The Lake Apopka Marsh Flow-Way

Using nature to filter pollutants from lake water

FAST FACTS

The marsh flow-way has treated nearly twice Lake Apopka's volume in water, stored nearly 31 million pounds of suspended solids and 20,000 pounds of phosphorus.

Restoring Lake Apopka

Returning Lake Apopka to a state resembling its glory days, when it boasted bountiful game fish and scenic vistas, is at the core of restoring the lake.

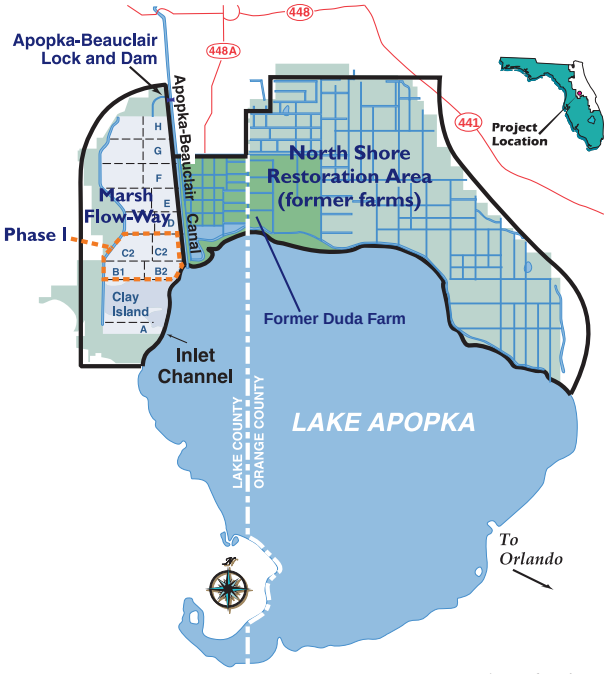
This central Florida lake degraded during a period of more than 50 years (beginning in the 1940s), as farms located in the lake's historic marshes pumped millions of gallons of water, laden with fertilizers and other chemicals, off farm fields into the 31,000-acre lake.

An aerial view shows phase 1 of the Lake Apopka Marsh Flow-Way.

Ongoing restoration work by the St. Johns River Water Management District (District) includes harvesting gizzard shad, reflooding portions of the former farms, and operating the marsh flow-way. As a result of the District's efforts, the lake has improved, and since 1995, phosphorous levels in the lake have fallen by 56 percent and water clarity is 54 percent better than earlier conditions. Additional signs of improvement include increased numbers (about 350) of native submersed aquatic plant beds and expanding recreational opportunities.

Site description of the marsh flow-way

The marsh flow-way is located on District land west of the Apopka-Beauclair Canal. It covers approximately 760 acres and contains four separate treatment wetland cells, (managed as emergent marshes), in addition to levees, canals and ditches. Dominant plants growing in the flow-way include pickerel weed (*Pontederia cordata*), arrowhead (*Sagittaria lancifolia*), cattail (*Typha* spp.), primrose willow (*Ludwigia peruviana*), and pennywort (*Hydrocotyle ranunculoides*). The marsh flow-way treats incoming lake water, which has excessive amounts of phosphorus, algae and sediments. It then discharges cleaner water to Lake Apopka. Cleaner water also goes through the Apopka-Beauclair Canal, that in turn transports water downstream to the Ocklawaha Chain of Lakes.



