



Reclaiming the land for future generations



Planting the idea

Cover: One of several reclaimed lake habitats within the Mosaic Fish Management Area.

Left: Each Mosaic staff member uses meticulous detail during the reclamation process.

Long before the first bucket of sand is dug, an idea is planted. Prior to the mining process, a reclamation plan is nurtured, reviewed and perfected. While heavy equipment seeks out rich phosphate reserves below the land's surface, an entire team of environmental experts is setting its sights on re-creating a thriving natural environment from the ground up. These experienced biologists, botanists and environmental engineers are doing more than just restoring the mining site; they're coming up with ways to improve it.

Each mine site will become home to a variety of land uses — from lakes and wetlands to surrounding forests, scrub, prairies and pasture. At Mosaic, we know that finding the ideal balance between the needs of global agriculture communities and Florida's unique ecosystems isn't just good business; it's essential to our quality of life.



Mosaic staff directed the planting by hand of some 5 million sawgrass plants at a former mining site at Hookers Prairie.



Setting down roots

Left: Florida's phosphate companies have reclaimed more than 10,000 acres of wetlands.

Reclaiming land for nature doesn't happen overnight. It takes expertise and years of planning, patience, monitoring and, above all, commitment. We work closely with regulators and independent consultants to evaluate each site's current land uses, ecological value and areas for improvement. While the floodplains of rivers, important streams and wetlands are often identified for preservation, other heavily impacted areas become prime opportunities for hydrological and functional improvement through reclamation. Throughout the life of a mine, reclaimed areas are adjoined with natural areas so that greenway corridors exist for plants and wildlife.

"We take a great deal of pride in our work at Mosaic and our positive contributions to the protection, preservation and enhancement of Florida's environment."

Tom Myers
Assistant Vice President — Mining

Because we are sensitive to those who make their homes near our reclaimed mining sites, we work to exceed the expectations of regulatory agencies. That's why, when a Florida Department of Environmental Protection permit requires that a site achieve 80 percent coverage by desirable vegetation within three years, we aim for 100 percent within two. In the end, our goal is to provide the building blocks for succession to a potentially better environment.

Nurturing uplands

Left: A gopher tortoise makes its way through reclaimed uplands.

Slash and longleaf pine, the Florida elm and cherry laurel are just a few of the many species of trees that provide the crowning touch to the saw palmetto, blueberry and switchgrass that live beneath their canopy. These reclaimed environments almost immediately become home to animals, and dead trees are erected as perches for birds. Prickly pear, wiregrass, dayflower and pineland dropseed are planted to provide a favorite treat for gopher tortoises.

Recovery of the land is also achieved by putting reclaimed lands into agricultural production. Mosaic's reclaimed agricultural lands provide not only food, sod and ornamental trees, but also jobs and other agriculture-related services. Citrus, for instance, provides a use of reclaimed land resulting in a higher economic return than upland pastures. When grown on reclaimed land, citrus trees require less water for irrigation because reclaimed land holds more moisture than our typical sandy Florida soil. Mosaic harvests and sells thousands of bushels of fruit annually.

Mosaic has about 6,000 acres of citrus in production, and 500 of those acres are on reclaimed land.



Scrub habitats

Left: Scrub plants, palms, pines and broadleaf trees mingle together against a grassy plain within this reclaimed site.

Mosaic's reclaimed scrub habitats are xeric (dry) communities, home to a diverse array of plants and animals, including native plant species, burrowing owls, gopher tortoises, black racer snakes and Florida mice. Reclaimed scrub areas are more than vital wildlife habitat; they serve as valuable watersheds for nearby reclaimed wetlands. For example, the West Noralyn Scrub — a 462-acre reclamation project recognized by the National Association of State Land Reclamationists in 1998 — was awarded the Outstanding Environmental Achievement Award for habitat creation by the Tampa Bay Chapter of the Florida Association of Environmental Professionals.



Mosaic ecologists work with wildlife agencies and consultants to develop habitat management plans for burrowing owls. Successful nesting of translocated burrowing owls has demonstrated that reclaimed uplands are attractive habitats.



At Mosaic, land reclamation is an integral part of phosphate mining. The following sequence details the steps Mosaic takes to restore these lands to functioning and productive uses.

1

Reclamation plans are approved long before giant draglines begin removing the top layer of earth in search of phosphate. These crane-like machines often move in a direction that will optimize the groundwater flow and hydrology of the reclaimed site.

2

The draglines leave channels in the landscape, along with large piles of “overburden” — the soil and rock that once covered the phosphate ore. Some of this valuable upland topsoil or wetland “muck” is set aside for high-quality habitats.

3

For uplands reclamation, sand tailings are pumped through pipelines into the man-made gullies. Heavy equipment then knocks down the overburden piles.

4

Grading is carefully and methodically performed over the entire site to return the land to the desired topography and optimal drainage conditions. Some upland areas are capped with topsoil to promote tree density.

5

Some wetland areas are enriched with 3 to 6 inches of black, life-sustaining muck, which is alive with the seeds of beneficial plants, such as pickerelweed and arrowhead. Stream and lake edges are sloped and planted with grasses, shrubs and trees to prevent erosion.



6

Since cattails cannot germinate in water, the layer of muck is then covered with water to prevent this plant from gaining a foothold. This encourages diversity.

7

Depending upon the habitat, native trees are randomly planted by hand, often in densities of 600 to 800 per acre.

