



**Annual Report  
2004**

# **National Park Service / Public Health Program Annual Program Report – 2004**

## **INTRODUCTION**

As we enter into our eighty-seventh year of partnership with the National Park Service, it is with great pleasure that we present a report of the Public Health Program's activities for the 2004 fiscal year. This year has been filled with opportunities and challenges. At this time of ever tightening resources we've made an active effort to renew our commitment to NPS by reviewing all aspects of our program, searching for ways to continuously improve what we do.

For every organization there should be a set of core operating principles from which all actions and activities flow and are compared against. These statements should be more than slogans but rather substantive foundational anchors upon which to build our goals. As we move into the future, the program foundations listed below form the basis of our continuing commitment to those we serve at NPS.

As commissioned officers of the United States Public Health Service, assigned to the National Park Service, we are proud to serve the parks, our agency, and all of the visitors to our nations' park system.

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

- The NPS Public Health Program (PHP) uses a Systems or Ecologic-based problem solving approach, considering the entire web of connections between people, our environment and the activities of each park that may interact to affect visitor health in positive and negative ways.
- We strive to translate science into a pro-active exploration and understanding of how and where the cycles of disease may intersect with park settings, activities and infrastructure. Our policies, guidance and recommendations are based on the latest peer-reviewed literature, research and findings.
- Partnering and collaborating with anyone who shares our goals, we work to design practical, sustainable, public health interventions that target root causes of hazards and take into consideration any unintended consequences. We actively seek to create synergies with other groups, create efficiencies, and eliminate duplicative efforts.
- Acting as inside consultants to each Superintendent and Regional Director, implementation of our recommendations is carried out by each park so that these may be integrated into, and supportive of the entire NPS mission.
- All of our activities, actions, and results are continually communicated to the NPS in a transparent and accountable manner. We operate openly, without hidden agendas, responsibly and carefully leveraging the resources that the NPS and taxpaying public have given us.

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

## ACTIVITIES

### 1. Direct Delivery of Service to Parks

#### a. Summary of park visits by Office of Public Health staff

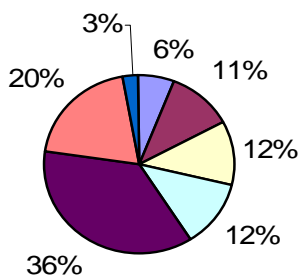
The officers assigned to the PHP provide direct public health services to the parks through onsite evaluations of food service operations, water and wastewater systems, and vector-borne disease threats, as well as investigations of outbreaks of disease among park visitors, employees, and partners. In addition to assistance provided by phone and correspondence, in 2004 these officers provided more than 300 days of onsite consultation to parks across all regions. Below is a breakdown by area of responsibility:

- i. **Onsite Evaluations and Consultations** – These visits provide some oversight of park stewardship/responsibilities for protecting visitors from potential public health issues and, perhaps more importantly, critical opportunities to interact with park staff, assist them with prevention efforts, and see first hand potential public health issues.

In 2004, the greatest number of onsite visits occurred in the IMR and the PWR. This is a natural consequence of the nature of these park units, containing larger amounts of land, more infrastructure, and additional interaction between visitors and the natural environment.

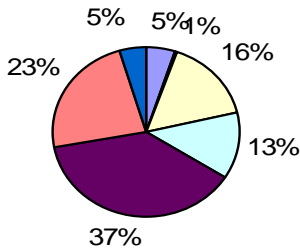
The following three charts show percentage of visits by region, amount of travel time by region, and individual evaluations conducted by region. Park visits are simply the number of visits to a park. Travel time varies and is determined by the amount of public health work to be conducted in each park. Parks that are larger, have more concessions, or by their nature historically have generated a larger number of known disease transmission events/issues, take additional time. The chart that illustrates individual evaluations is an attempt to show this variation in work load from park to park from another angle. Within each unit, the number of drinking water systems, waste water systems and food concessions varies widely, with one visit to a park unit resulting in the evaluation of two drinking water systems, while a visit to another unit may result in 12 separate evaluations.

