

**Fact Sheet<sup>1</sup>**  
**Wetland Banking at Former Mine Lands:**  
**An Ecological Solution with Economic Benefits**

*This fact sheet is intended to educate communities, mine land owners, potentially responsible parties, companies, and other interested individuals about the opportunities associated with reusing former mine lands to create wetland banks. It is one of a series of papers that describe a variety of tools that can be used to reuse former mining sites. Other topics in this series include carbon sequestration, water quality credits, and land conservation. This paper focuses on one tool, wetland banking, that may be applicable to only a small percentage of the former mine lands throughout the country. However, given the number of former mine lands, that small percentage may represent thousands of actual sites. This document also describes the opportunities and limitations associated with using water quality trading credits and provides resource and contact information.*

## **Introduction**

Across the United States hundreds of thousands of former mine lands lie idle or abandoned. Although they were once productive sources of raw materials for thriving industries they may now contaminate the environment. Wetland banking may provide a solution to the problems caused by former mine lands—a solution that not only returns idle land to productive use, but also benefits the environment, the property owner, and the local community.

Wetland banking, the restoration, creation, or enhancement of wetlands to offset future development impacts to other wetlands, was designed as a compensatory mitigation mechanism to support the wetland preservation requirements of the 1972 Clean Water Act (CWA). Today, wetland banking is a commonly employed compensatory mitigation approach and one which can produce numerous benefits at former mine lands.

As this paper will describe in greater detail, wetland banking at former mining sites

### **Wetland Banking Terms**

**On-Site Compensatory Mitigation:** The restoration, creation, or enhancement of wetlands and/or other aquatic resources to offset unavoidable adverse impacts which remain after all appropriate measures have been taken to minimize damage. On-site compensatory mitigation occurs adjacent or contiguous with the location of the damaged wetlands.

**Off-Site Compensatory Mitigation:** Replacing the functioning of damaged wetlands and/or aquatic resources through the creation, restoration, or enhancement of similar resources at a location other than the area near the damaged resources.

**Banking Instrument:** Essentially, the instrument is a document that outlines the scope of the wetland bank, including the physical and legal characteristics of the bank and how the bank will be established and operated.

**Bank Sponsor:** Any public or private entity responsible for establishing and, in most circumstances, operating a mitigation bank.

**Service Area:** The designated area (e.g., watershed, county) wherein a bank can reasonably be expected to provide appropriate compensation for impacts to wetlands and/or other aquatic resources.

*Source: Federal Guidance for the Establishment, Use, and Operation of Mitigation Banks. November 1995.*

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<sup>1</sup> This document does not represent official US EPA policy or guidance. Rather this material presents alternative approaches which may lead to environmental improvements at mining sites.

represents a reuse opportunity with benefits for the community, the environment, and the mine land owners.

## **What are Wetlands?**

Section 404 of the Clean Water Act defines wetlands as “areas that are inundated or saturated by surface and groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands include swamps, marshes, bogs, and similar areas, which provide a variety of ecologically important functions. These functions vary from wetland to wetland, but in general, wetland services include protecting and improving water quality, assisting in floodwater control, recharging water supplies in dry periods, and providing fish and wildlife habitats. Additionally, wetlands provide recreational opportunities such as fishing and hunting, aesthetic benefits to communities, and commercial fishery benefits.



**Wetlands such as this one in Tres Rios, Arizona, support a variety of animals and plant life.**

## **What is Wetland Banking?**

Wetland banking is the restoration, creation, or enhancement of wetlands to compensate for wetlands that are unavoidably destroyed by development activity in other locations. This approach was established to support CWA’s mandate that unavoidable impacts to wetlands be offset through the creation or restoration of similarly functioning wetlands, otherwise known as compensatory wetland mitigation. When possible, this mitigation should occur on site, in areas contiguous with the impacted wetlands. In instances where on-site mitigation is not possible, off-site compensatory mitigation such as wetland banking is allowable. The Federal Guidance for the Establishment, Use, and Operation of Mitigation Banks (hereafter referred to as “Banking Guidance”; available at <http://www.epa.gov/owow/wetlands/mitbankn.html>) further detailed the protocol for wetland banking.

