

## Collaborative Greening Projects Yellowstone National Park

**Introduction:** Yellowstone was set aside as the world's first national park in 1872 and is one of our nation's greatest natural treasures, a place to "be left unimpaired for future generations. Its popularity is evident by increasing number of visitors throughout the year. Yellowstone was visited by 50 million people during the first 100 years of its existence--it was visited by another 50 million people during the next 25 years. In the summer, it is transformed into a virtual city with 1.5 million people visiting in July and August alone. Because of these ever-burgeoning numbers, Yellowstone must be a flagship for the National Park Service's mission in sustainability and Environmental conservation. In 1997, when the Park celebrated its 125th anniversary, the most important question asked was, "What can we do to preserve and protect this national treasure for the next 125 years?" The result was the creation of a movement dubbed "The Greening of Yellowstone."

Since that time the Park has embarked on a very aggressive effort to address a wide variety of pollution prevention, waste reduction, alternate fuel and recycling projects. The successful development of partnerships between the National Park Service, local and state governments and a consortium of private interests were paramount to implementation and success of a wide variety of projects. No single entity in the greater Yellowstone region has adequate resources to successfully accomplish effective environmental conservation, but through the formation of partnerships, great success stories have emerged. Yellowstone's extraordinary name recognition is a key factor in fostering such partnerships.

### **Greening of Yellowstone Workshop and Symposium**

Yellowstone National Park is a key economic support of the regional tourism economy in Montana, Wyoming, and Idaho. To broaden the ways that economics and environmental concerns can complement one another, Yellowstone National Park partnered with the states of Montana and Wyoming, the Federal Department of Energy, and private groups to host three-day symposia in October of 1996 and May of 1998. These symposia fostered partnerships among local communities, state and federal agencies, and private industry, and offered a shared vision for sustainability of the park's values and provided ways to improve environmental quality.

The symposia identified five areas that had potential for expanding or creating new partnerships. To this end, participants considered a wide range of strategies, including a regional composting facility, alternate fuel vehicles, replacement of toxic solvents and the use of cleaner products, and modification of the energy infrastructure to make it more environmentally friendly. The meeting concluded with a commitment from all

participants to cohesively work as partners in protecting and enhancing the quality of the region's unique environment.

### **Recycled Plastic Boardwalk: Partnership with Lever Brothers Co.**

Yellowstone has over 15 miles of wooden boardwalk of which a majority are in excess of 20 years old. The boardwalks play a critical role in that they keep visitors from trampling sensitive thermal areas while allowing them to enjoy the features at close range. Most of the boardwalks were pressure treated with chemicals for preservation. Over time the walkways have deteriorated and the broken material gets deposited on the ground or in thermal waters with the eventual leeching of the chemicals. When the material has to be replaced, it has to be disposed of in the landfill.

Through the generosity and acute environmental awareness of Lever Brothers Company coupled with park management's commitment to environmentally favorable practices, a partnership was developed over the last few years, which has been highly successful. Lever Brothers has donated over \$300,000 worth of plastic lumber that was produced from discarded plastic containers. The park's maintenance staff installed the lumber at one of the most popular sites in the National Park system, Old Faithful. The equivalent of over 4 million plastic milk jugs were used to replace the existing wood viewing platform in front of the famous geyser. During any given summer day, thousands of visitors utilize this 30,000 square foot platform and receive an educational message about recycling and how to get involved. Approximately 2.5 million visitors use this boardwalk each year.

### **Truck-in-the-Park Project**

The Montana Department of Environmental Quality (DEQ) in partnership with the Department of Energy (DOE), Yellowstone National Park and the University of Idaho successfully demonstrated the use of an alternative fuel in Yellowstone. The fuel is rapeseed (canola) ethyl ester, produced from rapeseed oil reacted with ethanol that is made from potato waste generated by the food processing industry. Yellowstone National Park offered a unique opportunity to demonstrate this low emission, biodegradable fuel in an environmentally sensitive and extremely cold area.

