and related environmental threshold carrying capacities and standards, also known as "thresholds," to help protect Lake Tahoe and to provide a means to allow for additional growth in the region. There are two recreation thresholds, R-1 and R-2, which aim to preserve and enhance high quality recreation opportunities, and to ensure that a "fair share" of the Tahoe Basin's recreational capacity is available to the public. These thresholds are in the form of "policy statements" rather than numerical or management thresholds for other resources, which are generally aimed at limiting the effects of development in the basin. Measurement of "high quality recreation opportunities" has been based on visitor surveys, and the accounting of public lands, trails, and amenities. "Fair share" has been based on a cumulative accounting of "persons at one time" (PAOT) recreational capacity afforded by public lands and facilities. The most recent evaluation of these thresholds (2006) found that they were "in attainment." Efforts are underway to revise the Regional Plan, which may ultimately revise the recreational thresholds or their application.

Plan Area Statement – East Shore (#55)

The Plan Area Statement (PAS) for the East Shore (which encompass the Sand Harbor and Memorial Point Areas) provides a description of land use for the designated area and establish specific planning direction with three plan designations: a Land Use Classification (Recreation) a Management Strategy (Development with Mitigation), and Special Designation (Shorezone Preservation Area). Planning considerations (i.e., issues and concerns), special policies, and permissible uses (including several specific types of recreation facilities) are enumerated. The PAS establishes a recreational capacity for "group facilities" of 25 persons per acre. Some PAS may specify the amount of additional recreational capacity subject to Summer Day-Use PAOT (or winter day use or overnight PAOT) permissible within the Plan Area; however, the PAS allows no additional PAOT for the East Shore area. Additionally, the PAS contains permissible uses for what are termed Shorezone Tolerance Districts; several specific shoreline primary recreation uses and accessory structures are specified for the East Shore.

2006 Threshold Evaluation Report

The current Regional Plan contains 36 threshold indicators used "to measure the success of the environmental health of the region." This report provides a five-year status update for these threshold indicators. (Prior evaluations occurred in 1991, 1996, and 2001.) Recreation Thresholds R-1: High Quality Recreational Experience and Access, was found to be in attainment after having been found in nonattainment (below standards) in 2001. Recreation Threshold R-2: Capacity Available to General Public was found to be in attainment, as it had been in all previous evaluations.

Report and Plans Developed by TRPA with Other Partner Agencies

Pathway 2007 Public Lands and Waterways Vision Summary, Place-Based Planning
Regional Planning Partners (2006)

This document summarizes the results of a visioning exercise conducted for TRPA, which are presented as a series of vision statements expressing the desired direction and outcome of planning in the Tahoe Basin over the next 20 years (up to 2027). The exercise was directed by a working group composed of TRPA, USFS and several other regional agencies and organizations, and involved three community workshops. The workshops identified values and opportunities for public lands and waterways as well as guiding principles and key planning concepts for public access, capacity, and recreation (and restoration). Access concepts for the east shore include "public transit to area beaches and recreation sites would be provided and promoted." The capacity concept for the east shore is: "over-crowding and adverse environmental impacts would be avoided, primarily through the use of transit opportunities, including boat ferries and other means; the number of visitors would be capped, as warranted."

A Federal Vision for the Environmental Improvement Program at Lake Tahoe
TRPA and Lake Tahoe Federal Interagency Partnership (2006)

The Environmental Improvement Program (EIP) is a cooperative effort among regional agencies to define restoration needs for attaining environmental goals or Thresholds, and a means for meeting those Thresholds through investment of resources. The Federal Partnership has developed several focus areas for the EIP, one of which is Recreation and Scenic, and for which the USFS has primary responsibility among the federal agencies. There are two programs within the Recreation and Scenic Focus Area: Interpretation Services and Recreation. The Recreation Program enumerates 11 objectives in the areas of stewardship, education, assistance, and science. These objectives call for visitor use monitoring and visitor surveys, and maintaining use levels within PAOT capacities, where appropriate, according to Recreation Opportunity Spectrum (ROS) classifications.

Lake Tahoe Region Bicycle and Pedestrian Plan
TRPA and Tahoe Metropolitan Planning Organization (2010)

This plan evaluates numerous proposed bicycle and pedestrian path projects, with estimates of the cost per mile and total cost. Class 1/Shared Use paths evaluated include a 2.49 mile segment from Incline Village to Sand Harbor and a 2.41 mile segment from Sand Harbor to the Carson City County Line. Both of these are segments of the proposed Stateline to Stateline Bikeway, and are identified as being in preliminary planning and feasibility study phases, respectively. The first of these segments was estimated to cost approximately $20 million. The plan also evaluates two much less costly Class II/Bike Lane or Wide Shoulder projects that

would cover similar stretches of the East shore.

Other Regional Plans and Reports (Biological Resources, Misc. Recreation)

Conservation Strategy for Tahoe Yellow Cress
Bruce Pavlik and Dennis Murphy (2002)

The Conservation Strategy cites recreation activity on beaches as a primary cause, among several, of a decline in the number of shorezone sites occupied by TYC and describes strategies for the long-term protection of the species. Implementation of the strategy is a cooperative effort involving several agencies (including State Parks) and private interests. The strategy considered TYC extirpated from Sand Harbor as a result of recreation activity, and considered Sand Harbor a low priority restoration site (as noted above, TYC recolonized the Sand Harbor site in 2003).

Lake Tahoe Basin Northern Goshawk Population Monitoring Plan
U.S. Forest Service (2008)

The plan describes a science-based monitoring program to support the objective of protecting and recovering the Northern goshawk population in the Lake Tahoe Basin. Goshawks are describes as year-round residents distributed throughout the basin and breeding from lake level to near tree-line. Human presence is noted as having the potential to disturb goshawks, especially during the nesting period. Prior to 2000, several goshawk nests were detected near the shoreline south of Sand Harbor, and several detections had occurred upslope of Sand Harbor in more recent years.

Implementation of the Conservation Strategy for Tahoe Yellow Cress - 2009 Annual Report
Allison Stanton and Bruce Pavlik, BMP Ecosciences (2010)

This report (the ninth in the series) describes historical and current occurrence of Tahoe Yellow Cress (TYC) at Sand Harbor, with the 2009 occurrence among 47 known occupied shoreline sites for TYC. A total of 15 stems were counted, placing the site in the "low" rank among all sites where TYC was found. TYC had not been detected at Sand Harbor in 2006 or 2007, but had returned in 2003–05 after a 23-year absence. A fenced enclosure was present from 2003 to 2006 to protect a test population of TYC planted at the north end of the boat ramp beach. Low water conditions are believed to be the key factor in the recolonization. The report indicates that no significant disturbance of the plant had occurred.

2009 Lake Tahoe Basin Management Unit (LTBMU) Wildlife Program Annual Report
U.S. Forest Service - LTBMU (2009)

This report provides results of population monitoring and surveys of northern goshawk, bald eagle, and osprey (among several other species of wildlife), all of which have the potential to be affected by resource use and conditions at Sand Harbor and Memorial Point. Northern goshawk were surveyed and detected at Memorial Point, although no nests were found. Osprey were surveyed in both the Memorial Point and Sand Harbor areas, where several nest sites were known to exist, some of which were active during the surveys. One adult bald eagle was detected during a winter survey at Sand Harbor, but the only active nest known in the basin in on the west side of the lake (at Emerald Bay).

Lake Tahoe Non-Motorized Boating Framework Summary
Lake Tahoe Non-Motorized Boat Working Group (2010)

The Non-Motorized Boat Workgroup, of which State Parks is a member, has worked since 2007 to study and support the various forms for non-motorized boating on the lake. The group developed a set of guiding principles for management of this use, and gathered input on key issues affecting non-motorized boating. The framework addresses facility and access improvements, management and operational challenges, safety, and resource stewardship needs. The group assessed both day trip and overnight non-motorized boating experiences and needs. Capital improvement, management/operational, and education/outreach actions needed to support non-motorized boating are identified. The Sand Harbor area of the lake is highlighted as accessible for slower/beginner day paddlers, primarily due to the availability of the launch area at the Sand Harbor boat ramp beach.

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Appendix B
Survey Forms

- **LTNSP Recreation Count Form**
- **LTNSP Recreation Survey Forms**
- **LTNSP Employee Survey Form**

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LTNSP Recreation Count Form

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LAKE TAHOE NEVADA STATE PARK RECREATION COUNT FORM

Date: _____ Time (Start): _____ Surveyor: _____

Area: _____ Time (End): _____

NUMBER OF PEOPLE

Total:

OBSERVED ACTIVITIES

- ☐ Swimming
- ☐ Sightseeing
- ☐ Picnicking
- ☐ Sunbathing
- ☐ Resting/Relaxing
- ☐ Power Boating
- ☐ Kayaking
- ☐ Fishing (by boat)
- ☐ Fishing (from shore)
- ☐ SCUBA Diving
- ☐ Personal Watercraft (PWC) Use
- ☐ Sailing
- ☐ Special Event

Other activities (*describe*):

General description of numbers of people engaged in observed activities:

SURVEYOR OBSERVATIONS:

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LTNSP Recreation Survey Forms

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LAKE TAHOE NEVADA STATE PARK RECREATION SURVEY

Nevada State Parks is conducting a recreation survey of visitors to the Sand Harbor Unit of Lake Tahoe Nevada State Park. This survey relates to your recreational use of the Sand Harbor unit of the park.

Thank you in advance for your participation!

1. Is this your first visit to Sand Harbor? ☐ Yes ☐ No

If ***no***, about how many times have you visited in the past 12 months? _____

2. On this visit, how did you enter Sand Harbor?

☐ Personal vehicle ☐ Bus or Van ☐ Bicycle ☐ Walk-in ☐ Drop-off

3. How many people are in your group today? _____

4. How many vehicles did your group use to come to Sand Harbor? _____

5. About how much time will you spend at Sand Harbor today? _____ hours

6. Which of the following activities are you (and/or members of your group) participating in during this visit to Sand Harbor? *(check ✓ all that apply)*

☐ (1) Swimming ☐ (6) Power Boating ☐ (11) SCUBA Diving
☐ (2) Sightseeing ☐ (7) Kayaking ☐ (12) Personal Watercraft (PWC) Use
☐ (3) Picnicking ☐ (8) Fishing (by boat) ☐ (13) Special Event
☐ (4) Sunbathing ☐ (9) Fishing (from shore) ☐ (14) Other (*please describe*) _____
☐ (5) Resting/Relaxing ☐ (10) Sailing _____

7. Of the activities you checked above, what are the top three (3) that you're participating in during today's visit to Sand Harbor? *(write in corresponding number)*

Primary Activity _____ Second Activity _____ Third Activity _____

8. Are the current recreation facilities (e.g., restrooms, picnic sites, boat ramp, visitor center, concessions, etc.) provided at Sand Harbor adequate to meet your needs? ☐ Yes ☐ No

If *no*, please explain. _____

_____

9. On this visit, why did you choose to come to Sand Harbor? *(check ✓ all that apply)*

☐ Proximity/Closeness ☐ Good Diving ☐ Presence of Lifeguards/Park Rangers
☐ Water Quality ☐ Good Boating ☐ Scenery/Natural Environment
☐ Quality of Beaches ☐ Facilities Provided ☐ Other (*please describe*) _____

_____

10. How crowded do you feel at the area you are currently using? *(circle one number)*

1----------2----------3----------4----------5----------6----------7----------8----------9

Not at all Crowded	Slightly Crowded	Moderately Crowded	Extremely Crowded

11. How would you compare the level of crowding today with what you expected?

☐ Less crowded ☐ About what I expected ☐ More crowded ☐ I didn't know what to expect

LAKE TAHOE NEVADA STATE PARK RECREATION SURVEY

12. In general, the number of people at Sand Harbor…*(check ✓ one)*

☐ Adds a lot to my enjoyment ☐ Detracts a little from my enjoyment

☐ Adds a little to my enjoyment ☐ Detracts a lot from my enjoyment

☐ Doesn't really affect my enjoyment

13. Have you ever changed your visits to Sand Harbor to avoid crowding? ☐ Yes ☐ No

If ***yes***, I sometimes…*(check ✓ all that apply)*

☐ Visit earlier or later in the year ☐ Seek out quiet places at Sand Harbor

☐ Visit on weekdays instead of weekends ☐ Avoid holidays

☐ Come earlier or later in the day ☐ Go to other places in the Tahoe region

14. Have you ever not gotten into the park due to lack of available parking? ☐ Yes ☐ No

If ***yes;*** How many times in a season**?** _____

How many times have you parked along the highway due to this problem? _____

15. Below is a list of potential issues at Sand Harbor. For each, please indicate the degree of concern you may feel about these issues.

	Not a Problem	**Slight Problem**	**Moderate Problem**	**Serious Problem**	**Very Serious Problem**
Getting into the park or a parking space	☐	☐	☐	☐	☐
Unsafe parking conditions along SR-28	☐	☐	☐	☐	☐
Finding a picnic site	☐	☐	☐	☐	☐
Finding space on the beach	☐	☐	☐	☐	☐
Ability to launch a boat	☐	☐	☐	☐	☐
Conflicts with other users at boat ramp	☐	☐	☐	☐	☐
Conflicts between boaters and other users	☐	☐	☐	☐	☐
Disruptive behavior by other park users	☐	☐	☐	☐	☐

16. Please describe any problems (if any) you may have had with other visitors during this or past visits to Sand Harbor. _____

_____

17. On this visit, what is your motivation for coming to Sand Harbor? *(check ✓ all that apply)*

☐ Relaxation ☐ Exercise ☐ Enjoying outdoors/scenery ☐ Being near the water

☐ Family bonding ☐ Partying ☐ Social interaction

☐ Other *(please describe)* _____

18. What is the postal Zip Code of your primary residence? _____

19. Overall, how satisfied are you with your recreation experience during this visit? *(check ✓ one)*

☐	☐	☐	☐	☐
Very Dissatisfied	Dissatisfied	Neither Dissatisfied nor Satisfied	Satisfied	Very Satisfied

20. If you could change one thing at Sand Harbor, what would it be? _____

_____

_____

LAKE TAHOE NEVADA STATE PARK RECREATION SURVEY

Nevada State Parks is conducting a recreation survey of visitors to Lake Tahoe Nevada State Park, of which Memorial Point is a part. This survey relates to your recreational use of Memorial Point.

Thank you in advance for your participation!

1. Is this your first visit to Memorial Point? ☐ Yes ☐ No

If ***no***, about how many times have you visited in the past 12 months? _____

2. How many people are in your group today? _____

3. How many vehicles did your group use to come to Memorial Point? _____

4. About how much time will you spend at Memorial Point today?

_____ minutes (if I hour or more) _____ hours

5. Did you use the trails or go to the shoreline during this visit to Memorial Point? ☐ Yes ☐ No

6. Are the current recreation facilities (e.g., restrooms, trails, etc.) provided at Memorial Point adequate to meet your needs? ☐ Yes ☐ No

If *no*, please explain. _____

_____

7. Please indicate the degree of concern you may feel about the parking issues below.

	Not a Problem	**Slight Problem**	**Moderate Problem**	**Serious Problem**	**Very Serious Problem**
Getting a parking space	☐	☐	☐	☐	☐
Unsafe parking conditions along SR-28	☐	☐	☐	☐	☐

8. What is the postal Zip Code of your primary residence? _____

9. Overall, how satisfied are you with your recreation experience during this visit? *(check ✓ one)*

☐	☐	☐	☐	☐
Very Dissatisfied	Dissatisfied	Neither Dissatisfied nor Satisfied	Satisfied	Very Satisfied

10. Have you visited or do you intend to visit Sand Harbor today? ☐ Yes ☐ No

Thanks again for your participation in this important survey effort!

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ENCUESTA RECREATIVA: PARQUE ESTATAL LAKE TAHOE NEVADA

El Sistema de Parques Estatales de Nevada está tomando una encuesta de los visitantes de la unidad Sand Harbor del Parque Estatal Lake Tahoe Nevada. Esta encuesta tiene que ver con su uso de la unidad Sand Harbor.

Gracias por su participación!

1. Es esta su primera visita a Sand Harbor? ☐ Sí ☐ No

   Si *no es su primera visita*, aproximadamente cuantas veces a visitado en los ultimos 12 meses? _____

2. En esta visita, como entró a Sand Harbor?

   ☐ Vehículo Personal ☐ Autobús o Autovan ☐ Bicicleta ☐ Caminando ☐ Alguien lo trajo

3. Cuántas personas estan en su grupo hoy? _____

4. Cuántos vehículos usó su grupo para venir a Sand Harbor? _____

5. Aproximadamente cuánto tiempo permanecerán en Sand Harbor hoy? _____ horas

6. En cuáles de las siguientes actividades participarán Usted (o miembros de su grupo) durante su visita a Sand Harbor? *(marque ✓ para señalar las actividades)*

   ☐ (1) Natación ☐ (6) Uso de barco motorizado ☐ (11) Buceo
   ☐ (2) Visita turística ☐ (7) Ir en Kayak ☐ (12) Uso de barco personal
   ☐ (3) Ir de picnic ☐ (8) Pescar (en barco) ☐ (13) Evento Especial
   ☐ (4) Baño de sol ☐ (9) Pescar (desde la orilla) ☐ (14) Otro (*por favor describa*) _____
   ☐ (5) Descanso ☐ (10) Navegación en barco _____

7. De las actividades que marcó arriba, cuáles son las tres (3) actividades primarias en las cuales participarán durante su visita a Sand Harbor hoy? *(escriba el numero correspondiente)*

   Actividad Primaria _____ Actividad Secundaria _____ Actividad Tercera _____

8. Son adecuados los servicios y las instalaciones existentes (por ejemplo, baños, sitios de picnic, rampas para lanzar barcos, centros para visitantes, etc.) proporcionados en Sand Harbor? ☐ Sí ☐ No

   Si no son adecuados, por favor explique. _____
   _____

9. Porqué decidió visitar Sand Harbor? *(marque ✓ para señalar sus razones)*

   ☐ Cercaniá ☐ Buen Buceo ☐ Presencia de Salvavidas/Guardabosques
   ☐ Calidad del Agua ☐ Buen Paseo en Barco ☐ El Paisaje/Medio Ambiente Natural
   ☐ Calidad de las Playas ☐ Servicios Proporcionados ☐ Otro (*por favor describa*) _____
   _____

10. Qué tan lleno de gente está el área que usted está usando ahora? *(circule un numero)*

    1----------2----------3----------4----------5----------6----------7----------8----------9

    No hay gente — Hay poca gente — Hay un numero moderado de gente — Hay mucha gente

11. Cómo compararía la cantidad de multitud en el parque hoy con la cantidad de multitud que usted esperaba?

    ☐ Menos atestado ☐ Mas o menos lo que esperaba ☐ Mas atestado ☐ No sabia que esperar

12. Por lo general, el nivel de atestamiento en Sand Harbor…*(marque ✓ para señalar una respuesta)*

    ☐ Contribuye mucho a mi diversión ☐ Afecta negativamente un poco mi diversión
    ☐ Contribuye un poco a mi diversión ☐ Afecta negativamente mucho mi diversión
    ☐ No afecta mi diversión

13. Ha modificado sus visitas a Sand Harbor para evitar el atestamiento? ☐ Sí ☐ No

Si su respuesta es sí, a veces …*(marque ✓ para señalar todas sus respuestas)*

☐ Visito más temprano o más tarde en el año
☐ Busco lugares más silenciosos en Sand Harbor
☐ Visito durante la semana, no el fin de semana
☐ No visito en días de fiesta
☐ Llego más temprano o más tarde en el dia
☐ Voy a otros sitios en el área de Lake Tahoe

14. Alguna vez no a podido entrar al parque por falta de lugares para estacionar? ☐ Sí ☐ No

Si usted *sí a tenido esa experiencia;* cuántas veces a ocurido eso durante una temporada? _____

Cuántas veces se ha estacionado en la orilla de la carretera por esa razón? _____

15. Lo que sigue es una lista de problemas potenciales en Sand Harbor. Para cada uno, por favor indique el nivel de preocupación que usted siente relacionado a estos temas.

	No es Problema	Problema Pequeño	Problema	Problema Serio	Problema Muy Serio
Entrar al parque o hallar estacionamiento	☐	☐	☐	☐	☐
Condiciones peligrosas al estacionarse al lado de la Carretera 28	☐	☐	☐	☐	☐
Encontrar un sitio para picnic	☐	☐	☐	☐	☐
Encontrar un sitio en la playa	☐	☐	☐	☐	☐
Poder lanzar un barco	☐	☐	☐	☐	☐
Conflictos con otros visitantes en la plataforma de lanzamiento	☐	☐	☐	☐	☐
Conflictos entre los que usan barcos y otros visitantes	☐	☐	☐	☐	☐
Comportamiento prejudicial de parte de otros visitantes	☐	☐	☐	☐	☐

16. Por favor describa problemas (si hay algunos) que usted ha tenido con otros visitantes durante esta o pasadas visitas a Sand Harbor. _____

_____

17. En esta ocasión, cual fue su motivo para visitar Sand Harbor? *(marque ✓ todas sus respuestas)*

☐ Relajamiento ☐ Ejercicio ☐ Disfrutar de la naturaleza ☐ Estar cerca del agua
☐ Convivir con familia ☐ Celebración ☐ Interacción social
☐ Otra razón *(por favor describa)* _____

18. Cuál es el código postal de su hogar primario? _____

19. Por lo general, qué tan satisfecho está usted con su experiencia recreativa durante esta visita? *(marque ✓ para señalar una respuesta)*

☐	☐	☐	☐	☐
Muy Insatisfecho	Insatisfecho	Ni Insatisfecho ni Satisfecho	Satisfecho	Muy Satisfecho

20. Si usted pudiera cambiar una cosa en Sand Harbor, que sería? _____

_____

Gracias de nuevo por su participación en esta encuesta!

ENCUESTA RECREATIVA: PARQUE ESTATAL LAKE TAHOE NEVADA

El Sistema de Parques Estatales de Nevada está tomando una encuesta de los visitantes a la unidad Memorial Point del Parque Estatal Lake Tahoe Nevada. Esta encuesta tiene que ver con su uso de la unidad Memorial Park.

Gracias por su participación!

1. Es esta su primera visita a Memorial Point? ☐ Sí ☐ No

   Si no es su primera visita, aproximadamente cuantas veces a visitado en los ultimos 12 meses? _____

2. Cuántas personas están en su grupo hoy? _____

3. Cuántos vehículos usó su grupo para venir a Memorial Point? _____

4. Aproximadamente cuánto tiempo permanecerán en Memorial Point hoy?

   _____ minutos (si más de una hora) _____ horas

5. Usó las veredas de campo o fue a la orilla del agua durante esta visita a Memorial Point? ☐ Sí ☐ No

6. Son adecuados los servicios y las instalaciones existentes (por ejemplo, baños, veredas de campo, etc.) proporcionados en Memorial Point? ☐ Sí ☐ No

   Si no son adecuados, por favor explique.

   _____

   _____

7. Por favor indique el nivel de preocupación que usted siente relacionado a los siguientes temas.

	No es Problema	Problema Pequeño	Problema	Problema Serio	Problema Muy Serio
Hallar estaciónamiento	☐	☐	☐	☐	☐
Condiciones peligrosas al estaciónarse al lado de la Carretera 28	☐	☐	☐	☐	☐

8. Cuál es el código postal de su hogar primario? _____

9. Por lo general, qué tan satisfecho está usted con su experiencia recreativa durante esta visita? (marque ✓ para señalar una respuesta)

☐	☐	☐	☐	☐
Muy Insatisfecho	Insatisfecho	Ni Insatisfecho ni Satisfecho	Satisfecho	Muy Satisfecho

10. Ha visitado o piensa visitar Sand Harbor hoy? ☐ Sí ☐ No

Gracias de nuevo por su participación en esta encuesta!

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LTNSP Employee Survey Form

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LAKE TAHOE NEVADA STATE PARK EMPLOYEE SURVEY

Please respond to each question based on your level of experience at Sand Harbor. Include Memorial Point, but not Hidden Beach. If you need additional space for any question, please use the back side of the sheet and number accordingly.

1. What category of employee are you?

____ Permanent Full Time; ____ Seasonal Temporary; ____ Administration; ____ Previous Employee

2. What do you consider the most serious issue affecting use at Sand Harbor?

_____

_____

_____

_____

3. What other issues do you feel affect use at Sand Harbor? In priority order.

_____

_____

_____

_____

4. Do you feel the existing facilities are adequate to serve the existing level of visitation at Sand Harbor?

Yes ____ ; No _____ ; If no, what would you change? _____

_____

_____

_____

_____

5. How would you rate the quality of facilities at Sand Harbor? (Circle One)

Poor (1) (2) (3) (4) (5) (6) (7) Excellent

6. How would you rate the level of service provided to visitors at Sand Harbor? (Circle One)

Poor (1) (2) (3) (4) (5) (6) (7) Excellent

7. Do you feel the Sand Harbor areas could accommodate more visitation? (exclude parking as a limitation)

Yes ____ ; No _____ ; If Yes, Where or When? _____

_____

_____

_____

_____

8. Do you feel visitor's expectations are being met? Yes _____ ; No _____ ; if No, explain:

_____
_____
_____
_____

9. What trends do you see that could affect use at Sand Harbor? _____

_____
_____
_____
_____

10. What new services or facilities do you feel are needed at Sand Harbor? _____

_____
_____
_____
_____

11. Do you feel use at any of the following areas exceeds social capacity (crowding, conflict) on high use weekends and holidays? Check all that apply.

Main Beach _____ ; Divers Cove _____ ; Boat Beach _____ ; Picnic Area _____

Memorial Point _____ ; Explain: _____

_____
_____
_____

12. Do you feel use at any of the following areas exceeds facility capacity (boat ramp, picnic sites, restrooms, showers) on high use weekends and holidays? Check all that apply.

Main Beach _____ ; Divers Cove _____ ; Boat Beach _____ ; Picnic Area _____

Memorial Point _____ ; Explain: _____

_____
_____
_____

13. Do you feel use at any of the following areas exceeds environmental capacity (trampling, vegetative damage) on high use weekends and holidays? Check all that apply.

Main Beach _____ ; Divers Cove _____ ; Boat Beach _____ ; Picnic Area _____

Memorial Point _____ ; Explain: _____

_____
_____
_____
_____

14. Do you feel there are sufficient personnel to provide quality service and safety for visitors?

Yes _____ ; No _____ ; if No, Explain: _____

_____

_____

_____

15. Do you feel concessions should be expanded at the park? Yes _____ ; No _____ ; if Yes, What types?

If No, Why? _____

_____

_____

_____

_____

16. Other Comments

_____

_____

_____

_____

_____

_____

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Appendix C
Ecological Impact Indicators Form

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ECOLOGICAL IMPACT INDICATORS FORM

Site Name: **Assessment Area:** **Date:**_____

Researcher:_____ **Photos:**_____

Lake elevation (ft):_____

INDICATORS	NOTES		
General Site Description	***Total Acreage of Assessment Area***:	(From GIS)	
	***Primary Rec. Uses*:**		
	Infrastructure: (Check if present) (Indicate quantity in space provided)	❑ picnic tables _____ ❑ fire ring/pits _____ ❑ boat launch _____ ❑ walkways (paved)_____ ❑ walkways (dirt)_____ ❑ restrooms _____ ❑ garbage cans _____ ❑ piers _____ ❑ Other ( ) _____	
	Additional Notes:		
Vegetation	***Vegetation types present*** ❑ Conifer forest	***Percent Cover*** ❑ N/A ❑ 0-25% ❑ 26-50% ❑ 51-75% ❑ 76-100%	***Dominant Species*** *(over- and under-story)* Evidence of pine tree recruitment (list species): ❑ seedlings ❑ saplings ❑ mid-story
	❑ Beach/dune	❑ N/A ❑ 0-25% ❑ 26-50% ❑ 51-75% ❑ 76-100%	
	❑ Meadow, wetland, or riparian	❑ N/A ❑ 0-25% ❑ 26-50% ❑ 51-75% ❑ 76-100%	
	❑ Chaparral	❑ N/A ❑ 0-25% ❑ 26-50% ❑ 51-75% ❑ 76-100%	

Site Name: Assessment Area: Researcher: Date:

Habitat Features (indicate quantity, if feasible)	❑ large trees (> 30”dbh) _____	❑ snags _____	❑ dead/broken top trees _____	❑ CWD _____	❑ Other _____

Ground Cover	***Cover Type***	***Percent Cover (%)***			
	Bare ground	❑ 0-25% Estimate:	❑ 26-50% 1_____	❑ 51-75% 2_____	❑ 76-100% 3_____
[In forest-dominated areas: based on a visual estimate from 3 representative locations marked on a map; in beach-dominated areas: based on linear extent of the shoreline with vegetation between water’s edge and paved walkways at the top of beach]	Vegetation (shrub/herb)	❑ 0-25% Estimate:	❑ 26-50% 1_____	❑ 51-75% 2_____	❑ 76-100% 3_____
	Rock	❑ 0-25% Estimate:	❑ 26-50% 1_____	❑ 51-75% 2_____	❑ 76-100% 3_____
	Hardened Surfaces (from GIS)	❑ 0-25%	❑ 26-50%	❑ 51-75%	❑ 76-100%
		% cover from GIS:			
	Additional Notes:	(include info on soil compaction)			

Erosion Characteristics	***Types Observed***	❑ none	❑ Channeling Soil Movement	❑ Down-cutting	❑ Exposed tree/shrub roots
	Locations of Erosion				
	Extent of Erosion	[Note: record estimated area of erosion in forested areas or % of shoreline with erosion in beach/dune areas]			
	Severity of Erosion	[e.g., depth of down-cutting/exposed roots, distance of soil movement, etc.]			