Ecologically, wetlands creation can transform former mines into thriving habitats for plants and animals, and the wetlands can aid in removing harmful metals from contaminated waters. Wetlands creation can provide mine land owners with financial rewards as well, through the sale of bank “credits” to landowners or developers who must compensate for damage to wetlands during development. Mine owners can then use the revenue from these credit sales to help fund site cleanup. Remediation at mining sites can sometimes take decades to complete, but wetland banking provides

mine owners with the possibility of recouping at least some of the remediation costs.

As a compensatory mitigation approach, wetland banking is unique in that the banks are created in advance of any damage to wetlands. According to the Banking Guidance, these banks are designed to “replace essential aquatic functions that are anticipated to be lost through authorized activities within the bank’s service area.” Once fully functional, the services wetland banks provide are quantified as “credits,” which developers can buy from the bank sponsor to offset the “debit” created when development activities impact the functioning of a wetland. The quantity and type of credits that a bank provides depend on the amount of acreage and wetland type at the bank and/or on the habitat, physical or biological functions, or social values the wetland furnishes.

**Activities that can Generate Demand for Wetland Credits:**

- Transportation development (i.e. highway or road widenings, parking areas, new road development)
- Utilities (i.e. pipeline or power line construction)
- Commercial and industrial construction
- Residential development

At former mine lands, the mine land owner would serve as the bank’s sponsor and would be responsible for the operation, monitoring, and overall functioning of the bank as well as the success of the credit exchange system. The Army Corps of Engineers oversees the exchange of credits on a project-specific basis and determines the number and availability of credits required to compensate for proposed impacts in accordance with the terms of the banking instrument. Once the Corps approves the sale of credits, the bank sponsor issues a certificate or receipt to the purchaser. The purchaser, in turn, furnishes the certificate to the regulatory authority to verify the completed transaction and satisfaction of the developer’s mitigation requirement. The bank sponsor should also make the appropriate real estate arrangements, such as conservation easements and transfer of title to a federal or state resource agency or non-profit organization, to ensure the wetland is preserved in perpetuity, guaranteeing that wetland functioning will continue at the site and that incompatible uses such as industrial development or vehicular use will be prohibited.

Mine land owners may create wetlands at former mining sites for a variety of reasons: to remediate mining-related contamination such as acid mine drainage, to protect the property from potential acid mine drainage and regulatory actions, and/or to establish additional wetland acreage in a formerly non-wetlands area. Certain wetland construction activities at former mine lands, however, do not qualify for wetland banking. Banking credits cannot be issued for wetlands that were created as a component of a former mining site’s remedy. Additionally, the Banking Guidance stipulates that “federally-funded wetland conservation projects undertaken via separate authority and for other purposes cannot be used for the purpose of generating credits within a mitigation bank.”<sup>2</sup>

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<sup>2</sup> For instance, wetland projects associated with the Wetlands Reserve Program, Farmer’s Home Administration fee title transfers or conservation easements, or the Partners for Wildlife Program cannot be used to generate banking credits.

## Benefits of Wetland Banking

### *Economic Benefits*

Wetland banking at former mine lands can provide direct economic benefits to site owners as well as the surrounding community. For site owners, the financial rewards of establishing a wetland bank on site are clear. Bank sponsors can sell credits to developers for \$2,300 to upward of \$100,000 per acre depending on the wetland's location, the services it provides, and the market value of the credits. The cost of developing large wetland tracts is significantly less per acre than creating a small parcel, and accordingly, the return on investment is much higher. For instance, the Missouri Department of Transportation ([www.conservation.state.mo.us/conmag/2003/01/almanac.htm](http://www.conservation.state.mo.us/conmag/2003/01/almanac.htm)) estimates that the development of small wetland parcels in the state can cost more than \$20,000 per acre while large parcel development can be completed for as little as \$3,000 per acre. With credits from the Missouri bank (<http://www.mldda.org/wetlandbank.htm>) priced as high as \$17,000 per acre, the potential for profit is significant.

The community stands to gain economically from wetland banking as well, in the form of increased local property values and tourism revenue. This economic benefit, however, is typically realized only after site remediation is underway or completed. Depending on the extent and severity of contamination at the site, this cleanup process can take decades to complete.

