



## Public Health Update

Saturday, March 13, 2004

### Virus Stopped By Alert Ranger !!

Since at least 1994, Grand Canyon National Park has had recurring outbreaks of Norovirus. This very small round virus causes what most people would describe as “24 hour stomach flu.” While symptoms are usually mild and disappear within a day or two, dehydration can occur, especially in the backcountry.

For several years now the NPS Public Health Program (PHP) and GRCA have been working together, along with researchers from the Centers for Disease Control and Prevention, to understand the cycle of this transmission. The PHP has also worked with GRCA Rangers and concessions to establish a sensitive surveillance system for this critter, as well as procedures for limiting spread once it gets started.



Because this virus is only known to have humans as a host, and because it has a fecal-oral route of transmission, prevention is concentrated on keeping it out of water, food, and sanitizing objects once they become contaminated. Extremely infectious, with those

who are ill shedding trillions of virus particles in a cubic centimeter of stool, it takes only 10 to 100 particles to cause infection.

Because this virus gets around so quickly, it often causes what are called “explosive” outbreaks. If someone brings the virus into a situation where people are living closely (on river trips, camps, dorms or shared cabins) it can take off in a hurry, and in almost no time at all, hundreds of people are infected. You might recall all of the cruise ship outbreaks... that’s our bug!

On February 18<sup>th</sup>, Ivan Kassovic, a LE Ranger in the Canyon District was contacted by a hiker at the Phantom Ranch Ranger Station. This hiker had come down from the rim the day before and during the night had acute onset of gastrointestinal symptoms, including vomiting and diarrhea. Ivan was later contacted by this same individual and informed that another member of the hiking party was ill.

On February 23<sup>rd</sup>, another group of hikers contacted Ivan with a similar illness. Because Ivan had been working with the PHP and had his surveillance “radar” on for Norovirus, he recognized that the rapid onset, GI symptoms, and short duration of these illnesses was a possible match for our little round friend.

Ivan, as had been previously discussed with the PHP,

immediately notified the Phantom Ranch concession of the possibility that an outbreak was beginning. The PHP had discussed with the concession the



steps they should take if they received such a notice. After talking to Ivan, the concession started their “virus drill,” disinfecting hard surfaces, maintaining care when cleaning dorms and cabins, and being extra careful about hand washing and food handling.

Miracle of miracles, this easily transmitted virus was stopped after only infecting six people, even in the close confines of Phantom Ranch!

While we can’t be certain that this was Norovirus (there is no laboratory confirmation), the MO of these cases certainly match what has been seen before at GRCA and confirmed as Norovirus. If so, then the alert and quick action by Ivan and the Phantom Ranch Concession likely resulted in sparing 70 to 150 visitors the ugly memory of GI illness at the bottom of the Grand Canyon. This episode is a powerful example of partnership

between NPS units and the concession.

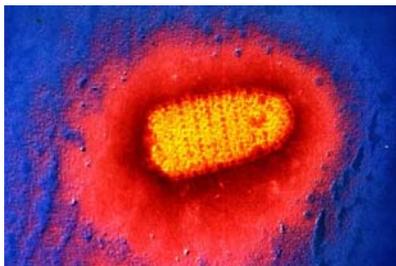
Many thanks to Ivan Kassovic for his outstanding contribution to the protection and well being of NPS visitors!!

CAPT Charles L. Higgins  
Director, NPS Office of Public Health

### Human Death Associated With Bat Rabies

*The following information has been obtained from the Centers for Disease Control and Prevention (CDC) and edited for this publication.*

Although human rabies is rare in the United States, park clinics and medical responders should consider rabies when a



history of possible bat contact is known or when unexplained atypical progressive neuropathy or unusual febrile encephalitis is observed. Persons coming into DIRECT contact with bats should seek consultation with their health care provider immediately to receive post exposure prophylaxis, if appropriate.

Rabies is a rapidly progressive, incurable viral encephalitis that is, with rare exception, transmitted by the bite of an infected mammal. On September 14, 2003, a previously healthy man aged 66 years who resided in Trinity County, California, died from rabies approximately 6 weeks after being bitten by a bat.