Tree Health	***Exposed roots*** *(# trees)*	❑ none	❑ 1-3	❑ 4-6	❑ 7-10	❑ >10
		Ave depth of exposure *(inches):*_____				
	Gashes, or other damage *(# trees)*	❑ none	❑ 1-3	❑ 4-6	❑ 7-10	❑ >10
	Mistletoe *(# infected trees)*	❑ none	❑ 1-3	❑ 4-6	❑ 7-10	❑ >10
		Species infected:				

Key Ecological Features (e.g., sentinel trees, tyc habitat)	***Features:***	***Location/Notes on condition:***

Site Name: Assessment Area: Researcher: Date:

Walkways (paved/boardwalk)	***Average width***	❑ <12” ❑ 12-24” ❑ >24”
	Total length	Walkway Length (ft)*:* _____*(from GIS data)*
	Erosion observed along paths	Length of erosion (ft): _____ Average depth (in): _____ Locations:_____
	Comments	(include resources potentially impacted by walkways or assoc. erosion)
Walkways (user created-dirt)	***Average width***	❑ <12” ❑ 12-24” ❑ >24”
	Total Length	Walkway Length (ft)*:* _____*(map with GPS)*
	Erosion along paths	Length of erosion (ft): _____ Average depth (in): _____ Locations:_____
	Comments	(include resources potentially impacted by walkways or assoc. erosion)
Wildlife Observations and Sign (see note below)	(Note special-status/special-interest species and potential nuisance species)	
Osprey nest sites:	(distance to closest known nest site, potential for nest sites on site)	
Plant Detections	(Note special-status/special-interest species or habitat and invasive species)	
Other Notes:		

Note: Recent surveys have detected northern goshawks and bald eagles in the Sand Harbor and/or Memorial Point areas. Several active and inactive osprey nests have been documented at Memorial Point and short distance south of Sand Harbor. Only one active bald eagle nest is known in the Lake Tahoe basin (at Emerald Bay) (ref: LTBMU 2009 Wildlife Program Annual Report).

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Appendix D
Facility Inventory and Condition Assessment Form

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FACILITY INVENTORY AND CONDITION ASSESSMENT FORM

Project Name: **Tahoe S. P. – Sand Harbor** **Site Name:** _____ **Date:**_____

Researcher:_____ **Photos:**_____

INDICATORS	NOTES							
General Site Description	❑ Picnic area ❑ Group use area ❑ Boat launch	❑ Desig. swim beach ❑ Other beach ❑ Nature trail	Other site elements:					
Developed Features			CONDITION					
		Number	Good	Needs Maint.	Needs Repair	Needs Replace	ADA-Access	# ADA
1	❑ signs	_____	❑	❑	❑	❑	❑	_____
2	❑ picnic tables	_____	❑	❑	❑	❑	❑	_____
3	❑ fire rings	_____	❑	❑	❑	❑	❑	_____
4	❑ grills	_____	❑	❑	❑	❑	❑	_____
5	❑ water fountain/ spigot	_____	❑	❑	❑	❑	❑	_____
6	❑ trash receptacles	_____	❑	❑	❑	❑	❑	_____
7	❑ trash dumpsters	_____	❑	❑	❑	❑	❑	_____
8	❑ restroom building	_____	❑	❑	❑	❑	❑	_____
9	❑ flush toilets	_____	❑	❑	❑	❑	❑	_____
10	❑ showers	_____	❑	❑	❑	❑	❑	_____
11	❑ pay station (s-s)	_____	❑	❑	❑	❑	❑	_____
12	❑ pay station (staff)	_____	❑	❑	❑	❑	❑	_____
13	❑ stage	_____	❑	❑	❑	❑	❑	_____
14	❑ amphitheater	_____	❑	❑	❑	❑	❑	_____
15	❑ group ramada	_____	❑	❑	❑	❑	❑	_____
16	❑ paved walkways	_____	❑	❑	❑	❑	❑	_____
17	❑ interpretive displays	_____	❑	❑	❑	❑	❑	_____
18	❑ irrigated landscaped areas	_____	❑	❑	❑	❑	❑	_____
19	❑ swim area markers	_____	❑	❑	❑	❑	❑	_____
20	❑ beach safety sign or apparatus	_____	❑	❑	❑	❑	❑	_____
21	❑ boat ramp	_____	❑	❑	❑	❑	❑	_____
22	❑ courtesy dock	_____	❑	❑	❑	❑	❑	_____
Other Site Notes (continue on additional page if necessary)								

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Appendix E
Visitor Survey Response Frequencies and Means/Medians

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Sand Harbor Visitor Survey

May 31 – September 6, 2010

(n = 647)

Q 1. Is this your first visit to Sand Harbor?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	94	14.5	14.6	14.6
	no	552	85.3	85.4	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

***If no,* about how many times have you visited in the past 12 months?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	34	5.3	6.7	6.7
	1	86	13.3	17.1	23.8
	2	82	12.7	16.3	40.1
	3	73	11.3	14.5	54.6
	4	44	6.8	8.7	63.3
	5	32	4.9	6.3	69.6
	6	40	6.2	7.9	77.6
	7	10	1.5	2.0	79.6
	8	13	2.0	2.6	82.1
	9	3	.5	.6	82.7
	10	28	4.3	5.6	88.3
	11	1	.2	.2	88.5
	12	14	2.2	2.8	91.3
	13	1	.2	.2	91.5
	14	3	.5	.6	92.1
	15	10	1.5	2.0	94.0
	20	18	2.8	3.6	97.6
	24	1	.2	.2	97.8
	25	4	.6	.8	98.6
	30	3	.5	.6	99.2
	35	1	.2	.2	99.4
	40	2	.3	.4	99.8
	60	1	.2	.2	100.0
	Total	504	77.9	100.0	
Missing	skip (first time visitor)	93	14.4		
	No response	50	7.7		
	Total	143	22.1		
Total		**647**	**100.0**		

		Number of visits past 12 months
N	Valid	504
	Missing	143
	Mean	5.28
	Median	3.00

Q 2. On this visit, how did you enter Sand Harbor?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Personal vehicle	618	95.5	95.8	95.8
	Bus or Van	8	1.2	1.2	97.1
	Bicycle *	2	.3	.3	97.4
	Walk-in	14	2.2	2.2	99.5
	Drop-off	3	.5	.5	100.0
	Total	645	99.7	100.0	
Missing	No response	2	.3		
Total		647	100.0		

* Both respondents who used a bicycle to enter the park used a vehicle to reach the park area.

Q 3. How many people are in your group today?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	6	.9	.9	.9
	2	90	13.9	14.0	14.9
	3	56	8.7	8.7	23.6
	4	88	13.6	13.7	37.3
	5	69	10.7	10.7	48.1
	6	59	9.1	9.2	57.2
	7	47	7.3	7.3	64.5
	8	46	7.1	7.2	71.7
	9	26	4.0	4.0	75.7
	10	32	4.9	5.0	80.7
	11	12	1.9	1.9	82.6
	12	16	2.5	2.5	85.1
	13	9	1.4	1.4	86.5
	14	12	1.9	1.9	88.3
	15	15	2.3	2.3	90.7
	16	5	.8	.8	91.4
	17	5	.8	.8	92.2
	18	5	.8	.8	93.0
	19	3	.5	.5	93.5
	20	18	2.8	2.8	96.3
	21	2	.3	.3	96.6
	22	1	.2	.2	96.7
	25	4	.6	.6	97.4
	27	1	.2	.2	97.5
	30	7	1.1	1.1	98.6
	40	4	.6	.6	99.2
	45	1	.2	.2	99.4
	50	2	.3	.3	99.7
	100	2	.3	.3	100.0
	Total	643	99.4	100.0	
Missing	No response	4	.6		
Total		647	100.0		

		Group Size
N	Valid	643
	Missing	4
	Mean	7.88
	Median	6.00

Q 4. How many vehicles did your group use to come to Sand Harbor?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0*	1	.2	.2	.2
	1	342	52.9	53.0	53.2
	2	160	24.7	24.8	78.0
	3	71	11.0	11.0	89.0
	4	34	5.3	5.3	94.3
	5	14	2.2	2.2	96.4
	6	8	1.2	1.2	97.7
	7	4	.6	.6	98.3
	8	4	.6	.6	98.9
	10	3	.5	.5	99.4
	14	1	.2	.2	99.5
	15	1	.2	.2	99.7
	25	1	.2	.2	99.8
	30	1	.2	.2	100.0
	Total	645	99.7	100.0	
Missing	No response	2	.3		
Total		647	100.0		

* Respondent indicated that they came to Sand Harbor by boat.

		Number of vehicles
N	Valid	645
	Missing	2
	Mean	2.02
	Median	1.00

Q 5. About how much time will you spend at Sand Harbor today (hours)?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0.5	1	.2	.2	.2
	1	3	.5	.5	.6
	1.5	3	.5	.5	1.1
	2	16	2.5	2.5	3.6
	2.5	4	.6	.6	4.2
	3	58	9.0	9.0	13.2
	3.2	1	.2	.2	13.4
	3.5	7	1.1	1.1	14.4
	4	118	18.2	18.3	32.8
	4.5	6	.9	.9	33.7
	5	107	16.5	16.6	50.3
	5.5	6	.9	.9	51.2
	6	133	20.6	20.7	71.9
	6.5	4	.6	.6	72.5
	7	55	8.5	8.5	81.1
	7.5	3	.5	.5	81.5
	8	75	11.6	11.6	93.2
	8.5	1	.2	.2	93.3
	9	9	1.4	1.4	94.7
	9.5	2	.3	.3	95.0
	10	22	3.4	3.4	98.4
	11	1	.2	.2	98.6
	12	8	1.2	1.2	99.8
	16	1	.2	.2	100.0
	Total	644	99.5	100.0	
Missing	No response	3	.5		
Total		647	100.0		

		Time plan to spend in park (hours)
N	Valid	644
	Missing	3
	Mean	5.59
	Median	5.00

Q 6. Which of the following activities are you (and/or members of your group) participating in during this visit to Sand Harbor?

Swimming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	562	86.9	87.0	87.0
	no	84	13.0	13.0	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

Sightseeing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	258	39.9	39.9	39.9
	no	388	60.0	60.1	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

Picnicking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	479	74.0	74.1	74.1
	no	167	25.8	25.9	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

Sunbathing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	504	77.9	78.0	78.0
	no	142	21.9	22.0	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

Resting/Relaxing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	593	91.7	91.8	91.8
	no	53	8.2	8.2	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

Power Boating

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	54	8.3	8.4	8.4
	no	592	91.5	91.6	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

Kayaking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	86	13.3	13.3	13.3
	no	560	86.6	86.7	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

Fishing (by boat)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	6	.9	.9	.9
	no	640	98.9	99.1	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

Fishing (from shore)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	19	2.9	2.9	2.9
	no	627	96.9	97.1	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

Sailing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	7	1.1	1.1	1.1
	no	639	98.8	98.9	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

SCUBA Diving

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	10	1.5	1.5	1.5
	no	636	98.3	98.5	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

Personal Watercraft (PWC) Use

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	44	6.8	6.8	6.8
	No	602	93.0	93.2	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

Special Event

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	19	2.9	2.9	2.9
	No	627	96.9	97.1	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

Other activity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	103	15.9	15.9	15.9
	No	543	83.9	84.1	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

"Other" activities described (summarized responses):

Activity	Frequency	Percent*
Jumping off/climbing on rocks	15	2.3%
Special Event/Holiday	12	1.9%
Catching crawdads	11	1.7%
Walking/jogging/hiking/trail use	8	1.2%
Playing in sand	7	1.1%
Snorkeling	7	1.1%
Time with family/friends, Socializing	6	0.9%
Paddle boarding	6	0.9%
Rafting	5	0.8%
Food (restaurant/snacks)	4	0.6%
Art/photography	3	0.5%
Sports/games/swim training	3	0.5%
People watching	2	0.3%
Reading	2	0.3%
Invalid/unusable response	10	1.5%
No response	2	0.3%
Total responses	103	

* Percentages based on total survey sample (n = 647).

Note: Verbatim responses are provided at the end of this appendix.

Q 7. Of the activities you checked above, what are the top three that you're participating in during today's visit to Sand Harbor?

Primary Activity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Swimming	144	22.3	23.4	23.4
	Sightseeing	19	2.9	3.1	26.5
	Picnicking	68	10.5	11.1	37.6
	Sunbathing	69	10.7	11.2	48.8
	Rest/Relaxing	216	33.4	35.1	83.9
	Power boating	23	3.6	3.7	87.6
	Kayaking	27	4.2	4.4	92.0
	Fishing by boat	2	.3	.3	92.4
	Sailing	1	.2	.2	92.5
	SCUBA dive	3	.5	.5	93.0
	PWC Use	15	2.3	2.4	95.4
	Special event	6	.9	1.0	96.4
	Other	22	3.4	3.6	100.0
	Total	615	95.1	100.0	
Missing	No response	32	4.9		
Total		647	100.0		

Second Activity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Swimming	135	20.9	22.6	22.6
	Sightseeing	29	4.5	4.9	27.5
	Picnicking	132	20.4	22.1	49.6
	Sunbathing	128	19.8	21.4	71.0
	Resting/Relaxing	116	17.9	19.4	90.5
	Power boating	7	1.1	1.2	91.6
	Kayaking	17	2.6	2.8	94.5
	SCUBA diving	2	.3	.3	94.8
	PWC Use	7	1.1	1.2	96.0
	Special event	3	.5	.5	96.5
	Other	21	3.2	3.5	100.0
	Total	597	92.3	100.0	
Missing	No response	50	7.7		
Total		647	100.0		

Third Activity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Swimming	156	24.1	27.3	27.3
	Sightseeing	38	5.9	6.7	34.0
	Picnicking	104	16.1	18.2	52.2
	Sunbathing	90	13.9	15.8	68.0
	Rest/Relaxing	121	18.7	21.2	89.1
	Power boating	9	1.4	1.6	90.7
	Kayaking	15	2.3	2.6	93.3
	Fishing by boat	1	.2	.2	93.5
	Fishing from shore	3	.5	.5	94.0
	Sailing	1	.2	.2	94.2
	PWC Use	6	.9	1.1	95.3
	Other	27	4.2	4.7	100.0
	Total	571	88.3	100.0	
Missing	No response	76	11.7		
Total		647	100.0		

Q 8. Are the current facilities (e.g., restrooms, picnic sites, boat ramp, visitor center, concessions, etc.) provided at Sand Harbor adequate to meet your needs? (Yes/No)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	521	80.5	80.9	80.9
	no	123	19.0	19.1	100.0
	Total	644	99.5	100.0	
Missing	No response	3	.5		
Total		647	100.0		

If no, please explain:

Summarized Responses	Frequency	% of All Survey Respondents (n = 647)	% of All Responses to Question (n = 122)
Restrooms (need more, need maintenance, need improvement, etc.)	48	7.4%	39.3%
Parking (need more, need ADA parking spaces, need more boat trailer parking, etc.)	18	2.8%	14.8%
Concessions (need better food, too expensive, service too slow, etc.)	16	2.5%	13.1%
Positive comments (great place, beautiful, no complaints, etc.), although checked "No" in response to facility adequacy question	12	1.9%	9.8%
Boat ramp (needs improvement, needs to function at lower water levels, etc.)	8	1.2%	6.6%
Site amenities (more picnic tables, more grills, more trash receptacles, etc.)	5	0.8%	4.1%
Drinking fountains (need more, need to be fixed, etc.)	4	0.6%	3.3%
Too expensive (entrance fee)	2	0.3%	1.6%
Other facility comments	9	1.4%	7.4%
Total valid responses	**122**		
No response (no facility inadequacy described although checked "No" in response to facility adequacy question)	3		

Note: Two of the 123 respondents provided two responses. Verbatim responses are provided at the end of this appendix.

Q 9. On this visit, why did you choose to come to Sand Harbor? (check all that apply)

Proximity/Closeness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	307	47.4	47.5	47.5
	no	339	52.4	52.5	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

Water Quality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	409	63.2	63.3	63.3
	no	237	36.6	36.7	100.0
	Total	646	99.8	100.0	
Missing	No response	1	.2		
Total		647	100.0		

Quality of Beaches

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	505	78.1	78.1	78.1
	no	141	21.8	21.8	99.8
	No response	1	.2	.2	100.0
	Total	647	100.0	100.0	

Good Diving

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	63	9.7	9.7	9.7
	no	583	90.1	90.1	99.8
	No response	1	.2	.2	100.0
	Total	647	100.0	100.0	

Good Boating

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	79	12.2	12.2	12.2
	no	567	87.6	87.6	99.8
	No response	1	.2	.2	100.0
	Total	647	100.0	100.0	

Facilities Provided

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	261	40.3	40.3	40.3
	no	385	59.5	59.5	99.8
	No response	1	.2	.2	100.0
	Total	647	100.0	100.0	

Presence of Lifeguards/Park Rangers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	90	13.9	13.9	13.9
	no	556	85.9	85.9	99.8
	No response	1	.2	.2	100.0
	Total	647	100.0	100.0	

Scenery/Natural Environment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	400	61.8	61.8	61.8
	no	246	38.0	38.0	99.8
	No response	1	.2	.2	100.0
	Total	647	100.0	100.0	

Other reasons?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	95	14.7	14.7	14.7
	no	551	85.2	85.2	99.8
	No response	1	.2	.2	100.0
	Total	647	100.0	100.0	

"Other" reasons described (summarized responses):

Reason	Frequency	Percent*
Family/friends	15	2.3%
Tradition	11	1.7%
Good sand/nice (best) beach	8	1.2%
Vacation/visit new place	7	1.1%
Favorite area to visit	7	1.1%
Beauty/best area on lake	6	0.9%
Activities	6	0.9%
Special Event/Shakespeare	5	0.8%
Reasonable fee	4	0.6%
Boat launch	3	0.5%
ADA access	3	0.5%
Other	15	2.3%
TOTAL	**90**	

* Percentages based on total survey sample (n = 647).
Note: Verbatim responses are provided at the end of this appendix.

Q 10. How Crowded do you feel at the area you are currently using? (circle one number)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	(1) Not at all crowded	121	18.7	18.8	18.8
	1.5	2	.3	.3	19.1
	2	61	9.4	9.5	28.6
	3	70	10.8	10.9	39.5
	3.5	5	.8	.8	40.3
	4	71	11.0	11.0	51.3
	5	61	9.4	9.5	60.8
	5.5	1	.2	.2	61.0
	6	117	18.1	18.2	79.2
	6.5	3	.5	.5	79.6
	7	73	11.3	11.4	91.0
	7.5	3	.5	.5	91.4
	8	28	4.3	4.4	95.8
	8.5	2	.3	.3	96.1
	(9) Extremely crowded	25	3.9	3.9	100.0
	Total	643	99.4	100.0	
Missing	No response	4	.6		
Total		647	100.0		

		Perception of Crowdedness (rating)
N	Valid	643
	Missing	4
	Mean	4.34
	Median	4.00

Q 11. How would you compare the level of crowding today with what you expected?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less crowded	177	27.4	27.5	27.5
	About what I expected	344	53.2	53.5	81.0
	More crowded	86	13.3	13.4	94.4
	Didn't know what to expect	36	5.6	5.6	100.0
	Total	643	99.4	100.0	
Missing	No response	4	.6		
Total		647	100.0		

Q 12. In general, the number of people at Sand Harbor…(check one)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Adds a lot	58	9.0	9.0	9.0
	Adds a little	81	12.5	12.6	21.6
	Doesn't really affect	331	51.2	51.5	73.1
	Detracts a little	148	22.9	23.0	96.1
	Detracts a lot	25	3.9	3.9	100.0
	Total	643	99.4	100.0	
Missing	No response	4	.6		
Total		647	100.0		

Q 13. Have you ever changed your visits to Sand Harbor to avoid crowding (Y/N)?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	340	52.6	53.3	53.3
	No	298	46.1	46.7	100.0
	Total	638	98.6	100.0	
Missing	No response	9	1.4		
Total		647	100.0		

***If yes,* I sometimes….(check all that apply)**

Visit earlier or later in the year

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	81	12.5	24.0	24.0
	No	257	39.7	76.0	100.0
	Total	338	52.2	100.0	
Missing	skip (have not changed visits)	298	46.1		
	No response	11	1.7		
Total		647	100.0		

Visit on weekdays instead of weekends

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	174	26.9	51.5	51.5
	No	164	25.3	48.5	100.0
	Total	338	52.2	100.0	
Missing	skip (have not changed visits)	298	46.1		
	No response	11	1.7		
	Total	309	47.8		
Total		647	100.0		

Visit earlier or later in the day

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	211	32.6	62.4	62.4
	No	127	19.6	37.6	100.0
	Total	338	52.2	100.0	
Missing	skip (have not changed visits)	298	46.1		
	No response	11	1.7		
	Total	309	47.8		
Total		647	100.0		

Seek our quiet places at Sand Harbor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	77	11.9	22.8	22.8
	No	261	40.3	77.2	100.0
	Total	338	52.2	100.0	
Missing	skip (have not changed visits)	298	46.1		
	No response	11	1.7		
	Total	309	47.8		
Total		647	100.0		

Avoid holidays

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	154	23.8	45.6	45.6
	No	184	28.4	54.4	100.0
	Total	338	52.2	100.0	
Missing	skip (have not changed visits)	298	46.1		
	No response	11	1.7		
	Total	309	47.8		
Total		647	100.0		

Go other places in the Tahoe region

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	110	17.0	32.5	32.5
	No	228	35.2	67.5	100.0
	Total	338	52.2	100.0	
Missing	skip (have not changed visits)	298	46.1		
	No response	11	1.7		
	Total	309	47.8		
Total		647	100.0		

Q 14. Have you ever not gotten into the park due to lack of available parking? (Yes/No)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	316	48.8	51.3	51.3
	No	300	46.4	48.7	100.0
	Total	616	95.2	100.0	
Missing	No response	31	4.8		
Total		647	100.0		

***If yes*, How many times in a season?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	2	.3	.7	.7
	1	139	21.5	47.9	48.6
	2	87	13.4	30.0	78.6
	3	29	4.5	10.0	88.6
	4	15	2.3	5.2	93.8
	5	9	1.4	3.1	96.9
	6	2	.3	.7	97.6
	8	1	.2	.3	97.9
	9	1	.2	.3	98.3
	10	3	.5	1.0	99.3
	12	1	.2	.3	99.7
	15	1	.2	.3	100.0
	Total	290	44.8	100.0	
Missing	skip (never refused entry)	300	46.4		
	No response	57	8.8		
	Total	357	55.2		
Total		647	100.0		

		No. of times not gotten into park
N	Valid	290
	Missing	357
	Mean	2.04
	Median	2.00

How many times have you parked along the highway due to this problem?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	108	16.7	44.4	44.4
	1	55	8.5	22.6	67.1
	2	51	7.9	21.0	88.1
	3	10	1.5	4.1	92.2
	4	9	1.4	3.7	95.9
	5	6	.9	2.5	98.4
	6	2	.3	.8	99.2
	7	1	.2	.4	99.6
	10	1	.2	.4	100.0
	Total	243	37.6	100.0	
Missing	skip (never refused entry)	300	46.4		
	No response	101	15.6		
	System	3	.5		
	Total	404	62.4		
Total		647	100.0		

		No. of times parked on SR 28
N	Valid	243
	Missing	404
	Mean	1.16
	Median	1.00

Q 15. Below is a list of potential issues at Sand Harbor. For each, please indicate the degree of concern you may feel about these issues.

Getting into park or a parking space

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not a problem	211	32.6	32.9	32.9
	Slight problem	140	21.6	21.8	54.8
	Moderate problem	152	23.5	23.7	78.5
	Serious problem	89	13.8	13.9	92.4
	Very serious problem	49	7.6	7.6	100.0
	Total	641	99.1	100.0	
Missing	NA/No Response	6	.9		
Total		647	100.0		

Unsafe parking along SR 28

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not a problem	257	39.7	41.7	41.7
	Slight problem	82	12.7	13.3	54.9
	Moderate problem	97	15.0	15.7	70.7
	Serious problem	**105**	16.2	17.0	87.7
	Very serious problem	76	11.7	12.3	100.0
	Total	617	95.4	100.0	
Missing	NA/No Response	30	4.6		
Total		647	100.0		

Finding a picnic site

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not a problem	409	63.2	66.8	66.8
	Slight problem	111	17.2	18.1	85.0
	Moderate problem	63	9.7	10.3	95.3
	Serious problem	20	3.1	3.3	98.5
	Very serious problem	9	1.4	1.5	100.0
	Total	612	94.6	100.0	
Missing	No response	35	5.4		
Total		647	100.0		

Finding space on the beach

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not a problem	305	47.1	48.9	48.9
	Slight problem	176	27.2	28.2	77.1
	Moderate problem	110	17.0	17.6	94.7
	Serious problem	24	3.7	3.8	98.6
	Very serious problem	9	1.4	1.4	100.0
	Total	624	96.4	100.0	
Missing	No response	23	3.6		
Total		647	100.0		

Ability to launch a boat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not a problem	376	58.1	78.5	78.5
	Slight problem	41	6.3	8.6	87.1
	Moderate problem	31	4.8	6.5	93.5
	Serious problem	12	1.9	2.5	96.0
	Very serious problem	19	2.9	4.0	100.0
	Total	479	74.0	100.0	
Missing	No response	168	26.0		
Total		647	100.0		

Conflicts with other users at boat ramp

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not a problem	385	59.5	81.7	81.7
	Slight problem	48	7.4	10.2	91.9
	Moderate problem	21	3.2	4.5	96.4
	Serious problem	10	1.5	2.1	98.5
	Very serious problem	7	1.1	1.5	100.0
	Total	471	72.8	100.0	
Missing	No response	176	27.2		
Total		647	100.0		

Conflicts between boaters and other users

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not a problem	395	61.1	80.0	80.0
	Slight problem	62	9.6	12.6	92.5
	Moderate problem	23	3.6	4.7	97.2
	Serious problem	7	1.1	1.4	98.6
	Very serious problem	7	1.1	1.4	100.0
	Total	494	76.4	100.0	
Missing	No response	153	23.6		
Total		647	100.0		

Disruptive behavior by other park users

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not a problem	408	63.1	68.1	68.1
	Slight problem	120	18.5	20.0	88.1
	Moderate problem	50	7.7	8.3	96.5
	Serious problem	17	2.6	2.8	99.3
	Very serious problem	4	.6	.7	100.0
	Total	599	92.6	100.0	
Missing	No response	48	7.4		
Total		647	100.0		

Q 16. Please describe any problems (if any) you may have had with other visitors during this or past visits to Sand Harbor.

Summarized Responses	Frequency	% of All Survey Respondents (n = 647)	% of All Responses to Question (n = 132)
Conflict-related responses			
Disruptive behavior (e.g., swearing/foul language, drinking/alcohol, smoking, loud music/noise, etc.)	75	11.6%	56.8%
Conflicts with boaters/Boat ramp conflicts	15	2.3%	11.4%
Other visitor conflicts	4	0.6%	3.0%
Non-conflict related responses			
Parking/traffic issues	15	2.3%	11.4%
Littering	9	1.4%	6.8%
Facility maintenance	5	0.8%	3.8%
Other (non-conflict related)	9	1.4%	6.8%
Total responses	**132**		

Note: Verbatim responses are provided at the end of this appendix.

Q 17. On this visit, what is your motivation for coming to Sand Harbor? (check all that apply)

Relaxation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	556	85.9	86.5	86.5
	no	87	13.4	13.5	100.0
	Total	643	99.4	100.0	
Missing	No response	4	.6		
Total		647	100.0		

Family Bonding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	379	58.6	58.9	58.9
	no	264	40.8	41.1	100.0
	Total	643	99.4	100.0	
Missing	No response	4	.6		
Total		647	100.0		

Exercise

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	109	16.8	17.0	17.0
	no	534	82.5	83.0	100.0
	Total	643	99.4	100.0	
Missing	No response	4	.6		
Total		647	100.0		

Partying

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	69	10.7	10.7	10.7
	no	574	88.7	89.3	100.0
	Total	643	99.4	100.0	
Missing	No response	4	.6		
Total		647	100.0		

Enjoying outdoor scenery

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	452	69.9	69.9	69.9
	No	191	29.5	29.5	99.4
	No response	4	.6	.6	100.0
	Total	647	100.0	100.0	

Social interaction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	189	29.2	29.2	29.2
	No	454	70.2	70.2	99.4
	No response	4	.6	.6	100.0
	Total	647	100.0	100.0	

Being near the water

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	482	74.5	74.5	74.5
	no	161	24.9	24.9	99.4
	No response	4	.6	.6	100.0
	Total	647	100.0	100.0	

Other Motivations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	67	10.4	10.4	10.4
	no	576	89.0	89.6	100.0
	Total	643	99.4	100.0	
Missing	No response	4	.6		
Total		647	100.0		

“Other” motivations described (summarized responses):

Activity	Frequency	Percent*
Special event	17	2.6%
Boating/kayaking	12	1.9%
Vacation/special trip	8	1.2%
Beautiful place/love it	6	0.9%
Activities (swimming, jumping off rocks, etc.)	5	0.8%
Time with family/friends	4	0.6%
Sandy beach	4	0.6%
Great for kids	3	0.5%
Facilities/staff	3	0.5%
Other	5	0.8%
Total responses	67	

* Percentages based on total survey sample (n = 647).
Note: Verbatim responses are provided at the end of this appendix.