Once the environmental quality of the site is restored, however, nearby property values previously impaired by real and perceived contamination may increase. Additionally, the creation of new wetlands provides the community and visitors to the area with new recreational opportunities such as hunting, fishing, birdwatching, and photographing wildlife. These activities can produce significant economic benefits for the community; in fact, the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation found that over 82 million U.S.

adults engaged in wildlife-associated recreation in 2001, spending a total of \$108 billion on equipment, guides, lodging, and food. The increase in property values and tourism revenue will, in turn, increase tax revenue for the community and aid the community in marketing itself as an attractive environment for businesses and families.

### **What are the Benefits of Wetland Banking?**

- Wetland credit sales generate revenue for the property owner (\$2,300-\$100,000 per acre)
- Boosts local property values
- Creates new recreational opportunities
- Attracts tourists
- Supports a diversity of plants and wildlife
- Assists in controlling flood waters
- Filters contaminants from water, including acid mine drainage
- Recharges water supplies in dry periods
- Increases the likelihood of compensatory mitigation success
- Eliminates the temporal losses of wetland functioning that often occur with development



### *Ecological Benefits*

In recent years, studies have reaffirmed the critical role that wetlands play in the healthy functioning of humans, wildlife, and watersheds. The ecological services wetlands provide are considered so important that researchers have attempted to quantify their value in economic terms. A study on wetlands in Washington state (<http://www.ecy.wa.gov/pubs/97100.pdf>) valued wetland functions at \$8,000 to \$51,000 an acre while a global study of wetland services pinned their value at \$7,927 per acre per year. The functions quantified include supporting an immense variety of plants and animals; assisting in floodwater control (by absorbing large volumes of water); improving water quality through filtering; buffering shorelines, stream banks, and agricultural soils from erosion; recharging stream flow during dry periods; and sequestering carbon (by absorbing carbon in its plant communities and soil rather than releasing it as carbon dioxide). Wetlands' ability to filter contaminants out of water is of particular importance to mine land owners, because constructed wetlands have been instrumental in remediating acid mine drainage at many mining sites.

As a compensatory mitigation approach, wetland banking provides certain ecological benefits that other compensatory mitigation methods do not. Because the wetlands at a bank must be monitored and fully functional *in advance* of development that adversely affect wetlands, wetland banking is more likely to successfully offset the damaged wetland functioning than mitigation occurring after the damage has taken place. Additionally, the wetland bank's existence and proven functionality prior to a developer's need for its credits eliminates the temporal



**Powell River Project Wetland Construction**



Source: *Virginia Cooperative Extension.*

losses of wetland services that typically occur when developers themselves initiate mitigation during or after the development impacts occur.

## Requirements and Limitations

The creation of wetlands requires meticulous attention to a variety of ecological and procedural details. Careful consideration must be given to the ecological suitability of a site for wetlands. Additionally, the site's size, location, hydrologic sources, compatibility with adjacent land uses and watershed management plans must be considered.

Procedurally, prospective bank sponsors should first discuss their proposals with the appropriate state or local agencies, which are typically the state or county environmental agencies. Following this discussion, the sponsor must submit an initial plan, referred to as a prospectus, to the Army Corps of Engineers or the Natural Resources Conservation Service (NRCS) to initiate the formal agency review process. The prospectus should discuss the objectives of the bank and how the bank will be established and operated. A Mitigation Bank Review Team (MBRT) will review the prospectus. The Mitigation Bank Review Team will include representatives from the Army Corps of Engineers, NRCS, EPA, Fish and Wildlife Service, and/or National Marine Fisheries Service, as appropriate given the projected use of the bank. This team and the bank sponsor will eventually agree on an "instrument" that embodies the information in the prospectus.

The instrument defines several parameters including the bank's service area. The service area, which generally consists of the regional watershed or county, is the area wherein a bank

can reasonably be expected to provide compensation for impacts to wetlands. In the interest of integrating banks with other resource management objectives, bank service areas may encompass larger watershed areas if the designation of such areas is supported by local or regional management plans, state wetland conservation plans or other federally sponsored or recognized resource management plans. Ultimately, the viability of a wetland bank depends on the amount of development impacting wetlands in the bank's service area. Demand for wetland bank credits will be highest in areas where there is a high level of development activity.

