

SMARA UPDATE

The Quarterly Newsletter of the Department of Conservation, Office of Mine Reclamation

The Abandoned Mine Lands Unit: Ten Years of Major and “Miner” Challenges



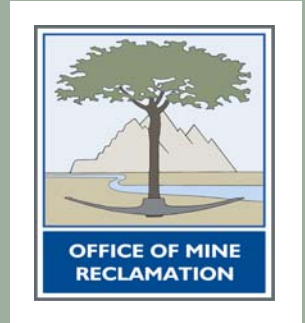
The Abandoned Mine Lands Unit (AMLU) staff celebrates its tenth year.
 Photo provided by Heather M. Smith

Since 1999, the Federal Mine Safety and Health Administration (MSHA) has reported more than 245 nationwide fatalities in abandoned mine accidents. Fatalities included men, women, and children of all ages. During that period, many others were involved in "near miss" accidents, which the MSHA defines as "accidents that could have resulted in a fatality, but did not." Last year, three fatalities and five injuries were recorded at abandoned mines in California. With an estimated 47,000 abandoned mines in California, the challenges facing the Office of Mine Reclamation's

(OMR) relatively young Abandoned Mine Lands Unit (AMLU) and its many partners are immense.

This year marks the tenth anniversary of the AMLU's inception. The program started in 1997, when the Legislature directed the OMR to evaluate existing data and literature on abandoned mines, conduct field inventories of abandoned mine sites, compile these data into a statewide database, and report back to the Legislature within three years.

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Choosing the Plant Palette for Revegetation



Bush Monkeyflower (*Mimulus aurantiacus*) is a hardy shrub with apricot-orange flowers.

Photo provided by Leah G. Miller

“Plant palette” is a landscaping term used to describe the list of species that will be included in a planting plan. While we may think of an artist when we think of a palette, it is important to realize that there is a science as well as an art to choosing the best species for a project.

Baseline studies

A complete species list should be compiled for the entire site by a trained botanist. If the site is already highly disturbed, it may be necessary to gather this information from a nearby reference site. The botanist will need to survey for sensitive species to satisfy the California Environmental Quality Act (CEQA), but every single species should be noted on this inclusive floristic list. If more than one habitat type occurs, plants should be listed separately or given codes to designate the habitat type to which they belong. This list will not only serve as the basis for species selection; it will also alert land managers to any noxious weeds that are present and that will need to be managed. Other baseline information taken during this plant

survey should include the cover, density, and species richness values from which revegetation performance standards can be developed.

The species selection process

First, the complete list of species for the site should be broken into categories or given codes to designate the characteristics of each plant. The first breakout should be of native versus exotic plants. Next, plants should be noted as to whether they are annual or perennial (annuals only last one year while perennials come back year after year) and what their growth form type is (grass, herb, shrub, or tree).

Different types of plants will have differing rooting strategies. Some other qualities to look for are whether the plant is a nitrogen-fixer and how well a plant volunteers and grows without much care (what we refer to as early successional, pioneer plants, or “good colonizers”). By diversifying the species selection, the chances of success are greater, the diversity of the resulting site is higher, and the root systems of the selected species are less likely to compete.



California Lilac (*Ceanothus sp.*) blooms in shades of blue and ranges in size from groundcovers to tall shrubs.

Photo provided by Leah G. Miller

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Many other considerations can come into play, and this is where the selection process becomes more of an art form. It helps to have a background in horticulture in order to know how easy a plant is to propagate, how well it naturally sets viable seed, how fast it grows, and how aesthetically pleasing it will be. There may be additional considerations such as planting to create visual barriers, or to provide wildlife habitat for target species that will affect your plant selection and site design.

General guidelines

A large number of species should be used for your planting mixes, with the idea to “not put all your eggs in one basket.” If you are recreating more than one habitat type, separate lists and standards should be developed that are appropriate to each habitat. As a guideline, a minimum of one-third of the native species from the list should be reintroduced to your site during revegetation and the minimum number should not go below five. For example, if thirty native plants grow on your site, your species list should include at least ten of them. If only seven native plants grow on your site, you should still include five of them. If there are other good species for revegetation that occur in your ecoregion but are not specifically found on your site, they may be added to the list at the discretion of the botanist, ecologist, or other trained restoration professional such as a native plant nursery or seed company technician.