Q 18. What is the postal Zip Code of your primary residence?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	01776	1	.2	.2	.2
	04846	1	.2	.2	.3
	06820	1	.2	.2	.5
	10128	1	.2	.2	.7
	11530	1	.2	.2	.8
	11713	1	.2	.2	1.0
	19063	1	.2	.2	1.2
	20619	1	.2	.2	1.3
	20817	1	.2	.2	1.5
	34141	1	.2	.2	1.7
	50111	1	.2	.2	1.8
	54301	1	.2	.2	2.0
	60026	1	.2	.2	2.2
	60175	1	.2	.2	2.3
	68116	1	.2	.2	2.5
	77381	1	.2	.2	2.7
	78216	1	.2	.2	2.8
	78703	1	.2	.2	3.0
	80027	1	.2	.2	3.2
	80528	1	.2	.2	3.3
	80640	1	.2	.2	3.5
	83328	1	.2	.2	3.7
	84106	1	.2	.2	3.8
	84108	1	.2	.2	4.0
	85048	1	.2	.2	4.2
	85248	1	.2	.2	4.3
	89001	1	.2	.2	4.5
	89032	1	.2	.2	4.7
	89052	1	.2	.2	4.8
	89101	1	.2	.2	5.0
	89107	1	.2	.2	5.1
	89402	1	.2	.2	5.3
	89403	10	1.5	1.7	7.0
	89408	6	.9	1.0	8.0
	89410	6	.9	1.0	9.0
	89423	11	1.7	1.8	10.8

89428	2	.3	.3	11.1
89431	18	2.8	3.0	14.1
89433	8	1.2	1.3	15.4
89434	9	1.4	1.5	16.9
89436	31	4.8	5.1	22.1
89439	1	.2	.2	22.3
89440	1	.2	.2	22.4
89441	6	.9	1.0	23.4
89444	1	.2	.2	23.6
89447	1	.2	.2	23.8
89449	1	.2	.2	23.9
89450	3	.5	.5	24.4
89451	9	1.4	1.5	25.9
89460	6	.9	1.0	26.9
89501	2	.3	.3	27.2
89502	14	2.2	2.3	29.6
89503	13	2.0	2.2	31.7
89506	13	2.0	2.2	33.9
89508	6	.9	1.0	34.9
89509	21	3.2	3.5	38.4
89511	39	6.0	6.5	44.9
89512	7	1.1	1.2	46.0
89519	6	.9	1.0	47.0
89521	40	6.2	6.6	53.7
89523	19	2.9	3.2	56.8
89701	30	4.6	5.0	61.8
89703	11	1.7	1.8	63.6
89704	6	.9	1.0	64.6
89705	6	.9	1.0	65.6
89706	8	1.2	1.3	66.9
90274	1	.2	.2	67.1
90277	2	.3	.3	67.4
90815	1	.2	.2	67.6
91107	1	.2	.2	67.8
91301	1	.2	.2	67.9
91304	1	.2	.2	68.1
91320	1	.2	.2	68.3
91321	1	.2	.2	68.4
91402	1	.2	.2	68.6

92102	1	.2	.2	68.8
92117	1	.2	.2	68.9
92308	1	.2	.2	69.1
92373	1	.2	.2	69.3
92562	1	.2	.2	69.4
92571	1	.2	.2	69.6
92592	3	.5	.5	70.1
92630	1	.2	.2	70.3
92821	1	.2	.2	70.4
92869	1	.2	.2	70.6
93004	1	.2	.2	70.8
93445	1	.2	.2	70.9
93923	2	.3	.3	71.3
94002	2	.3	.3	71.6
94010	4	.6	.7	72.3
94015	1	.2	.2	72.4
94019	1	.2	.2	72.6
94024	1	.2	.2	72.8
94030	1	.2	.2	72.9
94037	1	.2	.2	73.1
94040	1	.2	.2	73.3
94061	1	.2	.2	73.4
94066	1	.2	.2	73.6
94070	2	.3	.3	73.9
94087	1	.2	.2	74.1
94112	1	.2	.2	74.3
94114	1	.2	.2	74.4
94115	1	.2	.2	74.6
94116	2	.3	.3	74.9
94117	1	.2	.2	75.1
94121	2	.3	.3	75.4
94122	1	.2	.2	75.6
94123	2	.3	.3	75.9
94131	1	.2	.2	76.1
94132	1	.2	.2	76.2
94303	1	.2	.2	76.4
94403	2	.3	.3	76.7
94503	1	.2	.2	76.9
94506	2	.3	.3	77.2

94517	1	.2	.2	77.4
94518	1	.2	.2	77.6
94521	2	.3	.3	77.9
94523	1	.2	.2	78.1
94526	3	.5	.5	78.6
94534	1	.2	.2	78.7
94541	1	.2	.2	78.9
94549	3	.5	.5	79.4
94550	3	.5	.5	79.9
94553	3	.5	.5	80.4
94558	1	.2	.2	80.6
94563	1	.2	.2	80.7
94566	1	.2	.2	80.9
94568	2	.3	.3	81.2
94583	1	.2	.2	81.4
94588	2	.3	.3	81.7
94591	1	.2	.2	81.9
94597	1	.2	.2	82.1
94611	1	.2	.2	82.2
94706	1	.2	.2	82.4
94901	2	.3	.3	82.7
94903	1	.2	.2	82.9
94925	1	.2	.2	83.1
94941	1	.2	.2	83.2
94945	1	.2	.2	83.4
94949	3	.5	.5	83.9
94952	3	.5	.5	84.4
94954	3	.5	.5	84.9
94957	1	.2	.2	85.0
95005	1	.2	.2	85.2
95008	1	.2	.2	85.4
95037	1	.2	.2	85.5
95066	1	.2	.2	85.7
95070	1	.2	.2	85.9
95111	1	.2	.2	86.0
95120	2	.3	.3	86.4
95125	2	.3	.3	86.7
95126	1	.2	.2	86.9
95135	1	.2	.2	87.0

95136	1	.2	.2	87.2
95242	2	.3	.3	87.5
95247	1	.2	.2	87.7
95337	1	.2	.2	87.9
95366	1	.2	.2	88.0
95377	1	.2	.2	88.2
95602	1	.2	.2	88.4
95607	1	.2	.2	88.5
95608	1	.2	.2	88.7
95610	1	.2	.2	88.9
95618	1	.2	.2	89.0
95630	2	.3	.3	89.4
95648	1	.2	.2	89.5
95650	1	.2	.2	89.7
95661	1	.2	.2	89.9
95670	2	.3	.3	90.2
95678	1	.2	.2	90.4
95682	2	.3	.3	90.7
95687	2	.3	.3	91.0
95688	1	.2	.2	91.2
95709	1	.2	.2	91.4
95713	1	.2	.2	91.5
95726	1	.2	.2	91.7
95746	2	.3	.3	92.0
95747	2	.3	.3	92.4
95758	1	.2	.2	92.5
95762	1	.2	.2	92.7
95816	1	.2	.2	92.9
95817	1	.2	.2	93.0
95818	1	.2	.2	93.2
95819	1	.2	.2	93.4
95821	1	.2	.2	93.5
95822	1	.2	.2	93.7
95825	1	.2	.2	93.9
95831	1	.2	.2	94.0
95945	2	.3	.3	94.4
95949	1	.2	.2	94.5
95961	1	.2	.2	94.7
95969	1	.2	.2	94.9

	95982	2	.3	.3	95.2
	95991	1	.2	.2	95.3
	96003	1	.2	.2	95.5
	96015	1	.2	.2	95.7
	96120	3	.5	.5	96.2
	96142	1	.2	.2	96.3
	96143	1	.2	.2	96.5
	96150	4	.6	.7	97.2
	96158	1	.2	.2	97.3
	96160	2	.3	.3	97.7
	96161	3	.5	.5	98.2
	96162	1	.2	.2	98.3
	97008	1	.2	.2	98.5
	97212	1	.2	.2	98.7
	97302	1	.2	.2	98.8
	98012	1	.2	.2	99.0
	98052	1	.2	.2	99.2
	98460	1	.2	.2	99.3
	98511	1	.2	.2	99.5
	98512	2	.3	.3	99.8
	99203	1	.2	.2	100.0
	Total	602	93.0	100.0	
Missing	Foreign country	6	.9		
	Provided state only (CA or NV)	3	.5		
	No Response/Not Valid	36	5.6		
	Total	45	7.0		
Total		647	100.0		

Q 19. Overall, how satisfied are you with your recreation experience during this visit? (check one)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	31	4.8	4.8	4.8
	Dissatisfied	3	.5	.5	5.3
	Neither	10	1.5	1.6	6.8
	Satisfied	241	37.2	37.5	44.3
	Very Satisfied	358	55.3	55.7	100.0
	Total	643	99.4	100.0	
Missing	No response	4	.6		
Total		647	100.0		

		How Satisfied
N	Valid	643
	Missing	4
	Mean	4.39
	Median	5.00

Note: Satisfaction responses were recorded in the survey database as follows: Very dissatisfied (1), Dissatisfied (2), Neither Dissatisfied nor Satisfied (3), Satisfied (4), Very Satisfied (5).

Q 20. If you could change one thing at Sand Harbor, what would it be?

Summarized Responses	Frequency	% of All Surveys (n = 647)	% of Responses to Question (n = 419)
More parking	94	14.5%	22.4%
Reduce fee	62	9.6%	14.8%
Weather/water/natural features	37	5.7%	8.8%
Reduce crowding	34	5.3%	8.1%
Better maintenance	31	4.8%	7.4%
Misc operational/rule changes	31	4.8%	7.4%
Improve concessions	20	3.1%	4.8%
Picnic sites/grills on/near beach	14	2.2%	3.3%
Extend/improve ramp	13	2.0%	3.1%
Increase enforcement/ranger presence	13	2.0%	3.1%
Add site amenities	13	2.0%	3.1%
No smoking	10	1.5%	2.4%
More/better bathrooms	10	1.5%	2.4%
Larger beach/larger site	8	1.2%	1.9%
Misc. facility improvements	7	1.1%	1.7%
Allow dogs	6	0.9%	1.4%
Improve access/circulation	6	0.9%	1.4%
Provide rental equipment	5	0.8%	1.2%
Add shuttle	3	0.5%	0.7%
Prohibit SR-28 parking	2	0.3%	0.5%
TOTAL	**419**		**100.0%**

Note: Verbatim responses are provided at the end of this appendix.

Verbatim Responses to Open-Ended Survey Questions

Q 6. Which of the following activities are you (and/or members of your group) participating in during this visit to Sand Harbor? ("Other" activities described):

4th of July
4th of July
Aired up boat
Art, painting, photography
BB
Beach walk
Beer pong
Birthday
Boardwalk
Catching crawdads
Catching crawdads
Celebrating bachelorette pre party
Cliff diving
Climbing on rocks
Climbing on rocks
Crawdad catching
Crawdad fishing
Crawdad fishing
Crawdad fishing
Crawdadding
Crawdadding on the rocks
Crawdadding and drinking beer
Crawdadding catch and release
Crawfishing
Discriminating against squirrels.
Family picnic
Family time
Family time
Family vacation
Food
Free time, no school
Friend's birthday
Having fun
Hiking
Hiking
Hiking, photography
Holiday
Jogging

Jumping off rocks
Kids jumping off rocks
Kids play in sand
Kids Shakespeare
Long Toss, Crunchy Groove Sunday
Paddle ball
Paddle board
Paddle board
paddle boarding
Paddle boating
Paddleboarding
People watching
People watching and frolicking
Personal relations
Photography
Play at beach
Play in the sand
Playing in sand
Playing in sand
Playing on the rocks
Raft
Raft
Raft, jumping of rocks
Rafting
Rafting
Rafts, inflatable row boat
Reading
Restaurant, playing in sand, visitor's museum, nature trail.
Rock climb
Rock climbing
Rock climbing
Rock climbing/jumping in water
Rock jumping
Rock jumping
Rock jumping
Rock jumping *(smiley face)*
Sand castles
Sandcastle building
Searching for water creatures
See the fireworks
Shakespeare

Shakespeare
Shakespeare play for the young
Snacks
Snorkeling
Snorkeling
Snorkeling
Snorkeling
Snorkeling
Snorkeling, rock climbing
Snorkeling
Stand up paddle
SUP
The 4th
Therapeutic outlet
Training for open water swim
Trusa Rummele (?) novel
Visited neighbors that were sitting right next to us
Volleyball
Walking
Watercolor painting, photography
Wheelchair accessible trail
Wrapped in blankets

Q 8. Are the current facilities (e.g., restrooms, picnic sites, boat ramp, visitor center, concessions, etc.) provided at Sand Harbor adequate to meet your needs? (If "No", facility needs/inadequacies described):

A working water fountain would be nice!
Although more vegetarian/vegan food items would be awesome! Espresso machine for latte's, etc.
Although the last time I visited in Aug the lady at the pay station was extremely rude, I thought I had change coming to me from my 10.00. I was unaware of the price increase. Last year I visited around 8 times, this year twice.
Bathroom could be cleaned on a more regular basis during the day.
Bathroom needs cleaning
Bathrooms are a little dirty.
Bathrooms are not accessible enough
Bathrooms could be bigger, upgraded, showers could be added.
Bathrooms could use improvements
Bathrooms great, however toilets clogged, stinky.
Bathrooms should be cleaned more frequently
Bathrooms smelled, fix ramp!
Beautiful
Best place on the lake
Better/more parking/open up reserved parking lot

Boat ramp is a sorry mess
Boat ramp needs some modification for the levels. Trailers get stuck.
Boat ramp should stay open until sunset! [not a facility complaint, but a management complaint]
But I do hope the char pit adds a small store again - sundries for the lake, etc.
But if drinks (sodas, water, etc.) were for sale that would be great
But the bathrooms are always very dirty and smelly and never have any toilet paper.
But- the south lot bathroom closed sometime earlier in the year
But will like more shade in picnic area
Clean bathrooms
Cleaner bathrooms
Cleaner bathrooms
Cleanliness of bathrooms not good
Closest bathroom was locked!
Concessions are too slow due to overuse
Could use more parking
Delighted to have the grill
Drinking fountain not operable, no latte at 7am *(smiley face drawn)*
Drinking fountain was not functioning (More accessible water)
Everything great except very slow food concessions
Excellent locations and clean
First the restrooms are very dirty and they need more toilets and for us that's the most important thing.
Food is too expensive, parking is so expensive, and the bathrooms are gross.
Great
Great for families, clean, well maintained
Haven't visited any yet
However there could be more women's restrooms
I always launch at boat ramp… Please watch parking! Non boaters taking spaces for boats.
I wish the gift shop was open.
I would like it if there were more BBQ pits to use along the beach
I would like to see toilet santiguards in bathrooms and paper towels, I hate seeing tourists littering in the lake.
Indoor tables to eat would be nice option when you are waiting for it to warm up. We ended up going somewhere else for lunch.
It would be nice to have restrooms cleaned often and have soap supplied.
It's really expensive, especially with today's economy
Kayak only launch sites
Love it
More bathrooms are needed during special events. Parking in the group area should be included when renting the pavilion and an employee should monitor the group area parking for the price charged.
More handicap would be so nice for parking
More kayak parking
More parking
More parking
More restrooms
My four year old says the bathroom stinks

Necesita regaccia par bano *(need to…bathroom)*
Need more boat trailer parking; Major Problem - drop off at end of boat ramp causes damage to trailers - need to fill in the drop off!
Need more cleanliness in bathrooms - could clean more frequently and add hand sanitizers
Need soap in all bathrooms
Need trash cans on beach
Needs more parking
No drinking fountain
No t.p.
No the bathrooms are gross and not a place for…*(sentence unfinished*)
Not enough parking
Not enough parking
Not sure how to improve them but with the restrooms were less smelly
Only the bathroom could use some help - everything else, wonderful!!
Overnight parking situation has been very disappointing. Caused great problems and disappointment when traveling/kayaking to South Lake.
Parking
Parking spaces are limited
Parking!!!!
Please fix the boat ramp for use all summer
Please note however more parking would be helpful, can trash be set off spaces?
Preferred snack bar last year with breakfast items, coffee, healthy salads, and some grill items. Wait at gate and snack bar very long receipts in window unnecessary
Restroom was gross and smelled bad
Restrooms are too dirty. They don't have toilet paper.
Restrooms could be cleaned and stocked more often
Restrooms more clean, open early
Restrooms need more stalls (in women's)
Restrooms need soap
Service in the snack shack could have been quicker…but thanks for having a sale on beer!
Should have soap in mens room
Soap in bathrooms would be great!
Soap in bathrooms would be nice
Sometimes parking is too crowded
Sometimes the parking is scarce and they close the park - that's rough!
Squirrel problems
The bathroom doors have been broken for years
The bathrooms are wet, not a place for night crawling
The bathrooms could be a little cleaner
The bathrooms have no seat covers and need more maintenance, more grills would help too
The concession was better last year
The recreation parks needs more picnic tables
The restrooms could be cleaner
The sand needs to be raked

There are no toilet covers or hand soap in the restrooms
There needs to be somewhere to get a snack or chips or candy like a general store.
There should be more merchandise for Sand Harbor
They are great
They aren't very clean, other than that good
They're nice!
This year concession not as good as last year. Food choices not as good and wait time very long. Over 1 hour for a burger!
Upgrade the boat ramps- make them deeper like at Cave Rock
Usually the service and concession stand very slow - to the point we hardly use it.
Very clean and well kept
We asked for ice cream in a cup and after 10 minutes we got ice cream in a cone upside down in a cup and the server stated, "That's the way we do it here."
We haven't used any facilities provided today
We just love this place
We need more picnic tables
When parking available let visitors in
When we arrived today I had to pick up lots of trash before we could set up camp.
When we sail the ramp is getting hairy at low water
World class
Would like snack bar
Would like some soap in bathroom
Would like to see separate entrance here for pass holders
You need handwash in the bathrooms

Q 9. On this visit, why did you choose to come to Sand Harbor? ("Other" reasons described):

Access to boat launch
Accessibility
Band/Shakespeare practice during the day
Beautiful beach! *Smiley face drawn*
Beauty
Been coming here for 47 years
Best beach on the lake
Best in Tahoe
Best sand beach in Tahoe
Best sand in Tahoe
Boat launch
Boat ramp
Cause this is where we've come for 30 years!
Char-Pit
Cheaper
Chosen by school
Cleanliness

Cool air climate
Cost per car instead of per person - private
Daughter lives in Sparks and comes here
Destination for the day
Don't know!
End of summer
Excellent beach/facility
Family
Family friendly
Family fun
Family history
Family tradition
Favorite spot
Fees reasonable
Food
Friends
Friends invited us
Get away from the boys!
Great family place (i.e. shallow water)
Grew up here love it!
Incline is such a quick drive up from Reno
It's beautiful
It's beautiful - we come from south shore.
It's our annual visit
It's our favorite
Jumping off rocks
Just a great place to come
Just because
Lake and view
Lifeguards and rangers are critical
Love it
Love it here
Nice beach and place to eat
Nice folks
Nicest beach Tahoe has to offer
No rocks in water
No sharks
On the way between destinations
One of the few you can drive into - expensive though
Peer pressure
Place we've always come

Public beach
Recommended beach
Relatives brought us. They have a cabin in Tahoe.
Relatives visiting and wanted time at the lake
Rock climbing
Rocks as area for children to play
Safe and fun place in water with kids
Safety
Season pass holder
Shakespeare
Shakespeare event
Shallow waters for children
Show it to visitors
Snack shack & concessions
Something new
Special event
Spending time with friends at the beach
Swimming in clean water
The lifeguards rule
The play
To meet family for a day at the beach
Tourism
Tradition
Tradition
Vacation
Visiting Reno from New Zealand
Visual
Wanted nice sand for our 17month old daughter
We just love it and have for many years
We just love it here.
We know where it's at!
We love the beach boat area
We never go anywhere else! This is our family place
Wheelchair access
Wheelchair trail
Where friends came

Q 16. Please describe any problems (if any) you may have had with other visitors during this or past visits to Sand Harbor:

A little language this AM but a park ranger quickly addressed the problem.
A rare rude one
Again - come early. Just getting boat tagged *(marked with graffiti)* at 8:05pm
Alcoholic beverages with boaters
Bathrooms need more attention
Beach combers want access to the water and they try and cross in front of you.
Beach needs to be raked
Bits of garbage in the sand
Boat decontamination - they need to communicate with out of state.
Boat etiquette - someone needs to "guide" boaters/launches - better now because of inspectors.
Boat ramp and parking. Park closes boat ramp when water level is low. Small boat owners are locked out even though they paid for a seasons pass.
Boater with trailer scolded me
Boaters little testy with our kayaks on the sand by their boats
Boaters too close to swimming area
Boats crowding in and putting their anchor line between our towels and our kids tripping over line.
Boats entering beach area too fast. My kids were almost hit last summer and we had to find a ranger.
Boats not being using boat ramp in efficient manner, or thinking of other boaters' ramp needs.
Bringing dogs and crapping on beach
Can't reach entrance to boat side as the traffic sometimes blocks the right side of the traffic (those going to non-boat side)
Cars driving fast, need speed bumps to slow them down.
Cigarette smoking
Clogged bathrooms, inconsiderate soccer players
Crowding at boat launch, people swimming in front of boat
Dirty diaper left on top of rocks
Disrespectful/foul language, too many people on weekends
Drink in glass bottles; no control over drunk people, which can put people (especially kids) in danger.
Drinking alcohol, foul mouth kids or couples a "little too close."
Drunk (taken care of)
Fights between other visitors
Getting hit by Frisbees while sunbathing
Got hit in the shoulder by a football - adults were playing
Guy tried to kill squirrel while inebriated.
Hard sha… water c…t in Diver's Cove - glass bottles and litter *(unsure of complete words due to illegible handwriting/copy)*
I have been hit with football and with a baseball but it's usually too crowded for the activities.
I like to swim the length of the swim area and often times jet skiers/boaters come in too close and too fast to buoys.
I think most of the problems result from people drinking/having too much to drink or not being in control of their children.
If you're not here early you probably not find parking
Inconsiderate people

Issues with individuals using sports equipment - playing baseball, football.
Jet ski - kayak rentals, private parties taking up vast amount of space. Would suggest designated area for rentals on far north end of beach.
Just noisy, inconsiderate
Just over-crowding
Just parking
Just people breaking common sense rules (no wake zone, etc.)
Just people not controlling their children or themselves.
Just people not supervising their children
Just some loud rude people on occasion when it's extra crowded.
Kids partying and drunk
Lack of organization at boat ramp - Extremely discourteous behavior by other people utilizing ramp.
Lack of space at beach to access water, pedestrians walking on hwy 28
Leave the trees for shade
Listening to cell phone conversations or people crowding your existing beach space
Litter - people who do not respect nature
Littering, feeding wildlife, screaming, hard plastic and glass on the beach - ouch.
Loud
Loud
Loud music
Loud music
Loud music
Loud people (when by younger crowd)
Loud radio music (seldom); also loud jet skis
Loud radios
Loud radios, young people swearing around my children - drinking.
Loud teens occasionally - what do you do…?
Mexicans
Music - boom boxes
Music playing
No life guard
No parking space on beach
No scuba taking up lakefront!
No trash can on the beach; do not accept credit cards/debit cards to pay for parking
Noise - loud music - poorly supervised children.
Noisy stereos
Not watching kids, alcohol on beach
Nudity in front of children and loud drunken behavior
Obnoxious music or parents
Occasional (my son included) using profanity
Older kids coming around and playing rough around smaller kids
Once with a boat owner that had too much to drink
Other users leaving their trash

Other visitors have "invaded our space" on the beach practically sitting on top of us.
Out of control kids (probably not Sand Harbor's fault)
Parking
Parking causes large problem!!!
Parking is limited but expected
Parking lot full, too many people
Parking spots
Parking sucks and sometimes I don't come because of the parking issue
Parking! Unsafe on side-road. Spaces open not taking anymore vehicles.
Past visits - overly noisy
People come and leave anchor tackle staking out a place and then leave on their boat
People drinking alcoholic beverages and being disruptive/driving boats under the influence.
People from HWY 28 South cut in a longer line + more time spent in line - you should have a park person directing traffic and monitoring cutters
People leaving their trash! We've picked up trash, dirty diapers! Ugh!!
People not cleaning up after themselves.
People saving parking for others or family members.
People sitting at picnic sites. Holding tables for others.
People smoking
People take alcohol on beach with I believe not the way I want my kids to see
Personal space issues (occasionally)
Picnic people interruptions the people on the beach
Playing radios
Profanity used by some youth
Radio and tossing balls and Frisbees
Respecting other boaters - un-experienced boaters
Rowdy teens
Rude and inconsiderate behavior, smoking, foul language, loud Hispanic music
Rudeness - inconsideration of some people or beach visitors
Single space cars w/kayaks taking parking spaces
Smoking
Smoking
Smoking and 30ft RV in handicap parking could not get past - too tight for RV parking
Smoking on beach
Smoking!
So there was a man who put his buttocks in my face. Not pleasant. But nice butt.
Some disorderly conduct on weekends w/young adults - profanity
Some people wear provocative/inappropriate bathing suits
Someone needs to direct boats in/out at peak times - people are unsafe.
Sometimes people playing loud music
Sorting out kids toys at end of day
Squirrels
Stepping on glass

Sunglasses stolen from chair - loud noisy behavior from youth
Swearing of other patrons
Swimming at boat ramp. Lack of boat beach access.
That it is getting expensive
The garbage left on the beach
There is no problem with the visitors. The real problem is the availability on parking space
Too many people in front of us when we are close to the water.
Trailer almost got stuck on ramp
Ugly horse shoes in the way
We avoid cooking out on holidays/weekends because of larger groups, loud music, lack of supervision of children

Q 17. On this visit, what is your motivation for coming to Sand Harbor? ("Other" motivations described):

4th
4th of July!
Beach
Beautiful views
Birthday
Birthday celebration
Birthday Party
Birthday party
Birthday party
Boating
Boating
Boating
Boating
Boating, swimming
Celebrating my 2 daughters birthdays
Commemorating special event
Cooler than Reno
Cooler water
End of summer
Event
Exercise
Father's day
Food
For use of Seadoos
Friend bonding
Fun
Granite counter top at BBQ area
Great beach for kids
Jet ski

July 4th
Jumping off rocks
Kayaking
Kayaking
Kayaking
Kayaking
Kids enjoyment
Kids playing in sand
Last day of summer
Last days of summer
Launch ramp protected from wind
Lifeguards
Love it
Love this place - have for years
Meet friends
Meeting with friends
Memorial service
One of the most beautiful beaches on earth - (we have a private beach, however, we come here!)
Ryan says epic fun/ people watching
Sailing
Sand (heart) sand
Sand holes
Sandy beach
School function
School trip
Shakespeare
Shakespeare concert
Showing my nephew Lake Tahoe - he's never seen it!
Sun
Swimming
Swimming
Tahoe *(heart drawn)*
Tanning, playing, boating
Time with friends
To get the hell out of Carson
Vacation
Vacation
Visiting from Vegas

Q 20. If you could change one thing at Sand Harbor, what would it be?

# of people
$10 parking
$12.00 parking fee is absurd!
A courtesy phone for emergencies; to call a locksmith because I locked my keys in the car 10 minutes ago (frowney face drawn)
A designated drop off and unload point and then go park. Usually the gate is locked for reservation area (gazebo).
Ability to park small water craft on beach
Accept IVGID cards - extend boat ramp
Add a playground for kids or volleyball nets
Add boat access to beach areas
Add kayak parking. No motorized personal watercraft.
Add more bathrooms
Add more kayak parking!
Add more parking for people, not enough parking spaces. Traffic parking along highway into sand …*illegible*…BBQ pits close to the beach.
Add waterslide! No pine needles!
Adding more picnic tables
Additional parking - limit alcohol.
Algae in the water/clarity
Allow dogs
Allow dogs
Allow dogs; have overnight camping
Allow George Matthews to advertise for his Jet Ski/Boat rental
Allow kayaks on south beach
Allow people to launch jet skis even when water low
Allow pets! we miss our golden today!
Allowing camping
Allowing dogs would be nice
Amount of kids/Asians
Ban cigarettes and radios
Banos *(bathrooms - my translation)*
Barbecue near the beach
Bathrooms
Bathrooms are too dirty and no hot water
BBQ
BBQ and pets allowed on beach
BBQ area on the beach would be nice
BBQ closer to the beach
BBQ closer to the beach
BBQ grills need adjustment for cooking consistency.
BBQ on beach
BBQ's are closer to beach

Beer vending machines on beach
Being able to use the boat launch parking lot when you don't have a boat. We only use the boat launch beach and it's quite a walk with all the gear it requires to spend a day at the beach.
Better attended boat launch ramp and also see above *(refers to text in 16)*
Better beach bathrooms
Better boat launch
Better boat launch - extend it.
Better boat ramp
Better concession
Better flow and use of parking areas.
Better lighting in the restrooms
Better parking
Better parking!
Better snack bar - Bring back the snack bar from 2008,2009
Bigger
Bigger
Bigger area!
Bigger bathrooms
Bigger beach for more to enjoy, more parking
Bigger parking spaces for everybody to enjoy and be able to get in and not be turned around.
Boat launch chaos
Boat ramp needs to be accessible all summer - not by July 4th if not enough water.
Boat ramps - longer use
Boaters should not be allowed to leave anchor tackle as a place holder if your boat leaves and you leave the tackle it should be confiscated.
Bring back trash recycling bins near bathrooms
Bring more squirrels and some bitch is smoking
Build concession stand at south end also
Build more parking and picnic areas in different surrounding areas
Build more parking spaces and picnic tables and restrooms
Cabana boys
Can't get much better! Except cost of parking.
Charge for either parking fee or walk-in fee. I got charged both because I couldn't find a parking spot inside and then later when I parked.
Cheaper concessions!
Cheaper entrance fee for half day use
Clean and stock bathrooms, natural shade, no smoking, more garbage cans, diversity with entertainment
Clean the beaches
Clean up beaches, more patrol at beaches for rule breakers
Cleaner bathroom
Cleaner bathrooms
Cleaner beach space!
Cleaner beach, fewer people
Cleaner beach, keep all bathrooms open.