In September 2003, the patient was admitted to a hospital emergency department (ED) for assessment of atypical chest pain. He had a 2-week history of mild, nonspecific complaints (drowsiness, chronic headache, and malaise), a 5-day history of progressive right arm pain and paresthesias, and a 1-day history of right-hand weakness. The arm pain was severe enough to wake him from sleep and progressively worsened. He also described a sharp pain radiating bilaterally up the right arm to his axilla and left chest. The pain was relieved by administering nitroglycerin in the ED. The patient reported being bitten by a bat on the right index finger while in his bed approximately 5 weeks before admission. He removed the bat from his home, and it flew away. The patient washed the wound but did not seek rabies postexposure prophylaxis at that time.

The patient had steady neurologic decline during the following week with confusion and disorientation. By the fifth hospital day, he had a right lung infiltrate, and his electroencephalogram showed diffuse slowing. Two days later, he died.

During 1990 to 2000, a total of 24 (75%) of U.S. human rabies cases were caused by bat-associated rabies virus variants. In 22 (92%) of these cases, no documentation



of a bite existed; however, this does not mean that a bite did not take place. Instead, such a history was most likely not uncovered.

*Editorial Note: It is important to note that this disease is very rare and these exposures should be placed into the overall context of the beneficial aspects of bat presence. However, visitor or employee bite exposures should never be taken lightly.*

Possible exposures should be referred to a health care provider and the incident reported to the NPS Public Health Program. Together with the park and Dr. Margaret Wild (the NPS Veterinarian), the incident will be investigated to determine if any other actions are necessary. Listed below are Regional NPS / PHP contacts.

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## Mott Island Proposed Microfiltration Water Treatment Plant

*Isle Royal National Park,  
Michigan*

The existing Katodyn water treatment system no longer meets the new Environmental Protection Agency's Long Term Enhanced Surface Water Treatment Rule (LTrESWTR). The Katodyn system at Mott Island will not meet the lower turbidity requirements of the new rule.

The new rule affects public and non-public surface water treatment systems including ground water systems under the influence of surface water within the National Park Service. A compliance date of January 2004 is now in effect.

The rule sets a combined filter effluent turbidity of 0.3 NTU for conventional water treatment plants achieved in 95% of the samples taken in a one-month period. Measurements for turbidity must be performed every four hours and must be less than 1.0 NTU at all times.

With that in mind, Isle Royal National Park with the help of the Public Health Consultant has decided on a new Microfiltration water treatment scheme for Mott Island. Microfiltration water treatment will meet the new surface water turbidity regulations.

The microfiltration unit utilizes hollow fiber membrane technology allowing only a 0.2 micron or smaller particle to pass through the membrane filters. The membranes are made up of polypropylene membrane

material, polyurethane potting material and a nylon housing material. An example cut out view of a filter module is shown below.



*Hollow Fiber Membranes within the Filter Modules.*

The system will utilize an outside-in, dead-end configuration effectively blocking the particles as water flows through the membrane. When particles build up on the hollow fiber membranes, the system uses a patented air-water backwash. This backwash technique scours and removes particle buildup on the fibers. A chemical clean and an acid clean of the filter media are required to remove hardness from the fibers on a routine basis. The filtered water will then be chlorinated and fed into the existing water system.

This proposed project may be the first utilization of a Microfiltration water treatment unit in the National Park Service.

CDR Robert Reiss  
Regional Public Health Consultant  
NPS/PHP, Midwest Region

## Public Health Issues Questions & Answers

If you have a public health issue that you would like to see information on or if you have questions about a public health subject, please feel free to write to:

[Charles\\_higgins@nps.gov](mailto:Charles_higgins@nps.gov)

and we will try to include your issue or question in an edition of PH Updates. Or... You can try our website at:

[www.nps.gov/public\\_health](http://www.nps.gov/public_health)

## U.S. Public Health Service Officers on Specific Assignments Within NPS

Did you know that besides the Regional Public Health Consultants, there are 23 PHS officers assigned to specific parks, projects, or programs within NPS?

These officers on specific assignments include Engineers, Industrial Hygienists, and EHO's (Environmental Health Officers).

These officers are assisting NPS with NPS Risk Management, park or regional construction projects, environmental issues at parks and concessions, ensuring that land acquisitions don't come with extra "stuff" that NPS will have to clean up later, and teaching courses on handling hazardous materials incidents.



**In Partnership for nearly 100 years, the National Park Service and the United States Public Health Service have worked to protect the health of visitors in Americas Parks !**