The bank instrument also articulates the monitoring requirements and general procedures for

### How do Wetland Banks Benefit Developers?

- Reduce the amount of time needed to process a COE 404 permit\*
- Decrease developers' legal exposure
- Minimize developer contact with federal agencies
- Eliminate the developer's risk of constructing a wetland that fails
- Eliminate the burden of locating an appropriate mitigation site
- Eliminate the long-term responsibility for monitoring and reporting wetland performance to government agencies
- Ease the developer's wetland mitigation burden

*\* Note: A COE 404 Permit, issued by the Army Corps of Engineers, permits the discharge of dredged or fill material into navigable waters at specified locations.*

identifying and implementing remedial actions at the bank. Typically, the bank sponsor must monitor the wetland bank for five years to ensure that the wetland is functioning as intended, although it may be necessary to extend this period for projects requiring more time to reach a stable condition or where remedial actions were undertaken. The bank sponsor should issue monitoring reports annually to the authorizing agencies, which then distribute these reports to other members of the MBRT.

## **Wetland Banking Resources**

Although the specifics of establishing a wetland bank vary from one place to another, the basic protocol for wetland banking is available in the Banking Guidance. Many states and counties issue their own guidance manuals, which detail the nuances of wetland banking in their specific areas. A number of agencies, resources, and programs can help mine land owners weave through the web of wetlands banking regulations and create a wetland bank that is effective and profitable. The Appendix lists some of these organizations and government agencies.

## **Conclusions**

Across the country today, hundreds of thousands of former mining sites stand idle and underutilized, no longer providing the local community with a job base and tax revenue. Wetland creation, however, can help return these areas to productive parts of the community. Areas that once provided industry with coal and minerals can now provide the community with recreational opportunities and tourist attractions. Lands that once bustled with miners and extractive machines can now support diverse plants and wildlife, providing the community with an aesthetically pleasing amenity and the region with immensely valuable ecosystem services. The creation of wetland banks at former mine lands provides mine land owners with an opportunity to benefit financially from long-underused sites where conventional development opportunities are limited. Moreover, wetland banking offers mine land owners a reuse approach that can have far-reaching benefits for the community and the environment.

### *Contact Information*

Interested in pursuing wetland banking at a local former mine land site? For additional information, contact the following resources.

- EPA's Abandoned Mine Land Team can provide communities with technical support and resources as they explore reuse opportunities available at former mine lands. EPA's AML Team works in partnership with communities to clarify EPA's interests at former mining sites and address potential obstacles to reuse at these sites. For information about EPA's AML Team, please see the Web site at: <http://www.epa.gov/superfund/programs/aml/>
- EPA also supports the reuse of former mine lands through the Superfund Redevelopment Initiative (SRI). For additional information, see SRI's Web site, at [www.epa.gov/superfund/programs/recycle](http://www.epa.gov/superfund/programs/recycle). It provides tools, case studies, and resource information addressing the reuse of Superfund sites, including former mine lands.



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## Appendix: Community Resources

<b>Wetland Banking Resources</b>	
American Society for Mining and Reclamation. Available online at <a href="http://ces.ca.uky.edu/asmr/">http://ces.ca.uky.edu/asmr/</a>	A non-profit organization dedicated to reestablishing, enhancing, and protecting natural resources on lands disturbed by mining or other human activities, or by disturbance through natural events..
Association of State Wetland Managers. Available online at <a href="http://www.aswm.org">www.aswm.org</a>	A nonprofit membership organization established to promote and enhance protection and management of wetland resources, to promote application of sound science to wetland management efforts and to provide training and education for members and the public.
Clean Water Act Section 404. Available online at <a href="http://www.epa.gov/region5/water/pdf/ecwa_t4.pdf">www.epa.gov/region5/water/pdf/ecwa_t4.pdf</a>	Established a program for regulating the discharge of dredged and fill material into US waters and a protocol for compensating for unavoidable wetland or aquatic resource impacts.
Critical Habitats, Inc. Guide to Wetland Banking. Available online at <a href="http://www.criticalhabitats.com/about2.htm#WhatIs">http://www.criticalhabitats.com/about2.htm#WhatIs</a>	Provides a brief overview of how wetland banking works and the benefits it can generate for the bank sponsor.
Federal Guidance for the Establishment, Use, and Operation of Mitigation Banks. Available online at <a href="http://www.epa.gov/owow/wetlands/mitbankn.html">http://www.epa.gov/owow/wetlands/mitbankn.html</a>	The regulatory document providing guidance for the establishment, use, and operation of mitigation banks for the purpose of providing compensatory mitigation for authorized adverse impacts to wetlands and other aquatic resources.
National Mitigation Banking Association. Available online at <a href="http://www.mitigationbanking.org/index.html">http://www.mitigationbanking.org/index.html</a>	An association of individuals focused on conducting research and promoting policies that encourage mitigation banking as a sound compensatory mitigation approach. Members are involved with numerous wetland banking projects across the U.S.
National Research Council Report <i>Compensating for Wetland Losses Under the Clean Water Act</i> , pages 82-93. Available online at <a href="http://books.nap.edu/books/0309074320/html/82.html#pagetop">http://books.nap.edu/books/0309074320/html/82.html#pagetop</a>	An overview of compensatory mitigation actions authorized under Section 404 of the Clean Water Act.
National Wetlands Mitigation Banking Study Model Banking Instrument. Available online at <a href="http://www.iwr.usace.army.mil/iwr/pdf/wmb_tp1_May96.pdf">http://www.iwr.usace.army.mil/iwr/pdf/wmb_tp1_May96.pdf</a>	Provides potential bank sponsors with an example of how a bank instrument might look.
North Carolina State University's Water Quality Group Water, Soil, and Hydro-Environmental Decision Support System (WATERSHEDS) Mitigation Banking webpages. Available online at <a href="http://h2osparc.wq.ncsu.edu/info/wetlands/mitbank.html">http://h2osparc.wq.ncsu.edu/info/wetlands/mitbank.html</a>	Provide a great overview of the history, regulatory framework, obstacles, opportunities, and logistics of wetland mitigation banking.