Cleans *(?)* on the bathrooms
Closer parking
Closer parking *(illegible word)* down 28
Closer restrooms
Cocktails on beach; 1/2 price off-season park entrance fees
Coffee at 8:30am
Completely remodel the bathrooms (too old)
Cost and parking
Cost to get in.
Could be cleaner - trash on beach sometimes people don't clean up like they should. Soap/bathrooms. Been coming to beach for 39 years *(smiley face)*.
Crowdedness
Crowding
Crowds
Crowds
Curbing at the boat ramp parking lot. I hit curbs every time I go to park boat trailer.
Do not charge $10 for parking. If fund raising is needed, $5 sounds much better. Not everyone has a lot of extra $ these days.
Dogs shouldn't be allowed/smoking only in designated areas
Don't allow so many people in the park
Easier parking close to beach.
Entrance fee is expensive
Entrance lines
Entry, parking, waiting in line on SR-28 to park
Extend the ramp
Fee difference for CA residence
Fee too high limits people of lower socioeconomic status from fair usage
Fees - NV vs. CA residents. Why the difference?
Fees back to $8.00
Fewer people
Fewer visitors
Finer sand.
First experience with Char Pit restaurant 3 weeks ago: 50 minutes to get food.
Fix the bathroom door handles. Go back to car for car when the lot is full instead of closing for hours. (smiley face drawn)
Fix the boat ramp
Fix the boat ramp drop off
Food/drink preferences stated on other side *(smiley face drawn)*
For more parking
Free food or cheap food, more separation between swimmers and boaters
Free motorcycle parking, $10 is way too expensive
Geese
Get back to 30 years ago! (smiley face drawn)
Get rid of parking on the street - it's over-crowded

Go back to last year's entry charge of $8.00 - very surprised to see such a large increase in one year
Guarantee to always have space at the "cove."
Have ladders so you can jump off rocks, but we need something to help us get up. Also a quick shop.
Have lockers to put beach stuff in and pay for it per day
Having a closer snack shack
Having more park attendants to deal with boater conflicts.
Having to pay to park
I know the economy is a problem but I wouldn't raise park fees anymore. I drive 45 minutes to come so I'm already spending money on food and gas. Maybe offer rentals - paddle boats, kayaks, tubes.
I love it just as is! Maybe more reminders to people to clean up after themselves. To pack out what they bring in to keep the beach beautiful.
I would like to come into the park 5 eve to eat in the café and not be charged the park fee
I would limit the crowd number
I would put cement under the picnic tables.
I would rake the beach from all pine needles/cones.
If you pay walk in because of lack of parking - when parking becomes available you should pay the difference to move your car in
In recent years I have seen more garbage on the beach.
Increase park fees to reduce/restrict excessive access
Indoor dining at the concessions.
It is great we really enjoy it but the fee could be a little less.
It would be nice to have more availability of activities like rental equipment to play on.
Just the parking
Kayak rentals
Kayak rentals/better pricing in char pit/lifeguard not enough. Lower cost to enter.
Keep the litter out from under the boulders.
Labeling for parking, had problems to find the boat launch.
Larger parking
Less $ to park
Less algae
Less commercialization; downsizing special events
Less crowded
Less crowded. The website had incorrect info too. Said it opened the lot at 11 am, which is when we arrived, but it was actually totally packed by then. So we couldn't get a decent spot next to the water until 4 hours later.
Less crowding
Less crowds
Less expensive parking other than that nothing!
Less littering - bigger fines?
Less loud music
Less money expected 6 per visit 40 season pass.
Less people
Less people
Less people - more shade
Less power boat parking and more kayak parking

Less squirrels & birds
Less trash
Liked when lifeguards were at each chair.
Limit # of visitors/day
Litter
Loud people
Lower parking fee
Lower the cost of parking or give seniors a break!
Make it a non-smoking beach
Make it easier to bring boats (kayaks etc.) on crowded days, more parking for kayaks, canoes, boats generally.
Make park entry fee cheaper
Make parking easier
Make parking easier
Make sure the sand is clean after events
Make the parking bigger and make more …ells *(unsure of word)* so people could barbeque in Lake Tahoe.
Make the shoreline more public and not privately owned
Mas estacionamionto *(More parking lots - my translation)*
Matinee of Shakespeare festival
Maybe BBQ pits close to the beach. Should inspect boats away from boat ramp and not tie up the boat ramp. People shouldn't be at the boat ramp when loading up boat before launching. Everyone should be treated fair and George should be allowed to rent his equipment at boat ramp like the other people.
Mirrors in the bathroom
Moderate how many people are on the beach
More beach front, more parking
More beach space!
More boat parking - add a concession area
More close up parking, or a shuttle service
More enforcement of rules
More food variety at the snack bar salads and healthy fare.
More free food
More handicapped parking
More kayak parking!!!
More less expensive food vendors
More lifeguards needed
More liquor control
More merchandise in visitor center
More parking
More parking
More parking
More parking
More parking
More parking

More parking
More parking
More parking
More parking
More parking
More parking
More parking
More parking
More parking
More parking
More parking
More parking
More parking
More parking
More parking
More parking - bathrooms checked, concessions are very slow. Thanks!
More parking - two story
More parking (handicap too) and less unsupervised children
More parking and "no smoking" signs
More parking and decrease fees
More parking and less fee coming in.
More parking and make it non-smoking
More parking and picnic areas
More parking and picnic areas during summer
More parking and section for dogs
More parking for busy days
More parking is needed
More parking maybe.
More parking spaces
More parking, keep up good work on improvements
More parking, more trees
More parking; website indicating full parking lot
More restrooms
More rocks to jump
More secluded beaches.
More space
More space on the sand
More spaces for grilling
More sunshine needed today *(smiley face drawn)*
More trailer parking
More trash cans
More trees along the beach and BBQ facilities
Move hiking trails
Move larger family tents at least 50 feet from the water.

Need metal brush to clean grills; need soap in toilets
Need more parking
No drinking water
No geese
No more people than are already here! No shuttles!!!
No pine needles
No pine needles on beach!!
No rain more sun!!!
No smoking
No smoking
No smoking on the beach
No smoking on the beach, add trash cans to beaches
No smoking on the beach.
Nonsmoking
Non-smoking areas
Not allow canopy tents. More kayak launch parking.
Not allow motor boats - kayaks only
Not allowed use of just skis, or other loud engines on lake
Not having everyone else know about it so we wouldn't have to come super early or super late.
Not much - maybe parking?
Not so crowded at Cove Beach
Not sure; keep the store open
Offer set # of parking prepaid for the day
Open bathrooms in late season, several seem to be closed
Open the south gate earlier
Open up private party parking weekend lodge when no event scheduled, and valet parking
Outdoor shower for rinsing off sand prior to getting in car - especially for feet
Overcrowding
Overnight parking
Overnight parking for trailers; more expensive for out of state people and cheaper for locals
Overuse of alcohol
Park entrance fee (I'm a resident of Incline Village for over 8 years)
Parking
Parking
Parking
Parking
Parking
Parking
Parking
Parking
Parking
Parking
Parking

Parking
Parking
Parking - as if you could add it…shuttle bus at Incline?
Parking - no saving parking
Parking along SR 28
Parking and fees too much!
Parking costs
Parking extend to boat ramp
Parking fee is too high to come frequently
Parking fees
Parking fees are very high
Parking fees.
Parking is too expensive!!! $12 to park on a beach are you kidding me?
PARKING more of it please.
Parking spots, bathroom locked, trashcan closed
Parking!
Parking!!!
Parking, shuttle people from somewhere else.
Parking, smoking on beach.
Parking/crowded
Parqueaderos mas grandas (More parking - *my translation*)
Paying less
Paying less to enter
Picnic area closer to beach
Pine needles in feet
Pine needles in the sand
Please do all you can to keep landscape thriving. This beach is a jewel and the pristine water is soul enriching - also soap in all bathrooms.
Price
Price for … *(illegible final word)*
Price of parking lot
Price to get in is ridiculous!
Price unacceptable but a lot
Put picnic areas closer to beach
Quicker service at the Char-Pit
Rake the beach
Ralles *(?)* are too expensive
RAMP!!! - Please!
Rates have gone up much in bad economy (42.00)
Recycling bins, cheaper parking
Reduce number of people, then there's more parking etc.
Reduce the entrance fee
Re-entry would be great!

Sand Harbor must have rangers or someone to enforce peace and tranquility.
Separate turn lane off SR-28
Slightly warmer water *(with smiley face drawn)*
Soap in bathrooms
Soap in the restrooms
Somebody should clean in the morning the from evening perhaps.
Something to dry your hands on in the bathroom
Sometimes parking
Stop the wind - ha ha
Temp of water 101!
The $10 parking
The 50 ft swimming rule.
The ability to use bbq's on the beach
The amount of access to get to the water - some trails should be cleaned.
The big rocks, we need more *(smiley face drawn)*
The big tent that no one uses belonging to the scuba divers
The cost
The cost is a little high - I remember 2 years ago $5.00
The cost of entry
The crowds
The huge buses full of kids
The parking for us with the kayaks is horrible we have to put in here but you have no place for us to park, it's wrong.
The parking space limit is one thing I would change, but other than that, it's a lovely beach.
The price of admission is a little high
The price of fee to get in (Don't raise the fee again! Please!!)
The price of parking - make it cheaper
The price to enter the park
The restroom was not in the best shape but it met my needs.
The sand on the beach
The way they run the front gate. They don't need to lock up during prime hours.
The weather
The weather!!
Too many enforcement officers hanging around.
Too many people
Too many people into the park, Nevada should have preference. Should rise price for non-residents, should have monthly or weekly po..*(script cut off)…*easier to load a boat here.
Too many pine needles in sand
Topless
Umbrellas only - not big canopies on beach
Unfortunately, this will be our last visit with a boat. the launch fee is too expensive.
Update boat ramp to allow most boat's ability to launch without going off the cement
Upkeep restroom; lower entrance fee
Wait at gate when there is still available parking

Waitress on the beach
Walk-ins get to come in free
Warm up the water a little
Warmer water
Warmer water
Warmer water
Warmer water
Warmer water
Warmer water
Warmer water (smiley face drawn), maybe people cleaning up.
Warmer water (smiley face drawn).
Warmer water!
Water level
We love it but do adapt to accommodate the crowds and parking issues.
We need more parking so more people can use the beach. Possible bus transport with areas for storage of beach equipment might help. Say during July and August on weekends. We love Sand Harbor.
We would love the sun!
Working drinking fountains, soap in the bathrooms.
Wow, the cost $18 to enter but then $45 to check water craft on our first visit - no wonder it's not crowded.
Year round 80 degree weather! Other possibility - beach waiters! Note: unfortunately people are not picking up after themselves…*(illegible)*…..trash on the beach and lake

Memorial Point Visitor Survey

June 13 – September 6, 2010

(n = 145)

Q 1. Is this your first visit to Memorial Point?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	108	74.5	74.5	74.5
	no	37	25.5	25.5	100.0
	Total	145	100.0	100.0	

***If no,* about how many time have you visited in the past 12 months?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	3	2.1	9.4	9.4
	1	11	7.6	34.4	43.8
	2	6	4.1	18.8	62.5
	3	6	4.1	18.8	81.2
	4	1	.7	3.1	84.4
	6	3	2.1	9.4	93.8
	10	1	.7	3.1	96.9
	12	1	.7	3.1	100.0
	Total	32	22.1	100.0	
Missing	No response	5	3.4		
	First Visit	108	74.5		
	Total	113	77.9		
Total		145	100.0		

		Visits past 12 months
N	Valid	32
	Missing	113
	Mean	2.66
	Median	2.00

Q 2. How many people are in your group today?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	7	4.8	4.8	4.8
	2	78	53.8	53.8	58.6
	3	21	14.5	14.5	73.1
	4	19	13.1	13.1	86.2
	5	6	4.1	4.1	90.3
	6	5	3.4	3.4	93.8
	7	3	2.1	2.1	95.9
	8	2	1.4	1.4	97.2
	11	1	.7	.7	97.9
	17	1	.7	.7	98.6
	18	1	.7	.7	99.3
	26	1	.7	.7	100.0
	Total	145	100.0	100.0	

		Group size
N	Valid	145
	Missing	0
	Mean	3.25
	Median	2.00

Q3. How many vehicles did your group use to come to Memorial Point?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	133	91.7	91.7	91.7
	2	7	4.8	4.8	96.6
	3	2	1.4	1.4	97.9
	4	2	1.4	1.4	99.3
	5	1	.7	.7	100.0
	Total	145	100.0	100.0	

		Number of vehicles
N	Valid	145
	Missing	0
	Mean	1.14
	Median	1.00

Q 4. About how much time will you spend at Memorial Point today? (minutes)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	.7	.7	.7
	5	5	3.4	3.5	4.2
	7	1	.7	.7	4.9
	10	19	13.1	13.2	18.1
	15	15	10.3	10.4	28.5
	20	46	31.7	31.9	60.4
	25	1	.7	.7	61.1
	30	27	18.6	18.8	79.9
	35	1	.7	.7	80.6
	40	1	.7	.7	81.2
	45	2	1.4	1.4	82.6
	50	1	.7	.7	83.3
	60	12	8.3	8.3	91.7
	90	1	.7	.7	92.4
	120	5	3.4	3.5	95.8
	160	1	.7	.7	96.5
	180	1	.7	.7	97.2
	240	3	2.1	2.1	99.3
	360	1	.7	.7	100.0
	Total	144	99.3	100.0	
Missing	No response	1	.7		
Total		145	100.0		

		Time spend on site (minutes)
N	Valid	144
	Missing	1
	Mean	36.45
	Median	20.00

Note: Some of the 11 visitors who reported spending from 2 to 6 hours at Memorial Point may have responded in regards to time spent at Sand Harbor, not Memorial Point. Five of the11 indicated (in their response to question 10) that they had visited or intended to visit Sand Harbor that day.

Q 5. Did you use the trails or go to the shoreline during this visit to Memorial Point?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	104	71.7	73.8	73.8
	no	37	25.5	26.2	100.0
	Total	141	97.2	100.0	
Missing	No response	4	2.8		
Total		145	100.0		

Q 6. Are the current recreation facilities (e.g., restrooms, trails, etc.) provided at Memorial Point adequate to meet your needs?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	127	87.6	92.0	92.0
	no	11	7.6	8.0	100.0
	Total	138	95.2	100.0	
Missing	No response / NA	7	4.8		
Total		145	100.0		

If no, please explain:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	[No explanation provided]	1	.7	9.1	9.1
	Bathrooms need to be updated	1	.7	9.1	18.2
	Closed for repairs	1	.7	9.1	27.3
	Maybe a few more bathrooms	1	.7	9.1	36.4
	Restroom under renovation	1	.7	9.1	45.5
	Restrooms are closed	1	.7	9.1	54.5
	Restrooms closed	2	1.4	18.2	72.7
	Restrooms not open	1	.7	9.1	81.8
	Spider webs, dirty, dark, scary	1	.7	9.1	90.9
	The one (restroom) is closed for the season	1	.7	9.1	100.0
	Total	11	7.6	100.0	
Missing	[“Yes” or no response to Q 6]	134	92.4		
Total		145	100.0		

Q 7. Please indicate the degree of concern you may feel about the parking issues below.

Getting a parking space:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not a problem	99	68.3	68.3	68.3
	Slight problem	22	15.2	15.2	83.4
	Moderate problem	16	11.0	11.0	94.5
	Serious problem	3	2.1	2.1	96.6
	Very serious problem	5	3.4	3.4	100.0
	Total	145	100.0	100.0	

Unsafe parking conditions along SR-28:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not a problem	77	53.1	56.6	56.6
	Slight problem	18	12.4	13.2	69.9
	Moderate problem	24	16.6	17.6	87.5
	Serious problem	7	4.8	5.1	92.6
	Very serious problem	10	6.9	7.4	100.0
	Total	136	93.8	100.0	
Missing	No response	9	6.2		
Total		145	100.0		

Q 8. What is the postal Zip Code of your primary residence?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	01784	1	.7	.8	.8
	07307	1	.7	.8	1.5
	08844	1	.7	.8	2.3
	15088	1	.7	.8	3.0
	15486	1	.7	.8	3.8
	17055	1	.7	.8	4.5
	19061	1	.7	.8	5.3
	20613	1	.7	.8	6.0
	23135	1	.7	.8	6.8
	25276	1	.7	.8	7.5
	30064	1	.7	.8	8.3
	30078	2	1.4	1.5	9.8
	30662	1	.7	.8	10.5
	32174	1	.7	.8	11.3

32765	1	.7	.8	12.0
33064	1	.7	.8	12.8
33186	1	.7	.8	13.5
33426	1	.7	.8	14.3
33458	1	.7	.8	15.0
34904	1	.7	.8	15.8
47905	1	.7	.8	16.5
48433	1	.7	.8	17.3
55408	1	.7	.8	18.0
59802	1	.7	.8	18.8
61265	1	.7	.8	19.5
61759	1	.7	.8	20.3
66216	1	.7	.8	21.1
68048	1	.7	.8	21.8
72019	1	.7	.8	22.6
72756	1	.7	.8	23.3
74037	1	.7	.8	24.1
75061	1	.7	.8	24.8
77092	1	.7	.8	25.6
78249	1	.7	.8	26.3
78725	1	.7	.8	27.1
79022	1	.7	.8	27.8
80126	1	.7	.8	28.6
80831	1	.7	.8	29.3
81523	1	.7	.8	30.1
83117	1	.7	.8	30.8
84081	2	1.4	1.5	32.3
84107	1	.7	.8	33.1
84405	1	.7	.8	33.8
84790	1	.7	.8	34.6
85425	1	.7	.8	35.3
85629	1	.7	.8	36.1
87521	1	.7	.8	36.8
88888	1	.7	.8	37.6
89410	1	.7	.8	38.3
89411	1	.7	.8	39.1
89423	2	1.4	1.5	40.6
89429	1	.7	.8	41.4
89433	1	.7	.8	42.1

89434	1	.7	.8	42.9
89436	2	1.4	1.5	44.4
89450	1	.7	.8	45.1
89451	1	.7	.8	45.9
89502	1	.7	.8	46.6
89509	1	.7	.8	47.4
89511	6	4.1	4.5	51.9
89512	1	.7	.8	52.6
89523	2	1.4	1.5	54.1
89525	1	.7	.8	54.9
89706	1	.7	.8	55.6
90026	1	.7	.8	56.4
90046	1	.7	.8	57.1
90277	1	.7	.8	57.9
90403	1	.7	.8	58.6
90731	1	.7	.8	59.4
91016	1	.7	.8	60.2
91343	1	.7	.8	60.9
92020	1	.7	.8	61.7
92028	1	.7	.8	62.4
92127	1	.7	.8	63.2
92345	1	.7	.8	63.9
92503	1	.7	.8	64.7
92804	1	.7	.8	65.4
93804	1	.7	.8	66.2
94075	1	.7	.8	66.9
94080	1	.7	.8	67.7
94086	1	.7	.8	68.4
94111	1	.7	.8	69.2
94131	1	.7	.8	69.9
94306	1	.7	.8	70.7
94516	1	.7	.8	71.4
94523	2	1.4	1.5	72.9
94526	1	.7	.8	73.7
94549	1	.7	.8	74.4
94560	1	.7	.8	75.2
94606	3	2.1	2.3	77.4
94945	1	.7	.8	78.2
94949	1	.7	.8	78.9

	95008	1	.7	.8	79.7
	95014	1	.7	.8	80.5
	95054	1	.7	.8	81.2
	95111	1	.7	.8	82.0
	95123	1	.7	.8	82.7
	95124	1	.7	.8	83.5
	95269	1	.7	.8	84.2
	95329	1	.7	.8	85.0
	95603	1	.7	.8	85.7
	95630	1	.7	.8	86.5
	95682	1	.7	.8	87.2
	95683	1	.7	.8	88.0
	95695	1	.7	.8	88.7
	95762	1	.7	.8	89.5
	95811	1	.7	.8	90.2
	95825	1	.7	.8	91.0
	95826	1	.7	.8	91.7
	95901	1	.7	.8	92.5
	95969	1	.7	.8	93.2
	95981	1	.7	.8	94.0
	96145	1	.7	.8	94.7
	96148	1	.7	.8	95.5
	96161	1	.7	.8	96.2
	96532	1	.7	.8	97.0
	97006	1	.7	.8	97.7
	97007	1	.7	.8	98.5
	97203	1	.7	.8	99.2
	97537	1	.7	.8	100.0
	Total	133	91.7	100.0	
Missing	Non-US	9	6.2		
	No response/unclear	3	2.1		
	Total	12	8.3		
Total		145	100.0		

Q 9. Overall, how satisfied are you with your recreation experience during this visit?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very dissatisfied (1)	6	4.1	4.2	4.2
	Dissatisfied (2)	1	.7	.7	4.9
	Neither Dissatisfied or Satisfied (3)	2	1.4	1.4	6.3
	Satisfied (4)	46	31.7	32.2	38.5
	Very Satisfied (5)	88	60.7	61.5	100.0
	Total	143	98.6	100.0	
Missing	No response	2	1.4		
Total		145	100.0		

		How satisfied with visit?
N	Valid	143
	Missing	2
	Mean	4.46
	Median	5.00

Note: Satisfaction responses were recorded in the survey database as follows: Very dissatisfied (1), Dissatisfied (2), Neither Dissatisfied nor Satisfied (3), Satisfied (4), Very Satisfied (5).

Q 10. Have you visited or do you intend to visit Sand Harbor today?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	42	29.0	29.4	29.4
	no	100	69.0	70.6	100.0
	Total	143	97.9	100.0	
Missing	No response/not sure	3	2.1		
Total		145	100.0		

Appendix F
Memorial Point Survey Data Summary

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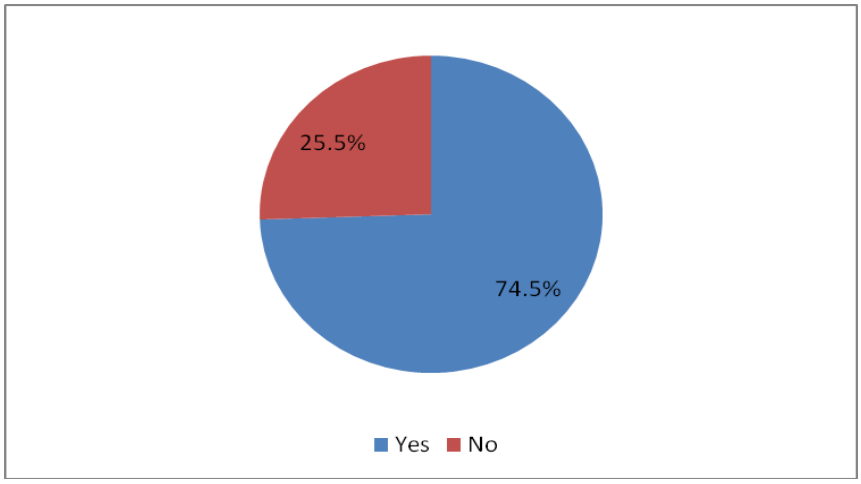
Memorial Point Visitor Survey Summary

A total of 145 visitors completed surveys at Memorial Point between June 13 and September 6, 2010. Summary results from these surveys are provided below by question.

1. Is this your first visit to Memorial Point?

Most visitors (nearly 75 percent) reported that they had never been to Memorial Point prior to their current visit.



If no, about how many times have you visited in the past 12 months?

On average, the visitors who had previously been to Memorial Point made about 3 (2.7) previous visits to the site in the past 12 months. Visitor responses regarding the number of previous visits (in the past 12 months) ranged from 0 to 12 trips. The majority visited from 0 to 2 times.

2. How many people are in your group today?

The average group size at Memorial Point was about 3 (3.2). Visitor responses regarding group size ranged from 1 to 26 and the median group size was 2. Over 80 percent of those surveyed were in groups of 2 to 4 people.

3. How many vehicles did your group use to come to Memorial Point?

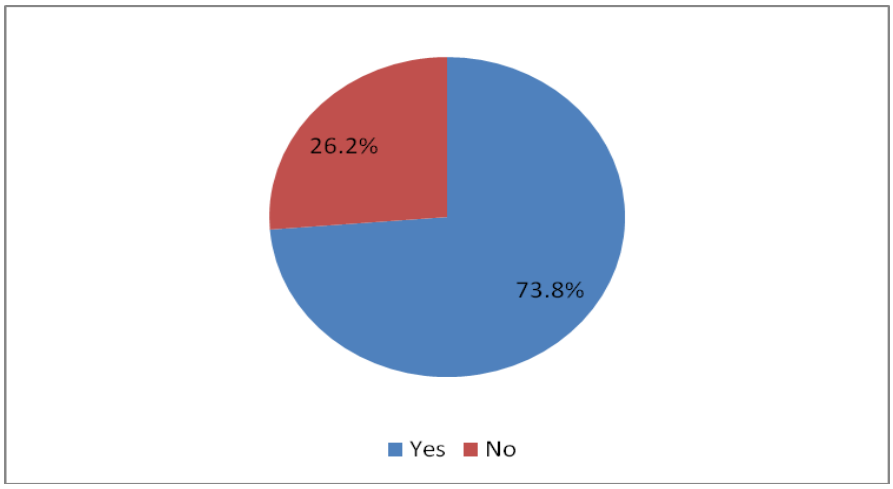
The average number of vehicles used to come to Memorial Point was 1 (1.14); this was also the median. Visitor responses regarding the number of vehicles ranged from 1 to 5, but over 90 percent of groups arrived in one vehicle.

4. About how much time will you spend at Memorial Point today?

On average, visitors to Memorial Point reported spending about 36 minutes at the site. Visitor responses regarding time spent on-site ranged from 2 minutes to 6 hours, with a median of 20 minutes. However, nearly 40 percent of visitors reported spending more than 20 minutes at Memorial Point. (Eleven visitors indicated that they would spend 2 to 6 hours at Memorial Point; some of these may have been responding in regards to time spent at Sand Harbor, not Memorial Point.)

5. Did you use the trails or go to the shoreline during this visit to Memorial Point?

Nearly 74 percent of visitors to Memorial Point reported using the trails or going to the shoreline during their visit.



6. Are the current recreation facilities provided at Memorial Point adequate to meet your needs?

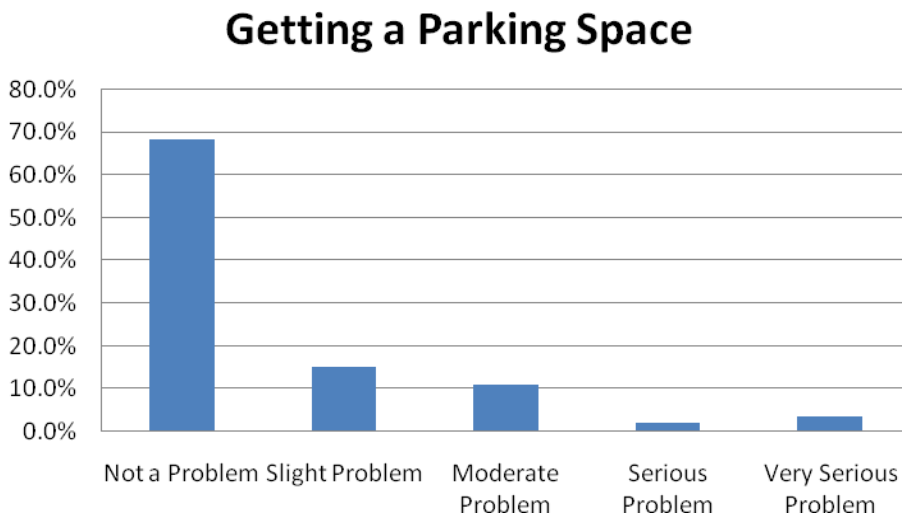
Most visitors (92%) reported that the current recreation facilities at Memorial Point were adequate to meet their needs.

If no, please explain.

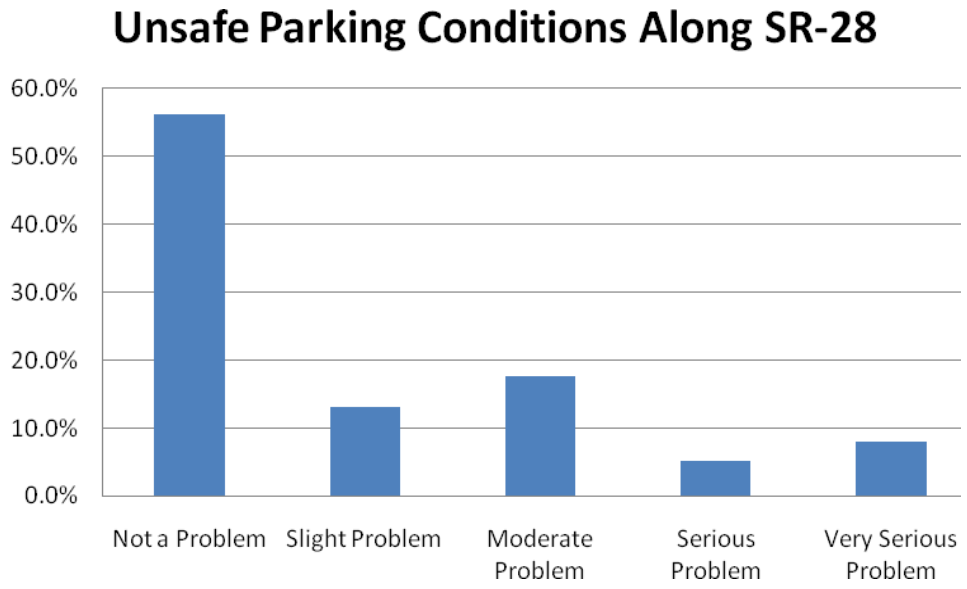
Of the 8 percent of visitors (11 surveys) who did not feel the facilities provided at Memorial Point were adequate, most indicated that the restrooms were closed (7 responses) and the remainder expressed concerns about the condition or cleanliness of the restrooms.

7. Please indicate the degree of concern you may feel about the parking issues below.

Slightly less than 32 percent of visitors indicated a concern or problem (combination of slight, moderate, serious, and very serious problem response categories) with getting a parking space at Memorial Point. However, only about 6 percent of visitors indicated getting a parking space was a serious or very serious problem.



Slightly more than 43 percent of visitors indicated a problem (combination of slight, moderate, serious, and very serious problem response categories) with unsafe parking conditions along SR-28. This includes about 13 percent of visitors who indicated that unsafe parking conditions were a serious or very serious problem.