8

Food plants are nurtured to provide sustenance to the wildlife that will soon call a reclaimed area home.

9

Nesting boxes, platforms and dead trees called “snags” are installed to provide cozy and safe retreats for birds.

10

Reclaimed areas, after meeting water quality standards, are re-connected to adjacent un-mined areas, forming important greenway corridors.

11

Reclamation areas are maintained and monitored for years to gauge the viability of the particular environment, as well as to control any noxious and intrusive plants.



Flowing streams

Left: One of two small tributaries that Mosaic mined and reclaimed – now providing freshwater flow to Maron Run, and eventually the Peace River.

Transitional areas, especially the dynamic edges, or “ecotones,” provide an all-important link to the uplands that rise above them and the wetlands that are replenished by them below. Because they serve as a gateway to adjoining ecosystems, great care must be taken in providing the variety and stability needed to sustain the wildlife and plant life that enhance these lands.

Mosaic undertook the difficult and rewarding task of restoring headwater wetlands and tributaries to Maron Run, a stream that flows to Bowlegs Creek, which feeds the Peace River. The project, on a site that was mined in 1995 and reclaimed by 2000, helped re-create the stream’s original drainage while reforesting and replanting wetland species like giant bulrush, arrowhead and pickerelweed to provide water quality control. A colorful mixture of red maple, sweet bay, tupelo and dahoon holly not only provides a profusion of blooms each spring, it also offers important food sources for wildlife. Innovative natural soil amendments were used in restoration activities to help promote organic topsoil development. Between 600 and 800 trees per acre were hand planted to best mimic the natural setting. The stream bed beckons alligators, otters and raccoons.

Lowland reclamation is more than just re-contouring the land. It is designed to provide food sources for the wildlife that will help restore the habitat to its original state.

Refreshing wetlands

Left: At the Hookers Prairie reclamation project, millions of sawgrass seedlings were raised in a local nursery and then planted to mimic their natural spread.

Wetlands retain moisture, which slows the force of flooding. They maintain water tables during dry cycles. They control erosion and dampen the effects of storm water runoff. The open water habitat is a magnet for numerous migrating birds and home to a diverse array of mammals, birds, fish, amphibians and reptiles.

Mosaic's Hookers Prairie reclamation project was a recipient of the Bureau of Mine Reclamation's Outstanding Wetland Project in 2000 and was recognized by the National Association of State Land Reclamationists in 1996. The Hookers Prairie reclamation project was the first wetlands reclamation to effectively establish sawgrass in a man-made marsh.

At Hookers Prairie, more than 3,000 acres of sawgrass marsh have been reclaimed to mimic their original splendor. Intensive monitoring of surface and groundwater elevations began long before mining, allowing Mosaic's reclamation team to re-create the ideal hydrology and topography for this rich wetland site.

Wood storks and roseate spoonbills feed on insects, snails, fish and other small aquatic creatures in this reclaimed sawgrass marsh.



Making connections

Left: Mosaic's Morrow Swamp reclamation project was also recognized for achieving success as a diverse and productive wetland, winning recognition from the Corporate Conservation Council of the National Wildlife Federation and the National Association of State Land Reclamationists.

The Hal Scott Wildlife Conservation Area was named after the late Hal Scott, past president of the Florida Audubon Society and longtime champion of Florida's environment. More than 1 million native wetland plants and more than 100,000 native trees were planted at this site. This 460-acre project in Polk County contains a balance of open water and upland and wetland habitats and received recognition from the Florida Native Plant Society in 1994 and from the Association of State Land Reclamationists in 1993. Mosaic's reclamation of this land adjacent to Hookers Prairie has expanded both the prairie and the headwater wetlands, contributing flow to the South Prong of the Alafia River.



Dense strands of thriving sawgrass trap sediment and remove excess nutrients, improving water quality and creating valuable wildlife habitat.



Land & lakes for recreation

Left: Excellent fish habitats, as well as recreational outlets, are some of the benefits of "land and lakes" reclamation.

Mosaic's reclamation team has successfully created environments for parks, fishing and recreation for the public to enjoy. For example, in 2000, Mosaic donated 1,260 acres of land to Hardee County for public use. Hardee Lakes Park and its quality fishing opportunities were featured in the July 2004 issue of Florida Sportsman magazine. In addition to the park, Mosaic donated a conservation easement featuring forested wetlands with cypress and bay trees that parallels the Payne Creek floodplain for about two miles and is part of a regional wildlife corridor. The Florida Department of Environmental Protection awarded Mosaic its Outstanding Ecosystem Project of 2000 award for the Hardee Lakes Park project.

Opened to public fishing in 2001, the Mosaic Fish Management area is a series of lakes managed jointly through a cooperative agreement with Mosaic and the Florida Fish and Wildlife Conservation Commission. These lakes are located in Polk and Hardee counties, near the town of Fort Meade, and were visited by more than 3,900 anglers who caught more than 27,500 bass, crappie, catfish and sunfish in 2012 alone.



Our pride is growing

At Mosaic, we pride ourselves on advancing the science and practice of reclamation. After all, more than our future success as a company depends on it. Our employees are lifelong residents of Florida who live, work and raise families in the communities that will benefit from our efforts. And we will continue to be a leading business presence in Florida for many years to come. We don't take that responsibility lightly. It's our philosophy to do more than just cover our tracks. We're sowing seeds for future generations.





13830 Circa Crossing Drive, Lithia, FL 33547 • 813-500-6300
mosaicco.com/florida



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