Bone Valley: A Restorationist's Paradise

Orlando E. Rivera, PWS, CERP
Florida State University

There is a place in Central Florida where one of the most destructive activities takes place in the Sunshine State. It is a place where phosphate mining occurs. Yes, Florida is indeed a mining state. Phosphate mining has occurred in this state since the 1890s. Most minable phosphate deposits in Florida are in an area known as "Bone Valley", covering approximately 1.3 million acres of land within Polk, Hardee, Hillsborough, Manatee, and DeSoto counties (see Figure 1). The Bone Valley formation is a geologic term for the mixture of sand, clay and phosphate deposits in Central Florida that are loaded with vertebrate fossils, hence the name. Bone Valley contains the headwaters of five rivers: the Peace, Alafia, Manatee, Little Manatee, and Myakka. These rivers are ecological treasures, and they provide some drinking water for the Tampa Bay and Charlotte Harbor areas. Florida phosphate mining also occurs outside Bone Valley in Hamilton County, west of Jacksonville. Hamilton County mines are within the Suwannee River Basin. The Suwannee River is designated by the Florida Legislature as an Outstanding Florida Water, which is supposed to provide more protection.

Phosphate mining obliterates the land (see Figure 2), and typically disturbs approximately 5,000 acres of land per year. That is the equivalent of nearly 3,800 football fields. Approximately 150,000 acres of Florida land was mined for phosphate before July 1, 1975, when the Florida Legislature required mandatory reclamation of land mined or disturbed for phosphate. Before July 1975, virtually no reclamation took place, and the remaining moonscape was left to heal itself because it was grandfathered from the new reclamation requirement. Since 1975, approximately 258,576 acres of land have been mined for phosphate. Seventy-four percent of this land has been reclaimed. The remaining land is still used for phosphate production.

Mandatory reclamation includes reshaping the land to recreate prior landscapes to the greatest extent possible. Florida's reclamation standards are extensive and address the following: safety, backfilling and contouring, soil zone, wetlands and waterbodies, linear footage replacement of streams, water quality, flooding and drainage, waste disposal, revegetation, wildlife, time schedules, and a rate of reclamation.

Given all of this, you must be wondering why this is one of my favorite places in Florida. The extent of reclamation and environmental restoration that takes place in Bone Valley is second to none. Some argue that reclamation and restoration would not be necessary if phosphate mining had not taken place. Others argue that American food production depends on fertilizer coming from these mines.