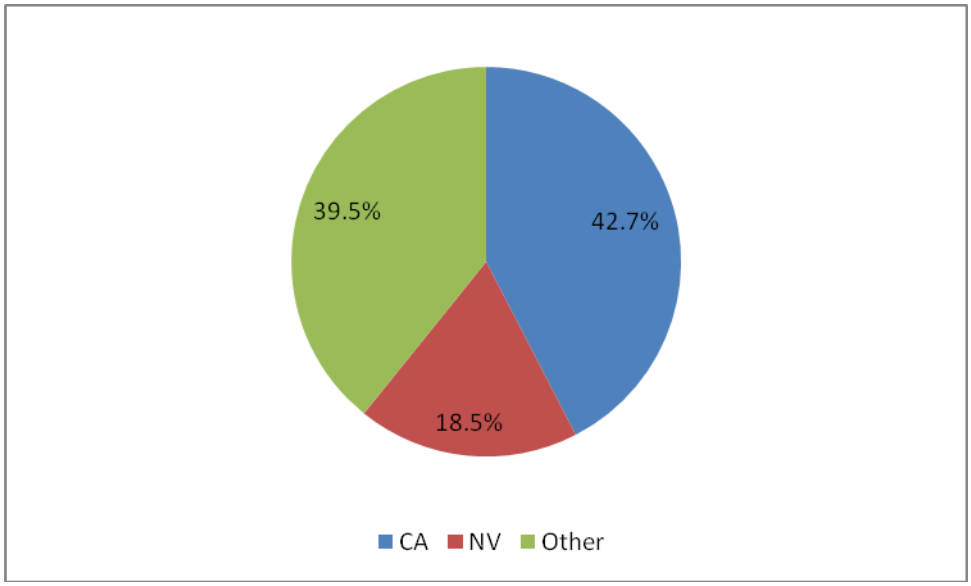


8. What is the postal Zip Code of your primary residence?

Survey participants provided 124 usable US Zip Codes. An additional 9 visitors provided foreign mail codes, including:

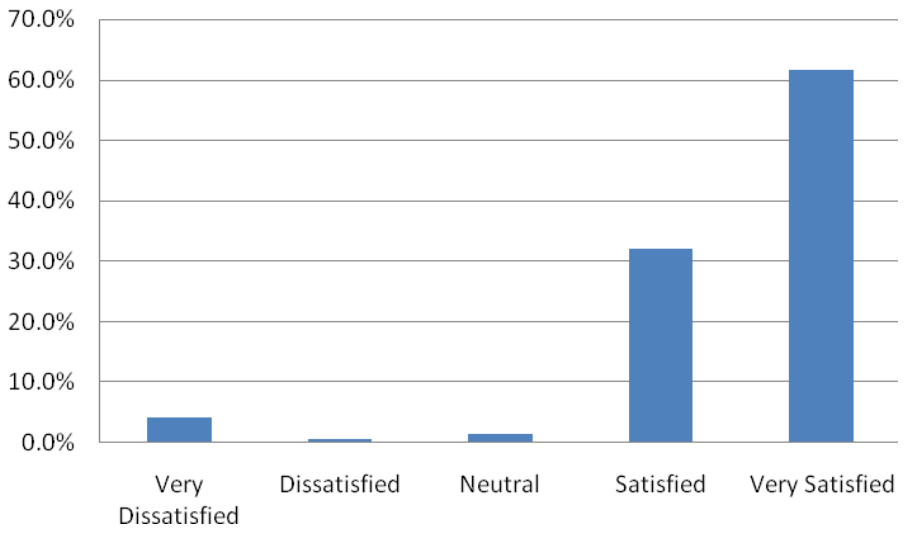
- Belgium
- Canada
- Holland
- France
- Germany
- Russia
- Switzerland

Visitors from California accounted for nearly 43 percent of the completed surveys at Memorial Point (excluding foreign visitors). Visitors from Nevada accounted for slightly less than 19 percent of survey participants. The remaining survey participants (39.5%) came from several states, including: New Jersey, Massachusetts, Oregon, Arizona, Utah, Colorado, Texas, Arkansas, Nebraska, Kansas, Illinois, Montana, Minnesota, Indiana, Florida, Georgia, Maryland, the District of Columbia, Pennsylvania, and Oklahoma.



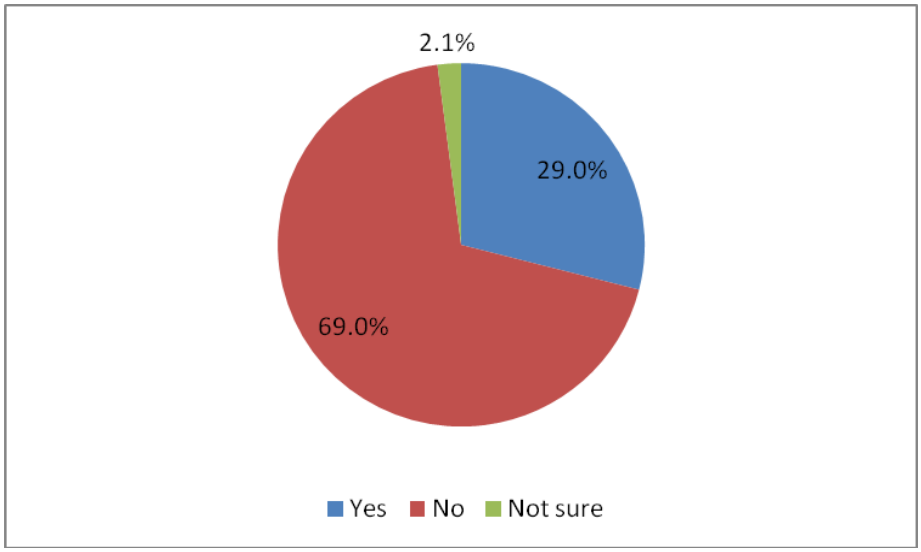
9. Overall, how satisfied are you with your recreation experience during this visit?

Nearly 94 percent of visitors to Memorial Point reported being satisfied (combination of satisfied and very satisfied response categories) with their recreation experience at Memorial Point.



10. Have you visited or do you intend to visit Sand Harbor today?

About 29 percent of visitors to Memorial Point also reported visiting or planning to visit Sand Harbor on the day they were surveyed.



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Appendix G
Lake Tahoe Surface Elevation: 2004, 2006, 2010

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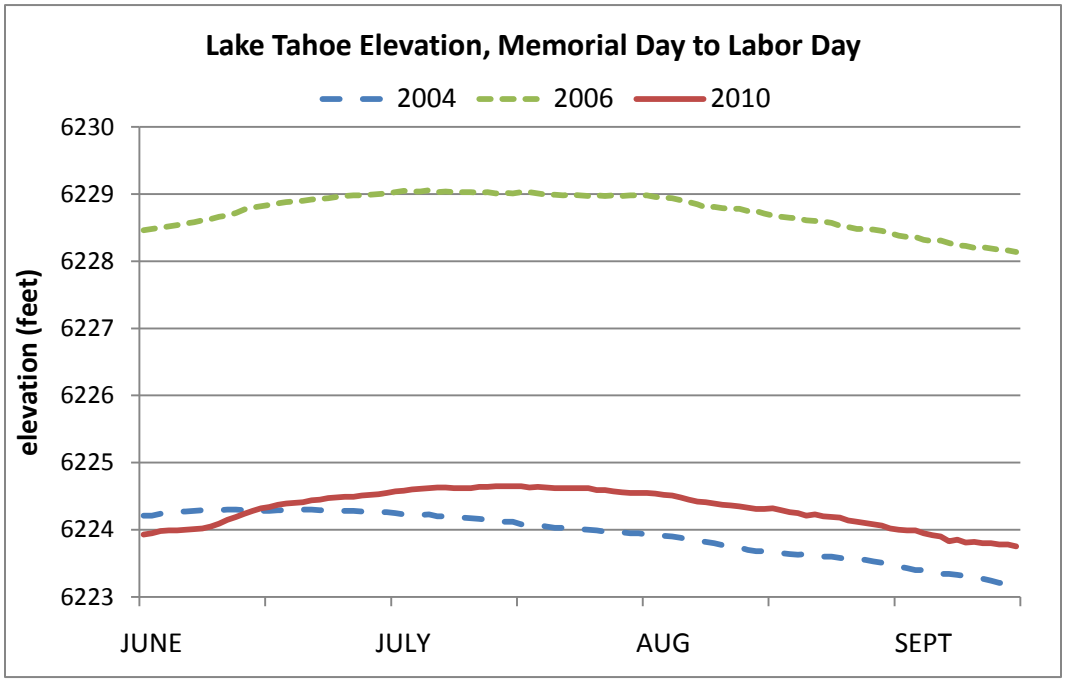
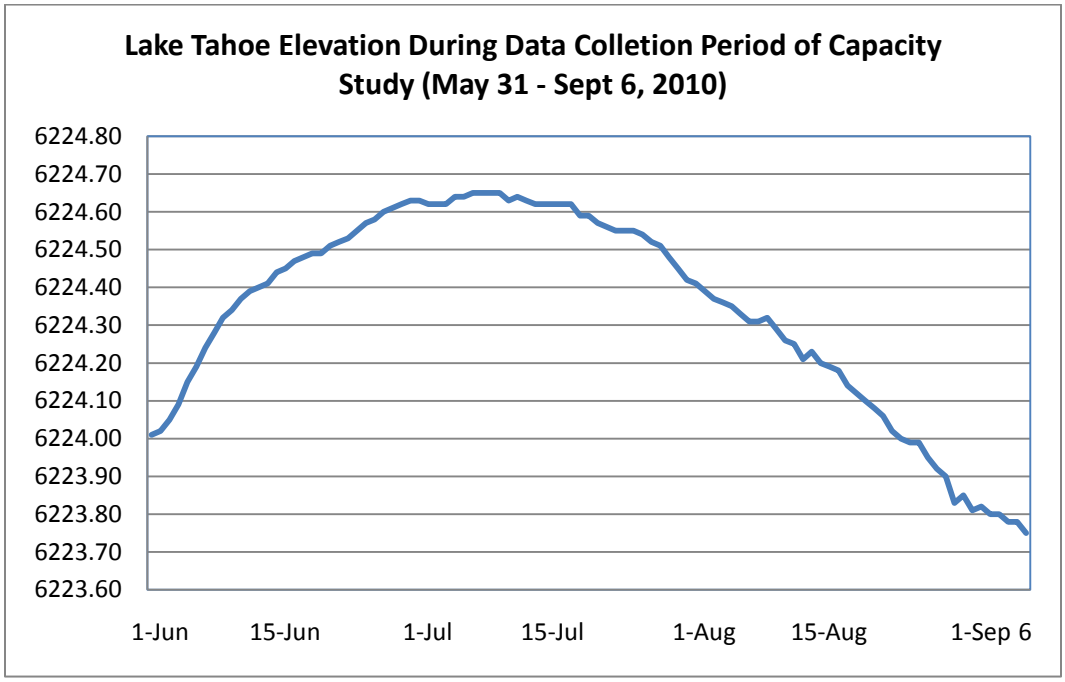
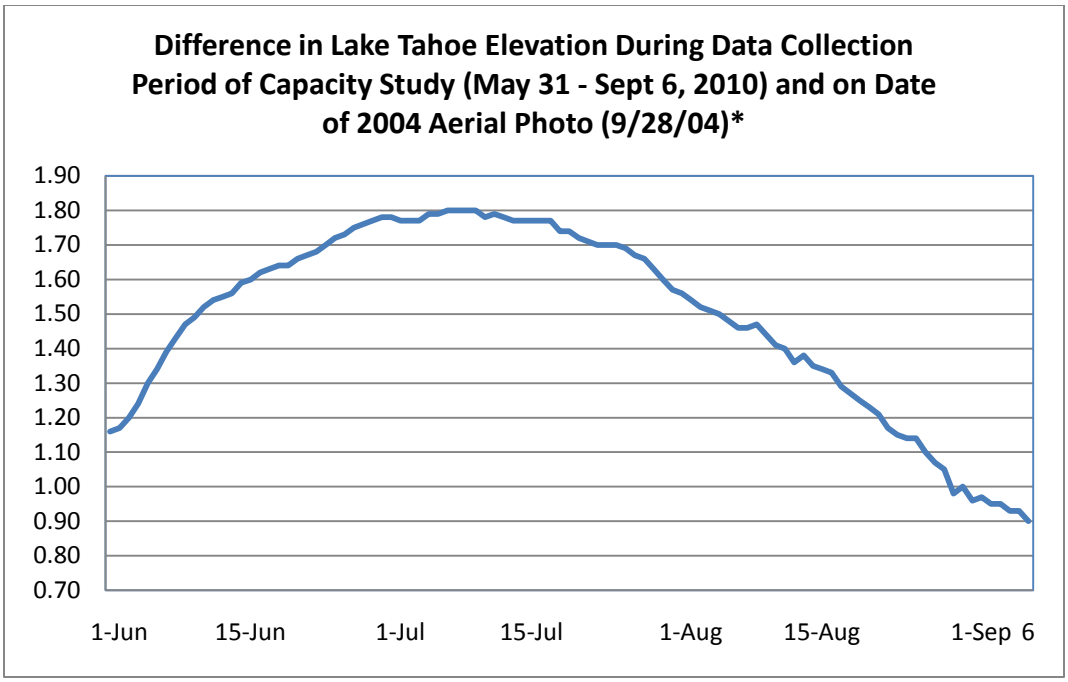
All data in this appendix was obtained from the USGS National Water Information System web interface, gage 10337000 (Lake Tahoe at Tahoe City, CA).



Note: 2004 is used to represent a “low water year” and 2006 is used to represent a “high water year” for the physical capacity portion of this study, specifically regarding calculation of available beach acreage during high and low water conditions.





* Aerial photo taken Sept. 28, 2004 was used in calculation of beach acreage for “low water years” for the physical capacity element of this study.

Appendix H
Visitor Count Data Summary

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Appendix H

Visitor Count Data Summary

The tables in this appendix provide all persons-at-one-time (PAOT) visitor counts obtained by surveyors between May 31 and September 6, 2010 at the four primary use areas studied at Sand Harbor (Main Beach, Family Picnic Area, Diver's Cove, and Boat Ramp), at the Sand Harbor Nature Trail, and at Memorial Point. The count results are listed in the tables in the chronological order that they were obtained for each of the 12 one-hour time periods covered by the field survey schedule. Generally, for the entire survey season, from three to five counts were conducted at each use area during several of the mid-day time periods (mid-morning to mid-afternoon), with fewer counts conducted earlier and later in the day. (Although visitor counts were conducted at each use area on each of the 17 survey days, they are listed in the order obtained rather than by specific date to provide more condensed and readable summary tables than listing by date would allow.)

Because only two counts were conducted at each use area each survey day, following the random selection survey schedule, the first count conducted at a use area during each time period generally did not occur on the same day. For example, at the Main Beach the first count (Count 1) during the 1 to 2 p.m. time period occurred on May 31, while the first count during the 4 to 5 p.m. time period occurred on June 20. The same is true for Counts 2, 3, 4, and 5.

In total, 21 weekend and holiday visitor counts were conducted at all of the Sand Harbor use areas, except at the Boat Ramp where 22 were conducted. In total, 22 visitor weekend and holiday counts were conducted at Memorial Point. Most counts were conducted between 11 a.m. and 5 p.m., the peak use hours at the park.

In total, 12 weekday visitor counts were conducted at all of the Sand Harbor use areas, and at Memorial Point; 10 weekday visitor counts were conducted at the Nature Trail.

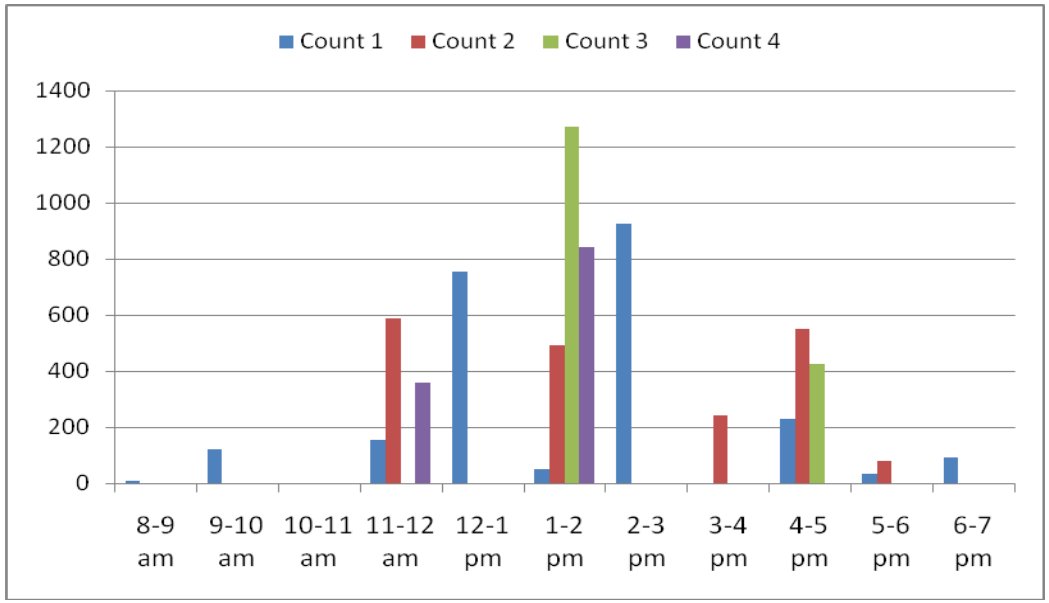
WEEKEND AND HOLIDAY VISITOR COUNTS

Note: Counts shown in **bold** were conducted on the July 4 holiday, the highest use day during the study period. (Memorial Day use levels were low, and Labor Day use levels were not above typical summer weekend levels.)

MAIN BEACH

Count No.[1]	Time Period											
	8-9 a.m.	**9-10 a.m.**	**10-11 a.m.**	**11-12 a.m.**	**12-1 p.m.**	**1-2 p.m.**	**2-3 p.m.**	**3-4 p.m.**	**4-5 p.m.**	**5-6 p.m.**	**6-7 p.m.**	**7-8 p.m.**
Count 1	7	119	152*	156	756	50	927	**500***	230	33	92	
Count 2				587		491		243	548	81		
Count 3				**550***		1272			423	**		
Count 4				360		840						

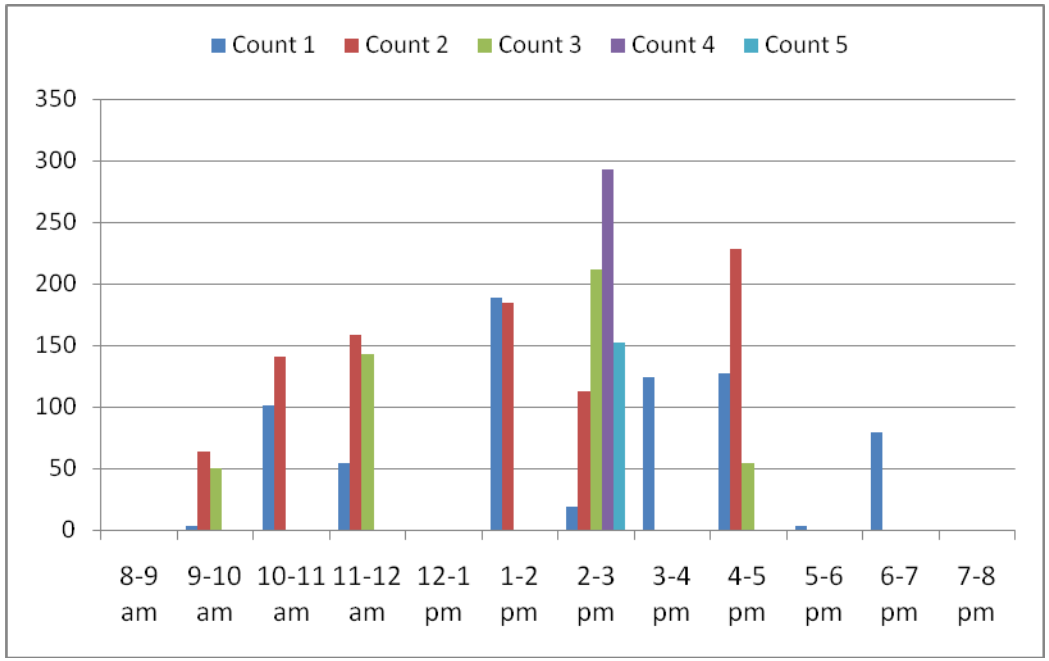
1. Chronological order of count for each time period; Counts 1, 2, 3, and 4 generally occurred on several different days across the range of time periods covered.
* Count covered only 2 of 4 beach zones, due to heavy use; actual use levels were estimated to be 2x these counts.
** Cancelled count due to bad weather.



DIVER'S COVE

Count No.[1]	Time Period											
	8-9 a.m.	**9-10 a.m.**	**10-11 a.m.**	**11-12 a.m.**	**12-1 p.m.**	**1-2 p.m.**	**2-3 p.m.**	**3-4 p.m.**	**4-5 p.m.**	**5-6 p.m.**	**6-7 p.m.**	**7-8 p.m.**
Count 1		3	**101**	54		189	19	124	127	3	79	
Count 2		64	141	158		184	113		228			
Count 3		50		143			**211**		54			
Count 4							293					
Count 5							152					

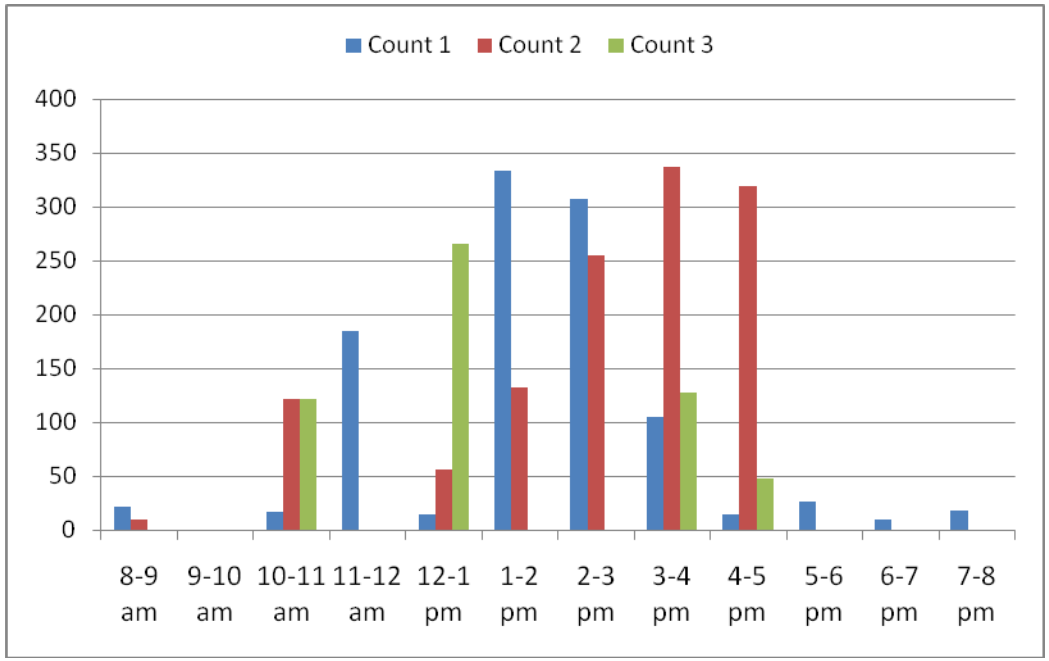
1. Chronological order of count for each time period; Counts 1, 2, 3, and 4 generally occurred on several different days across the range of time periods covered.



BOAT RAMP AREA

Count No.[1]	Time Period											
	8-9 a.m.	**9-10 a.m.**	**10-11 a.m.**	**11-12 a.m.**	**12-1 p.m.**	**1-2 p.m.**	**2-3 p.m.**	**3-4 p.m.**	**4-5 p.m.**	**5-6 p.m.**	**6-7 p.m.**	**7-8 p.m.**
Count 1	22		17	185	14	333	307	105	14	26	9	18
Count 2	10		121		56	132	255	337	**319**			
Count 3			122		**266**			127	48			

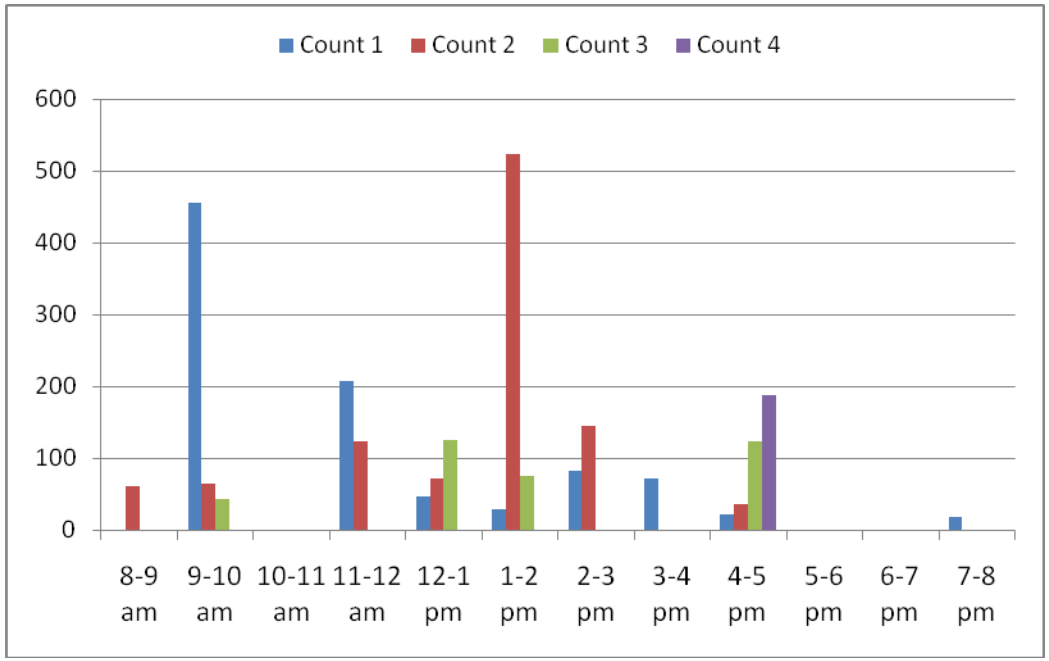
1. Chronological order of count for each time period; Counts 1, 2, 3, and 4 generally occurred on several different days across the range of time periods covered.



FAMILY PICNIC AREA

Count No.[1]	Time Period											
	8-9 a.m.	**9-10 a.m.**	**10-11 a.m.**	**11-12 a.m.**	**12-1 p.m.**	**1-2 p.m.**	**2-3 p.m.**	**3-4 p.m.**	**4-5 p.m.**	**5-6 p.m.**	**6-7 p.m.**	**7-8 p.m.**
Count 1	0	**456**		207	46	28	82	72	22			18
Count 2	60	65		123	72	**524**	144		35			
Count 3		43			125	75			124			
Count 4									187			

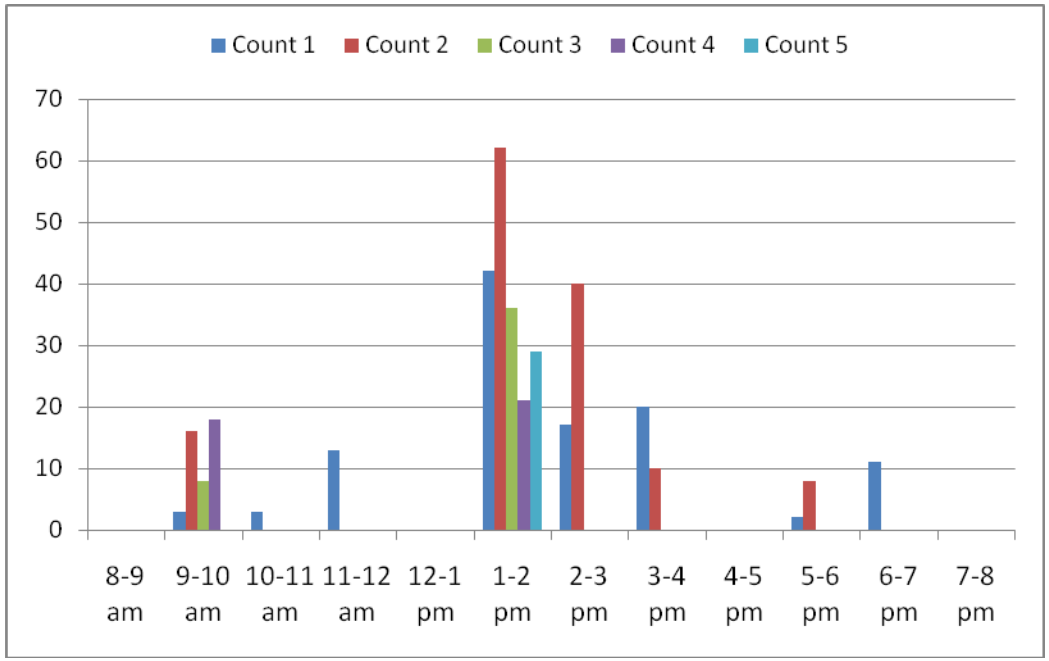
1. Chronological order of count for each time period; Counts 1, 2, 3, and 4 generally occurred on several different days across the range of time periods covered.



