

Buried Treasure

A dredging project to restore a unique freshwater lake in New Jersey turned a myth into reality, writes Bob OERTEL

Buried under 20,000m³ of contaminated sludge was a spring that, within a day of being uncovered, caused the water level in 13-acre *Lake Lily* to rise by more than a foot and has a vital part to play in the lake's future.

The existence of the spring was rumoured, but never proven and over the decades had become an item of local mythology.

It was no myth, however, that the only natural freshwater lake on Cape May and the only coastal freshwater source between New Jersey's Monmouth County and Norfolk, Virginia, was likely to die in a few years unless urgent action was taken.

In 1904, the lake was 10ft to 12ft deep, rich in freshwater mussels, schools of bass and covered in the water lilies that gave it its name.

At the turn of 2004, Lake Lily was less than three feet deep – in some places barely a foot – and heavily contaminated

with bird and duck droppings.

As early as 1979, the New Jersey Department of Environmental Protection (DEP) had concluded Lake Lily was slowly dying from eutrophication – a study endorsed in 1993 by the Delaware County *Aquarium Society* which stated that: 'Lake Lily will disappear in a relatively few years.'

BACKGROUND

At the southern tip of New Jersey, about 675m from the Atlantic Ocean and Delaware Bay, Lake Lily's at the lowest point of an 87ha watershed and has been called a 'giant pothole.'

During the Revolutionary War, it was Philadelphia residents' source of fresh water during the British blockade and was later settled by the Wannaker family in 1875. It was during this time that lilies were planted in the lake.

The lake's also the headwaters for a wetlands ecosystem of international importance for migrating birds – and the birds compounded a problem caused by a disastrous storm in 1962 that flooded most of Cape May Point and Lake Lily.

The vegetation, thick stands of lilies and fish that were once able to offset the damage from bird droppings were killed by salt water and though the lake began to make a slow recovery, the increasing numbers of visiting birds gave it no real chance.

Millions of birds now visit during the

Lake Lily looking south

▼ *Lilies, not seen in Lake Lily since the 1960s, are now returning*



autumn migration and Cape May veteran birdwatcher Robert Connor identified 170 different species in one four-day period – "Birds hang on the bushes and shrubs and literally cover the ground, there're so many birds you just can't believe it," he said.

That phenomenon attracts thousands of birdwatchers from around the world who in turn bring an estimated \$20M in tourist business for the Cape May area – another imperative to save the lake.

PROJECT PLANNING

With the establishment of the *Lake Lily Restoration Committee*, Cape May Point hired Pennsylvania environmental engineering firm **F.X. Browne** (FXB) in 1997 to develop a restoration plan for Lake Lily.

A year later, the State Legislature introduced a funding bill to carry out the plan – but it wasn't until May 2001 that \$468,750 was awarded, subsequently topped up in 2003 by the New Jersey Department of Community Affairs with a further \$248,500.

"The good news swept through our community with some of the greatest enthusiasm I've witnessed in my 12 years in office," said Mayor Malcolm Fraser. "Perhaps this was because everyone recognized and appreciated the tremendous time and effort that many



Building the sediment containment basin

▼ Restocking the lake with...



▲ ...fathead minnows



people have invested to conserve and protect this lake.”

The restoration contract went to local firm **Albrecht & Heun**, who were assisted by **FXB** for engineering and testing, borough engineers **Van Note Harvey** for site surveillance and New Jersey’s **Bureau of Fish and Wildlife**. The scope of work had three main facets:

- 1). *Dredging the lake*
- 2). *Extracting the bird guano, and*
- 3). *Returning cleansed water to the lake.*

ENTER THE DRAGON

Albrecht & Heun’s (A&H) first task was to build a holding basin for the dredged material. They chose a nearby abandoned magnesite plant and created an oblong-shaped basin with internal dykes that sloped gently to one end. A heavy plastic liner topped with a layer of clay prevents leaching into the surrounding earth.

A&H then brought in a 370hp Mud Cat series *Dragon* cutter suction dredger, built by Maryland-based **Ellicott**, to tackle the lake’s mixture of sediment and guano.

The resultant slurry was pumped 350m through a 250mm diameter pipe to the upper end of the basin where it flowed slowly in a zigzag pattern around the in-basin dykes towards the lower end. Most

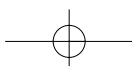


▲ *The Dragon arrives*



The lake’s a great attraction for homeowners

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▲ The slurry was pumped 350m to...



▲ ...the sediment basin

of the guano settled out of the slurry as it moved through the basin, leaving the water virtually clear and ready for recycling into Lake Lily.

In total, about 20,000m³ of sediment was removed, deepening the lake by nearly a metre. The 'buried treasure' spring will now do its bit by flushing cleaner water into the lake, providing better water flow to the wetlands and restoring the lake's water quality allowing the lilies and fish to return.

Even the guano has a valuable new role. With the dredging over, it's being allowed to dry and will be used to fertilize land at the abandoned plant.



▲ Mayor Malcolm Fraser (l.) and Commissioner Joe Nietubicz at the lake – photo by Bill Godfrey, courtesy of Cape May Star and Wave newspaper



▲ Restoration Committee members (l. to r.) Nancy Kirtland (chair), Marguerite Chandler, Vern Mancini, Anita van Heeswyk and Francine Nietubicz

FINALLY...

"The clean out sets the stage for the community to restore the lake's original, natural ecological balance," says Malcolm Fraser. "We're working with the Bureau of Fish and Wildlife regarding restocking the lake with proper fish species and also dealing with a renowned grower of lilies to ensure what we plant will be similar to those in the lake in the late 1880s. We also want to get an aeration spray to help in getting the lake back to its natural state as quickly as possible."

And all that, the mayor reckons "will probably keep the Restoration Committee working over the next three to five years."

Indeed, Cape May Point residents, the birds and birdwatchers will all have something exciting to look forward to in the years ahead.

More info at www.fxbrowne.com + www.dredge.com

▼ A painted dredger on a painted lake

