



A number of wetlands have been established within the former production area at the Fernald Preserve.

Wetland Mitigation at the Fernald Preserve

By Jane Powell and John Homer

Beneficial ecosystems can be destroyed during the cleanup of a contaminated site, as happened at the Fernald Preserve, located near Cincinnati, Ohio, on the site of the former Feed Materials Production Center, a uranium-processing facility that operated from 1951 to 1989 as part of the U.S. Department of Energy's weapons complex. The site has since undergone remediation pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The DOE's Office of Legacy Management now manages and maintains it. Approximately 10 acres of wetlands were affected during cleanup. Through negotiations with regulators, the DOE became responsible for creating 17.8 acres of compensatory wetlands. Mitigation plans were incorporated into sitewide ecological restoration planning, and a variety of projects were completed from 1999 through 2006.

The DOE negotiated a path forward for monitoring as part of settling a natural resource damage claim under Section 107 of CERCLA. As a result, the Fernald Natural Resource Trustees (the DOE, Ohio Environmental Protection Agency [EPA], and U.S. Department of the Interior) developed a comprehensive wetland mitigation monitoring approach to evaluate whether compensatory mitigation requirements have been met.

Numerous ecological restoration projects were carried out to create compensatory wetlands at the Fernald site from 1999 through 2006, and a follow-up three-year monitoring program indicates that high-quality wetlands are forming.

Typically, a multistep evaluation process is used to efficiently estimate the size, type, and quality of wetlands *before* they are affected. At the Fernald Preserve, however, impacts on wetlands occurred years before the natural resource damage claim settlement. The DOE had to account for this when developing the *Fernald Preserve Wetland Mitigation Monitoring Plan*. While the size of affected wetlands could be approximated from a 1993 wetland delineation that was completed before remediation began, the quality of the wetlands had to be inferred. This resulted in the establishment of standards associated with a cattail marsh impoundment. Ohio EPA performance standards and monitoring protocols for mitigated wetlands were incorporated into the evaluation process. Performance standards were used to ensure that the wetlands created provide both the processes (functions) and



Fragrant water lily (Nymphaea odorata) has been established within several created wetlands at the Fernald Preserve.

Dragonflies are frequently observed in the created wetlands.

Ambystomatid salamanders are used to evaluate wetland ecosystem functions and values.





A vegetation survey records species richness and cover. Data collected are used for assessing wetland vegetation quality.

ecological services (values) that the affected wetlands provided in the past.

With the standards established, field personnel began a three-year monitoring program designed to evaluate and compare site wetland development to the standards. From 2009 to 2011, crews monitored wetland vegetation, wildlife, soil biochemistry, and hydrology. A wetland delineation was completed in 2011 to determine acreage and basin morphology.

Monitoring results indicate the successful establishment of created wetlands at the Fernald Preserve. Although not all performance standards were met, the data show that hydrology is supporting wetland vegetation establishment and hydric soil development, and the field data, wildlife observations, and progress photographs indicate that high-quality wetlands are forming.

The performance standards are not intended to be “pass/fail” criteria. They are instead reference points for use in making decisions regarding future monitoring and maintenance. The approximately 31 acres of created wetlands at the Fernald Preserve are likely of higher quality than the original wetlands that were replaced. Therefore, the mitigation goal has been met. The Natural Resource Trustees approved the *Fernald Preserve Wetland Mitigation Monitoring Report* in April 2012 with the provision that long-term monitoring of the wetlands continues. ■



Field personnel collect soil samples to determine the extent of hydric soil establishment.

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