NATURE TRAIL

Count No.[1]	Time Period											
	8-9 a.m.	**9-10 a.m.**	**10-11 a.m.**	**11-12 a.m.**	**12-1 p.m.**	**1-2 p.m.**	**2-3 p.m.**	**3-4 p.m.**	**4-5 p.m.**	**5-6 p.m.**	**6-7 p.m.**	**7-8 p.m.**
Count 1		3	3	13		42	17	20		2	11	
Count 2		**16**				62	40	10		8		
Count 3		8				**36**				0		
Count 4		18				21				0		
Count 5						29						

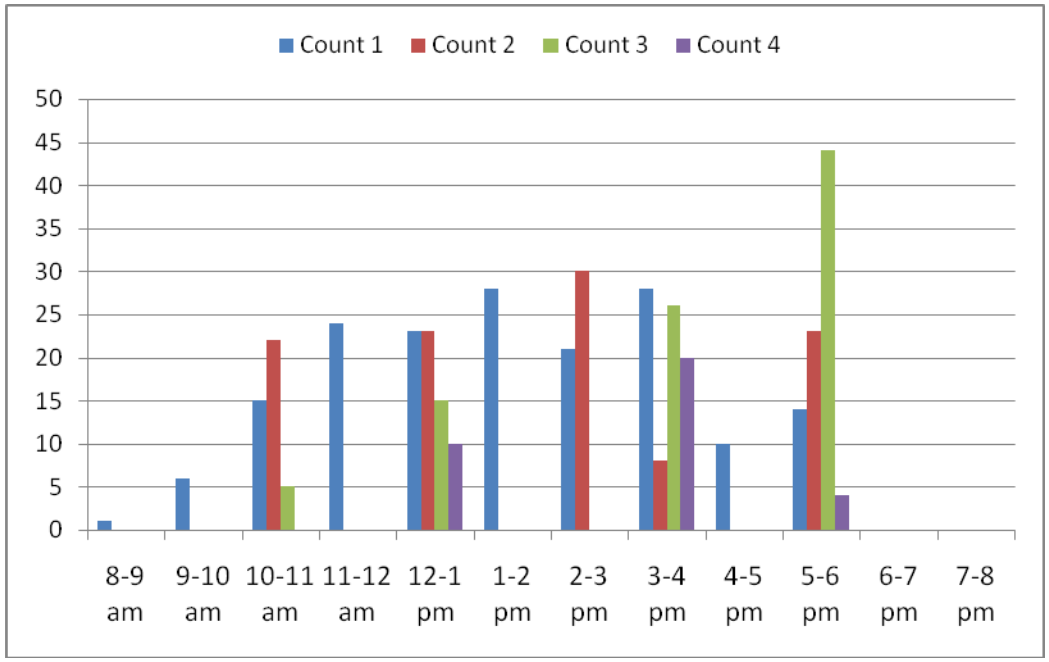
1. Chronological order of count for each time period; Counts 1, 2, 3, and 4 generally occurred on several different days across the range of time periods covered.



MEMORIAL POINT

Count No.[1]	Time Period											
	8-9 a.m.	**9-10 a.m.**	**10-11 a.m.**	**11-12 a.m.**	**12-1 p.m.**	**1-2 p.m.**	**2-3 p.m.**	**3-4 p.m.**	**4-5 p.m.**	**5-6 p.m.**	**6-7 p.m.**	**7-8 p.m.**
Count 1	1	6	**15**	24	23	28	21	28	10	14		
Count 2			22		23		**30**	8		23		
Count 3			5		15			26		44		
Count 4					10			20		4		

1. Chronological order of count for each time period; Counts 1, 2, 3, and 4 generally occurred on several different days across the range of time periods covered.



WEEKDAY VISITOR COUNTS

MAIN BEACH

Count No.[1]	Time Period											
	8-9 a.m.	9-10 a.m.	10-11 a.m.	11-12 a.m.	12-1 p.m.	1-2 p.m.	2-3 p.m.	3-4 p.m.	4-5 p.m.	5-6 p.m.	6-7 p.m.	7-8 p.m.
Count 1	0	21		187*		215			430	48		
Count 2		6				69			188*	134		
Count 3						909						
Count 4						434						

1. Chronological order of count for each time period; Counts 1, 2, 3, and 4 generally occurred on several different days across the range of time periods covered.
* Count covered only 2 of 4 beach zones; actual use level was estimated to be 2x these counts.

DIVER'S COVE

Count No.[1]	Time Period											
	8-9 a.m.	9-10 a.m.	10-11 a.m.	11-12 a.m.	12-1 p.m.	1-2 p.m.	2-3 p.m.	3-4 p.m.	4-5 p.m.	5-6 p.m.	6-7 p.m.	7-8 p.m.
Count 1			0	32			307	43	24			93
Count 2			71	118			255	251				
Count 3			78					96				

1. Chronological order of count for each time period; Counts 1, 2 and 3 generally occurred on several different days across the range of time periods covered.

BOAT RAMP AREA

Count No.[1]	Time Period											
	8-9 a.m.	9-10 a.m.	10-11 a.m.	11-12 a.m.	12-1 p.m.	1-2 p.m.	2-3 p.m.	3-4 p.m.	4-5 p.m.	5-6 p.m.	6-7 p.m.	7-8 p.m.
Count 1	2			2	50	168		3	35		83	
Count 2				101		223		208	48			
Count 3				71								

1. Chronological order of count for each time period; Counts 1, 2 and 3 generally occurred on several different days across the range of time periods covered.

FAMILY PICNIC AREA

Count No.[1]	Time Period											
	8-9 a.m.	9-10 a.m.	10-11 a.m.	11-12 a.m.	12-1 p.m.	1-2 p.m.	2-3 p.m.	3-4 p.m.	4-5 p.m.	5-6 p.m.	6-7 p.m.	7-8 p.m.
Count 1	0	0	9		23	14	0			10	0	
Count 2						19	4				7	
Count 3						10						

1. Chronological order of count for each time period; Counts 1, 2 and 3 generally occurred on several different days across the range of time periods covered.

NATURE TRAIL

Count No.[1]	Time Period											
	8-9 a.m.	9-10 a.m.	10-11 a.m.	11-12 a.m.	12-1 p.m.	1-2 p.m.	2-3 p.m.	3-4 p.m.	4-5 p.m.	5-6 p.m.	6-7 p.m.	7-8 p.m.
Count 1		3	2			8	13	5		12	22	
Count 2			8			24		35				
Count 3												

1. Chronological order of count for each time period; Counts 1, 2 and 3 generally occurred on several different days across the range of time periods covered.

MEMORIAL POINT

Count No.[1]	Time Period											
	8-9 a.m.	9-10 a.m.	10-11 a.m.	11-12 a.m.	12-1 p.m.	1-2 p.m.	2-3 p.m.	3-4 p.m.	4-5 p.m.	5-6 p.m.	6-7 p.m.	7-8 p.m.
Count 1		15	17	8	19	12	23	15		20		
Count 2			5					8		13		
Count 3			13									

1. Chronological order of count for each time period; Counts 1, 2, and 3 generally occurred on several different days across the range of time periods covered.

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Appendix I
SR 28 Shoulder Parking Usage Data Summary

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APPENDIX I
SR 28 SHOULDER PARKING USAGE DATA SUMMARY

These tables provide the results of counts of vehicles parked along SR 28 in the vicinity of Sand Harbor and Memorial Point. The counts covered an approximately 1.4 mile segment of the highway: between Memorial Point and the Sand Harbor main entrance (0.75 miles) and between the main entrance and a shoulder parking area adjacent to the Spooner pump station (0.67 miles to the south of the main entrance).

Counts were conducted between Memorial Day and Labor Day, 2010. Surveyors conducted two counts of vehicles along SR 28 each survey day, typically one in the late morning and one in the late afternoon.

Weekend and holiday counts are in the shaded rows of the tables.

(In recent years, TRPA and TMPO have conducted parked vehicle counts on one August weekday and weekend day along the entire SR 28 east shore corridor, as an element of the Mobility 2030 Transportation Monitoring Program. Three of the count zones overlap but are more extensive than the SR 28 segment that was the focus of counts for this study; therefore, the results are not directly comparable. However, the TRPA/TMPO counts generally confirm the study counts.)

ALL COUNTS			
Date	**Day**	**Start time**	**Count**
May 31	Monday (holiday)	2:05 p.m.	3
		6:05 p.m.	1
June 13	Sunday	11:00 a.m.	7
		4:00 p.m.	25
June 16	Wednesday	8:00 a.m.	0
		1:00 p.m.	2
June 20	Sunday	8:00 a.m.	0
		1:00 p.m.	14
June 25	Friday	11:00 a.m.	0
		4:00 p.m.	4
June 26	Saturday	11:00 a.m.	5
		4:00 p.m.	48
July 4	Sunday (holiday)	11:00 a.m.	87
		1:00 p.m.	139
July 12	Monday	11:00 a.m.	6
		4:00 p.m.	27
July 17	Saturday	11:00 a.m.	43
		4:00 p.m.	143
July 20	Tuesday	11:30 a.m.	19
		4:00 p.m.	21
July 25 (see note below)	Sunday	11:00 a.m.	17
		4:10 p.m.	53
August 4	Wednesday	11:00 a.m.	6
		4:00 p.m.	41
August 7	Saturday	11:00 a.m.	47
		4:00 p.m.	138
August 8	Sunday	10:00 a.m.	12
		3:00 p.m.	90
August 21	Saturday	11:00 a.m.	7
		4:00 p.m.	5
August 26	Thursday	11:00 a.m.	11
		4:00 p.m.	16
September 6	Monday (holiday)	12:00 p.m.	14
		5:00 p.m.	16

July 25 - Heavy thunderstorm from 5:00 to 6:30 p.m. may have substantially reduced park attendance and thus parking along SR 28 during that afternoon in advance of the bad weather and during/after storm.

WEEKEND/HOLIDAY ONLY			
Date	**Day**	**Start time**	**Count**
May 31	Monday (holiday)	2:05 p.m.	3
		6:05 p.m.	1
June 13	Sunday	11:00 a.m.	7
		4:00 p.m.	25
June 20	Sunday	8:00 a.m.	0
		1:00 p.m.	14
June 26	Saturday	11:00 a.m.	5
		4:00 p.m.	48
July 4	Sunday (holiday)	11:00 a.m.	87
		1:00 p.m.	139
July 17	Saturday	11:00 a.m.	43
		4:00 p.m.	143
July 25	Sunday	11:00 a.m.	17
		4:10 p.m.	53
August 7	Saturday	11:00 a.m.	47
		4:00 p.m.	138
August 8	Sunday	10:00 a.m.	12
		3:00 p.m.	90
August 21	Saturday	11:00 a.m.	7
		4:00 p.m.	5
September 6	Monday (holiday)	12:00 a.m.	14
		5:00 p.m.	16
Average - AM counts			23.9
Average - PM counts			56.3
Maximum			143

WEEKEND/HOLIDAY – P.M. ONLY (deleted Memorial Day due to cool weather/very low activity)			
Date	**Day**	**Start time**	**Count**
June 12	Sunday	4:00 p.m.	25
June 20	Sunday	1:00 p.m.	14
June 26	Saturday	4:00 p.m.	48
July 4	Sunday (holiday)	1:00 p.m.	139
July 17	Saturday	4:00 p.m.	143
July 25	Sunday	4:10 p.m.	53
August 7	Saturday	4:00 p.m.	138
August 8	Sunday	3:00 p.m.	90
August 21	Saturday	4:00 p.m.	5
September 6	Monday (holiday)	5:00 p.m.	16
Average			67.1
Maximum			143

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Appendix J
Comprehensive Ecological Impact Assessment Information

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APPENDIX J – Ecological Capacity Assessment: Comprehensive Description of Ecological Impact Variables Assessed, and Ecological Impacts Observed at Sand Harbor and Memorial Point

1 Description of Ecological Impact Variables Assessed

The following sections describe ecological impact variables evaluated under each identified area of impact and the specific criteria used to determine the intensity of each impact.

Soil Impacts

Soil Erosion

Soil erosion is the loss of soil that often results from the loss of stabilizing organic material. Erosion is most often caused by wind or water; however, recreational activities may increase erosion by trampling plants, which ultimately results in removing vegetation that stabilizes the soil. Soil erosion is typically a permanent loss from the site that will not “recover” during the off season. The most serious concern regarding erosion is the formation of gullies (i.e., channeling) that may spread and cause an area to lose valuable topsoil, the undermining of hardened surfaces (e.g., down cutting) that can destabilize and lead to the deterioration of these surfaces, and root exposure of stabilizing shrubs and trees that may result in further vegetation losses and erosion propagation. Although Sand Harbor and Memorial Point are highly developed recreation sites that include extensive hardened surfaces to minimize these effects (e.g., paved trails, paved parking areas, and boardwalks), high levels of use still occur on beaches and other bare ground throughout the study area. Recreational use outside of hardened areas has generally been allowed to maintain the dispersed recreation visitor experience. However, due to the increasing levels of visitation experienced in recent decades at Sand Harbor and Memorial Point, impacts related to soil erosion are becoming an increasing concern. Within the study area, erosion is found along the upper extent of beaches, at dispersed recreational access points off of hardened paths and surfaces, along user-created trails, and in areas where soil compaction occurs adjacent to shoreline areas affected by wave action. Generally, beach erosion and stability are the major concerns, as well as the loss of stabilizing dune vegetation. Erosion observed within the study area may not be entirely caused by visitor use, but appears to be exacerbated by that use.

To characterize the magnitude and status of soil erosion impacts in each use area, each use area was walked on foot, all observed sites of erosion were mapped, and locations were recorded in a handheld global positioning system (GPS) unit. Erosion at each site was identified as being associated with paved or otherwise hardened pathways, user-created dirt trails or related areas of soil compaction, or vegetation (i.e., trees). Additionally, the length of the erosion site (along associated pathways or other features) and depth of soil loss were recorded.

Soil Compaction

Soil compaction causes an increase in soil density (the amount of soil particles remains the same, but soil volume decreases as pore space within the soil diminishes) that often decreases its ability to absorb water. Soil compaction can also lead to erosion; compaction and erosion can expose the roots of trees and shrubs (compaction and erosion reduce the depth of the soil profile, which can expose tree roots), which can lead to vegetation stress. Compaction also reduces aeration of the soil, which can limit root function and development and also lead to vegetation stress. Vegetation stress can have negative effects on plant vigor (including mortality and subsequent loss of vegetation) and can also increase plant susceptibility to pathogenic organisms (see *Vegetation Impacts*, below, for impact variables related to this topic). Compaction can also inhibit seed germination and subsequent vegetation recruitment.

Soil compaction in the study area is caused by heavy trampling in concentrated use areas and along user-created trails. Areas with the greatest concerns of compaction related to concentrated use include the Group Use Area and Family Picnic Area. Areas with the most extensive development of user-created trails include the Family Picnic Area, portions of Sandy Point and Diver's Cove, and Memorial Point. Site recovery from soil compaction can occur to some extent in the off season as frost, rain, or non-use may allow for soil density to decrease (soil volume increases as pore space within the soil is restored); however, repeated annual use and heavy snow loads throughout much of the off-season may limit this type of recovery in the study area.

To characterize the magnitude and status of soil compaction impacts in each use area, areas of obvious compaction related to repeated concentrated use were mapped and general conditions in the area of impact were recorded, including approximate area, substrate and extent of soil surface hardening, and evidence of related vegetation damage (e.g., exposed roots) or erosion. Additionally, all user-created trails accessible from paved or otherwise hardened surfaces were mapped and any related erosion was noted.

Vegetation Impacts

Loss of Ground Cover

Loss of ground cover at recreation sites typically results from use of hardened surfaces that crushes vegetation, either by off-road vehicle use or vegetation trampling from excessive foot traffic. Activities that repeatedly crush vegetation typically lead to plant mortality and the loss of vegetative ground cover. The loss of ground cover often facilitates increased access to and use of impacted areas which can lead to further vegetation trampling and loss of ground cover in adjacent areas. The high levels of use and trampling that cause ground cover loss also often result in soil compaction and subsequent erosion (see *Soil Impacts*, above, for a discussion of effects of soil compaction and erosion). Initially small losses in ground cover can quickly expand into much larger areas of impact if not addressed. Ground cover losses in the study area are primarily the result of concentrated foot traffic in some areas and a dispersed network of user-created trails. Primary concerns related to these impacts are the loss of stabilizing vegetative

cover along beaches and dunes, loss of forest understory cover and impacts on forest health, and loss of unique mature oak scrub habitat near Diver's Cove.

To characterize the magnitude and status of ground cover loss in each use area, ground covering vegetation was measured in one of two ways. For use areas comprising sandy beaches (e.g., Main Beach and Boat Ramp Area/Boater's Beach), vegetation cover was measured as the proportion of the shoreline length with stabilizing ground cover vegetation present at any point along the back of the beach. For use areas not associated with sandy beaches (Sandy Point, Family Picnic Area, and Memorial Point) vegetation cover was estimated using transects or visual estimations at three locations throughout the use area. In general, at least one of the three sampled locations was selected to be representative of "un-impacted" areas of vegetative cover in the respective use area and at least one was selected to be representative of "impacted" areas with evidence of ground cover loss due to recreation use. For the Diver's Cove and Group Use Area, both methods were conducted, with the shoreline approach used along the beach at Diver's Cove and the three-sample estimation approach used in the Group Use Area adjacent to the pavilion and Rocky Point.

Dwarf Mistletoe Infestation of Conifers

Dwarf mistletoe (*Arceuthobium* spp.*)* is an obligate parasitic plant that infects only conifers (Adams 1991); most dwarf mistletoes have a single preferred host species but some may infect a group of related species (Muir and Geils 2002). The primary effects on conifers include reduced vigor and growth, distorted growth (e.g., witches brooms), and increased susceptibility to secondary stressors. Dwarf mistletoe can cause either a localized or systemic infection, or both; localized infections typically result in a single plant growing from a swollen portion of the branch, whereas a systemic infection results in shoots arising throughout the entire infected branch (Adams 1991). Systemic infections often cause witches brooms, the dense proliferation of foliage on infected limbs which can be used as a visual tool for identifying infected trees. However, infected trees may not show visual signs of infection for several years. Mistletoes increase the host plant's need for water and nutrients and can reduce their ability to deal with additional stresses such as attacks by bark beetles, other diseases, or drought. Conversely, trees that are already compromised by drought, high levels of use (soil compaction), or other natural or anthropogenic impacts may be more susceptible to mistletoe infestations (Scharpf et al. 1988). Dwarf mistletoe infestations are not typically eradicated from a stand but can be managed to reduce impacts through limbing and/or selective removal of seriously damaged trees. Some pine species are known to be resistant to mistletoe infestation; however, the degree of resistance/susceptibility can vary widely among individuals of the same species. Dwarf mistletoe infestation is of concern throughout the study area. Areas of greatest concern occur in the southernmost areas of Sand Harbor (Family Picnic, Main Beach, and Sandy Point use areas) where extensive limbing has occurred as a control measure in recent years.

To characterize the magnitude and status of dwarf mistletoe infestation in each use area, the number of trees observed with evidence of mistletoe infestations (e.g., mistletoe visible on branches, witches brooms present) were counted while walking along the primary paved pathway or along beaches of each use area and the Hawksworth dwarf mistletoe rating (State

Parks 2010)[1], a standardized method for rating infestations, was recorded for each infected tree (or as an average rating across all infected trees). This survey does not constitute a complete stand survey for dwarf mistletoe, but was intended to provide a relative index of infestation across use areas.

Root Exposure

The exposure of roots in trees and shrubs within the study area is caused by erosion. Erosion can result from wave action along the shoreline or as a result of run-off events in combination with the loss of stabilizing ground cover or organic materials surrounding the base of trees and shrubs. Root exposure can increase water loss and cause water stress on the affected tree or shrub, can cause root damage due to exposure to the hot sun and other climatic variables, and can undermine the structural integrity of the affected plant. All of these factors can affect tree growth and vigor, potentially making the tree less resilient to disease or drought, or otherwise cause premature loss of the tree or shrub. While some level of root exposure may be sustainable without consequence, recovery from root exposure is not likely to occur naturally. Measures such as mulching around the roots, educating visitors about impacts, and/or excluding uses in particular areas of concern can be effective at reducing impacts to trees and shrubs.

To characterize the magnitude and status of root exposure impacts on trees in each use area, the number of trees observed with exposed roots was counted and the depth of exposure (i.e., soil erosion) was recorded while walking along the primary paved pathway or along the beaches of each use area.

Pine Forest Recruitment

Forest recruitment is critical for the long-term persistence of forests; it is responsible for the development of the future forest canopy and creates structural diversity important to wildlife. A reduction in the recruitment of trees in forests could result in changes to forest character (e.g., relative openness/seclusion), stand structure, microclimate (e.g., degree of shading/cooling), and composition; a complete lack of recruitment would ultimately result in the conversion of forest to non-forest over time. Additionally in the Sierra Nevada, the history of fire suppression has led to the increased prevalence of fir species in the understory and concern over recruitment of fire resistant pine forest. In the study area, the recruitment of pine trees in the shorezone is also important for long-term soil and beach stability and for perching and nesting sites of osprey and wintering bald eagle. Pine tree recruitment may be affected by numerous factors acting throughout the recruitment process from seed production through maturation and senescence, including both natural and anthropogenic factors of influence. Factors that could affect pine forest recruitment in the study area include understory trampling and soil compaction caused by high levels of recreation and competition for resources with understory white fir.

[1] To determine the dwarf mistletoe rating the level of infection is visually estimated in the lower, mid, and upper crown. For each crown portion, no infection=0; less than half the branches infected= 1; and more than half the branches infected=2 (any portion of the crown with a broom=2). The level of infection in the tree equals the sum of the numbers, 0=no infection; 1 to 3=light infection; and 4 to 6=heavy infection.

To characterize the potential for impacts related to pine tree recruitment in each use area, the presence of pine tree saplings or multiple age classes of pines was noted while conducting evaluations of other ecological capacity variables in each use area. A detailed evaluation of the magnitude (extent and intensity) and status of this variable was not completed as was done for other ecological variables; instead, a more general assessment of the level of concern related to pine recruitment was determined. Areas in which sapling or younger age class pine trees were not observed in the understory were characterized as having a moderate to high (M/H) level of concern for pine recruitment impacts, whereas areas in which pine saplings or multiple age classes of pines were noted were determined to having either low level (L) or no impacts (None) related to pine recruitment.

Damage to Unique Ecological Features

Sentinel Pines and Mature Oak Scrub Habitat

Sand Harbor and Memorial Point attract a large number of visitors every year as a result of several featured attractions, primarily the beaches, lake views, and accessible rocky shoreline. Contributing to these main attractions, as identified by State Parks staff, are two unique ecological features of concern within the study area: one is the collection of large pine trees lining the main beach that provide a sentinel-like character to the beach, and the other is the mature oak scrub habitat that grows forest-like amongst the rocks near the Group Use Area (and also to some extent at Memorial Point) and provides a sense of seclusion and mystery to the shoreline user experience. Damage to these features is already apparent in the form of exposed roots, compacted soils, and the lack of soil stabilizing ground cover around the base of these large trees and mature oak shrubs, as well as mistletoe infestations of sentinel pines. Evidence of previous losses is also present in the form of remnant stumps. Damage is likely the result of sustained heavy foot traffic that tramples ground covering vegetation and compacts soil, potentially contributing to soil erosion in proximity to these unique features. An assessment of these unique features and their condition has not previously been documented. It is presumed that the degradation and/or loss of these unique features negatively affects the user experience within the park; therefore, a qualitative (for mature oak scrub) and quantitative (for sentinel pines) assessment of these features, in use areas where they occur, has been included in the ecological assessment.

To characterize the magnitude and status of impacts on large sentinel trees in each use area where they were identified, all uniquely large pines were mapped and the number of trees with exposed roots and/or visual signs of mistletoe infestation was recorded. The severity rating of mistletoe infestations was estimated using the Hawksworth dwarf mistletoe rating (State Parks 2010; see also the *Dwarf Mistletoe Infestation of Conifers* section, above). Additionally, the average depth of root exposure, presence or lack of ground covering vegetation, and any other obvious signs of damage (including cankers) were also recorded. To characterize the magnitude and status of impacts on mature oak scrub habitat, observations were recorded regarding the condition of oak shrubs in use areas where this unique habitat feature occurred, including root exposure, prevalence of compacted soils around the base of shrubs, dead branches, and evidence of shrub removal (i.e., cut stumps).

Wildlife Habitat Impacts

Osprey and Bald Eagle Perch (and Potential Nest) Sites

Large trees and snags that occur within the shorezone are particularly important as perching, roosting, and nesting sites for osprey and bald eagle. Osprey regularly occur in the shorezone of Lake Tahoe and surrounding lakes during summer; nesting and perching sites (historic and recent) are known in the vicinity of Sand Harbor and Memorial Point (USFS 2009). Osprey typically prefer large snags or trees with broken or dead tops as nest sites, and may perch in large trees or snags along the shoreline. No osprey nest sites currently occur in the study area; however, osprey probably use perch sites on occasion in the study area while foraging.

Bald eagles occur in the vicinity of Lake Tahoe year round but they are primarily observed during fall and winter (Romsos no date). Bald eagles are often found using the most prominent large trees or snags along the shoreline. No bald eagle nest sites occur in the study area (the closest nest site is at Marlette Lake); however, bald eagles have been observed perching in the study area during winter. Osprey and bald eagle perching sites and nesting trees are protected under the TRPA code of ordinances (Chapter 78; TRPA 2001); they are not to be physically disturbed and a non-degradation standard applies to all habitat within disturbance zones around nest trees (0.25-mile buffer for osprey nests and 0.5-mile buffer for bald eagle nests).

The retention of large trees and snags, particularly snags in the shorezone, is identified as a management goal for the Lake Tahoe Nevada State Park (State Parks 2010). However, trees or snags that pose a human safety risk are removed as necessary. Hazard tree removal practices over the years probably contributed to the greatest impact on persistence of large trees and snags in the shorezone of Lake Tahoe, including at Sand Harbor and Memorial Point. Therefore, future retention of these habitat features is becoming increasingly important. Other impacts that could affect large tree and snag retention include infestation with dwarf mistletoe (live trees only) or root exposure as a result of soil erosion or compaction (trees or snags). This could undermine their health or structural integrity and could ultimately result in their removal as hazard trees. Additionally, recreational disturbances, such as noise and human activities that are common in the study area during summer, could deter wildlife from using large trees or snags, despite their presence on the landscape. The effects of recreation disturbance on use or avoidance of potential perch sites by sensitive wildlife were not evaluated because that would require more extensive surveys rather than the single visit site assessment that was conducted.

To characterize the magnitude and status of existing impacts on large trees and snags (as potential perch sites for osprey and bald eagle) in the study area, all prominent large trees and snags (generally approximately 24 to 30 inches dbh or more) observed within the shorezone during the site assessment were recorded and mapped. Observations of damage (e.g., depth of root exposure, presence and severity rating of dwarf mistletoe) were also recorded. Additionally, the number of large cut stumps observed was tallied for each use area as an indication of the prior removal of large trees or snags from the landscape. Use areas where no large trees, snags, or stumps were observed were not evaluated for this impact.

Special-status Plant Impacts

Impacts on Tahoe Yellow Cress

Tahoe yellow cress (TYC) is a California and Nevada state-listed endangered species that is endemic to the shoreline of Lake Tahoe. Most populations of TYC are found on beaches with greater than 75 percent sand cover; however, beaches with 30 percent or more sand are considered suitable (Pavlik et al. 2002). To what degree sites of marginal suitability could support TYC is unknown. Suitable habitat for TYC is present at Sand Harbor (Main Beach, Diver's Cove, and Boat Ramp Area), but there is no suitable habitat at the Sandy Point or Family Picnic use areas nor at Memorial Point. Natural populations of TYC have been recorded at the east and west ends of the Main Beach use area, and nowhere else in the study area (State Parks 2010). Historically, TYC has been observed in the study area as early as 1979 (Stanton and Pavlik 2010). In 2003 and 2004, an experimental population was established at the north end of Boater's Beach using outplantings; however, the establishment was not successful and by 2006 no TYC had survived (State Parks 2010). TYC exhibits a metapopulation dynamic that is linked to shoreline water elevation; local populations experience reductions or complete disappearance in high water years and will often recover or recolonize exposed beaches in low water years. Populations around Lake Tahoe have been rated according to their conservation priority and restoration potential as follows: core, high, medium, and low conservation priority based on historic patterns in population size and persistence (Pavlik et al. 2002); site ranking is highly correlated with levels of development and recreational use. While Sand Harbor is identified as a low priority site for conservation and restoration (Pavlik et al. 2002), current direction is for all TYC occurrences to be protected from additional disturbance (State Parks 2010).

Primary threats to TYC are related to development and recreation such as trampling due to foot traffic from recreational use of beaches. Foot traffic on beaches also appears to reduce soil moisture retention which could indirectly affect TYC (Pavlik et al. 2002). Impacts can also result from boat dragging, beach raking, grazing by Canada geese (although not likely in the study area), and competition by non-native invasive plant species, including common mullein (*Verbascum thapsus*) and Bull thistle (*Cirsium vulgare*), where they occur (Stanton and Pavlik 2010). Impacts on TYC populations are typically greatest during high water years when available habitat is more limited. At population sites with high levels of use, areas of suboptimal habitat, where recreational access is often more limited, may provide important refuges for TYC populations to escape the effects of trampling. The use of boardwalks and signage to direct recreation away from TYC populations may help to limit impacts to sustainable levels (Pavlik et al. 2002).

To characterize the magnitude and status of impacts on Tahoe yellow cress, all observations of TYC were recorded and mapped during the site assessment by AECOM, and habitat suitability was evaluated where plants were observed.

2 Detailed Results: Ecological Impacts Observed at Sand Harbor

Main Beach (Use Area 1)

Soil Impacts

Soil Erosion

Soil erosion, as evidenced by exposed tree roots, down-cutting from hardened surfaces (paved walkways and fencing), and to some extent down-slope channeling of soil is extensive and quite severe in places within this use area. Erosion was observed at more than 10 locations along the back of the beach, primarily at points along the edge or terminus of hardened surfaces where there is access to the beach but also in association with many of the large pine trees along the beach. Over 900 feet (just under 50 percent) of the shoreline was affected by erosion. Observed impacts of erosion were greater along the western portion the beach, with the depth of exposure ranging from 6–36 inches, compared to approximately 4–8 inches along the eastern portion of the beach in this use area (Photos J-1a and J-1b, at the end of this appendix). It appears that visitor use combined with a lack of stabilizing ground cover near hardened surfaces and around the base of trees is the likely cause of erosion in this use area. Because recreation in the Main Beach use area is expected to continue at high levels, it is anticipated that soil erosion will continue to worsen with time.