**Park Visits by Region (n = 226)**



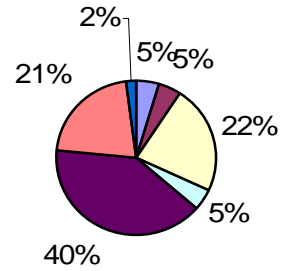
NER NCR SER MVR IMR PWR AKR

**Travel Days by Region**



■ NER ■ NCR □ SER □ MWR ■ IMR ■ PWR ■ AKR

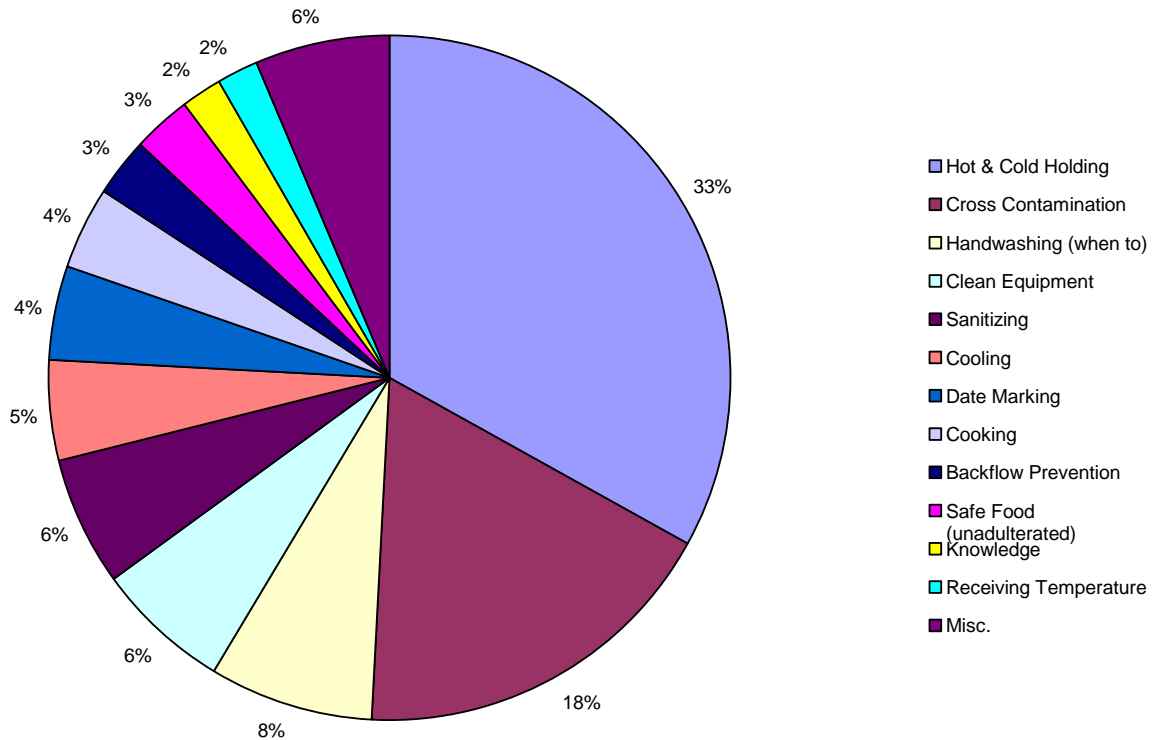
**Individual Public Health System Evaluations Received by WASO FY04 (n = 685)**



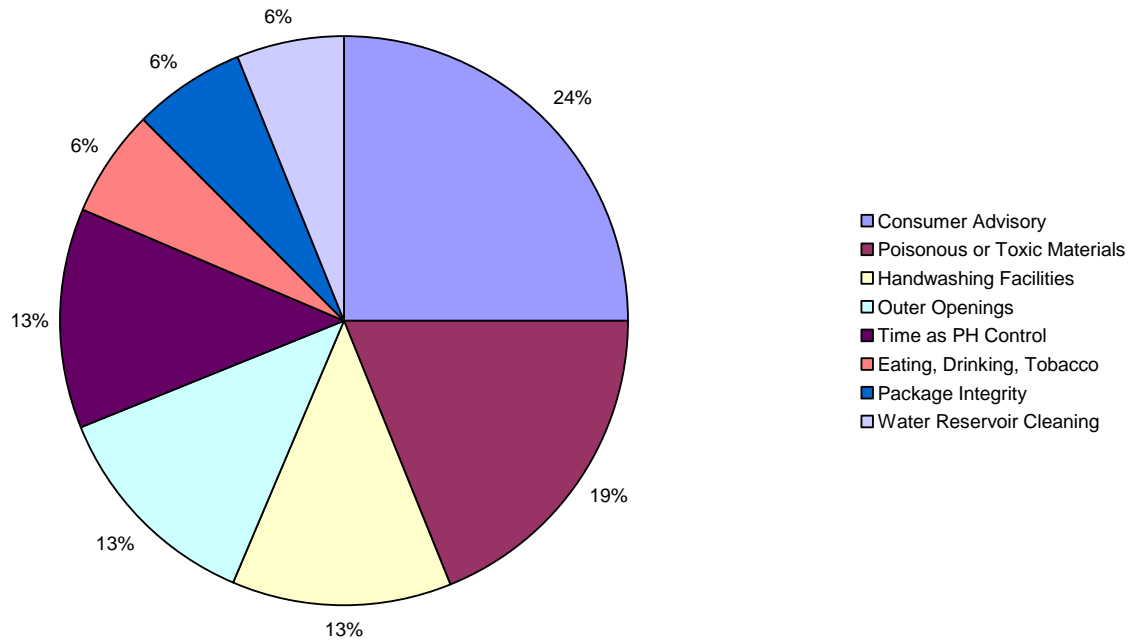
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ii. **Food service operations** – Nearly 400 in-depth evaluations of approximately 250 facilities were conducted in parks system-wide. The following chart shows critical findings from these food safety evaluations (the second chart further breaks down the “miscellaneous” category) and highlights system-wide issues that are most likely to affect visitor health.

**CRITICAL VIOLATIONS - 2004**  
(n = 252)



Miscellaneous Critical Violations - 2004  
(n = 16)



This year the program initiated a major change in our approach to conducting food safety evaluations. We shifted our methods from an inspectional approach (comparing on-site observations to a list of things to do and not to do – a food code) toward a systems-based analysis. In this new method, we go beyond traditional compliance inspection in an attempt to more deeply understand food operations and what degree of control they have over critical food safety issues. In time, we also hope to “drill” into why concessions have control over certain processes and not others so that we might better help them purposefully manage for a safe outcome.

The Office of Public Health utilizes this data to focus training as well as the consultation provided to concessions operators during evaluations. This approach allows the program to develop strategies to reduce risk and provide an opportunity for collaboration between operators and evaluators.

- iii. Vector-borne and zoonotic diseases** – The potential vector-borne diseases threats in National Parks are far and wide. From urban to rural and desert to tropical, the ecosystems in which parks exist are home to myriad host, vectors, and pathogens that can cause disease in human populations. The Office of Public Health assisted parks with many of these issues this year by consulting with each park visited on transmission potential that might be associated with that site due to location, climate, species inventories and other variables. We also assisted any

park who contacted us because they had identified a concern or a potential concern.

