



Applying knowledge to improve water quality

# Southwest States & Pacific Islands Regional Water Program

A Partnership of USDA CSREES  
& Land Grant Colleges and Universities

Summer 2005  
SWWQ002

## Lake Tahoe - Do Pet Recreation Areas Affect Water Quality?

Under the Safe Drinking Water Act, surface water supplied systems are required to filter water to remove microbial pathogens. However, due to the high quality of Lake Tahoe water, the EPA has granted waivers from filtration requirements to five public water suppliers on the Nevada side of Lake Tahoe. As a condition of maintaining the waivers, water suppliers are required to show that potential sources of microbial contamination are controlled in watersheds that contribute to their water supplies.

One potential source of microbial contaminants, such as *Cryptosporidium* and *Giardia*, is feces from companion animals. Concerns have arisen about the potential impact dog parks may have on water quality in the Tahoe Basin. The University of Nevada, in cooperation with the Tahoe Water Suppliers Association is using a dog exercise area of the Burke Creek subwatershed as a demonstration and research site. Like several pet exercise areas in the Lake Tahoe Basin, the Burke Creek area is heavily used and currently unmanaged.



Burke Creek as it flows into Lake Tahoe

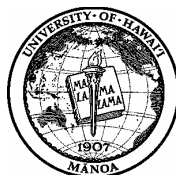


Burke Creek recreation area - Are management measures necessary to protect water quality?

### *Giardia and Cryptosporidium*

According to the Center for Disease Control, in the last two decades *Giardia* and *Cryptosporidium* have become two of the most common causes of waterborne disease within humans in the United States. *Giardia* and *Cryptosporidium* are parasites that are carried in the intestinal tracts of infected animals and humans. Both parasites have hardened structures that allow them to live for a prolonged period outside of a host. In the case of *Cryptosporidium*, the hardened survival structure also makes it very resistant to chlorine disinfection. Infection occurs through swallowing the parasite, generally with contaminated water, but also with soil, or other surfaces that have been contaminated with feces from infected hosts. With both parasites, the most common symptom is diarrheal illness in varying degrees. However, in sensitive subpopulations such as small children, pregnant women, the elderly, and individuals with compromised immune systems, rapid dehydration can become life threatening. Individuals with compromised immune systems may not be able to overcome infection.

University of Guam • American Samoa Community College • College of the Marshall Islands



College of Micronesia • Northern Marianas College • Palau Community College

## Southwest States and Pacific Islands Regional Water Program

### Southwest States

The University of Arizona  
Cooperative Extension  
Dr. Kitt Farrell-Poe  
kittfp@ag.arizona.edu

University of California  
Center for Water Resources  
Dr. Laosheng Wu  
laowu@mail.ucr.edu

University of Nevada Reno  
Cooperative Extension  
Dr. Mark Walker  
mwalker@equinox.unr.edu

### Pacific Islands

University of Hawaii  
Dr. Carl Evensen  
evensen@hawaii.edu

University of Guam  
David Crisostomo  
dcrisost@uog9.uog.edu

American Samoa Community College  
Dr. Don Vargo  
donvargo@rocketmail.com

College of Marshall Islands  
Amelet Kalem  
akalem20002000@yahoo.com

College of Micronesia  
Jackson Phillip  
jphillip@comfsm.fm

Northern Marianas College  
Lawrence Duponcheel  
lawontinian@vz.pacifica.net

Palau Community College  
Leilanie Rechelluul  
leirechelluul@yahoo.com

### Regional Agency Liaison

Christine French  
(951) 827-4327  
christine.french@ucr.edu

*This material is based upon work supported by the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture, under Agreement No. 2004-51130-02258*

The experimental approach was intended to quantify fecal loading patterns and achieve an understanding of how concentrated fecal loading from companion animals might affect stream water quality. In June of 2004, thirteen waste collection transects, each covering a seven foot radius, were established in the Burke Creek recreation area. Seven water sampling sites were established at selected points on Burke Creek. Each 2 weeks samples were taken from waste collection transects and water sampling locations. Solid waste collected from transects was desiccated, weighed, and expressed in kilograms per square meter. Water samples were tested for the presence of *E. coliform* to indicate fecal contamination.

## Findings

- **Fecal loading is highly localized.** The highest concentration areas were at park entrance points. We attributed this to canine territorial marking behavior. From a management perspective this means we can predetermine areas of heavy fecal loading by manipulating park access points. Selecting access points that allow for a maximum drying time of solid wastes or minimize the risk of runoff could further reduce bacteria levels in Burke Creek. Under another management option, we can use this data to determine best locations for sanitary glove dispensers and waste collection stations.
- **Fecal loading is seasonally variable.** Fecal loading declines sharply in colder months when the area receives less visitation. Additionally, microbial indicators do not appear to persist in freezing temperatures. In the case of Burke Creek, should monitoring or management options become necessary in the future, seasonal implementation of these options would likely prove sufficient as well as cost advantageous.
- **Water Quality is not affected consistently.** Findings to date suggest that the presence of the dog park within the Burke Creek recreational area does not have a consistent affect on water quality in nearby and downstream Burke Creek. Site factors, such as the presence of a sedimentation pond mid-course in the creek may have a role in preventing indicator organisms from reaching downstream locations. Also, fecal bacteria may not survive environmental stresses long enough to be transported by runoff events. Management options for this area are not necessary for the protection of water quality at this time. However, this could potentially change with variation in the amount and intensity of precipitation, snow melt, site use, and density of pet visitation.

For more information about this research, please contact:

Dr. Mark Walker

University of Nevada Cooperative Extension  
State Extension Water Specialist

email: [mwalker@equinox.unr.edu](mailto:mwalker@equinox.unr.edu)

Website - <http://www.ag.unr.edu/water/>

**About Our Program** - The Southwest States & Pacific Islands Water Program, a component of the National Water Program (a partnership of USDA-CSREES and Land Grant Universities and Colleges) seeks to ensure the integration of water quality efforts within the jurisdiction of each of the ten regions established by the U.S. Environmental Protection Agency. The Program is designed to make resources of the university system more accessible to Federal, State, and local water quality improvement efforts, thus enhancing opportunities for agricultural producers, and rural communities to adopt voluntary approaches for the improvement of water quality.

On the web at <http://ag.arizona.edu/region9wq/>