A meadow of lupines and grasses in Pt. Reyes National Seashore.

Photo provided by Leah G. Miller

Include some grasses and some nitrogen-fixers

Grasses establish quickly from seed, and their fibrous root systems hold the soil in place, combating erosion. Use mostly perennial grasses; however, annuals such as small fescue (*Vulpia microstachys*) can be included. Legumes such as clovers, lupines, and lotuses all add nitrogen to the soil.



California Buckwheat (*Eriogonum fasciculatum*) is a reclamation champion, growing well in poor soils.

Photo provided by Leah G. Miller

Include some early successional or good-colonizer species

Look at what is volunteering along roadsides and on waste piles. These are plants that sprout up early after a disturbance, being replaced by other plants as the years pass and the ecosystem matures. They tend to produce large amounts of viable seed, which can be collected and stored to apply during site reclamation. Grasses and forbs are often in this category, but some shrubs, such as California buckwheat (*Eriogonum fasciculatum*), are also good early colonizers. Four-wing saltbrush (*Atriplex confertifolia*)

and apricot mallow (*Sphaeralcea ambigua*) are great pioneer plants in southern desert regions of California.

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Western Redbud (*Cercis occidentalis*) bears fuchsia-pink flowers in spring, followed by attractive seed pods.

Photo provided by Leah G. Miller

Include some aesthetically pleasing plants

This is especially applicable if your site is visible from a road or if you want to create a more landscaped look to the entrance of your site. Many of our California natives, such as California poppy (*Eschscholzia californica*), California fuchsia (*Epilobium canum*), California lilac (*Ceanothus*), Flannel bush (*Fremontedendron*), and Redbud (*Cercis occidentalis*) make beautiful ornamental plants. Besides their visual appeal, blooming plants provide nectar for our native bees and butterflies.

Seek professional advice

Botanists, landscape architects, and native plant nursery workers have the depth of knowledge needed to achieve success with wildland revegetation. Seed companies that specialize in California natives for restoration projects also have the skills to help you develop appropriate seed mixes. Only these professionals know which species will do well from seed in your area and which will need to be grown out in a nursery setting and installed as container plants. Many of these contractors can even provide the seed collecting and plant propagation services for your mining operation.

OMR botanists are also ready and willing to review your plant lists and give advice on the best species and rates/methods of application for your project. Our *Special Publication 123: Rehabilitation of Disturbed Lands in California* contains great reference materials. *Appendix A: Species Commonly Used in Rehabilitation by Bioregion*, is a compendium of plant information suitable for revegetation listed by bioregion (or ecoregion). The plants are broken down by annual grass, perennial grass, annual herb, perennial herb, shrub, and tree. The publication can be downloaded as a PDF file from our Web site

<http://www.consrv.ca.gov/OMR/reclamation/sp123.pdf>

OMR also plans to add a searchable plant database to its Web site in the near future.

Happy planting!



Our state flower, the California poppy (*Escholschia californica*), has bright orange blossoms and reseeds readily.

Photo provided by Leah G. Miller

Leah Gardner Miller
Staff Environmental Scientist

State Mining and Geology Board Update

CHAIRMAN REAPPOINTED

Allen Jones was reappointed to the State Mining and Geology Board (SMGB) for a 2007-2010 term. Mr. Jones was originally appointed by Governor Gray Davis in 2000, and reappointed in 2004. His recent reappointment by Governor Arnold Schwarzenegger confirms that the SMGB retains its credibility and effectiveness because of the non-partisan manner in which it conducts its business. Jones says, "Issues are evaluated on their technical merit and regulatory status, without regard to political considerations." He added, "I think the high professional qualifications of our entire board speaks to this Governor's interest in appointing the most qualified persons, regardless of political affiliation."

Mr. Jones currently serves as Vice President of the H. G. Fenton Company in San Diego. Previously, Mr. Jones served as Deputy Planning Director for the City of San Diego as well as Chief of Staff for City Councilmember Bob Filner. He is a member of the American Planning Association and the Urban Land Institute.