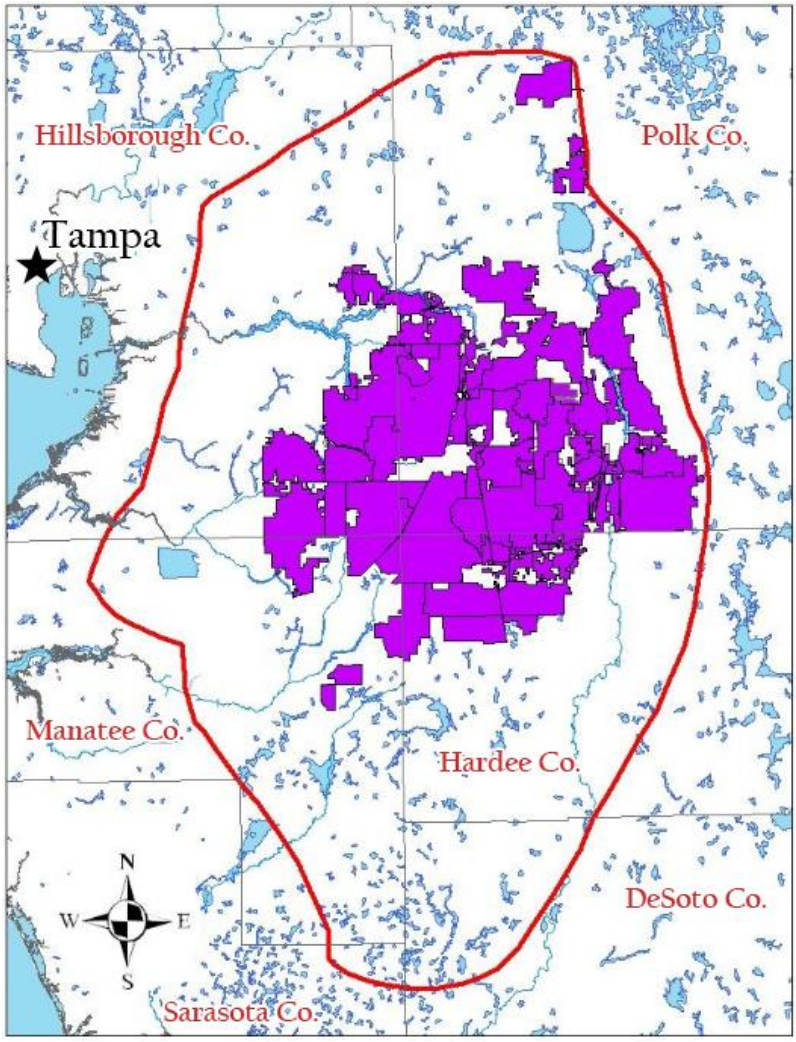

Figure 1. Florida's Bone Valley, a phosphate rich area delineated in red. Purple indicates historic and current phosphate mines. (Map adapted from FDEP, Mining and Mitigation Program)

Figure 2. Phosphate Mining. (Photo courtesy FDEP, Mining and Mitigation Program)

Phosphate mining clearly destroys landscapes, but it is a legal activity, and it has been taking place in Florida for more than a century. Since 1975, restorationists from both the government and the mining industry have worked together to heal and restore mined land. Threatened and endangered species of animals live in restored mines. For 32 years, I worked for the Florida Department of Environmental Protection's Mining and Mitigation Program. My job was to ensure that pre-mining wetlands and upland forests were restored. Restoration facilitates and expedites the healing and recovery of landscapes degraded mostly by human activities. Restoration takes time. It is my experience that damaged ecosystems can take between 5 to 20 years to recover. Successful restoration necessarily includes protection of water quality and quantity, replacement of regional drainage patterns, protection and replacement of habitats and species, and safeguarding the public's health and safety. Ecological restoration is an ongoing process in Bone Valley.

One of my favorite projects is the restoration of Hookers Prairie, a 3,636-acre predominantly sawgrass (*Cladium jamaicense*) wetland located in Polk County. The prairie serves as the headwaters for the South Prong of the Alafia River (see Figures 3 and 4). In addition to agriculture and cattle grazing operations that have directly and indirectly altered the prairie, the wetland was mined for

phosphate. Today, Hookers Prairie has been restored and it now hosts wildlife including threatened and endangered species. After the Everglades, Hookers Prairie is one of the largest wetland restorations in Florida!

Figure 3. Part of the restored Hookers Prairie mine site, 23 October 2018. Photo by author.

Figure 4. Part of the restored Hookers Prairie mine site, 23 October 2018. Photo by author.

In 2007, Florida's reclamation rule was changed to require linear footage replacement of streams destroyed by mining. Prior to the rule change, streams were being reclaimed mostly as wetlands or just water conveyances without appropriate geomorphological characteristics. A new era of stream restoration has begun. Southwestern Polk County's Gilshey Branch Stream Project is 9,560 linear feet (nearly two miles) of stream restoration built in 2012 (see Figure 5). South Bowlegs Stream Project, built in 2011 and also in Polk County (near Fort Meade), is restoring 5,000 linear feet of stream. Whether the streams are functioning as designed is subject for discussion.

The reclamation and restoration of wetlands and streams mined by the phosphate industry is a huge endeavor with ecological implications for the future of Florida. The restoration of these systems, not the mining, is what makes Bone Valley one of my favorite places in Florida!

Figure 5. Polk County's Gilshey Branch Stream Project, during and after construction. (Photos courtesy of Christine Keenan, FDEP, Mining and Mitigation Program).