

## **Duneland Beach Erosion Issues**

Since the mid-1930's, Duneland Beach has been one of the most progressive duneland communities in Indiana. The prevention of development north of lakeshore drive has ensured that the ecosystem services of protecting nearby infrastructure from the harsh weather conditions that exist along the Lake Michigan shoreline, continue to function. In addition, the natural beauty provided by preservation of the lakefront has elevated the quality of living for the residents of Duneland Beach.

Theron F. Miller was the original owner and developer of the Duneland Beach area. Mr. Miller's vision, which was highly progressive for its time, was for all residents to have a clear, unobstructed view of Lake Michigan from Lakeshore Drive and to preserve the critical habitat and ecosystem services of the lakefront and foredune.

Mr. Miller deeded the property north of Lakeshore Drive to the Duneland Beach Association in his last will and testament, which clearly states that the property is to be "perpetually maintained in its natural condition." Foot trails up and down the dune are directly negatively impacting the natural condition of the dune and its ability to provide critical ecosystem services.

Stabilization of dunes near development by minimizing the effects of erosion caused by wind, water and recreational use is essential to protect the infrastructure upon which, everyone depends. Foredunes play a very important role in protecting the adjacent infrastructure in developed areas.

The foredune environment is not static, but dynamic. All dune areas are subject to erosion of the sand dominate soil and the influence of wind, water, and recreational use impacts.

Areas in closest proximity to the lake are at highest risk for soil erosion.

The primary stabilizer of sand dunes is the native marram grass (*Ammophila breviligulata*). This species of grass provides a critical service to the habitat due to the extensive rhizome root systems that grows vertically and laterally, stabilizing the sand dunes. These rhizomes form large underground mats that not only stabilize the soil but provide critical structure for plants with lesser roots, otherwise unable to establish themselves in the shifting sands.

In foredune habitat, the force of wind erosion causes sand disturbance, which results in blowouts. Blowouts are the most destructive effect of erosion in lakeshore areas. Blowouts form when strong winds are allowed to travel, unimpeded from the open sand of the beach, up through the foredune. When constant foot traffic goes up and down the dune creating trails, marram grass is displaced along with the dune stabilization service it provides. These foot trails create a wind tunneling effect, which increases wind speed. During storm events, the increased wind speed through these tunnels results in more severe, centralized sand movement, leading to the formation of a blowout. A blowout of the foredune in the Duneland Beach area will have profound impacts on the residence of the community and the infrastructure everyone depends upon.

Eliminating foot trails is essential in the prevention of foredune erosion. Erosion of the foredune will lead directly to the deterioration of Lakeshore Drive and the use of financial resources required in the remediation of damage.

Everyone in our community depends on lakeshore drive. Therefore, it is imperative that foot traffic ceases and management of the lakeshore and foredune is afforded the ability to provide the necessary ecosystem services that prevent the deterioration of Lakeshore Drive.

Foot trails up and down the dune are the largest threat to our infrastructure, that we have the ability to control. Staircases have been put into place so that the residents of Duneland Beach can benefit from the recreation opportunities afforded by the lakeshore, while protecting the integrity of the foredune that protects Lakeshore Drive.

Since 2010, the Duneland Beach Association has been making significant efforts to responsibly manage this community resource and restore the health and ecological function of the foredune. The quality and functionality of the natural habitat of the foredune has increased substantially due to work performed involving removal of exotic/invasive plant species that were displacing dune stabilizing vegetation, as well as, impeding the beautiful lake and foredune views that we all enjoy today. The association continues to manage the threats of invasive species, while revegetating unhealthy areas of the foredune with dune stabilizing vegetation. In order to maximize the restoration and improvement efforts being performed on this community resource, foot traffic on non-designated areas of the foredune must cease. Foot traffic is only permitted on the staircases located conveniently at each stop which offer residents easy, safe, and responsible access to the beach.