Soil Compaction

Soil compaction to some level is to be expected at developed sites and heavily used areas; however, the sandy soils along the beaches at Sand Harbor, including within the Main Beach use area, are less susceptible to compaction than other soil types. Compaction is not an observed problem in this use area. Only very limited evidence of compacted soils was observed along user trails created by visitor use off of paved paths at the extreme east and west ends of the beach where soils appear to contain more silt. A total of seven short user-created paths totaling approximately 350 feet occur in this use area (see Figure 6-2 in the main report); these paths are relatively minor, have minimal levels of compaction, and are primarily the result of concentrated use extending from the terminus of paved walkways accessing the beach. Even with continued recreation in the Main Beach use area, it is not expected that soil compaction would get any worse; the only areas with soils susceptible to compaction are already being affected.

Vegetation Impacts

Loss of Ground Cover

Ground-covering vegetation is generally restricted to protected (i.e., fenced) upland areas in the Main Beach use area. Ground cover is absent between the water's edge and the first hardened structure at the back of the beach (paved path, fence, or structure) for approximately 53 percent of the length of the shoreline. Vegetative cover occurs somewhat continuously along the back of

the beach at the easternmost end of Main Beach where the shoreline approaches SR 28, becomes rocky, and visitor use is less concentrated. Elsewhere and outside of fenced areas, ground cover is absent or sparse, with two exceptions: a small area of well-developed and diverse dune scrub habitat occurs adjacent to the main bathroom facility in the central portion of the beach (Photo J-2); and in several locations along the eastern portion of the use area, the undulating fencerow at the back of the beach has created small areas of refuge for plant establishment where foot traffic is minimal due to visitor's desire to walk a straight line path.

Dwarf Mistletoe Infestation of Conifers

Dwarf mistletoe infestations were observed in a total of nine trees in the Main Beach use area, representing likely over 40 percent of all trees present in this use area. Infestation appeared most prevalent in the central and eastern portions of the use area, as was evidence of treatments (e.g., limbed trees) to minimize the spread of mistletoe. Dwarf mistletoe infestations were fairly severe; the average Dwarf Mistletoe Rating (DMR) for trees with observed infestations was approximately 3 (out of a maximum score of 6). Because the Main Beach use area is mostly open sand, the number of trees occurring here is limited; therefore, the extent and intensity of dwarf mistletoe infestation observed in this use area is of concern and is a potential threat to the health of the few remaining mature trees in this area.

Root Exposure

Tree root exposure as a result of soil (beach) erosion is a major concern in the Main Beach use area, primarily along the western portion of the use area. A total of 11 trees (probably 40–50 percent of all trees present in this use area) have exposed roots; the average depth of root exposure ranges from 6–24 inches, with exposure increasing toward the western end of the beach.

Pine Forest Recruitment

The Main Beach use area occurs at the interface between sandy beach and forested areas; therefore, forest recruitment is not a key process to this use area. However, the continued recruitment of pine trees that provide unique character along the back of the beach is of interest to park managers, especially given the somewhat unhealthy condition of many of the existing trees (see *Damage to Unique Ecological Features*, below). Recruitment of pine trees along the Main Beach does not appear to be a major concern; several sapling pines were observed during the site visit on November 17, 2010 along the back of the beach, primarily in protected pockets of shrubby vegetation (see Photo J-2 showing a few small saplings observed among the shrubs). Saplings were primarily observed among developed shrub habitat in areas protected by fencing. The prevalence of saplings diminished toward the west end of the beach where visitor impacts generally appear greater.

Damage to Unique Ecological Features

Sentinel Pines

Impacts on large sentinel-like pines along the back of the Main Beach are extensive and are of moderate to high severity (i.e., intensity). All six identified sentinel pine trees show at least some sign of damage. Impacts (i.e., damage) include dwarf mistletoe infestations, which are most prevalent in the central and eastern parts of this use area, and root exposure due to soil erosion, which was observed extensively in the western part of this use area. See the *Dwarf Mistletoe Infestation of Conifers* and *Root Exposure* sections above for a more complete description of these types of damage in the Main Beach use area. Root exposure and DMR of sentinel trees averaged a moderate to high level of intensity; average root exposures ranged from 6–24 inches (high) and DMR averaged around a value of 3 (moderate). Additionally at least six large stumps were observed along the beach, indicating that trees suffering damage in the past had been removed (see Photo J-3). Therefore, the long-term persistence of these sentinel pine features on the Main Beach is a concern. Although some pine recruitment was observed along the Main Beach (see *Pine Forest Recruitment,* above), it is not likely that recruitment is occurring at a rate sufficient to replace these large trees over time. Additionally, recruitment was only observed along the eastern part of this use area; therefore, sentinel trees present at the central and west end of this use area are threatened with permanent loss, unless targeted plantings or other forms of management to protect or replace these trees are considered.

Wildlife Habitat Impacts

Perch Sites

Because of heavy recreational use, large trees and snags (potential perch sites) in the Main Beach use area have relatively little value for sensitive wildlife during the high use season (summer). However, these features could function as perch sites for bald eagles during winter and occasionally for osprey during summer. The extent of impacts on large trees and snags was determined to be moderate; a total of six large cut stumps were observed (only six large trees currently remain), indicating that tree removal has affected a significant proportion (approximately 50 percent) of the trees in the Main Beach use area. Additionally, no snags occur in this use area, probably because of safety risks associated with retaining snags in heavily used recreational areas. As described under *Sentinel Pines*, above, the intensity of damage (e.g., dwarf mistletoe infestation and root exposure) to remaining large trees at the Main Beach was rated at moderate to high. The magnitude of this impact is likely increasing at a moderate to rapid rate (equivalent to a status rating of moderate-high) given the current severity of root exposure and evidence of potentially compromised tree health (e.g., mistletoe infestations).

Special-status Plant Impacts

Impacts on Tahoe Yellow Cress

TYC occurs at the east and west ends of the Main Beach use area in suitable to marginal habitat. Impacts on TYC at the Main Beach use area have been sustained for several decades; recreational impacts have been occurring at Sand Harbor since it was first leased from George Whittell by the State of Nevada in 1958 and probably for some time before that. The current distribution of TYC on the Main Beach is similar to historic records for this beach dating back to the late 1970s, indicating that TYC has been able to persist despite the existing recreational impacts. Thus, the extent of current impacts on this species is low relative to baseline conditions over the past few decades. The severity of impact to TYC is evident primarily in the quality of habitat where plants are located. Throughout the Tahoe basin, most populations of TYC occur on beaches with 75 percent or more sand cover, and beaches with 30 percent or more sand cover are considered suitable. Average sand cover at the east and west ends of Main Beach, where TYC occur, was estimated at 5 and 60 percent, respectively; rock, cobble, and pebbles made up the balance of cover types there. The remaining portions of beach, composed of nearly 100 percent sand, are more highly suitable for TYC, except that recreational disturbances make the area uninhabitable. TYC persists on the Main Beach only because areas of marginal habitat contain fairly high rock cover and are less desirable by beachgoers and may actually protect individual plants from the effects of trampling and reduced soil moisture as a result of foot traffic on the beach. The intensity of impacts on TYC at the Main Beach, as measured by the quality of habitat where they occur, was rated at a moderate to high intensity of impact.

Impacts on TYC at the Main Beach have the potential to increase (i.e., status of impact rated as moderate-high) because of the current limited distribution and vulnerability of the small population given the minimal level of protection. Sand Harbor has been identified as a low priority site for conservation and restoration because it is a developed recreation site (Pavlik et al. 2002). However, while signs informing the public of the presence and sensitivity of this species exists at the east end of the beach, no signs are present at the west end of the beach. Furthermore, access to the westernmost end of the beach is facilitated by user-created trails extending from the paved path to Sandy Point. During a site visit by AECOM on November 17, 2010, a group of visitors was observed accessing the beach this way and traversing along the rocky shoreline in the vicinity of observed TYC. Because of the potential for increased impact at the west end of the beach due to facilitated access, it is assumed that the magnitude of impacts for this species may be increasing (i.e., status of impact is moderate-high).

Sandy Point (Use Area 2)

Soil impacts

Soil Erosion

Soil erosion is one of the main concerns in the Sandy Point use area, although the magnitude of impact is not as severe as in the Main Beach use area. Soil erosion was primarily observed as down-slope channeling of soil along steep slopes (Photo J-4). Nine sites of erosion totaling approximately 150–200 feet in length (along pathways) were recorded in this use area during a site visit on November 17, 2010 (see Figure 6-2 in the main report). Although erosion sites were mapped throughout the use area (to the south, west, and north), erosion was primarily focused in three to four locations at the terminus of paved spur trails along the main loop trail and also along some user created trails in the area. Therefore, the extent of impact is rated at low–moderate. The depth of erosion observed in this use area typically ranged from 2 to 6 inches; however, it often resulted in soil movement a significant distance down slope (Photo J-4). Therefore, the intensity of erosion is considered moderate in this use area. Because of the rocky substrate throughout this use area, impacts as a result of erosion are not likely to get any worse.

Soil Compaction

Soil compaction is present in the Sandy Point use area; however, impacts are of relatively low to moderate concern. Soil compaction occurs in two concentrated viewing areas associated with the terminus of paved spur trails along the west side of the loop trail and along user-created trails. Eight user trails were mapped totaling a length of approximately 350 feet (see Figure 6-2 in the main report); additional unmapped user trails may occur closer to the shoreline at the point where extensive surveys were not completed during the 2010 site visit. The rocky substrate in this use area likely reduces the potential effects of compaction on surrounding vegetation and provides some natural protection.

Vegetation Impacts

Loss of Ground Cover

Stabilizing ground cover (e.g., shrubs) appears mostly intact in the western half of this use area where rocky substrates predominate and likely provide some natural protection from recreational impacts. Vegetative cover is reduced in the majority of the eastern portion of the use area in and around the amphitheater, where other impacts related to ground cover losses (e.g., root exposure and soil compaction) also were observed. Sandy substrates on the eastern portion of this use area may have contributed to the vegetation being more susceptible to impacts from recreational use. Ground cover in the eastern portion of this use area (north of the amphitheatre) was estimated at approximately 25 percent compared to between 45 and 65 percent in the western portion of the use area where vegetation communities appeared mostly unimpacted; this represents a nearly 30 percent loss in vegetative cover, assuming cover was historically similar between these two areas. The lack of ground cover within the amphitheatre facility is part of the planned design within that facility and represents an acceptable level of

impact. Currently a fence surrounds this area, limiting the potential for additional disturbance during events to defined, acceptable limits. Additionally, protective fencing is present along both the northeast and southeast portions of the loop trail where it passes by the amphitheatre restricting visitor traffic between the amphitheatre area and adjacent beach areas (Diver's Cove to the north and the Main Beach to the south). However, vegetation loss in these areas indicates that vegetation recovery is slow (although still in progress) there following the restricted access between the amphitheatre and adjacent beaches implemented about 10 years ago (according to State Parks).

Dwarf Mistletoe Infestation of Conifers

No dwarf mistletoe infestations were observed in the Sandy Point use area. However, several limbed trees were observed in the west-southwest portion of this use area, indicating that dwarf mistletoe infestations had been recently treated. Tree limbing is a management strategy used to remove and reduce the spread of mistletoe infestations. Additionally, the lower overall tree density and fewer signs of tree stress (see the *Root Exposure*, section below) probably make this use area less susceptible to damaging levels of mistletoe infestation than elsewhere at Sand Harbor. Therefore, impacts of dwarf mistletoe in this use area are not of concern.

Root Exposure

Tree root exposure as a result of soil erosion is not a major concern in the Sandy Point use area. Only four trees with exposed roots were observed; these trees were located along the southern point, adjacent to the amphitheatre, and to the west at the edge of the loop trail. The depth of root exposure ranged from approximately 1 to 6 inches. Additionally, some shrubs at the northern end of this use area, where the slope gradient increases toward Diver's Cove, also had exposed roots.

Pine Forest Recruitment

While the Sandy Point use area is dominated by chaparral, the recruitment of pine trees along the shoreline is likely important for sustaining perch sites for sensitive wildlife (e.g., osprey and eagle) (see *Sentinel Pines*, below). Several age classes of pines were observed in this use area, including saplings north of the amphitheatre where ground cover impacts were observed. The presence of younger age class trees coupled with the fact that there are relatively few signs of tree stress (see the *Root Exposure* section, above) in this use area indicates that pine recruitment is not a concern.

Damage to Unique Ecological Features

Sentinel Pines

Although no unique ecological features were specifically identified by State Parks staff in the Sandy Point use area, one noticeably prominent large pine tree with value as a perch site occurs along the west side of this use area (see Figure 6-2 in the main report). A bald eagle was observed perching in this tree during the AECOM site visit on November 17, 2010. This tree is located at the terminus of the north spur trail along the west side of the loop trail where visitor use has created an area of compacted soil that is devoid of vegetation at its base. Minor root exposure (approximately 1 inch) was observed for this tree. Otherwise, this tree appeared healthy; no visual signs of dwarf mistletoe infestation were present. It is possible that further uses of non-hardened surfaces in this area could continue to degrade conditions surrounding this unique pine tree and cause additional damage or stress in the future. However the rate of degradation is likely to be slow considering that uses in the vicinity of this tree have likely been

occurring for quite some time and rocky soils in this area appear to provide some protection to the vegetation from recreational impacts.

Wildlife Habitat Impacts

Perch Sites

In total, five large trees and no large snags were recorded in the Sandy Point use area. The lack of large snags at high use developed recreational sites, such as Sand Harbor, is expected and to some degree acceptable because of the public safety risks associated with their retention. In addition, heavy recreational use in this area likely limits the value of large trees for wildlife during summer; however, they likely function as perch sites for bald eagles during winter, and may occasionally serve this purpose for osprey during summer. As noted above, a bald eagle was observed perching in one of these trees. The remaining large trees provide additional locations for perching or potential redundancy of perch sites should preferred perch sites die, fall, or otherwise be removed. Current damage, and apparent stresses, on these large trees is limited; all appear in fairly healthy condition with limited root exposure and no signs of mistletoe infestation. Therefore, impacts on large trees and snags in the Sandy Point use area are minor and not likely to be a problem.

Special-Status Plant Impacts

Impacts to Tahoe Yellow Cress

Tahoe yellow cress (TYC) does not occur in the Sandy Point use area because suitable habitat is not present. Therefore, impacts on this resource are not applicable.

Diver's Cove and Group Use Area (Use Area 3)

Soil impacts

Soil Erosion

Similar to other use areas at Sand Harbor, soil erosion is a noticeable problem in the Diver's Cove and Group Use Area. Although erosion was only mapped at six locations totaling approximately 120 feet along walkways and stairs in this use area (see Figure 6-2 in the main report), much of the erosion observed here was the result of channeling and soil movement. At Diver's Cove, soil has moved 15 to 35 feet down high gradient slopes toward the beach from the point of origin upslope (Photo J-5).

Soil Compaction

Soil compaction is quite extensive in the Diver's Cove and Group Use Area, primarily occurring along the upland Ramada Point in the vicinity of the Group Use pavilion. The total area of compaction was not quantified but essentially encompasses all areas of bare ground surrounding shrubs in the northern portion of this use area, plus the majority of area along and

to the east of the paved path that runs above the back of the Diver's Cove beach. Compaction is primarily the result of heavy recreational use and a web of user trails throughout this portion of the use area. In addition to these compacted areas, seven short user trails also were mapped from the paved path to the east downslope to the Diver's Cove beach (see Figure 6-2 in the main report). The level of soil compaction in this use area is severe, especially in the areas to the west and north of the Group Use pavilion. In these areas, compaction has probably caused root damage to the unique mature oak chaparral "forest" (see subsection *Mature Oak Scrub*, below) and reduced water infiltration into the soil. Recreational uses and resulting compaction have also led to a relatively large erosion scarp along the Boater's Beach area to the north where wave action is slowly undercutting the destabilized slopes there (Photo J-6).

Vegetation Impacts

Loss of Ground Cover

Similar to soil compaction impacts, ground cover losses in this use area are extensive and relatively severe both along the Diver's Cove beach and in the mature oak in the Group Use Area to the north. Soil stabilizing vegetation along the back of the Diver's Cove beach was present only along approximately ¼ of the length of the beach. This is likely the result of trampling associated with generally unrestricted visitor access to the Diver's Cove beach from surrounding upslope areas (e.g., the Group Use Area to the north and the parking lot to the east). Vegetation cover (shrubs primarily) in the Group Use Area to north also only averaged approximately 30 percent. Relatively unimpacted areas along Sandy Point maintained vegetation cover values of 65 percent; therefore, it is likely that vegetation losses in the Group Use Area are probably close to 35 percent. The presence of Mahala mat, a ground covering evergreen shrub, and rocky substrate in this use area has probably kept impacts from being even more extensive and severe.

Dwarf Mistletoe Infestation of Conifers

Dwarf mistletoe infestation does not appear to be of concern in this use area. Signs of dwarf mistletoe infestation were only observed on three trees out of approximately 15 or more present in this use area; therefore, the extent of infestation was low. Furthermore, DMRs for infestation intensity were also fairly low, ranging from 1 to 3.

Root Exposure

Tree root exposure from soil erosion is a potential problem in the Diver's Cove and Group Use Area. Eight trees (approximately 50 percent) of trees observed in this use area had exposed roots. The depth of root exposure ranged from 6 to 12 inches (Photo J-7). Root exposure could lead to the eventual loss of these trees along the shoreline, potentially changing the character of the beach and possibly accelerating the effects of beach erosion. Seven large cut stumps were counted in this use area at the AECOM site visit in 2010, suggesting that similar losses have already occurred.

Pine Forest Recruitment

Pine forest recruitment is not a key process of concern in this use area. The Diver's Cove and Group Use Area is dominated by beach and chaparral vegetation with relatively little tree cover. However, similar to the Main Beach use area, the continued recruitment of pines is probably important to maintaining the overall character and vegetative cover along the shoreline for stabilizing soils. Saplings were not noted during the AECOM site visit in 2010; however, multiple age classes of trees do exist in this use area. The high level of compaction throughout much of this use area may be limiting the potential for seedling establishment and eventual recruitment of pines in this use area.

Damage to Unique Ecological Features

Mature Oak Scrub Habitat

Impacts on mature oak scrub habitat in the Group Use portion of this use area are a primary concern. Huckleberry oak shrubs throughout this use area show numerous signs of damage, including exposed roots and dead and dying limbs. A few shrub stumps were observed, indicating that some mortality has occurred. Nearly the entire area surrounding the mature oak scrub "forest" consists of highly compacted soils that could be adversely affecting root health via reduced oxygen and water availability. Under such conditions, future growth and seedling establishment necessary to maintain oak scrub habitat in this use area are unlikely to occur; therefore, the magnitude of impacts on existing oak scrub habitat will most likely continue to increase. Further losses and deterioration of this unique habitat type are expected occur if management action is not taken.

Wildlife Habitat Impacts

Perch Sites

Impacts on large trees and snags are not relevant in this use area. No snags are present, and trees in this use area are not likely to provide habitat value to sensitive species. Therefore, no impacts were categorized for large trees and snags.

Special-Status Plant Impacts

Impacts on Tahoe Yellow Cress

Impacts on TYC are not applicable in this use area. TYC does not occur along the Diver's Cove beach. Although habitat along the beach is considered suitable for this species (a high percentage of sand cover is available), no historic records for this species occur here. Also, physical attributes about this location probably make this use area a less-than-ideal site for TYC. The beach is relatively short and steep and in some places fairly rocky; the protected nature of this cove might provide limited potential for TYC to disperse to this location.

Family Picnic Area (Use Area 4)

Soil impacts

Soil Erosion

Soil erosion is limited and not a major concern in this use area. Only four erosion sites were recorded along a total of 70 feet of paved paths in the southeast portion of the Family Picnic Area (see Figure 6-2 in the main report). The depth of erosion ranged from 2 to 5 inches. Soil erosion is not likely to increase in severity in this use area due to the relatively shallow slopes and prevalence of mulching (both natural pine needles and wood chips).

Soil Compaction

Soil compaction occurred in numerous locations throughout the Family Picnic Area. Compaction occurred in association with the extensive network of user-created trails throughout the forest and in concentrated areas surrounding the numerous picnic tables dispersed throughout this use area. The most extensive area of soil compaction occurs in the southeast portion of the use area, east of a lowland wet area of deciduous trees. In this area, few shrubs occur to deter or direct visitor use; thus, the entire area shows evidence of regular and extensive trampling between picnic tables. A total of approximately 2,800 feet of dirt paths, mostly user created, have been established within this use area. Unpaved user trails occur most extensively in the northwest and southeast portions of this use area (see Figure 6-2 in the main report). While soil compaction was evident throughout the majority of the use area, the level of compaction, loss of, and damage to surrounding vegetation was not quite as severe as observed in the Group Use Area.

Vegetation Impacts

Loss of Ground Cover

Ground cover losses were observed throughout the majority of this use area, with the exception of areas along its eastern edge between the paved loop path and SR 28. Ground cover losses were greatest in the southwestern portion of this use area, in pockets where shrubs are not the dominant element of the understory (probably because of the higher forest canopy closure and wetter soils there). It is likely that herbaceous vegetation has been highly impacted in these areas. In addition, ground cover losses were relatively extensive in the northwestern portion of the use area; picnic tables in this area probably receive the most extensive and consistent use. It is likely that a combination of herbaceous and shrub cover has been affected in this portion of the use area. Vegetation cover, as measured in the northwest and southeast, averaged approximately 20 percent. Areas that appeared relatively unimpacted (along the eastern boundary of this use area) measured nearly 50 percent cover of vegetation. Therefore,

recreational impacts are likely to have resulted in a 30 percent loss of ground covering vegetation in the Family Picnic Area.

Dwarf Mistletoe Infestation of Conifers

The infestation of conifers by dwarf mistletoe is of moderate concern in the Family Picnic Area. Signs of infestation were observed in 22 trees, and at least an additional 24 trees had been limbed suggesting recent treatment of infestations. While the total number of visually infected trees is greater than in any other use area, the proportion of trees affected was estimated at approximately 50 percent. DMRs were not estimated for each individual tree with infestation; however, it was noted that current infestations were on average of low to moderate severity (i.e., intensity). It is unlikely that recreational impacts are solely responsible for infestation of conifers by mistletoe in this use area; however, soil compaction could contribute additional stress on trees, making them vulnerable to infestation. Tree density also may be contributing to the prevalence of infestations in the Family Picnic Area. Dwarf mistletoe is dispersed through ballistic means, and proximity of uninfected trees to infected trees could influence the rate at which this parasitic plant spreads. Competition between trees in high density stands also may contribute additional stress on trees, making them more vulnerable to infection.

Root Exposure

Tree root exposure is minor and not a concern in the Family Picnic Area. Only two trees were noted with exposed roots of no more than 3 inches in depth. These trees were located along the paved path in the southeast portion of the use area.

Pine Forest Recruitment

Recruitment of pine trees in the Family Picnic Area does not appear to be a concern. Saplings were most evident in the relatively unimpacted areas along the eastern border of this use area, possibly, but not necessarily, due to fewer ground disturbances there. However, many younger age classes of pines were observed throughout the use area.

Damage to Unique Ecological Features

Sentinel Pines and Mature Oak Scrub Habitat

No unique ecological features were identified in this use area; therefore, impacts to such features were not evaluated.

Wildlife Habitat Impacts

Perch Sites

No large trees or snags are present in this use area. Therefore, impacts on these features are not relevant.

Special-Status Plant Impacts

Impacts on Tahoe Yellow Cress

TYC does not occur in the Family Picnic Area because suitable habitat is not present. Therefore, impacts on this resource are not applicable.

Boater's Beach and Boat Ramp (Use Area 5)

Soil Impacts

Soil Erosion

Soil erosion, as evidenced by soil channeling or downslope soil movement from hardened and compacted upslope areas, was observed along a relatively small proportion of Boater's Beach. Four erosion areas were recorded along a total of approximately 90 feet of shoreline; two were located at the southern end of this use area just below the highly compacted terrace surrounding the Group Use pavilion in the adjacent use area, and two occurred along the paved surface adjacent to where the boat launch enters the beach (see Figure 6-2 in the main report). Erosion was of moderately severity (i.e., intensity); the average depth of erosion was approximately 12 to 18 inches. Erosion at the south end of Boater's Beach has formed a nearly vertical cliff that may be partly exacerbated by wave action from high levels of boat use in the area because of the neighboring boat launch.

Soil Compaction

Impacts related to soil compaction are minimal in this use area. Compacted soil only occurs in association with five short user-created paths connecting the paved pathway at the back of the beach and down to the beach (see Figure 6-2 in the main report); user trails occur at the southern, middle, and northern ends of the use area; however, their extent is minimal. The total length of compacted user trails was only approximately 250 feet. The severity (i.e., intensity) of compaction along these paths also was minimal because of the generally sandy soils occurring where user trails were located; sandy soils are less susceptible to compaction.

Vegetation Impacts

Loss of Ground Cover

Loss of stabilizing ground cover is of relatively little concern at Boater's Beach and the Boat Ramp use area relative to elsewhere at Sand Harbor. Shrub or herbaceous ground cover occurred along the back of the beach for approximately 60 percent of the shoreline length. The entire section of beach north of the boat launch contained intact shrub and other ground cover along the back of the beach, protecting the beach from accelerated erosion. Only sections along

the southern portion of the beach had reduced ground cover because of regular visitor travel between facilities (paved paths and restrooms) and various locations along the beach.

Dwarf Mistletoe Infestation of Conifers

Dwarf mistletoe infestations were rare and therefore of limited extent in this use area, in part because trees were relatively few and widely spaced. Only one pine tree was observed with visual signs of infection during the AECOM site visit in 2010. The DMR was not recorded for this tree; however, the infection was noted as not being severe.

Root Exposure

While erosion is not of heightened concern in this use area, exposed tree roots were noted on eight trees along the back of Boater's Beach, primarily those to the north of the boat launch where the beach slopes more steeply from the adjacent upland habitat. This probably represents 30–40 percent of trees in the use area, and nearly 50 percent of those bordering the back of the beach; therefore, this impact is moderately extensive. The depth of root exposure ranged from 4 to 12 inches; on average, this is equal to a low to moderate severity (i.e., intensity) impact.

Pine Forest Recruitment

Pine forest recruitment is not a key process in this use area. The habitat is dominated by beach along the shoreline and shrubs in the upland with only sparse tree cover. However, as mentioned for other beach-dominated use areas, the continued recruitment of pine trees is probably important for maintaining the overall character and vegetative cover along the shoreline for stabilizing soils. Although pine saplings were not noted in this use area during the AECOM site visit in 2010, recruitment is probably occurring in this use area because of the generally unimpacted vegetation communities observed.

Damage to Unique Ecological Features

Sentinel Pines and Mature Oak Scrub Habitat

No unique ecological features were identified in this use area; therefore, impacts to such features are not applicable.

Wildlife Habitat Impacts

Perch Sites

No prominent large trees or snags that would be used as perch sites were observed along the shoreline in the Boater's Beach and Boat Ramp use area; therefore, impacts on these features were not evaluated and are not applicable.

Special-Status Plant Impacts

Impacts on Tahoe Yellow Cress

TYC does not currently occur along the beach in the Boater's Beach and Boat Ramp use area, nor did it occur historically in this part of Sand Harbor. Therefore, an impact evaluation for this species was not conducted for this use area. However, suitable habitat is present along most of Boater's Beach (with the exception of the high level of human disturbance that is unfavorable). An experimental population was transplanted to the northern end of Boater's Beach in 2003 and 2004 in an attempt to establish an additional population site at Sand Harbor. However, the population failed to establish and by 2006 all evidence of the population had disappeared despite the use of protective fencing surrounding the plants. The absence of TYC in this use area is not likely the result of recreational impacts.

3 Detailed Results: Ecological Impacts Observed at Memorial Point

Soil Impacts

Soil Erosion

Overall impacts of soil erosion were relatively limited in their extent and were generally of low to moderate severity at Memorial Point. Only four erosion sites were observed along approximately 80 feet of established dirt paths (see Figure 6-7 in the main report), primarily north of the restroom facility. The depth of erosion across all sites ranged from approximately 2 to 12 inches, on average a low to moderate severity (i.e., intensity). Erosion sites farthest north and south showed the greatest severity of impact, also including entrainment of soil downslope for a considerable distance (Photo J-8). Because of the predominantly rocky substrate at Memorial Point, impacts from erosion appear stable and are not likely to get much worse than the current condition, with the possible exception of the two sites with considerable downslope soil entrainment.

Soil Compaction

Soil compaction is evident at Memorial Point, primarily the result of the extensive network of user trails accessing the shoreline from the parking area along SR 28. Nearly 0.5 mile (approximately 2,100 feet) of user-created trails was mapped in proximity to the main access point for Memorial Point; numerous additional access trails from the highway down to the shoreline likely occur farther north and south of Memorial Point. However, the overall intensity of soil compaction appears minimal, probably because of the predominantly rocky substrate at Memorial Point that provides some level of protection from heavy recreational uses.

Vegetation Impacts

Loss of Ground Cover

Ground cover losses as a result of recreation at Memorial Point are limited and not of concern. Ground cover (primarily dense shrub cover) averages between 80 and 90 percent throughout the Memorial Point use area. No evidence of ground cover impacts was observed.

Dwarf Mistletoe Infestation of Conifers

Dwarf mistletoe infestation of conifers is not a problem at Memorial Point. No signs of infestation were observed. In addition, no limbed trees were observed that would indicate the recent treatment of infestations.

Root Exposure

Tree root exposure was observed at Memorial Point but is not likely to be an issue of concern. Only eight trees (probably no more than 10 percent of all trees at this use area) were observed with exposed roots during the AECOM site visit in 2010. Observed root exposure averaged between 4 and 6 inches, with a few trees showing more marked damage along the steep rocky shoreline to the north. It is likely this impact is stable and will not worsen because of the predominantly rocky substrate at Memorial Point that provides some level of stability and protection.

Pine Forest Recruitment

No obvious recreation-related impacts on pine recruitment were observed at Memorial Point. Various age classes of trees were present, suggesting that recruitment is actively occurring.