In addition to serving as Chairman, Mr. Jones fills the Mineral Resource Conservation, Development and Utilization position, and chairs the Board's Policy and Legislation Committee.



Allen Jones

*Photo provided by
the SMGB*

NEW LOCAL GOVERNMENT REPRESENTATIVE APPOINTED

Kathy Lund is newly appointed to the State Mining and Geology Board (SMGB) for a 2007-2011 term in the Local Government Representative position. Ms. Lund is currently serving her sixth



Kathy Lund

*Photo provided by
the SMGB*

term as mayor and city councilmember for the City of Rocklin. She is also a member and past-chair of the Placer County Transportation Planning Agency, a member of the Sacramento Area Council of Governments, and a past-member of the California Cities Policy Committee on Transportation, Communications and Public Works.

Ms. Lund has also served on the Placer County Economic Development Board, the Highway 65 Joint Powers Authority, and with numerous regional and local committees. She was named "Woman of the Year" by Assembly Member Tim Leslie in 2001. In 1996, Ms. Lund was awarded the Daughters of the American Revolution's "Excellence in Community Service Award." In 1993, Rocklin/Roseville Women in Business recognized Ms. Lund as a "Woman of Achievement."

*Kit Gonzales
Reporting Analyst*

How to Prepare for a Lead Agency Review

Early this year, the Office of Mine Reclamation (OMR) launched its new Lead Agency Review program. This program is designed to help lead agencies meet their responsibilities under the Surface Mining and Reclamation Act (SMARA) and improve compliance by surface mine operators. Currently, pilot reviews are being conducted at three of the state's 133 SMARA lead agencies. Over the past few months, a number of lead agencies have told OMR that they are taking steps to improve their SMARA programs. Several have asked if there is anything they can do to prepare for OMR's review. Here are some things that you can do in advance of a lead agency review that will both improve your SMARA program and simplify the OMR review process.

Organize your mine files. The first phase of every lead agency review is the identification of available documents for each surface mining operation within its jurisdiction. These include mining permits, reclamation plans, interim management plans, financial assurance cost estimates and mechanisms, inspection reports, and enforcement-related documentation. OMR will request lead agencies to provide copies of all documents that are not currently in OMR's files. If your mine files are not well organized, putting them in order now will help speed up this phase of the review process.

Identify the approved reclamation plan for each mining operation. Several documents may comprise the current, approved reclamation plan for a mine site. These can include the reclamation plan document itself, referenced supporting documents (such as a storm water pollution prevention plan, a waste discharge requirements permit, a streambed alteration agreement, etc.), California Environmental Quality Act (CEQA) mitigation requirements, and conditions of approval. Compilation and identification of the documents that make up the current, approved reclamation plan for each mining operation can be done in advance of the lead agency review. Having this available at the start of the review will help avoid confusion and allow OMR staff to proceed more quickly to other phases of the review.

Review all inspection reports. Review all recent inspection reports and note any SMARA violations or compliance issues that are mentioned in them. Follow up to ensure that proper enforcement actions were taken and that the mine operator has either resolved the matter or is taking appropriate steps to come into compliance. If a mine has not been inspected within the last year, schedule and conduct an inspection right away and send an inspection report to OMR. If you lack expertise in this area, you may want to hire a qualified contractor to perform the inspections and pass along this cost to the mine operator (SMARA provides that mine operators are solely responsible for the cost of SMARA inspections).

Review all financial assurances. Verify that the financial assurance cost estimate for each mining operation has been adjusted in the past year. This annual adjustment is a basic requirement of SMARA and cannot be ignored. A revised financial assurance cost estimate is required even for sites that have had no disturbance in the past year (including sites with interim

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management plans). If you have not submitted a revised cost estimate in the past year for any mine within your jurisdiction, prepare and submit one to OMR for review right away. Once you have received OMR's comments, incorporate them into the cost estimate, approve it, and require the operator to submit a new financial assurance mechanism or an increase/decrease rider.

Take SMARA enforcement actions. Lead agencies have primary responsibility for enforcing SMARA. As a part of the lead agency review process, OMR will be evaluating each lead agency's enforcement actions – or lack of action. If a SMARA violation has existed at a site for more than 30 days, you may want to consider issuing a notice of violation (and an order to comply if the violation isn't corrected within 30 days).

