

experience for some visitors. During the high use season, the sound of all boats can be continuous in the high use zones, marinas and main channel. Boat noise is noticeable in the Natural and Cultural zones during periods of high boating activity, but there are extended periods when boating noise is not noticeable.

Noise from watercraft operating in excess of the noise decibel requirements could negatively impact visitors. Noise abatement is regulated by the NPS within Glen Canyon NRA and other units of the National Park System (36 CFR, part 3.7). "Operating a vessel in or upon inland waters so as to exceed a noise level of 82 decibels measured at a distance of 82 feet (25 meters) from the vessel is prohibited." The NPS is proposing to amend 36 CFR 3.7 to a different SAE testing standard in order to make enforcement of our existing decibel level easier.

Boating noise is also regulated by the States of Utah and Arizona. The respective states have developed standards relative to boat noise and these standards are enforced by state law enforcement officers on Lake Powell. Glen Canyon is working with the States of Arizona and Utah to address inconsistencies in boating laws, including noise regulations.

The nature of the noise generated from PWC may be more disturbing than other watercraft operating at similar decibels due to rapid changes in acceleration and direction typical of the operation of PWC. Although within the federal and state noise standards described previously, the changes in pitch can be annoying to some visitors. Where legislation allows for specific noise-making activities, such as motorized boating in parks, the soundscape management goal is to reduce the noise to the level consistent with the best technology available and consistent with park purposes and operations in order to mitigate the noise impact.

Manufacturers of PWC are aware of the concerns of the public related to the noise of their operation and have taken steps to reduce the noise by using more rubber in construction and eliminating vibrations. It is anticipated the PWC manufacturers will continue to reduce the noise associated with PWC. As the existing fleet is converted to the newer engine technology by the year 2012, it is expected noise will also be significantly reduced. Noise levels generated by watercraft on Lake Powell, including PWC, is consistent with park purposes and within the standards established by NPS. No additional restrictions are proposed.

### Visitor Use, Conflicts, and Safety

Boat days were used as a basic unit of analyzing the intensity and impact of watercraft use upon Lake Powell. A 'boating day' equals one watercraft on the lake sometime during a 24-hour period. Total annual boating days on Lake Powell were estimated by multiplying the total number of boats estimated to enter the recreation area by the average length of time boats spend on the lake during a visit. The average amount of time each watercraft spent on the lake was estimated by a University of Minnesota 2000 visitor survey, in which watercraft users were asked how many nights they spent on the lake during their stay (Visitor Use at Glen Canyon National Recreation Area, Comparison of Personal Watercraft Users and Nonusers, James 1999–2001).

The total number of boats was estimated using boat rental, boat slip, and boat buoy data obtained from ARAMARK (the national recreation area concession operator), and from the recreation area's monthly entry and trailer counts gathered at the Wahweap, Lone Rock, Antelope Point, Bullfrog, Halls Crossing, and Hite launch areas.

Total annual Glen Canyon National Recreation Area watercraft use in 2001 was 823,148 boating days. This was the only year that all factors necessary for calculating boating days were recorded and available for analysis. There are several important characteristics of this use. PWC use accounted for 27 percent of the boating days estimated in 2001.

The visitor survey identified that, typically, many watercraft are used by a large group of friends or family, and groups often include more than one boat type. Generally one boat type in the group is the primary watercraft. The most common primary watercraft are powerboats. The second most common primary watercraft are houseboats.

It is common for houseboat and powerboat groups on Lake Powell to bring PWC on their trips. Of all groups traveling on Lake Powell with houseboats, 39 percent also included at least one PWC. Twenty-five percent of all powerboat groups included at least one PWC.

Half of all respondents to the summer survey stated that they operated a PWC during their visit. Visitors have and use multiple types of watercraft, including PWC, during a recreation trip, and PWC use is not restricted to a specific user or age group.

Watercraft use peaks in the months of June through September. About 79.5 percent of the total boating days in 2001 occurred during this peak use period. PWC use accounted for 30 percent of the

boating days. Because PWC sales have actually decreased over the last several years, based on information provided by the Personal Watercraft Industry Association, the NPS has assumed that PWC use levels will likely remain constant over the next several years. Should PWC sales increase in the near future, use numbers could increase as well.

Over the course of the year, PWC use will vary in proportion to other watercraft. Watercraft use of the lake originates primarily from the four marinas with launch ramps at Wahweap, Bullfrog, Halls Crossing and Hite. From marinas, watercraft users distribute themselves on the lake to popular destinations. Some visitors remain in the vicinity of the marina. Because of the distribution of marinas with fueling stations along the length of the lake, houseboats and powerboats have access to and may travel to any point on the lake.

PWC use correlates with other watercraft use in remote areas of the lake because of the association of PWC with houseboat and powerboat groups. However, PWC operators were more likely to recreate in the Wahweap, Bullfrog, and Halls Crossing portal areas than other areas based on the fuel holding capacity of these vessels.

Boating use originates from outside of Glen Canyon on the San Juan and Colorado Rivers. The Bureau of Land Management issues permits for trips that originate typically from BLM's Sand Island Recreation Site (river mile 0) or Mexican Hat (river mile 27) on the San Juan River and terminate at Clay Hills Crossing (river mile 84) within Glen Canyon (personal communications, Berkenfield, BLM). Canyonlands National Park issues permits for trips that originate within Canyonlands on the Colorado River and terminate within Glen Canyon at Hite (personal communications, Henderson, NPS). PWC are prohibited within Canyonlands.

PWC users and other watercraft users come to Glen Canyon with motives for and expectations about their visit. These reflect the visitor's desired experiences and indicate the basis for a satisfactory visit.

Respondents to the University of Minnesota summer 2000 watercraft survey (James, 2001) described their motives for visiting the recreation area. Little difference exists between the desired experiences of PWC and other watercraft users. Among the most important were "to enjoy the scenery of Lake Powell," "to do something with my family," "to get away from the usual demands of life," "to be with members