Damage to Unique Ecological Features

Sentinel Pines

Although no unique ecological features were specifically identified by State Parks staff for Memorial Point, two noticeably prominent large pine trees with high value as perch sites for osprey and bald eagle occur along the shoreline just below the main restroom facility at Memorial Point (see Figure 6-7 in the main report). One (50 percent) of the two identified sentinel pine trees in this use area has signs of minor damage in the form of root exposure; this tree is located slightly farther north and upslope from the shoreline than the other. Roots on a portion of this tree were exposed up to 4 inches. Exposure of the roots is likely the result of recreational use along a user-created path that ends at the base of this tree.

Wildlife Habitat Impacts

Perch Sites

Two prominent large trees and no large snags were observed at Memorial Point. These prominent trees are likely suitable perch sites for both osprey during summer and bald eagle during winter. They could also provide potential future nest sites for osprey; a recently active osprey nest site occurs within one-quarter mile of Memorial Point, and osprey are known to use several nest sites in proximity to one another from year to year. The magnitude and status of impacts for these wildlife perch trees are reported above (refer the *Sentinel Pines* subsection).

Special-Status Plant Impacts

Impacts on Tahoe Yellow Cress

TYC does not occur at Memorial Point because no suitable habitat occurs there. Impacts on this resource are not applicable to this use area.

Photo Pages

(Photographs taken by AECOM, 2010)

Photo J-1a. Typical erosion condition at the eastern end of the Main Beach, showing minimal soil erosion along the paved pathway (in the background) and around the base of the pine tree.

Photo J-1b. Erosion along paved pathways at the western end of the Main Beach use area.

Photo J-2. Uncharacteristic pocket of developed vegetative cover along the beach in the Main Beach use area.

Photo J-3. Stump of sentinel pine near center of Main Beach.

Photo J-4. Erosion channeling at southern end of Sandy Point.

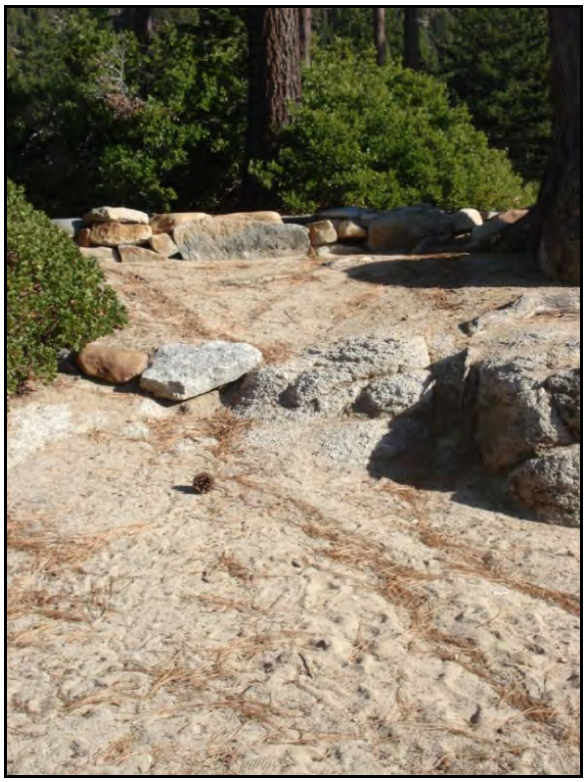

Photo J-5. Soil channeling and downslope movement that is typical of erosion sites at Diver's Cove and the Group Use Area.

Photo J-6. Heavily compacted soils north of the Group Use Area pavilion and resulting erosion along the upper terrace and drop-off to Boater's Beach.

Photo J-7. Example of root exposure along a path to Dive's Cove beach from the Visitor Center near the south end of the Diver's Cove and Group Use Area.

Photo J-8. Erosion resulting from highway culvert draining across user-created trail north of Memorial Point (erosion extends from the trail down to lakeshore).

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Appendix K
Additional Photographs of Observed Ecological Impacts

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Photo K-1. Marginal TYC habitat at east end of Main Beach (past monitoring has detected TYC in this area).

Photo K-2. TYC and TYC habitat at west end of Main Beach.

Photo K-3. Shrubs at dune margin of Main Beach (note sand captured by shrubs).

Photo K-4. Trees with exposed roots at west end of Main Beach.

Photo K-5. Representative vegetative cover at southern end of Sandy Point.

Photo K-6. Sentinel wildlife tree at Sandy Point (with roots beginning to be exposed due to foot traffic off the paved path).

Photo K-7. Vegetative cover at midpoint of Sandy Point (revegetation area).

Photo K-8. Erosion and exposed roots at south end of Diver's Cove beach.

Photo K-9. Undercutting and channeling erosion at north end of Diver's Cove beach.

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Appendix L
Summary of Stakeholder Consultations

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Summary of Stakeholder Consultations and Information Received

No.	Stakeholder	Contact Name(s)	Provided New Data or Information Relevant to Capacity Study	Expressed a Concern Related to Recreation Capacity Issue at Sand Harbor	Provided Suggestion(s) Regarding Potential Capacity Management Actions or Policies at Sand Harbor[1]
1	California Tahoe Conservancy	Peter Eichar	✓		✓
2	Carson City Parks and Recreation Department	Ann Bollinger		✓	✓
3	Incline Village General Improvement District	Bill Horn	✓	✓	
4	League to Save Lake Tahoe	Nicole Gergans		✓	✓
5	Nevada Department of Transportation	Anita Lyday	✓	✓	✓
6	Nevada Division of Wildlife	David Catalano		✓	✓
7	Nevada Highway Patrol	Rob Stepien	✓	✓	✓
8	Nevada State Lands	Jim Lawrence	✓	✓	✓
9	North Lake Tahoe Fire Protection District (Incline Fire)	Mike Brown	✓	✓	✓
10	Shakespeare Festival	Bob Taylor / Billie Danforth	✓	✓	✓
11	Sierra Club	Laurel Ames		✓	✓
12	Stateline-to-Stateline Bikeway Working Group	Karen Mullen			✓
13	Tahoe Regional Planning Agency	John Hitchcock	✓	✓	✓

No.	Stakeholder	Contact Name(s)	Provided New Data or Information Relevant to Capacity Study	Expressed a Concern Related to Recreation Capacity Issue at Sand Harbor	Provided Suggestion(s) Regarding Potential Capacity Management Actions or Policies at Sand Harbor[1]
14	Tahoe Transportation District	Carl Hasty	✓		
15	Tahoe Trans. District / Stateline-to-Stateline Bikeway Working Group	Alfred Knotts	✓	✓	✓
16	Thunderbird Lodge Preservation Society	Bill Watson	✓	✓	✓
17	U.S. Forest Service (Lake Tahoe Basin Management Unit)	Bob Becker	✓	✓	✓
18	Washoe County Sheriff's Department	Wayne Yarbrough / Dwayne Myer	✓	✓	✓
19	Washoe Tribe	Darrel Cruz		✓	

[1] A summary of the specific suggestions provided be stakeholders is provided in the table below.

Summary of Stakeholder Suggestions

No.	Stakeholder	Suggestion(s) Regarding Potential Capacity Management Actions or Policies at Sand Harbor
1	California Tahoe Conservancy	• Possibly park people at old Ponderosa for the bike path staging. • Parks needs to be clear about its objectives for the park in order to set capacities. • New visitor center is not a traditional setup and should not be managed through a traditional model.
2	Carson City Parks and Recreation Department	• Maybe Skunk Harbor parking could be expanded (USFS). • Sand Harbor is a high demand area with a need for more parking capacity; maybe Incline could provide additional capacity.
3	Incline Village General Improvement District	None
4	League to Save Lake Tahoe	• Need a more creative and innovative methodology to the traditional (TRPA) “persons at one time” (PAOT) approach. Look for a better way to define capacity.
5	Nevada Department of Transportation	• In the vicinity of Sand Harbor, would like to see no parking along the lake side of SR 28 and allow parking along the hill side. (This would reduce lake side erosion along road bank. There is usually more room on the hill side. They want to protect the lake side road slopes between residences and between guard rails.) • Want to work closely with State Parks on whatever they propose to do about SR 28 parking.
6	Nevada Division of Wildlife	• The Park needs to provide more bear proof containers that are readily accessible to the public. • Need to do a better job of educating the public about bear behavior and what to do when they encounter a bear. • Need to look at better ways of getting rid of trash within the Park [to minimize bear problems].
7	Nevada Highway Patrol	[Major issue for NHP is parking along SR 28 and left turn issues in front of Sand Harbor entrance during line up times during peak use days.] • The only thing that could affect the SR 28 parking issue would be a redesign of the roadway. • Use of electronic signs to support park operations: Portable reader board trailer mounted signs might be a possibility. (Only electronic sign where message can be changed is at bottom of Hwy 431 and on Hwy 395 in south Reno. They usually only use for traffic related messages. NDOT controls messages.)
8	Nevada State Lands	• Maybe one could look at limiting the number of hours a person could stay at the Park to provide more capacity. • Maintenance facilities located right next to SR 28: These are visually unsightly. Are there off site opportunities where these facilities could be moved? Maybe the maintenance area could be used for more parking or some other use.

No.	Stakeholder	Suggestion(s) Regarding Potential Capacity Management Actions or Policies at Sand Harbor
9	North Lake Tahoe Fire Protection District (Incline Fire)	• District supports alternative transportation modes and additional off-site parking to help reduce congestion and emissions issues. • Would support any efforts to improve or expand the boat launch facility - extend ramp. (Sand Harbor boat launch is a key facility for evacuation and law enforcement along the east and north shore of Lake Tahoe.)
10	Shakespeare Festival	• Would support off-site shuttle parking for patrons if available and would steer patrons to these areas.
11	Sierra Club	• Be careful when citing perception analysis as the means for making capacity decisions. • Using PAOTs (persons at one time) analysis is the old way of looking at capacity. It is a failed concept as no one pays any attention to it. • Want State Parks to do everything they can to improve the ecosystem within the Park. • Protecting the big Ponderosas in the Park is important; need to get good analysis from a Ponderosa expert to save the trees. • Can anything be done to move the maintenance facility away from the highway and outside the Park? Not a good location and visually intrusive. • Would support alternative transportation modes/mass transit from outside Park (they would not support additional parking at Sand Harbor).
12	Stateline-to-Stateline Bikeway Working Group	General Suggestions • As everyone moves toward transit options, need to think about moving the majority of the users to the larger beaches rather than the small coves. • Look for creative solutions. Use capacity to help drive solutions. • Look at holistic approaches to management issues at Sand Harbor. • Focus on the value of Sand Harbor not its operational issues to drive the planning. • Use capacity study as justification to identify needs. • Connect Sand Harbor with the economic vitality of the region. • Need a strong base of support from the public. Share findings. Facility and Staffing Suggestions • Need to consider reconfiguring group use sites in the picnic area based on cultural preferences. • Why are people setting in entrance booths? Are there automated solutions for entrance booths? Automated system for paying entrance fees. • Consider a Fast Pass system for entrance into the Park; contact Gordon Shaw (Tahoe City). • What about parking meters hooked into a monitoring system to tell you exactly how many spaces you have vacant? • Look at designated parking spots for the restaurant and visitor center. Maybe controlled with parking meters. Generate revenue for the park. • Why have the maintenance facilities within the Park? Move it outside and use the area potential revenue generating uses such as concessions, parking, etc. • Look at staff restructuring to become more effective and cost efficient.

No.	Stakeholder	Suggestion(s) Regarding Potential Capacity Management Actions or Policies at Sand Harbor
		Transportation Suggestions • Look at alternatives for transportation. Work closely with Carl Hasty (TTD) and his studies. • Maybe use private security company to issue parking citations along SR 28 to free up Park staff. • Consider countdown monitors along the major highways to Sand Harbor to notify the visitors of the number of parking spaces left. Funding Suggestions • Set up to be ready for the next bond issue or funding opportunity. Sand Harbor has high value to the region both economically and recreationally. • Use endowments, gifts, friends groups to help implement plans.
13	Tahoe Regional Planning Agency	• Provisions should be considered to replace or restrict of off-site parking within close proximity to Sand Harbor. • Consideration should be given to providing additional access to the site through alternative modes of transportation such as biking, hiking or transit.
14	Tahoe Transportation District	None
15	Tahoe Trans. District / Stateline-to-Stateline Bikeway Working Group	• Look for creative management strategies and a more holistic approach rather than more restrictions. • Look at alternative modes of transportation for Park access. Using a shuttle service is one good alternative. • Biking into the Park may be a good alternative as bikers have a shorter length of stay - up to 60% less (1.5 hours). Identify how the bikeway project could help serve the Park's own mission. • Look for ways to notify people about Park full and traffic issues before they arrive at the Park.
16	Thunderbird Lodge Preservation Society	• They support bicycle access to the Park (and to the Thunderbird Lodge). • There is a greater need to educate visitors about the Lodge, its mission, Whittell, and local history. This could be done cooperatively with State Parks in the Visitor Center or outdoor interpretive exhibits and printed materials.
17	U.S. Forest Service (Lake Tahoe Basin Management Unit)	• Be aware of the cultural shift in the basin and its affect on user preferences. • Hope that we don't use PAOTs because we couldn't find anything better. (USFS Does not want capacity numbers to be absolute because of public perception. PAOTs have limited use. They are not representative of total use of an area and the impact of that use on sustainability.) • AECOM [Fort Collins, CO office] is currently working with USFS on management issues along the west shore, Camp Richardson and Emerald Bay area. USFS is having them focus on sustainability. We may want to look at their model.
18	Washoe County Sheriff's Department	• Using existing electronic signs along the highways on the way to Sand Harbor may be a way to alert visitors of issues at the park including park closures. NHP is the contact, NDOT has jurisdiction. Park could request use of the signs at the request of their law enforcement personnel.

No.	Stakeholder	Suggestion(s) Regarding Potential Capacity Management Actions or Policies at Sand Harbor
19	Washoe Tribe	None

Appendix M
Entrance Station Traffic Data Summary and Analysis

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Surveyors collected people-per-vehicle (PPV) and other traffic-related data at the three Sand Harbor Unit entrances: Sand Harbor main entrance, Sand Harbor boat ramp entrance, and Memorial Point parking area. The primary purpose was to determine whether the vehicle occupancy factor used by State Parks for visitation estimates accurately reflected current use or needed revision. In making visitation estimates for June, July, and August, State Parks applies a vehicle occupancy factor (or "multiplier") of 3.8 to the vehicle count provided by mechanical traffic counters at the main entrance, boat ramp entrance, and Memorial Point. The data are also intended to provide information to gauge the level of accuracy of the traffic counters at each entrance, and to estimate the percentage of non-visitor traffic at the entrances.

Surveyors collected data at all three locations on each of the 17 survey days, with the exception of the first day (Memorial Day). On most survey days, a surveyor was stationed at each of the locations for 2 hours, once in the morning and once in the afternoon. (On a few survey days, data collection occurred at the boat ramp entrance and at Memorial Point only once.) Surveyors observed each vehicle entering and recorded the vehicle type (passenger vehicle, recreational vehicle, motorcycle, bus/van, State Parks, or other non-recreation vehicle) and how many people were in the vehicle. It was noted if an entering vehicle turned around and immediately left, and thus was not to be counted with recreation visitor vehicles. At the start, midpoint, and end of each survey period, surveyors also recorded the vehicle count from the mechanical counters installed at each location. Only weekend and holiday data (10 survey days) are used in this analysis, as the lower weekday traffic levels generally provided much smaller samples, and thus less reliable data.

Vehicle Occupancy Factor

The data collected by the surveyors on individual weekend and holiday survey days indicated that the average vehicle occupancy (i.e., PPV) ranged from 2.25 to 3.81 at the main entrance, 1.75 to 3.42 at the boat ramp entrance, and 1.92 to 2.79 at Memorial Point. Across all weekend and holiday traffic surveys, the average PPV was 2.91 at the main entrance, 2.62 at the boat ramp entrance, and 2.35 at Memorial Point (Table M-1). These estimates range from 0.89 to 1.45 PPV lower than the 3.8 vehicle occupancy factor currently applied by State Parks in making June, July, and August attendance estimates.

However, visitors often leave vehicles that are waiting to enter the park and walk into one of the Sand Harbor entrances, leaving only the driver (and sometimes one or two other visitors) in the vehicle. Other drivers drop off their passengers at a Sand Harbor entrance and park at Memorial Point (or along SR 28). Because of this, single-occupant vehicles often comprised more than 10 percent and at times as a much as one-third of the vehicles recorded by the surveyors at the main entrance and over 40 percent at the boat ramp and Memorial Point. On average, single-occupant vehicles accounted for about 15 percent of vehicles observed at the main entrance and about 21 percent of vehicles observed at the boat ramp entrance and Memorial Point. (See the endnote at the conclusion of this appendix for a discussion of visitor survey data related to single-occupant vehicles.[i]) The number of two- and three-occupant vehicles observed may have been similarly increased while the number of higher occupancy vehicles recorded was probably reduced. As a result, the average PPV estimates derived from the entrance station traffic

surveys were artificially lowered and should not be considered a reliable guide for revising the vehicle occupancy factor used by State Parks for visitation estimates.

Table M-1. People-per-Vehicle (PPV) Estimates from Entrance Station Traffic Surveys, Weekends and Holidays, Summer 2010.

Date	Day of Week	Survey[1]	PPV Estimate[2]		
			Main Entrance	Boat Ramp Entrance	Memorial Point
June 13	Sunday	1	3.07	2.79	2.29 **
		2	2.40 **	2.67 **	2.32 **
June 20	Sunday	1	2.94 *	2.26 **	2.10 *
		2	2.61 **	2.70	2.40 **
June 26	Saturday	1	2.85 *	2.85 *	2.46 *
		2	2.44 *	1.92 **	2.50 **
July 4	Sunday	1	3.37	3.42 *	2.35 **
		2	3.00 **	2.91 *	2.63 *
July 17	Saturday	1	3.14	2.44 **	2.13 *
		2	2.79 **	2.34 **	2.48 **
July 25	Sunday	1	3.55	no data	no data
		2	2.25 **	2.86 **	2.36 *
August 7	Saturday	1	3.11 *	3.18	1.95 **
		2	2.73 *	1.75 **	2.54 *
August 8	Saturday	1	3.21	3.07 *	2.79 *
		2	2.26 **	no data	2.33
August 21	Saturday	1	3.47 *	3.07 *	1.92 **
		2	2.75	2.09 **	2.67
September 6	Monday	1	3.81	2.27 *	no data
		2	2.50 *	2.57	2.16 *
Average			**2.91**	**2.62**	**2.35**
Current load factor: June-August			**3.8**	**3.8**	**3.8**
Current load factor: September			**2.3**	**2.3**	**2.3**

1. *The first survey each day generally started between 8 a.m. and 12 p.m. (a few started at 1 p.m.). The second survey each day started between 1 p.m. and 6 p.m.*
2. *The asterisks next to the PPV values indicate that single-occupant vehicles accounted for at least 10 percent of all vehicles observed by the surveyor, as follows:*

** = single-occupant vehicles accounted for 10–19 percent of all vehicles observed by surveyor.*
*** = single-occupant vehicles accounted for 20 percent or more of all vehicles observed by surveyor.*

Note: Although precise data on the percentage of visitors coming to the park alone in their vehicle (as a solo visitor or part of a larger group) are not available, the visitor survey data obtained for this study and the day-to-day observations of park staff suggest that the actual percentage does not likely exceed 10 percent. The entrance station traffic surveyors frequently observed visitors walking into the park, rather than waiting in their vehicle in the entrance station queue, particularly when the waiting lines were long. This phenomenon likely resulted in substantially lower PPV values most of the survey days.

The visitor surveys provide an alternative source of PPV data that can be compared with the vehicle occupancy factor in use, given that 639 surveyed visitors provided the number of people in their group and the number of vehicles their group used to come to the park, from which PPV can be calculated. Discounting response from visitors in the largest groups (30 to 100 people, comprising 3 percent of the visitor survey sample, and whose responses for the number of visitors and number of vehicles used may be less reliable[1]), the average PPV for Sand Harbor was 3.93. (If these largest groups are included, the average PPV was 3.99.) The survey sample may under-represent solo visitors (who may have been more likely to limit their visit to the walkways, nature trail, and visitor center); thus, this PPV value from the survey sample may be slightly higher than the true population value. Therefore, the survey data generally confirms the vehicle occupancy factor of 3.8 currently being used for summer season attendance estimates and does not indicate that a revision is required.

The average PPV at Memorial Point based on visitor survey responses was 2.76. However, the survey sample was considerably smaller than at Sand Harbor (145 responses to the relevant questions). Therefore, it may be reasonable to continue using the higher vehicle occupancy factor of 3.8 now in use, rather than adjusting downward based on this more limited sample.

State Parks uses lower vehicle occupancy factors during the off-season: 2.3 during September through November, 2.8 during December through February, and 3,8 during March through May. This is a typical practice at most parks, and presumably these off-season factors are based on past observations and day-to-day experience at Sand Harbor. However, the accuracy of these factors is not known, and the study data cannot be used to support or adjust them. To gauge the accuracy of the off-season factors and potentially improve off-season attendance estimates, State Parks could duplicate the entrance station data collection methods described in this appendix during the off-season.

Non-Visitor Adjustment to Counter Data

State Parks uses a non-visitor adjustment to traffic counter data of 20 percent of traffic at the main entrance, 60 percent of traffic at the boat ramp entrance, and 30 percent of traffic at Memorial Point.

At the main entrance, an average of 8.1 percent of observed traffic was recorded as non-visitor vehicles, which included State Parks and other official vehicles, and vehicles that crossed the vehicle counter but turned around and immediately left the park (Table M-2). During two of the June afternoon surveys, about 30 percent of observed traffic was recorded as non-visitor vehicles; however, these data do not represent typical conditions as they were collected late in

[1] The judgment that the data may be less reliable is based on a greater likelihood of less accurate “best guess” responses from visitors in these larger groups, whose responses for number of visitors tend to include only multiples of 10 (30, 40, 50, 100) and whose responses for number of vehicles used ranged from 2 to 30 vehicles. This is based on the expectation that a visitor from a more typical large group of, say, 10 or 12 people can accurately report the group size and that the group came in 2, 3, or 4 vehicles (typical responses), but that a visitor who is part of a group of 37, 54, or 102 people may not be able to do the same.

the day, when few visitors were arriving, and the total number of vehicles recorded was low (39 and 40 vehicles, as compared to 75 to over 260 vehicles most other surveys). Overall, the entrance station data indicate that the non-visitor adjustment for the main entrance of 20 percent is too high and should be lowered to a value closer to 8 percent.

Table M-2. Non-Visitor Vehicle Data from Entrance Station Traffic Surveys, Weekends and Holidays, Summer 2010.

Date	Day of Week	Survey	Non-Visitor Vehicles (%)		
			Main Entrance	Boat Ramp Entrance	Memorial Point
June 13	Sunday	1	8.4	84.6	0.0
		2	30.0[1]	25.0[2]	0.0
June 20	Sunday	1	13.9	42.3	2.0
		2	18.9	82.0	9.0
June 26	Saturday	1	3.8	66.3	0.0
		2	28.2[1]	76.9	23.0
July 4	Sunday	1	0.0	91.2[3]	35.0
		2	5.4	80.4	46.0
July 17	Saturday	1	0.9	65.7	16.0
		2	3.8	64.7	46.0
July 25	Sunday	1	10.3	no data	no data
		2	8.4	72.4	32.0
August 7	Saturday	1	0.5	68.2	17.0
		2	1.2	51.6	0.0
August 8	Saturday	1	0.0	54.3	8.0
		2	15.8	no data	17.0
August 21	Saturday	1	5.4	39.5	5.0
		2	0.0	80.0	0.0
September 6	Monday	1	2.5	51.9	no data
		2	4.2	57.4	0.0
Average			**8.2**	**64.1**	**24.0**
Current Non-Visitor Adjustment			**20.0**	**60.0**	**30.0**

1. *The first survey each day generally started between 8 a.m. and 12 p.m. (a few started at 1 p.m.). The second survey each day started between 1 p.m. and 6 p.m.*
2. *The relatively high non-visitor vehicle percentages recorded during these main entrance surveys may be due to the late time of day (4-6 p.m.), when few visitors were arriving, and the low number of vehicles recorded (40 vehicles on June 13, and 39 on June 26).*
3. *The relatively low non-visitor vehicle percentage recorded during this boat ramp entrance survey may be due to the late time of day (6-8 p.m.), when fewer turnarounds would occur, and the low number of vehicles recorded (12 vehicles).*
4. *The very high percentage of non-visitor vehicles does not represent actual conditions, given that the surveyor noted that many vehicles recorded as "turn-arounds" (did not park on site) dropped people off. It is not possible to determine from the survey data which "turn-arounds" were visitor vehicles and which were not. It is likely that this also applies to the July 4 afternoon survey, and most likely to other surveys conducted when the ramp parking was full.*

At the boat ramp entrance, an average of 64.1 percent of observed traffic was recorded as non-visitor vehicles (Table M-2). Most of these were vehicles that were recorded as having turned around at the boat ramp parking area and left. However, the surveyors at times noted that many of the vehicles recorded as “turn-arounds” had dropped off visitors or kayaks before leaving and so were actually visitor vehicles. Also, it was difficult for the observers to consistently and accurately differentiate visitor and non-visitor vehicles in the busy and congested setting of the boat ramp entrance. Therefore, the estimate of non-visitor vehicles from these observations cannot be considered reliable. Some of these vehicles immediately went to the main entrance, where they would be recorded as a visitor vehicle during the survey.

At Memorial Point, there was a wide variation in the percentage of vehicles recorded by surveyors as “turn-arounds” or other non-visitor vehicles. During several surveys, no vehicles were recorded as non-visitor vehicles. Yet, on two occasions, 46 percent of vehicles were recorded as non-visitor vehicles (Table M-2). This variation in observations appears to be primarily a result of variation in the pattern of traffic coming to the Sand Harbor area, depending on the time of day. It should also be noted that conducting the observations consistently at Memorial Point was more complex and challenging than at the Sand Harbor entrances due to the lack of a defined entrance lane with an entrance station, and more variable traffic patterns, with vehicles entering and leaving at both ends of the parking area. As a result, at certain times surveyors found it difficult to consistently keep track of whether individual vehicles were “turn-arounds” or visitor vehicles.

When surveyors were able to consistently observe high numbers of “turn-arounds,” which were most common during mid-morning to mid-afternoon surveys, these appeared to be due to vehicles travelling north on SR 28 using the parking area to reverse direction. General observation of traffic during the study season indicates that these vehicles were turning around to join the queue at the Sand Harbor main or boat ramp entrance, to search for SR 28 shoulder parking, or to drop off visitors on the west side of the highway. “Turn-arounds” were generally few during late-day surveys, when there are usually no waiting lines for Sand Harbor and parking is available. Other “turn-arounds” may have been attempting to find a restroom parking space but left when they failed to find an open space.

Discounting the surveys where no or few vehicles were recorded as non-visitor vehicles, which do not appear to represent actual conditions most of the day on summer weekends and holidays, the survey results generally confirm the use of a non-visitor adjustment of 30 percent at Memorial Point.

State Parks uses the same non-visitor adjustments during the off-season as during the peak season. Presumably these adjustments (like the vehicle occupancy factors) are based on past observations and day-to-day experience at Sand Harbor but, again, the accuracy of these factors is not known, and the study data cannot be used to support or adjust them. Here also, duplication of the entrance station data collection methods described in this appendix during the off-season could be used to gauge the accuracy of the off-season adjustments and potentially improve off-season attendance estimates.

Traffic Counter Error

It was observed that the counter at the main entrance usually over-counted the number of vehicles entering, with most overcounts ranging from 5 to 17 percent. The overcount across all surveys was 9.6 percent.

At the boat ramp, it was observed that the counter usually overcounted vehicles entering by at least 25 percent, and in several instances by over 100 percent. The overcount across all surveys was 63.0 percent. The overcounts appear to be largely due to vehicles pulling boat trailers, which are commonly counted two or more times by the traffic counter.

At Memorial Point, surveyors noted several instances of both overcounting and undercounting. For example, undercounts occurred when vehicles missed the counter loop, and when motorcycles crossed the counter loop close together; overcounts occurred when vehicles left the parking area in the wrong direction. In general, the less controlled traffic patterns in comparison to the traffic recorded by Sand Harbor entrance station counters reduces count accuracy. The vehicle counts based on surveyor observation ranged from about 10 to 20 percent higher than traffic counter counts in several instances, but were up to 13 percent lower during other surveys. Overall, the over and undercounts appear to approximately balance each other out.

State Parks is replacing the Sand Harbor traffic counters. The counters will be installed at new locations near the entrance stations but where the counter induction loops will be less affected by radio interference from the booths and less likely to have vehicles stop over the loops, causing multiple counts. The reinstallations should be followed by retesting of the counters' accuracy by comparing against counts derived from direct traffic observation, as was done during the 2010 surveys. It is unlikely that all counter error can be prevented, but more accurate counter data would considerably improve the reliability of the attendance estimates.

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[i] The visitor survey data provide information on the number of visitors and number of vehicles per group surveyed, but they do not provide complete data on the number of single-occupant vehicles. One reason for this is that the survey did not ask visitors from multiple-vehicle groups how the group was divided among those vehicles. Therefore, it is not known (for example) if a surveyed group composed of five visitors who used two vehicles to come to the park had 4 people and 1 person or 3 people and 2 people in the vehicles; so, it is not known if such a group included a single-occupant vehicle. However, the visitor survey data do indicate that more than half of visitors arrived with their group in a single vehicle, and that most of those vehicles carried 2 to 5 visitors, while solo visitors comprised only 1 percent of the total. Among larger multiple-vehicle groups in particular, it seems likely that most groups would distribute passengers more evenly, if possible, than would be the case if one or more members of the group drove to the park alone. Although these data cannot be used to quantify the percentage of single occupancy vehicles, they do suggest that single-occupant vehicles are not likely to comprise more than 10 percent of visitor's vehicles, even if the unknown numbers of single-occupant vehicles that are among those used by multiple-vehicle groups are accounted for.