Comply with SB 668 reporting and advance notice requirements. Recent legislation (Chapter 869, Statutes of 2006, effective January 1, 2007) imposed new requirements on lead agencies concerning their responses to OMR comments on reclamation plans and financial assurances. OMR will evaluate lead agency compliance with these requirements as a part of its review. Further details can be found at:

http://www.consrv.ca.gov/omr/official_notices/Notice%2020061228.pdf

These are just a few of the things that you can do to be prepared for a lead agency review. If you would like to discuss additional steps that can be taken, please contact the Reporting and Compliance Unit at (916) 323-9198.

Douglas W. Craig
Assistant Director, Office of Mine Reclamation

UPCOMING OMR WORKSHOP DATES and LOCATIONS - 2007

Focused Workshop: In-stream Mining and Monitoring	August 30, 2007	Fortuna, California
SMARA Lead Agency Training / Preparation and Review of Reclamation Plans	November 14-15, 2007	John Muir Room 801 K Street, 20th Floor Sacramento, CA.



Register Online Now! Spaces are limited.
Go to <http://www.consrv.ca.gov/OMR/workshops/registration.htm> to register.

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A culvert gate constructed at the Otter Creek Mine in El Dorado County.

Photo provided by Sam Hayashi

In June 2000, the AMLU submitted its signature report, *California's Abandoned Mines: A Report on the Magnitude and Scope of the Issue in the State*, to the Governor and the Legislature. The AMLU's findings, based on field investigations and statistical extrapolation, documented that the abandoned mine issue in California was greater than previously thought. Before the AMLU's report, agency staffs had estimated, based on legacy databases, that 7,000 to 20,000 abandoned mines were present in California. That's significantly less than the current estimates of approximately 47,000 mines and 165,000 mine features (e.g., shafts or adits [vertical or horizontal openings], tailings, machinery, and facilities). Based on these findings, the Legislature made the AMLU program a permanent part of the OMR.

Below are some other AMLU highlights during the past ten years.

- Since 1997, the AMLU has conducted onsite inventories of more than 2,400 abandoned mine sites and has recorded detailed information about more than 15,000 abandoned mine features found on those sites.
- In 2000, the AMLU initiated its "Stay Out, Stay Alive!" hazard awareness campaign, modeled after MSHA's nationwide program. The mission of this campaign is to deter curious individuals from exploring dangerous abandoned mine lands. The AMLU has promoted this message at safety fairs and through print media, radio, television, and the Internet. The AMLU also established a hot line for the public to report information about abandoned mines. The toll-free number is 1-877-OLD MINE (1-877-653-6463).
- In 2001, the AMLU completed a major project: compiling a digital spatial database of all mining features found on more than 2,800 of the United States Geological Survey's 7.5 minute topographic quadrangle maps. This database, known as Topographically Occurring Mine Symbols (TOMS), is a resource that is available to government agencies and other interested parties that are working toward the remediation and reclamation of abandoned mine lands in California.
- In 2002, the Legislature authorized the AMLU to start remediating the most hazardous abandoned mines. This effectively shifted half of the AMLU's budget and workload from locating and documenting abandoned mine features to remediating hazardous shafts and adits, removing debris, and addressing other abandoned mine hazards.



Backfill of the Golden Queen Mine in Imperial County during remediation.