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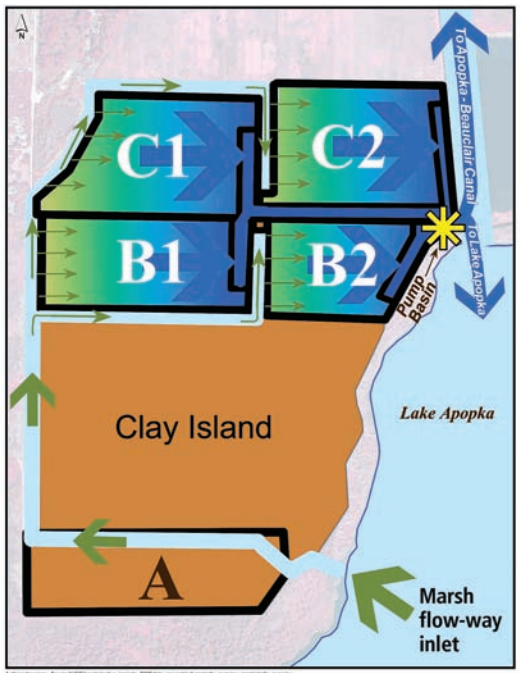
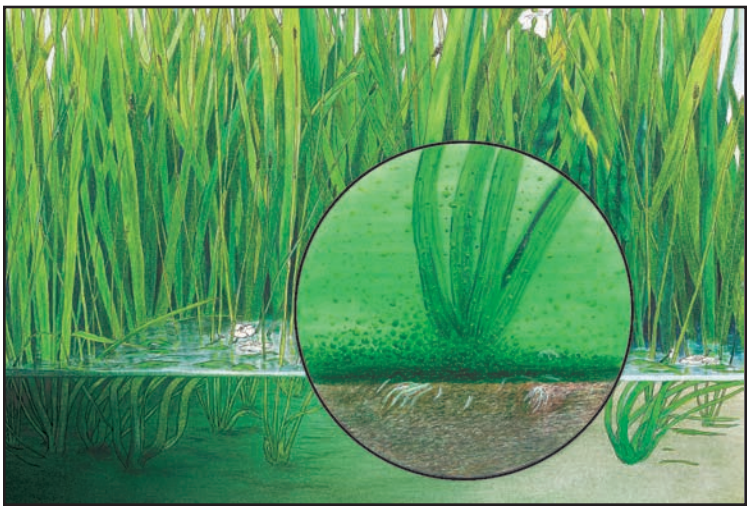


Individual wetland cells in the marsh flow-way move water downstream and back to Lake Apopka.

How the marsh flow-way works

In the circle at the center of the marsh flow-way drawing below, is a close-up of what happens to phosphorous-laden particles in the marsh. As incoming water flows through the marsh, the particles containing phosphorus (the dark green clumps) are blocked by vegetation and settle out. The vegetation breaks up water flow and prevents the wind from mixing sediments in the water, allowing particles to collect on the bottom substrate. At the bottom of the circle is the peat soil, which developed over centuries and is part of the original wetland soil. The darker layer represents a layer of new material, which formed due to particles settling and accumulating dead vegetation and biological material that has partially decomposed. This new material, which ultimately forms soil, replaces soils that were lost due to farming.



Performance of the marsh flow-way

From November 2003 through September 2007, the marsh flow-way system treated 274,000 acre-feet of lake water, or approximately 1.7 times the lake's volume. It discharged that water both downstream and back to the lake, depending on how the Apopka-Beauclair Canal Lock and Dam was operated. Retention time of lake water within the system ranged between 2 and 7 days in the individual wetland cells. Water depths within the cells ranged between 12 and 24 inches. During the monitoring period, the marsh flow-way reduced incoming loads of suspended solids by 91 percent, phosphorus by 29 percent, and nitrogen by 25 percent, and removed 28.6 million pounds of suspended solids and 17,400 pounds of phosphorus from Lake Apopka. The flow-way also reduced downstream loading of suspended solids and phosphorus from Lake Apopka by 7.2 million pounds and 2,400 pounds, respectively. Yearly reductions (2004 through 2007) in downstream suspended solid loads ranged between 42 and 81 percent, and reductions in downstream phosphorus loads ranged between 2 and 36 percent. Year-to-year differences depended upon rainfall and the amount of water discharged from Lake Apopka through the Apopka-Beauclair lock and dam.

The marsh flow-way in the bigger picture of Lake Apopka restoration

The marsh flow-way is one restoration project used within Lake Apopka's watershed to help improve the water quality of Lake Apopka and downstream lakes. The District has also collaborated with local, state and federal agencies to

- Reduce the amount of phosphorus that enters the lake by restoring wetlands in the watershed
- Remove phosphorus and other suspended material from the lake and reduce nutrient recycling, via removal of gizzard shad
- Purchase 19,000 acres of agricultural lands in the lake's northern shore to reduce amounts of phosphorus and other contaminants entering the lake
- Restore these purchased agricultural lands to wetlands and other natural habitat

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