- iv. **Water and wastewater** - The NPS operates several thousand water and wastewater treatment systems across the network of parks. The drinking water systems range from simple wells and springs to the highly complex trans-canyon system at GRCA, and from basic pit privies to large tertiary treatment plants for wastewater. During 2004 the Public Health Consultants assigned throughout the regions conducted over 800 onsite evaluations of park water and waste water systems and identified 32 critical issues.



- v. **Backcountry issues** – During on-site visits, where appropriate, consultation was provided for back country disease transmission potential including guide operations, drinking water, vector borne and zoonotic diseases, waste disposal, and food safety.
  - vi. **Special events** – Special events at park sites, especially the National Mall, frequently involve activities with significant potential impact to public health. Public Health Program staff were involved over the course of the year with numerous temporary events and evaluated or assisted parks with evaluating food safety, providing for drinking water, protecting visitors from exposure to disease agents such as West Nile Virus, and dealing with human waste.
- b. Disaster and emergency response** – Park Superintendents and Incident Commanders are able to tap into the expertise of the Public Health Program during any situation where infectious disease or other hazards may pose an immediate or potential public health threat. Such situations include intentional acts, accidents, or natural disasters that might affect drinking water, food, or waste water disposal. Incidents may also create an increased potential for vector borne (mosquitoes, ticks, etc.) and environmentally transmittable diseases, and person to person transmission.

Eight officers from the Public Health Program deployed in response to hurricanes in 2004, spending more than 100 days in the field responding to various public health issues.

**c. Highlights of activities from Public Health Service officers assigned to individual programs outside of the Office of Public Health**

- i.** Industrial Hygiene – some of the officers assigned to WASO programs, regions, and parks focus on worker safety and protection. The research, training, and prevention efforts are Heat stress study, Carbon monoxide study and recommendations, OSHA partnership, policy, respirator fit testing.
- ii.** Engineering and Construction Management – officers lead, manage, and assist in system-wide infrastructure projects. Whether designing wastewater disposal facilities or overseeing \$20 million construction projects, the engineering expertise provided by the PHS is bringing unique perspectives on systems design and construction that have resulted in many projects being designed in-house as well as completed under budget.
- iii.** Environmental Compliance – officers bring expertise in contaminant remediation, hazardous waste management, and environmental site assessment to the various programs to which they're assigned. The guidance provided in these critical areas ensures that the NPS is in compliance with state and federal environmental laws, employees and visitors are protected from hazardous materials that may exist in parks, and pre-acquisition assessments of land that the NPS will acquire. Efforts in sustainability are also a top priority of officers working with programs such as Concessions Management.

**2. Training**

- a. Systems Methodology** – In its system-wide rollout of the new methodology for food service evaluations, the PHP provided to training to all of the Public Health Consultants in the regional offices as well as the park assigned sanitarians and environmental health officers. This training was also provided to concessions specialists and operators in various parks and regions where training of PHP personnel took place.
- b. Concessions E&P** – The PHP continues its support of the Evaluation and Pricing Course that is coordinated by the WASO Concessions Program. The public health section of the course provides the student with the tools necessary to follow-up on managerial issues related to the production of safe food in NPS concessions operations, and also to know when consultation from the PHP is needed.
- c. Special Park Uses (SPU)** – The program works closely with the WASO Special Park Uses program and participates in the two courses that are put on each year.

- d. **Water Operator** – Three water operators training courses were held in 2004, which were attended by more than 60 NPS employees representing park maintenance operations. The training provided required continuing education units (CEUs) to park water treatment system operators to ensure the continued availability of safe drinking water for visitors, employees, and partners.

### 3. Partnership and Collaboration

- a. **Biological Resource Management Division (BRMD)** - The BRMD and PHP are entering into their third year of partnership after the formation of the Zoonotic, Environmental, and Vector-borne Disease Steering Committee. Since its formation the ZED group has worked on several issues, including WNV, Hanta, rabies, CWD, etc.

In order to better serve park managers and to provide coordinated advice, the Public Health Program regularly works in partnership with BRMD integrated pest management experts. Joint planning, problem solving and guidance development help to better integrate these two closely related subject areas.

A close working relationship has been established with Dr. Margaret Wild, the NPS Veterinarian. Close consultation and mutual support helps both parties in assisting parks with zoonotic (diseases transmitted from animals to man) and vector borne disease issues.

- b. **Concessions Management** – Because a large proportion of the public health work in the NPS is associated with park concessions operations, we continue our strong partnership with the Concessions Management Program (CMP). With CMP's financial assistance the PHP was able to conduct more onsite evaluations of the several hundred food service facilities in parks.
- c. **Facilities Management** – Officers work closely with facility managers at the park and regional level to address public health issues related to system infrastructure such as water and wastewater treatment operations. The PHP offers design and operation expertise, as well as training in the areas of facilities management that overlap the issue of potential disease transmission.
- d. **Risk Management Program** – Many health issues affect both the public and NPS employees. This joint risk requires that our two programs work closely and that has and continues to be the case. An example of this collaboration from this year is the investigation into the death of a park employee from Hantavirus Pulmonary Syndrome. An expert from each program teamed up to provide on-site evaluation of how and where this employee might have been exposed to this pathogen and how this information might be translated into improved prevention.
- e. **Colorado Mountain College** – In an effort to address complex, detailed public health questions that are difficult for our field staff to have the time to address, we are moving toward teaming with various academic institutions. This year a student intern from Colorado Mountain College assisted us with investigating two issues, exploring what was



already known, collecting any needed additional data, and providing a detailed risk assessment about what still might need to happen to reduce public risk.