Photo provided by Greg Pelka

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- In 2003, the AMLU formed the California Abandoned Mine Lands (AML) Forum. The Forum was created in response to the need for a discussion group for government agencies, consulting companies involved in abandoned mine remediation, and the public to confer about statewide AML issues. Issues discussed at Forum meetings include public safety, environmental impacts, resources, and the costs and benefits of technical solutions to problems caused by abandoned mines. The Forum recently held its 18th quarterly meeting.
- Also in 2003, the Legislature passed Assembly Bill 649, which created the Gold and Silver Mining Fee. This law requires active mine operators that produce gold or silver to pay five dollars per ounce of gold and/or ten cents per ounce of silver mined within the state. The Gold and Silver Mining Fee is now the AMLU's primary funding source for remediating abandoned mine hazards.
- By partnering with other agencies, such as the Bureau of Land Management, the U.S. Forest Service, the National Park Service, the California Lands Commission, and the California Department of Parks and Recreation, plus several nonprofit and private partners, the AMLU has closed many hazardous abandoned mines, while also protecting bats and other wildlife. The AMLU has also conducted outreach efforts to other agencies by hosting bat gate training workshops, which teach the techniques of building bat gates for horizontal openings and bat cupolas for vertical openings. Since 2002, the AMLU has worked with 33 different partners to remediate 337 abandoned mine features on 105 sites, including 174 features on 53 sites in the past 1 1/2 years using Gold and Silver Mining Fees. The remediation methods include a variety of techniques, such as the use of fencing, backfills, polyurethane foam plugs, and bat-compatible gates, cupolas, and culverts.



A completed bat cupola at the Southern Belle Mine in Inyo County. The cupola was constructed as part of an AMLU bat cupola and bat gate training class.

Photo provided by Sam Hayashi



The Rusty Gold Mine in Riverside County following AMLU's construction of a fence around the open shaft.

Photo provided by the AMLU

In the first half of 2007, no one was reported killed or injured in an accident at an abandoned mine in California. This stretch of "non-news" may be good fortune, or it just might be partly attributed to ten years of effort by the AMLU and its many partners. The AMLU reminds you to "Stay Out, Stay Alive!"

Cy Oggins

Supervising Environmental Planner, AMLU

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Wildlife and Mines

California Code of Regulations, Title 14, Section 3713(b), tells us that, prior to mine closure, "all portals, shafts, tunnels, or other surface openings to underground workings [must] be gated or otherwise protected from public entry in order to eliminate any threat to public safety and to **preserve access for wildlife habitat**" [emphasis added]. But which wild animals make use of



This bat gate, installed in an abandoned mine in San Bernardino County, allows bats to freely enter and leave the mine, but helps to ensure public safety.

Photo provided by
Leah G. Miller

mines? Do they only use abandoned mine shafts, or are there wildlife issues related to operating quarries and reclaimed mine sites? What special measures must be taken?

Many people have become aware of the beneficial roles bats play in the environment, especially by keeping harmful insects in check. Mine shafts and adits provide bats with good habitat for roosting, hibernating, and reproducing, in many cases replacing natural cave-type habitats that have been destroyed or disturbed. In fact, mines provide important habitat for more than half of the 45 bat species found in the U.S. In California, 20 bat species are associated with underground mines, 11 of which are sensitive species of concern.

Special bat gates and cupolas have been designed for installation at the entry to abandoned mine shafts and adits by Bat Conservation International and state agencies to provide access for bats while also denying access to people. For more information, contact the

Abandoned Mined Lands Unit (AMLU) or visit Bat Conservation International at <http://www.batcon.org>.

Other species of animals besides bats may be encountered at abandoned or active mine sites. The Department of Fish and Game's *California Wildlife Habitat Relationship System* (CWHR) lists 101 species ranging from lizards to wolverines that either depend on mines or find these human-made features preferable when it comes to seeking shelter, finding food, or having babies. Undoubtedly, some of these same species use surface mining areas (quarries) for the same reason. Rehabilitating quarries can also provide an area where wildlife can roam freely as they move from one prime area to another. This becomes increasingly important as their habitat becomes ever more fragmented due to human activities. Quarries are important for other reasons as well; they can provide a host of plant species that wildlife can feed upon that might not be available in adjacent areas.



A Chuckwalla (*Sauromalus obesus*) peacefully munches on a beavertail cactus flower in a demonstration garden outside the office of the Briggs Mine in Inyo County.

Photo provided by Amy Kulas

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These areas immediately adjacent to a quarry are known as edge habitat and are present whenever two adjacent habitats meet. These areas are known to house a greater number of species than typically exist in either of the two habitats alone. Rehabilitated quarries also act as dispersal areas for youngsters to move into, as adults maintain territories in more prime habitat. Finally, quarries often have unique soil types and, consequently, unique flora, providing biological islands that can harbor some rare species of animals.