In February 1995, Dodge truck Inc. donated to the project a new 1995 3/4 ton 4x4 pickup (\$30,000 value). Since that time, the truck, driven by Yellowstone employees, has gone over 100,000 miles on 100% biodiesel. It averages about 17 miles per gallon, the same as when it was tested with regular diesel fuel during baseline data development. No modifications were made to the truck's engine or fuel system. The emissions test conducted on the truck showed that smoke, hydrocarbons, nitrogen oxides and carbon monoxide were reduced by using the biodiesel. Tests also showed that the sweet odor of biodiesel exhaust does not attract bears, which was a concern to park managers. The park developed an extensive education program for the public. Lectures and information exchanges have occurred at visitor centers, trailheads, greening conferences, and numerous educational institutions.

The growing and harvesting of rapeseed, the oil extraction process, and fuel demonstration are all accomplished within a tri-state region around Yellowstone. The park will continue to commit to spearhead projects and partnerships that show regional success.

In September 1998, the truck's engine was completely torn down and analyzed, revealing very little wear and no carbon build-up. The truck is now in Phase 11, in which the intent is to accumulate 200,000 miles over the next three years.

### **Snowmobile -in-the -Park Project**

Currently, over 80,000 snowmobiles enter Yellowstone National Park in the winter, with up to 2,000 in the park on a busy winter day. Snowmobile emissions, which can range up to 1,000 times more than a modern automobile, are a major concern to park management. As a result, a partnership was developed with the state of Montana to look at various combinations of biological fuels and lube oils, and to measure their effect on emissions and snowmobile engine performance. The project did not develop new fuels or lube oils, but used existing products or those near commercialization. The lubrication oils tested included biodegradable synthetic oils developed from animal and plant fats. These lube oils have been shown to reduce emissions. Because of this example, most snowmobile rental companies in West Yellowstone voluntarily use this type of lubricating oil. Demand for the oil has resulted in at least 3 companies now making this product available.

Air quality testing continues at various congestion points within the park to gather baseline data. Yellowstone Park managers have been and will continue to work with various snowmobile manufacturers to develop cleaner, quieter machines to help insure that the park's pristine winter experience is not diminished. Additionally, working in partnership with DOE and the state of Montana DEQ a prototype electric snowmobile should be ready for demonstration by the fall of 2000.

### **Conversion to Environmentally Preferable Cleaning Products**

A project was completed this past year which replaced existing cleaning and janitorial products used by park and concessionaire personnel with environmentally preferable cleaning products. Yellowstone is the first park in the country to totally adopt this policy.

In August of 1998, the Region 8 office of the Environmental Protection Agency engaged in a partnership with Yellowstone National Park to assess the park's present line of cleaning products. After an assessment was conducted, the conclusion was that the existing products that were being used ranged from some with slightly toxic ingredients to those with potentially significant health hazards. As the true scope of the project became obvious, all concessions operations were included in the partnership. This is one more stage in Yellowstone's efforts in reducing source pollution while enhancing sustainability.

It is envisioned that Yellowstone will be one of the leaders for other national parks and the regional motel/hotel industry for instituting grass roots pollution prevention and driving local markets.

### **Photovoltaics at Remote Sites**

Several remote sites in Yellowstone National Park have been identified for conversion from fossil fuel generators to photovoltaic systems. The Lamar Buffalo Ranch, home of the Yellowstone Institute, is one such site. This generator has a 40-kilowatt load and is about 12 miles from the power grid. The site has been converted to an inverter/generator/battery/photovoltaic system this past year with great success. Currently an average of 70% of total electricity consumed is produced from the sun. The Department of Energy's partnering with Yellowstone National Park was paramount to the success of this project.

### **Recycling and Composting in Yellowstone**

Yellowstone is currently undertaking a multi-prong attack on the federal government's goal of reducing solid waste by 25% by the year 2002. Park officials chose to form a partnership with adjoining Montana counties that created a recycling network, the Headwaters Cooperative Recycling Project. The Cooperative includes seven Montana counties and three cities, plus Yellowstone, who work together to expand opportunities for recycling, collection and marketing.