<p>Oregon Division of State Lands' Wetland Mitigation Banking Guidebook for Oregon. Available online at <a href="http://statelands.dsl.state.or.us/mitbank_guidebk.pdf">http://statelands.dsl.state.or.us/mitbank_guidebk.pdf</a></p>	<p>A 156-page guide to wetland banking in Oregon. While the guide is focused on the particulars of banking in Oregon, it is a valuable resource for understanding many of the nuances of wetland banking.</p>
<p>Ramsar Convention on Wetlands' Online Wetland Restoration Resources. Available online at <a href="http://www.ramsar.org/strp_rest_links_tools.htm">http://www.ramsar.org/strp_rest_links_tools.htm</a></p>	<p>Provides a wide variety of online links to information and guidance on wetland restoration.</p>
<p>US Army Corps of Engineers' home page. Available online at <a href="http://www.usace.army.mil/">http://www.usace.army.mil/</a></p>	<p>The US Army Corps serve as one of the primary authorities on wetland bank operations. Corps representatives review the banking prospectus, serve as members of the MBRT, and oversee the exchange of wetland bank credits.</p>
<p>US Army Corps of Engineers' Institute for Water Resources National Wetlands Mitigation Banking Study. Available online at <a href="http://www.iwr.usace.army.mil/iwr/services/pdcpnwetlandsM.htm">http://www.iwr.usace.army.mil/iwr/services/pdcpnwetlandsM.htm</a></p>	<p>Evaluates the feasibility and appropriateness of wetland mitigation banks. This study was an important contributor to the development of the EPA guidance published in 1995.</p>
<p>US Army Corps of Engineers' Institute for Water Resources National Wetlands Mitigation Banking Study: Model Banking Instrument. Available online at <a href="http://www.iwr.usace.army.mil/iwr/pdf/wmb_tp1_May96.pdf">http://www.iwr.usace.army.mil/iwr/pdf/wmb_tp1_May96.pdf</a></p>	<p>Serves as a template for the establishment of wetland mitigation banks.</p>
<p>US EPA Wetlands Helpline. Available online at <a href="http://www.epa.gov/OWOW/wetlands/wetline.html">http://www.epa.gov/OWOW/wetlands/wetline.html</a></p>	<p>Information and referral service which handles requests for information on wetlands regulation, legislation and policy pursuant to Section 404 of the Clean Water Act, wetlands values and functions, and wetlands agricultural issues.</p>
<p>US EPA Wetlands Mitigation Banking Fact Sheet. Available online at <a href="http://www.epa.gov/OWOW/wetlands/facts/fact16.html">http://www.epa.gov/OWOW/wetlands/facts/fact16.html</a></p>	<p>US EPA overview of wetland banking and its benefits.</p>