- i. **GRSA** – Medino Creek, running through Great Sand Dunes National Park, has historically been shown to contain microorganisms that are indicators of the possible presence of human disease agents. This water is also a popular visitor attraction and recreational activity. This risk assessment looked at water quality, the exact nature of the visitor use/exposure, concluding that risk to the public is low but also identifying further areas of study.



- ii. **GRTE** – A risk assessment is underway for two drinking water issues at one location in the John D. Rockefeller Memorial Parkway, administered by GRTE. Past routine sampling has identified potential issues with arsenic and fluoride, both inorganic substances that can have human health effects. This assessment will seek to identify the magnitude of the problem and whether or not we have any real risk from this exposure for visitors.
- f. **Centers for Disease Control and Prevention (CDC)** – Renewed efforts to partner with the CDC have served both parties well. The world-class laboratory services that CDC provides during outbreaks of disease within parks help to identify the causative agent early so that the right corrective action can be implemented in order to protect public health. CDC’s assistance with norovirus research in the parks has given us the opportunity to develop guidance to parks and concessions operators based on the most up-to-date science. PHP-developed norovirus guidance has probably led to reducing the potential impact of this agent in parks and has been adopted by some cruise ship companies as the best available document on the subject.

A formal memorandum of understanding between NPS and CDC was signed this year and provides for on-going collaboration that will enable both parties to better understand the cycles of diseases of interest to us and improve our protection of visitors. This agreement will provide much needed laboratory support (at no cost to NPS) and regular

access to world-class expertise. In addition to the general provisions in the MOU, both groups have agreed to undertake a project at GRCA designed to develop a model public health program for a large western park. Listed below are some of the expected outcomes from this project.

**Benefits to the National Park Service:**

- Allows NPS to tap into the public health research resources at CDC
- Will give NPS / PHP the opportunity to be the first program to demonstrate the use of a new systems-based approach to public health problem solving
- Applied research into measuring the effectiveness of these new tools can be used to track outcomes from the work that the NPS / PHP conducts
- This project will produce a model public health program for a large park setting, one that can be transferred to other large parks within the NPS system

**Benefits to GRCA:**

- CDC will conduct a complete inventory of environmental health issues at GRCA
- This project will work toward establishing a model public health program at GRCA
- Applied research conducted in support of the practice model development will help to address environmental health issues at GRCA (for example understanding the Colorado River / Norovirus transmission cycles)

- g. Food and Drug Administration (FDA)** – While the FDA has always been a source of regulatory interpretation regarding human health risks associated with NPS food service establishments; we recently entered into the FDA Program Standards process. The FDA Program Standards process is intended to create program self-assessment and continuous improvement and is a mechanism for essentially “accrediting” government food safety programs. This effort will serve as a standardization tool for the officers in the program and allow for the PHP to be recognized as equivalent to state and local food protection programs.
- h. Wyoming Department of Health** – In an effort to explore ways to detect disease transmission with the NPS system, we have partnered with the State of Wyoming. The Wyoming Department of Health, as a matter of routine disease surveillance, is now looking for diseases that may be the result of park exposures and notifying the NPS Public Health Program immediately when these are discovered. Over the last two years, this has allowed us to identify several potential issues, respond, reduce transmission, and improve prevention. In addition to this notification effort, Wyoming has also contributed staff assistance during outbreak investigations, greatly reducing the time needed to identify the cause.
- i. New York City Department of Health and Mental Hygiene** – The 5-year partnership with the NYCDOH began with the emergence of West Nile Virus (WNV) in 1999. This relationship, which originally focused on mosquito surveillance and control, has expanded to include other vector-borne and zoonotic disease issues such as rabies and tularemia. The cooperation between the park and the city has served to protect not only the park visitors and employees, but the population of the greater metropolitan area. By

approaching disease issues in partnership we are able to create synergies that increase efficiencies for both parties, but also add to the greater body of scientific data available for developing intelligent, risk-based responses to human health issues in parks that are located in urban areas.

- j. Coconino County Health Department** – The CCHD has been a longtime partner with the PHP for concerns in Northern Arizona. We have been able to work with CCDH on a range of issues, including the outbreaks of norovirus at both GRCA and GLCA. Like the work with Wyoming, this timely assistance has enabled us to more quickly identify transmission, causes of outbreaks, and make improvements in disease prevention.
- k. Monmouth County Mosquito Commission** – The relationship with MCMC has also recently celebrated its five year anniversary. Like the partnership with NYCDOH, this too arose from the WNV outbreak of 1999. Working together to identify and control human risk of the disease these efforts have been recognized by the infectious disease community as a model of cooperation between agencies with similar goals.
- l. Grand Teton National Park** – This last summer, the Public Health Program provided a small amount of money to GRTE to enable them to monitor mosquito populations for West Nile Virus. A syndromic surveillance pilot effort was also started at GRTE as part of our overall disease surveillance system. This program is a partnership between the OPH, park, and concessionaire to track and analyze the sale of over-the-counter anti-diarrheal medications. Identifying the occurrence of disease as early as possible allows us to respond quickly in order to Stop the outbreak and reduce both the human health and economic impact.
- m. Grand Canyon National Park** – Financial assistance was provided this year to the GRCA River Sub-District in exchange for collecting needed public health data during their routine river patrols.

