

County emissions. The NPS-estimated emissions are on the same order of magnitude as those presented by the commenter, even though the NPS estimates a larger amount of emissions. The argument that a single source has negligible impact because of its small size compared to all the sources in the region is not valid. This point was effectively stated in *Kings County Farm Bureau v. City of Hanford*, a 1990 California case that has been widely publicized and used in subsequent environmental analyses. The *Kings County* case also addressed the impacts of ozone-forming pollutants, and emphasized that each source is important when considering cumulative impacts.

Clark County is currently in attainment of the federal 1-hour ozone standard. The EPA has not yet made attainment designations for the 8-hour ozone standard that was promulgated in 1997 but was delayed by litigation in implementation. Preliminary data indicates that Clark County might not attain the 8-hour ozone standard (<http://www.epa.gov/ttn/naaqa/ozone/areas/maps/nv8hr.gif>). Therefore, reduction of emissions from all sources in the county is an issue.

As shown in the previous responses, the proposed elimination of two-stroke carbureted engines from Lake Mead NRA after 2012 would result in a substantial reduction in emissions, and would contribute to the improvement of air quality in Clark County.

26. National Park Service notes that recent studies suggest changing from two-stroke carbureted to two-stroke direct injection PWC engines might increase PAH emissions. A study by Norman Y. Kado et al, *Airborne Particle Emissions from 2- and 4-stroke Outboard Marine Engines: Polycyclic Aromatic Hydrocarbon and Bioassay Analysis*, (Kado study) quantified PAH concentrations in airborne particulate emissions. The Kado study showed that the PAH emissions from the direct-injected two-stroke engines tested were greater than from carbureted two-stroke engines. The direct-injected two-stroke outboard engine used in that study was a 1999 model and represented very early technology, and the results of the study are not applicable to newer model direct-injection outboard engines, much less PWC engines.

NPS Response: The commenter rejects the applicability of the Kado study to newer engines including PWC engines. However, since no comparable data for newer engines was presented, and many older engines would be allowed to operate at the recreation area through 2012, the Kado study is relevant. NPS

acknowledges in the final EIS that further research is needed to identify what effect the conversion of two-stroke carbureted engines to two stroke fuel injected engines would have on PAH concentrations in water.

In speaking with local PWC businesses the NPS was informed that the majority of newer PWC models being sold are four-stroke engines, not two-stroke fuel injected engines, but no specific data is available. These comments concerning four-stroke sales are consistent with statements made by PWIA that nationally the two top-selling PWC models are four-stroke models. Nevertheless, while conversion of some carbureted two-stroke engines to direct-injected two-stroke engines would result in increased PAH emissions, the concurrent conversion to four-stroke engines would result in reduced PAH emissions. As shown by the commenter, using Kado data, the combined PAH emissions of one direct-injected two-stroke engine and one four-stroke engine would be slightly less than the PAH emissions of the two carbureted two-stroke engines that would be replaced. Therefore, the increase or decrease of PAH emissions as carbureted two-stroke engines are converted to cleaner engine types would depend on the relative numbers of the types of cleaner engines. The speculation of the mix of engine types would not appreciably change NPS conclusions made in the final EIS.

27. Continued PWC use on Lake Mead under the proposed rule will not pose any adverse health risks for park visitors under even the "worst case" airborne PAH concentrations that could theoretically be generated by the vessels.

NPS Response: A relevant study concluded that there are some health effects associated with PAH emissions. (See *Environmental and Occupational Exposure to Toxic Air Pollutants from Winter Snowmobile Use in Yellowstone National Park* (Kado, Kuzmicky, and Okamoto)). Therefore the NPS cannot support a conclusion as the commenter suggests, that PWC use at Lake Mead would pose no adverse health risks from toxic air pollutant emissions; however the final EIS does acknowledge that the impact would likely be minor.

Comments Related to Wildlife and Wildlife Habitat

28. One commenter questions the occurrence of the Southwestern willow flycatcher at the inflow areas of the Muddy and Virgin Rivers and stated that no Southwestern willow flycatchers nest within Lake Mead NRA.

NPS Response: Southwestern willow flycatchers have been recorded within

Lake Mead NRA, and are known to nest in certain areas. Monitoring has been conducted by the San Bernardino County Museum, the Bureau of Reclamation, and the National Park Service. The most recent published report (McKernan and Braden 2002) for the 2001 field season found flycatchers at the Virgin River-Lake Mead delta. In addition, since 1997, flycatchers have been observed breeding along the lower Muddy River on the Overton Wildlife Management Area, within Lake Mead NRA. There have also been flycatchers observed in the lower Grand Canyon, adjacent to the recreation area, in suitable habitat at Lake Mohave.

As stated in the draft and final EIS under the "Affected Environment" section, much of the shoreline areas of Lakes Mead and Mohave have riparian stands that are comprised of non-native tamarisk, or are too young to provide suitable nesting habitat. However, several areas have been determined suitable, and nest sites have been located. Of particular importance are the sensitive inflow areas, which will be protected by zoning for primitive and semi-primitive settings. In addition, if surveys find nesting pairs elsewhere along Lakes Mead and Mohave, closing the area under temporal zoning could be implemented to protect these sites.

29. One commenter takes issue with the impact discussion on shorebirds and other wildlife. They state, "on the basis of anecdotal evidence (chiefly testimony from park staff) the proposed rule concludes that PWCs could disturb wildlife through the interruption of normal activities, alarm or flight, avoidance and displacement of habitat, and nest abandonment. The term "could" demonstrates that National Park Service has not obtained evidence that such disturbance actually occurs at Lake Mead NRA."

NPS Response: There are many studies that relate to the impacts of motorized vessels, including PWC, on shorebirds, bald eagles, and other wildlife. These studies were considered in the development of the draft and final EIS. Buffer zones to protect foraging and loafing waterbirds from disturbance by personal watercraft in Florida (Rodgers 2000) determined that a buffer zones for motorized vessels would protect waterbirds. Effects of Motorboats and Personal Watercraft on Flight Behavior over a Colony of Common Terns (Burger 1998) showed disturbance responses from the use of motorized vessels, and recommended speed and distance restrictions close to tern colonies. Effects of Recreational Activities on Wintering Bald Eagles (Stalmaster and Kaiser 1998) showed that high