

that most cultural resource management professionals face on a daily basis. To date, the G&O team has worked over 2,500 hours on the project, including both the initial evaluation effort and subsequent project with the FCPA. FCPA staff and volunteers have contributed over 4,000 hours to the project. It is anticipated that G&O staff will participate in approximately another 1,000 hours of project effort matched by at least a similar number of FCPA staff and volunteer hours as fieldwork is completed and emphasis turns to artifact processing and data analysis. Clearly, FCPA's commitment of staff and volunteer labor has indeed leveraged the financial commitment of Lorton Town Center's private developer. The county's willingness to make a substantial contribution to a project in this way gives it considerable credibility when negotiating heritage preservation issues with developers.

It must be noted that this project was able to succeed because the developer addressed the

cultural resources issues of the project well in advance of construction. Volunteer labor is not well-suited to aggressive schedule requirements. In this case, there was time to be flexible and responsive to site data as it was developed and to work with a volunteer pool of labor whose size differed each day, although a core group could be relied on. In addition, volunteer labor is not completely free. Volunteers require, and deserve, instruction and careful supervision beyond that needed by a professional excavation team. Nonetheless, all parties involved in the Lorton Town Center project count it an archeological success.

---

*John P. McCarthy, RPA, is senior project manager—cultural resources with Greenhorne & O'Mara, Inc.*

*Michael Johnson is an archeologist with the Fairfax County Park Authority.*

*Nancy Anthony is archeology crew chief with Greenhorne & O'Mara, Inc.*

---

Nathan Caldwell and Nancy Thomas

## Volunteers Re-light Kilauea Point Lighthouse

---

**T**hanks to three dedicated, persistent volunteers who overcame several major obstacles, the historic Kilauea Point Lighthouse sent out its signature double flash for the first time in over seven years—and only the second since February 1976—for the Volunteer Recognition Dinner at Kilauea Point National Wildlife Refuge on November 21, 1997.

Kilauea Point's four ton, eight foot high, second-order clamshell Fresnel lens, now the world's largest, began sending out its signature flash May 1, 1913. It went dark in February 1976 replaced by an automated beacon. The lens was lit for the lighthouse's 75th anniversary in 1988. Its clockworks were engaged and the lens lit in 1989 for the 200th anniversary of the U.S. Lighthouse Service.

Originally, the lens sat in a tray base supported on mercury and compressed air. A clockwork mechanism of weights and pulleys,

rewound every three-and-one-half hours, turned the lens. Eventually, the light was electrified and its clock work mechanism replaced by an electric motor.

The lighthouse was placed on the National Register of Historic Places in 1979. In 1985 the lighthouse station on Kaua'i, at the northernmost point in the main Hawaiian Islands, was transferred to the U.S. Fish and Wildlife Service becoming Kilauea Point National Wildlife Refuge. Over 300,000 visitors annually view the lighthouse, seven species of seabirds and the endangered nene, or Hawaiian goose. It has also attracted hundreds of volunteers.

In 1986, then Refuge Manager Dan Moriarty convinced two volunteers, Herman Stiglemeier and Hal Frazier, to re-light the lens for the lighthouse's 75th anniversary. With the additional help of a Los Angeles firm called G Force, a laser light shown through the historic lens on its anniversary.

Getting the lens to rotate in 1989 for the 200th Anniversary of the U.S. Light House Service took Stiglemeier about a year. He redesigned and implemented a new motor operation and replaced the original bushings in the wheel bearings that the lens rotated on. The lens, showed its historic flash once again, but during a later cleaning a gear broke.

The lens stayed dark and frozen until 1996 when Jim Sparks, a volunteer with a mechanical background, asked Tom Alexander, the current refuge manager, "How can we get the lighthouse to work again?" With Alexander's permission and cooperation, and the assistance of another volunteer, Jim Hoffman, the saga began.

Hoffman and Sparks' first survey in October 1996 found a bracket missing at the top of the drive shaft. They designed a template, drew up a plan of the clockworks and took them to a machinist in Lihue, Kauai, to make a replacement. When the machine shop finished its work, a federal spending freeze prevented payment of the \$250 bill. The funds and the gear were not released until May.

Sparks cleaned everything; installed the bracket, and turned on the main switch. A piece of wiring went up in smoke! Sparks replaced the old wiring and hit the switch again, but one of the motor's two double circuit- breakers had burned out. Sparks switched breakers to get power to the motor. After liberal lubrication, he tried again. The works groaned, turned one-half revolution, and spit out five teeth from the top gear. The tray that held the lamp had been raised, preventing it from turning

Sparks ordered a replacement gear from a manufacturer on the mainland. When the gear arrived, it was two inches taller than the original. Hoffman and Sparks took new measurements and searched Hawaii for a machinist to custom mill the gear but couldn't find one. They tracked down the manufacturer on the mainland to custom make the gear. The price, because of the intense labor required, was \$437. The UPS strike lengthened the original five-week estimate! The gear finally arrived in August 1997.

Even with the gear and template installed and the motor overhauled, the lens would still not rotate. The wheel bearings could not touch the track they were designed to run in. The lens' weight had to be lifted to take the load off the tray to lower it to operating height.

Sparks called Stiglemeier, who described the technique used in 1988 to install the new bush-

ings and bearings: putting in bolts with nuts and using them like small jacks taking the lens' weight off the mercury tray. Jim repeated the procedure; the tray slid into place, and the lens came down to its proper position. It was unbound and could be turned with one hand.

The lens' light source was a 1,000 watt lumens bulb, 10 times brighter than the original kerosene white vapor lamp. It was available at a local electrical supply store which stocks them for island church's chandeliers. Because the mercury and compressed air lubrication was much smoother than the bearings, Sparks installed a dampening mat under the lighting fixture to keep the bearings' vibrations from blowing out the filament. Not as smooth as the original, but safer for the environment, the historic lens was ready to send out its flash again.

The first official re-lighting of the lens was at the Refuge's annual volunteer dinner. As the lens rotated above them, Jim Sparks and Herman Stiglemeier were honored for their efforts. It has shown for several events since.

The lens is never rotated for more than an hour, keeping wear on the track and bearings to a minimum. When the Refuge plans to light the lens, it contacts the Coast Guard, who issues a Notice to Mariners about the change of the signal at Kilauea Point, and the local media to inform homeowners that live along the shoreline that the light may illuminate their windows.

The mission of Kilauea Point is still protection, but the emphasis has shifted from mariners to natural resources. To protect Newell's shearwater, a threatened seabird species found nesting on the refuge in 1997, the lens is not lit during their nesting season, including the lighthouse anniversary, the first weekend of May. Shearwaters feed at night, finding their way to the sea by the light of the moon and stars. They are drawn to bright lights and can injure or kill themselves crashing into them. The historic lens is much brighter, but less efficient, than the automated beacon, so biologists feared some Newell's might crash into it.

---

*Nathan Caldwell is the outdoor recreation planner for the Oregon Coastal Refuges, Newport, Oregon. He was formerly outdoor recreation planner for the Kaua'i National Wildlife Refuge Complex.*

*Nancy Thomas is a volunteer at Kilauea Point National Wildlife Refuge.*

For more information call Kilauea Point National Wildlife Refuge at (808) 828-1413.