## **ADDITIONAL ACCOMPLISHMENTS**

### **1. Programmatic Shifts**

The Public Health Program within the National Park Service has two fundamental purposes; to protect the visitors to these sites, and to explore ways in which the nation’s parks might contribute to and promote the health of the American people.

In the next few years, the Public Health Program (PHP) intends to vigorously renew this commitment by re-examining all that we do, how we do it, and how we might become more effective and add even more value to our contributions to the NPS mission.

- a. Science** – Renewing our commitment to a program soundly grounded in science, we are; instituting peer review processes for guidance documents and informational materials, taking steps to ensure that literature searches and national expert consultations (as well as our own experience, knowledge and expertise) form the basis for our advice to parks, and seeking input from other scientists within NPS.

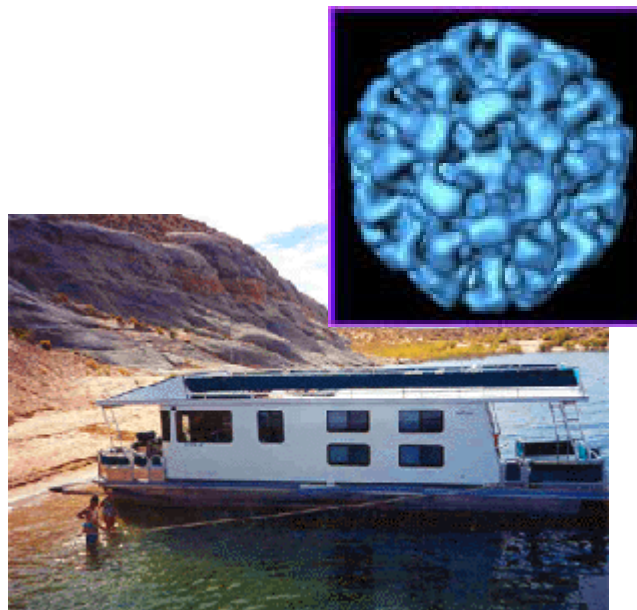
- b. **Risk-Based Decision Making** – In order to better target our resources, work must be approached in a way that prioritizes decisions about routine work based on the potential impact to public health. Beginning with FY05 planning, each PHC will develop a schedule based on the known and potential threats to public health. Due to the variation among parks (size, infrastructure, visitation, disease prevalence, etc.) public health resources may be allocated in a manner that does not appear to be evenly spread across all parks and regions. However, the use of limited resources will, by necessity, be focused on the most critical or imminent issues, presenting the greatest threat to our visiting public.
  - c. **Broad Public Health Practice** – Through the varied expertise of the program’s staff positions the Office of Public Health is able to respond to virtually any public health issue that may be encountered in the any of the nearly 400 sites of the National Park Service. The officers assigned to the National Park Service have extensive experience in subject matter areas including vector-borne diseases, food safety, sanitary engineering, disease surveillance and outbreak investigation, water and wastewater treatment, public health data management. Rather than focusing only on compliance issues, fully applying this expertise and making a holistic effort to assess any potential for the convergence of park activities and infrastructure with the cycles of disease will increase the value of our services to NPS.
  - d. **Proactive Consultation and Problem Solving** – Not willing to stand by and wait for diseases to be successfully transmitted, we desire to actively identify potential issues. Instead of serving as a regulator or scold, we provide a higher level of service to park administrators and staff by assisting them to find solutions, enable, achieve their varied park unit goals, AND protect visitors.
  - e. **Transparency and Accountability** - The Office of Public Health aims to efficiently and effectively spend every public dollar provided to us in a way that delivers value. We accomplish this through a continual review of program spending and delivery of service.
2. **Increasing Service in the Intermountain Region** - When the Intermountain Region (IMR) Public Health Consultant was selected as the Director of the NPS Public Health Program, it created an opportunity to review the region’s staffing. We first determined the most efficient method of assigning public health assets in the region. To accomplish this analysis, two PHCs from the IMR along with the program’s Deputy Director conducted a complete review of the public health workload in the region. This group determined that the most effective and efficient way to deliver public health services in the IMR was through the hiring of two junior officers to replace one senior officer. This approach provided for one additional staff member but at a very small additional cost. The new officers were hired in May and stationed closest to the region’s largest parks: Grand Canyon and Yellowstone.
3. **Region-by-region workload analysis** - The analysis of workloads in the other regions is underway and by early 2005 it should be completed. These efforts will result in an updated

estimate of the resources needed to provide public health services to the NPS and where best to locate these resources in order to best serve the parks.