Additionally, numerous species return to the reclaimed quarries as the habitat quality improves over time. In the



The Desert Tortoise (*Gopherus agassizii*) is an endangered species native to the Mojave Desert. Fences are often required on mine sites to keep the Desert Tortoise out of harm's way.

Photo provided by Leah G. Miller

case of in-stream mining or mining in a floodplain, sensitive species of fish such as the migrating salmonids must be considered.



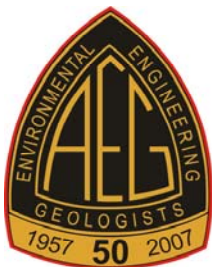
The ringtail (*Bassariscus astutus*), also known as the ring-tailed cat or the miner's cat, is a fully protected species in California.

Photo provided by Robert Shantz

Before any project begins, complete surveys of the site must be conducted by qualified biologists to ensure that all species of plants and animals are identified. During the CEQA process, impacts to all biological resources are identified, and site-specific mitigation measures are developed in conjunction with the Department of Fish and Game or the U.S. Fish and Wildlife Service. These biological survey reports should accompany all

reclamation plans submitted to OMR for review, and the mitigation measures developed under CEQA should be incorporated into reclamation plans. This could involve such actions as avoiding sensitive areas of a site, fencing off or creating buffers around certain areas, avoiding blasting during certain times of the year (such as nesting season), or educating employees about the characteristics and activities of species of concern. In this way, issues involving wildlife and mines can be addressed satisfactorily.

*Leah Gardner Miller, Staff Environmental Scientist, and
Douglas John, Environmental Scientist*



AEG 2007

ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS

"GOLDEN ANNIVERSARY IN THE GOLDEN STATE"

50th ANNUAL MEETING: Los Angeles, California, Sheraton Universal Hotel

September 24 - 29, 2007

For more information, visit <http://www.aegweb.com>

The SMARA Update is a quarterly publication of:

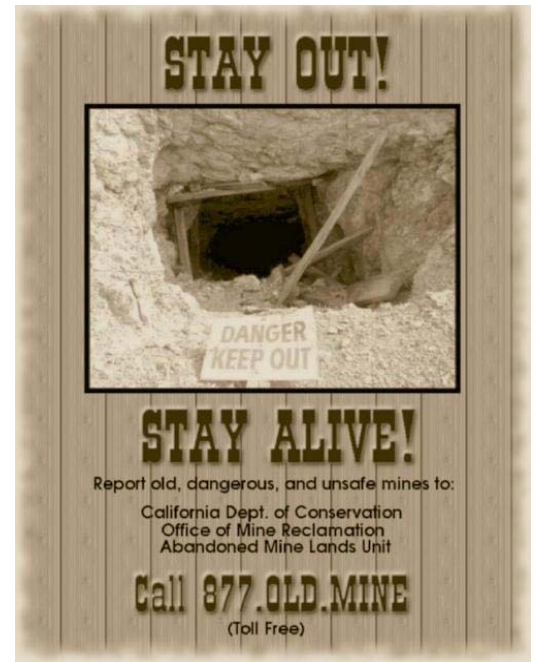
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Our Web site address is <http://www.conservation.ca.gov/omr>

The purpose of this publication is to impart the latest reclamation tips as well as changes in SMARA-related legislation or the interpretation of existing statutes by court decisions.

Director:	Bridgett Luther
Assistant Director for OMR:	Douglas W. Craig
Newsletter Editor:	Heather M. Smith



It's not too late to submit your photos for the Mine Reclamation Photo Contest



BEFORE



AFTER

Do you have some great before-and-after mine reclamation photos? If you do, please submit them for our **Mine Reclamation Photo Contest**. The purpose of this contest is to recognize outstanding photographic imagery of mine reclamation projects in California. The contest will also help OMR develop a library of such images for presentations and publications.

Entries must be submitted by **September 30, 2007**.

For the photo contest rules, please visit our Web site <http://www.consrv.ca.gov/omr/PhotoContestRules.pdf>

The two photos on the left show mine restoration in New Jersey. These photos are used with the permission of the Society for Ecological Restoration's Restoration Showcase.

OMR - Ensuring mined lands are returned to a beneficial end use after mining.