

When the glaciers retreated roughly 10,000 years ago from what would become southwest Michigan, they laid the foundations for the largest freshwater sand dune system in the world.

The receding glaciers also left behind the framework for the unique collection of habitats that make up Grand Mere State Park, 1,200 acres of interdunal wetlands, inland lakes, and high-relief dunes, both open and forested.

What makes the Berrien County park so uncommon is the wide variety of habitats and plant species represented in a relatively small area. In addition, plants from both northern and southern temperate latitudes grow in Grand Mere.

In April 1968, the U.S. Department of the Interior declared Grand Mere a National Natural Landmark (www.nature.nps.gov/nnl). The federal agency recognized the park for "providing a unique ecological area documenting the evolution of aquatic to terrestrial communities, surrounded by a buffer zone of dunes, and containing many rare relict species."

Grand Mere's rich diversity also supports a variety of wildlife. Deer, raccoons, voles, and squirrels all make their homes in the park's lush environment. Water-

Grand Mere is hardly untouched by the workings of human development. Various enterprises, including a saw mill, vacation resorts, cranberry cultivation, and fruit orchards have all been tried on the land. Several private homes line its edges.

But the most controversial of commercial endeavors has been a sand mine in the southwestern corner of the park. The fine, uniform sand is used by the auto industry for casting auto parts such as motor blocks.

In 1965, a company called Manley Brothers began mining sand from the privately owned Peters property in dunes adjacent to Grand Mere State Park. Mining stopped after a time, and by the time Manley Brothers wanted to start up again, the state's Sand Dune Management and Protection Act of 1976 was in effect, and mining required a permit.

Up to 40 years will be required for oak seedlings, planted amid beach grass and wildflowers, to grow into a fully functional forest.

After a series of lawsuits, an agreement was reached and a permit granted. Mining resumed in 1985 on the condition that, when mining ceased, the proper-

ties would be reclaimed and revert to the state as part of Grand Mere State Park.

ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

Project to Reclaim



ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

Sand-mining company works with agencies

fowl—herons, ducks, and geese—use the inland lakes, and other migratory birds of all types travel through the park.

Although now protected as a critical dunes area,

ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

ty occupied by the mine would be reclaimed and revert to the state as part of Grand Mere State Park.

ment that surrounds it.

The principals hoped the project, with its emphasis on native species and broad diversity, would also spur changes in all reclamation efforts and offer a blueprint for accomplishing a

Meanwhile, volunteers collected seeds from the native plants of nearby dune communities.

"By collecting the seed locally, we know those plants are adapted to grow in the site conditions found

vated the seeds, successfully propagating 81 of the 85 tried species. Planting began in earnest in 2000. The bare dunes were planted with wildflowers and grasses. Oak seedlings and native dogwood were

leys, on north slopes, and along wetland edges. These are the native habitats recreated on the TechniSand-Peters mine site, along with wetpanne habitat of sedges, rushes, grasses, and forbs that would surely have surrounded Grand Mere's inland lakes (now surrounded mostly by shrub swamp).

The three acres of wetpanne areas are entirely experimental and an exciting part of the plan for Palmgren. Wetpanne is a type of wetland characterized by water levels right at the surface. "The water level fluctuates slightly, sometimes flooding and sometimes drying out," he said. "I don't think anybody's tried to recreate one of those completely from scratch before. The EPA was interested in creating these wetland systems."

Small areas of hardwood forest and a prairie

Grand Mere State Park's dunes range from open to grass-covered to oak-forested, interspersed by inland lakes and wetlands.

also were planted.

Palmgren commends TechniSand for going "above and beyond" normal reclamation efforts. Sand mine reclamation hereto-

Grand Mere Dunes

By Terri Gordon
Photos by the Author



Hérons, ducks, and geese use the inland lake created by mining sand below the water table at the Manley-Peters site near Stevensville.



better reclamation.

The first step was preparing the site for planting. As it withdrew from the mine, TechniSand graded the area, creating "a

at Grand Mere," explained Palmgren, who authored the reclamation plan and guided its implementation as part of the State Park Stewardship Program. "We

added to the slopes. It is hoped the grasses will hold the sand in place while the trees take hold, and that eventually the forest will take over the open areas.

cies and citizens to restore diverse habitat.

broad wetland around the center of the pit—the bottom of the lake," Palmgren said, "and they contoured the slopes on the site to blend with the slopes on the surrounding dunes."

wanted not only native species, but native genetic varieties of these species, what we call local genotypes, from ecosystems in the area."

Nearby nurseries culti-

The forests of southwest Michigan, before European influx, were predominantly black and white oak. Northern pin oak grew on hilltops and ridges, with northern red oak in the val-

fore has consisted only of minimal grading and the planting of beach grass and failed to generate the complex, dynamic communities found in undisturbed dunes.

"The project warranted exceptional efforts due to its location in a unique and diverse environment in a critical dune area," said Joe Fodo, vice president of operations at TechniSand in Bridgman.

Those efforts seem to be paying off. In areas planted the earliest, beginning in 2000, at least 60 percent of the plantings have survived after three years, Palmgren said. The percentage may even be higher. "It will take a number of years to see," he said. "Our goal is to get these native species established on that site and let nature take its course as [they] sort themselves out. Some die out on the sites, and some new ones come in on their own."

To assist, the DNR plans to monitor the plant growth and invasive species that may threaten the restoration and natural colonization.

But Palmgren is pleased with the rate and diversity of the growth. He is also encouraged to find various animal species using the tract. "Just this past year, we noticed the Blanchard's cricket frog, a fairly rare frog species,

on the site," he said. "We've seen shorebirds using that site, and ducks have been really plentiful in the lake itself."

The reclamation of the TechniSand-Peters site sets new standards in the management of natural resources. True efficiency is getting the most benefit for the least amount of cost. Traditionally that cost has been calculated in dollars and cents, but the cost of losing a natural resource is increasingly being factored into the equation.

Trees stabilize the environment and produce oxygen. Wetlands filter the planet's water. With increased ecological awareness, better policies can be put in place and the negative impact on the environment minimized.

The DNR, TechniSand, and the community—the volunteers who collected seeds, the folks who germinated them, the people who planted them—have shown how various principals, with divergent interests can cooperate to accomplish responsible use.

TechniSand's Fodo found the experience enriching. "It demonstrates that a balance between mining and pro-

viding a product we depend on can be accomplished while leaving a legacy of an exceptional reclaimed ecosystem," he said.

As Carl Sandburg wrote, the dunes "are to the Midwest what the Grand Canyon is to Arizona and Yosemite to California. They constitute a signature of time and eternity."

It will take 30 to 40 years for the seedlings planted in 2000 to mature into a fully developed forest, assuming they are successful in doing so, and even then it won't be the virgin system that was.

"We can come pretty close to approximating these sites," Palmgren said, "but I don't think we've ever totally created a natural ecosystem and I don't think that will ever be possible, no matter how much we know, because they're so complex."

Still, he hopes the lessons learned from the Grand Mere reclamation project inspire new thinking with regard to mining on both public and private land and that more diverse, ecological reclamations will become the norm. ■