## SIGNIFICANT ISSUES

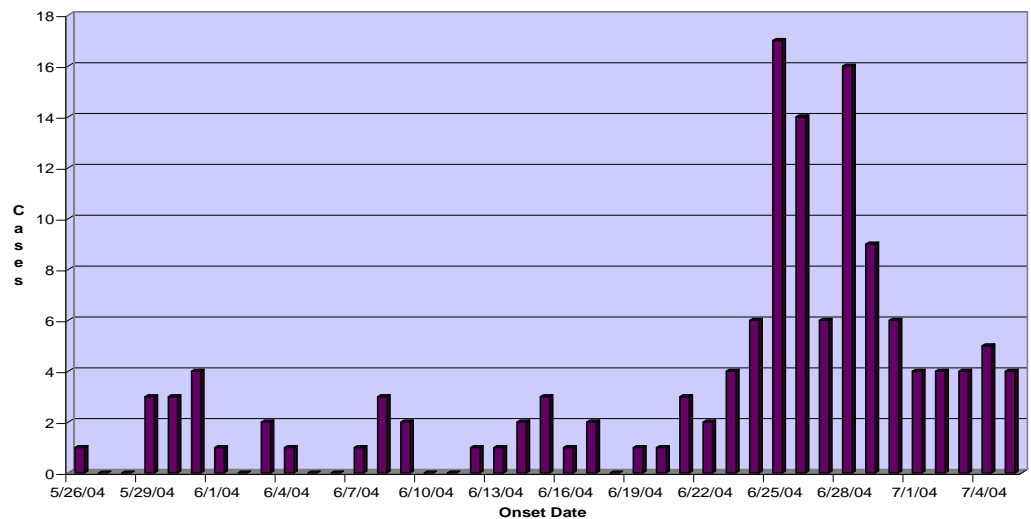
### 1. Outbreak Investigations

- a. **Bryce Canyon National Park** -In September an employee of the park concession was diagnosed with tuberculosis (TB). Subsequent screening using the purified protein derivative (PPD) skin test revealed that at least 10 other concessions employees at the park had been exposed to TB at some point in time (it should be noted that a positive PPD does not indicate “when” exposure occurred, just that a person had been exposed). Based on the positive PPD these employees were given chest x-rays in order to determine if they had active disease (a positive skin test indicates exposure not disease), which none had, so they were released and determined to be “fit for duty.” The Public Health Program worked with the park to provide adequate, up-to-date information regarding TB and the risks of exposure as well as active disease. The active case of disease and the 10 with positive skin tests were all foreign-born employees recruited for seasonal work.
- b. **Glen Canyon National Recreation Area** - A Norovirus outbreak was investigated this year at GLCA, associated with a single houseboat rental that repeatedly caused illnesses after being rented to three separate groups. The Public Health Consultant was able to respond and working with the Coconino County Health Department, with laboratory support from the University of Arizona, determined that someone in the first rental group arrived incubating the virus, vomited on the houseboat and contaminated surfaces including bathroom and kitchen. Visitors on subsequent rentals were exposed to these contaminated surfaces and became ill. The investigation uncovered weaknesses in the concession operator’s procedures that let to the virus survival between rentals.



- c. **Yellowstone National Park** - In addition to the food safety evaluations, concessions funds enabled the public health program to respond to an outbreak of gastroenteritis at YELL. Concessions funding allowed the Public Health Program Deputy Director to travel to YELL to lead an investigation team that consisted of the Public Health Consultant on site, two Epidemiologists and one Physician from the Wyoming Department of Health. The Centers for Disease Control and Prevention also provided expert consultation and laboratory support for the investigation team. The team determined that at least 137 people (concession employees, NPS employees and visitors) had become ill as a result of a complex set of circumstances that allowed for the rapid transmission of a pathogen called Norovirus. Results from this investigation have led to numerous new measures to improve the protection of employees and visitors. This outbreak investigation and follow-up is a model of cooperation and collaboration between the NPS and concessionaire in the protection of park visitors.

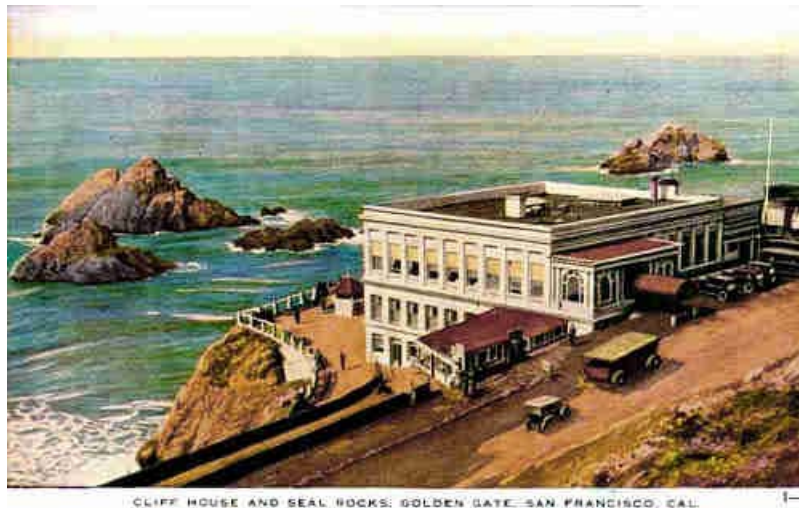
Epidemic Curve, Yellowstone National Park, Summer 2004



- d. **Yosemite National Park** - The Sanitarian stationed at YOSE received twenty-one reports of acute gastrointestinal illness between December 10 and 11, 2003. All cases were attendees of a private reception on December 7, 2003, and twenty of the cases attended the private holiday dinner that was held in the park on December 9, 2003. Initial onset occurred at 9:30 pm the evening of the dinner. It was discovered that many of the food service workers had been ill (or had contacts that had been ill) with similar symptoms the week prior to the reception. Although no conclusive evidence was found, the symptoms, onset, and duration were consistent with those of norovirus. Consultation with the concessions operator emphasized the importance of restricting ill employees from the workplace and implementing a corporate illness policy by 2005.

## 2. Plan Review

- a. **Golden Gate National Recreation Area (Cliff House)** - Beginning in 2002, the PHC in Oakland and the Deputy Director (in previous assignment) assisted GOGA and an historic restaurant located in the park, the Cliff House, in the review of plans for a total renovation. The major challenge of the project was the intent of the operator to remain open for business for a significant portion of the time in which the renovation took place. Below is how the restaurant looked around 1909.



CLIFF HOUSE AND SEAL ROCKS: GOLDEN GATE, SAN FRANCISCO, CAL.