Another partnership, the Southwest Montana Composting Project, consisting of four counties, three cities, and Yellowstone have recently completed a waste characterization study to determine the components of the area's solid waste and determine how much of that waste could be recycled, particularly the compostables

A 1994 Yellowstone waste characterization study showed that 60-75 percent of the waste stream is compostable with 40 percent being food waste. Preliminary results of the new study corroborate those figures, including data from the adjacent resort town of West Yellowstone, Montana. Add that to the information that some of our solid waste is trucked up to 200 miles away, it becomes very evident why this idea makes good sense. More importantly, the material has a new, usable role instead of being buried at the landfill. To this end, it is estimated that a cost savings of up to \$50.00 per ton will occur. In Yellowstone, that equates to over \$ 100,000 per year. This composting effort aligns with the park's commitment to environmental conservation, community involvement, and illustrates the importance of partnerships.

### **Clean Snowmobile Challenge 2000**

In January of 1998, a partnership was developed between Yellowstone National Park, Grand Teton National Park, the states of Montana and Wyoming, the Environmental Protection Agency, surrounding counties, and private interests to address environmental concerns associated with snowmobile use. The partnership challenged selected universities to explore creative solutions. The object of the challenge was to design a snowmobile that retains today's performance while reducing pollution and noise. The seven universities involved will demonstrate their modified machines in Jackson Hole, Wyoming in March of 2000. The partnership anticipates the event will spawn the snowmobile industry into developing more environmentally friendly snowmobiles. Clean Snowmobile Challenge 2001 is already in the planning stages.

### **Employee Ride Share Program**

In January 1998 the park initiated a Rideshare Program in Yellowstone National Park at the suggestion of Yellowstone employees.

As background information, employees working in Mammoth (park headquarters) reside in Mammoth (government housing), Gardiner, Montana (5 miles from Mammoth and a gateway community), Paradise Valley, or Livingston, Montana (50 miles one way).

Over the years, the number of permanent employees who live north of Gardiner, Montana, has grown to over 40. These employees commute to and from Mammoth individually or in small carpools. It was because of this large number of employees who commute that Superintendent Finley endorsed the idea of a rideshare program to be jointly financed by the employees in the ridership and Yellowstone Park.

In mid-February, the Superintendent authorized a 60-day feasibility study whereby an Interior-owned, 12-passenger van was used to transport 12 employees from Livingston (the furthest locale from the park) to Mammoth. The program's goal was to provide transportation at cost to the employees and look at associated benefits to determine if the program should grow to meet the needs of all employees commuting to the park.

At the end of the 60-day period, the vote was unanimous; the only hurdle was coming up with a vehicle to accommodate all commuting employees. To this end, a new partnership was forged with the Department of Energy's (DOE) Idaho Engineering and Environmental Laboratory (INEEL) whereby Yellowstone received two surplus coaches to be used for purposes like this program. Employees utilizing the Rideshare Program pay for fuel consumption and maintenance on the coach.

The program provides energy savings from reduced fuel consumption and decreased air pollution from the emission of hydrocarbons. It improves safety by decreasing traffic and easing parking constraints. It also provides for greater employee welfare in terms of morale and benefits to hiring and retention. Lowered individual vehicle insurance rates have also been recognized. This initiative has the potential to free up present park housing, decrease the need for future housing, and demonstrate the Park Service commitment to public transportation as a preferred method of travel. The authority for this program can be found in U.S. Code, Title 16 Section 1. 1 a-2(a)(b).

The Rideshare Program is two years old and presently transports approximately 35 employees to and from work. Employees have remarked on the many benefits of the program--cost savings, less stress especially related to winter driving months, and the feeling that management cares.

This is one more example of how Yellowstone management, in tandem with its employees, are working with outside businesses and other federal agencies to further the "greening" effort so important to the vitality of the park, and its ecosystem.