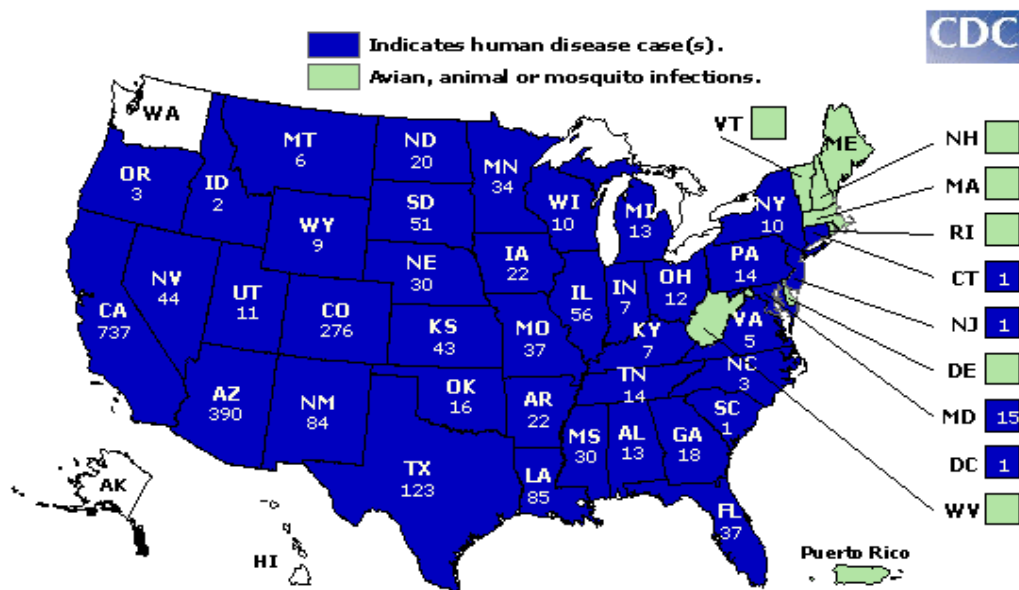
- b. **Grand Canyon National Park (Xanterra waste disposal)** - The Office of Public Health has provided consultation to the concessionaire at the South Rim of Grand Canyon National Park on the design requirements for several waste disposal facilities that no longer meet needs due to increased use.

## 3. Infectious Disease

- a. **Norovirus** – The virus continued to impact visitors in 2004. The number of reported cases in GRCA, which in 2002 had the NPS’s largest outbreak to date, was significantly down with only sporadic activity. 2004’s largest outbreak occurred in YELL over the Fourth of July weekend with a total of approximately 150 cases. With each occurrence we are able to learn more about the pathogen and ways in which we can limit both the spread and impact on parks. Guidance was developed for concessions operator’s use NPS-wide. The document has also been touted by the cruise ship industry as an outstanding resource on norovirus.
- b. **Hantavirus Pulmonary Syndrome** – HPS continues to be a risk at many of the parks throughout the system, and there was one fatal case of HPS in 2004. The Office of Public Health and Risk Management Program responded to the death of the NPS employee with an onsite evaluation as well as an information session for concerned park employees.

The rodent proofing guide has been updated and prevention efforts remain a priority for the Office of Public Health.

- c. **Relapsing Fever** - While this tick-borne disease is fairly infrequent the risk of exposure in the parks remains. One human case was reported by a park visitor in 2004. An onsite evaluation was conducted and did not indicate increased risk of transmission in the accommodation in which the visitor stayed – no evidence of rodent infestation. The investigation (interview with patient) was inconclusive.
- d. **West Nile Virus** – WNV continued its spread across the country causing disease in humans in every state with the exception of Washington: 2313 cases and 79 deaths.



Officers in every region continued to assist parks through frequent updates on the incidence of the virus, oversight of surveillance efforts, and guidance on control measures. The risk-based approach that is utilized in the decision making process protects both public health and park resources.

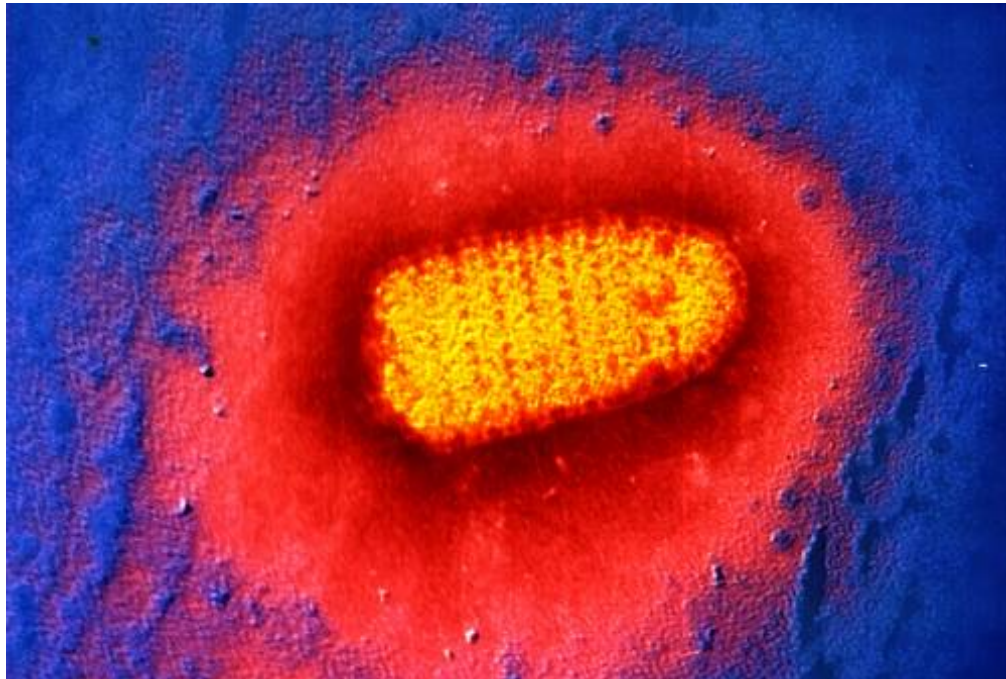
- e. **Tularemia** – In the summer of 2004, a visitor to a park in the Northeast Region was diagnosed with tularemia after contact with their pet dog that caught a rabbit, which was probably infected with the bacteria. The dog transferred the pathogen to the dog owner’s child through a lick to her face. In partnership with the NYCDOH the park has been conducting active surveillance of mammals in park in order to determine the prevalence of tularemia in the metro area. No other human cases have been identified.
- f. **Naegleria fowleri** - In a recent report from the Centers for Disease Control and Prevention (CDC) on illnesses associated with exposure to recreational waters such as beaches, swimming pools and spas, and natural springs, 12% of the reported cases of illness were attributed to *Naegleria fowleri*. While this organism was the cause in only a fraction of the cases, each case of *Naegleria fowleri* was fatal.



In 2002, prior to the CDC's report, the Office of Public Health issued guidance on this hazard related to the use of natural hot springs in the National Parks.

- g. Rabies** – The continued possibility of wildlife suffering from rabies exposing park visitors has prompted several incidents this year. Bat exposures led to the development and issuance of guidance to parks that will help them to make decisions about how to handle these exposures, including deciding when such exposures may be in need of treatment to prevent possible development of this potentially life-threatening disease.

*Electron Micrograph of a Single Rabies Virus*



- h. Chronic Wasting Disease** - In response to a request from the NPS Veterinarian, the PHP developed guidance on CWD for parks with overpopulated elk herds that were considering measures to thin herds. Because this hunting may be allowed or parks may choose to donate meat from such culling to charities, Superintendents are in need of guidance on the precautions necessary to protect the public.

## **FUTURE PLANS**

### **1. Surveillance**

Surveillance for public health issues is critical to understanding the potential health risks posed to park visitors and personnel. Surveillance is a fundamental component of public health and serves many functions, including monitoring disease trends; identifying, responding to, and controlling disease outbreaks; directing and evaluating the impact of public health programs

and interventions; and identifying unmet public health needs. In addition, information elicited through public health surveillance facilitates planning and allocation of resources.

Conducting disease surveillance within large, transient populations such as visitors in the national parks presents many logistic challenges. For example, the average visitor spends four hours (ranging from a brief look over the edge to 2-3 weeks) at the Grand Canyon National Park, during which time he visits several concessions, restrooms, and park trails. Visitors use multiple means of transport into the park, and originate and return to residences throughout the world.

Over the past two years, we have piloted simple surveillance projects in two large western parks (Grand Canyon National Park and Yellowstone National Park) in order to explore how we might accomplish disease surveillance within the NPS system. These projects have involved regional partners (e.g., WY Department of Health), and have utilized resources unique to the park systems (e.g., rangers, tour operators, park clinics). Although these projects remain in the pilot phase of implementation, they have enabled the NPS to detect several outbreaks of disease among visitors and park staff and respond with appropriate investigations and interventions for disease control and prevention.

In these two parks alone, outbreaks of gastrointestinal illness over the past two years have collectively affected more than 300 persons, and investigations have implicated multiple modes of disease transmission, including food, water, and person-to-person. Due to the transient nature of the population visiting National Sites, it is very likely that disease transmission in other National Parks goes largely unnoticed. An NPS surveillance system is essential to protect and ensure the health and well-being of park staff, visitors, and the greater communities from which visitors travel.

The Public Health Program is searching for resources and partnerships that will enable us to design and establish an NPS disease surveillance system. The Centers for Disease Control and Prevention is assisting us with the preliminary design of such a system.

2. **Develop models for risk-based decision making** – Work is underway to develop simple models that can be used to determine the relative risk that various park units inherently pose to the visiting public. These formulas will be used to set priorities for on-site visits by field personnel of the Public Health Program.
3. **Continue to Seek Partnership Opportunities** – Our efforts to further partner and collaborate with other agencies and organizations within and outside of NPS have proven extremely fruitful and we continue those efforts.

One area of great promise is a new opportunity to partner with the USGS National Wildlife Health Center, located in Wisconsin. Recent data analysis has indicated that disease transmission issues from wildlife to humans may be more important to NPS than previously recognized. To explore this potential risk, recent discussions with USGS indicate that during this next year, we will likely partner to pilot one or more projects designed to determine public health needs and solutions within this subject area.

4. **Workload Review** – Partially completed, we continue to analyze park and regional work demands so that placement of officers around the NPS system can be optimized for effectiveness and efficiency.
5. **Strategic Planning** – Given the program shifts listed above and the desire to reflect the latest approaches both in professional practice and customer service, a new strategic plan is being drafted. This next year will see that draft distributed for comments and suggestions, finalized and implemented.
6. **Standard Operating Procedures** – The rewriting of our strategic plan and programmatic reviews/shifts will necessitate a new set of standard operating procedures that guide staff in their everyday work.
7. **Improve delivery of service in PWR** – Anecdotal information and preliminary analysis indicates that the PWR may be under serviced. Efforts are under way to search for partnerships or other means that may allow additional public health services to be available for these large, complex parks.

