Partnership Project Success Story

State:	**Colorado**	**FS Funds Used:**	**$80,733**
National Forest/Grassland:	**Arapaho and Roosevelt National Forests and Pawnee National Grassland**	**Other Funds Used:**	**$**
		Partners:	**$64,000**
Project Name:	**Doctor Mine Reclamation and Wetland Restoration**	**Total Project Cost:**	**$144,733**

Project Purpose/Objectives: The Doctor mine is an abandoned mine on the Clear Creek Ranger District on the Arapaho National Forest. The mine site is adjacent to the west fork of Clear Creek where mine tailings and mine water have severely impacted a formerly productive willow and sedge riparian wetland complex. Soil and water contamination has killed wetland vegetation, and mine roads and tailings piles have interrupted natural hydrologic flow through the wetland complex and into the creek. Lack of vegetation allowed for stream bank erosion, altering stream morphology. The project's primary objectives were to reduce metals loading to the West Fork of Clear Creek and to restore the wetland complex. Principal project components follow: consolidate and cap mine-waste material; restore the hydrologic flow into the wetland; restore the impacted wetland; reconstruct the stream channel and bank; and re-vegetate reclaimed mine waste and mine roads.

The Phelps-Dodge Corporation, through the Clear Creek Watershed Foundation, provided funding and logistical support. The U.S. Fish and Wildlife Service provided on-site technical help with stream reconstruction and wetland restoration, and the U.S. Environmental Protection Agency provided technical project planning support.

Work Performed: The group performed the following activities:

- Remove mine waste from the wetland and along the stream bank.
- Consolidate mine waste in a central location, contour it to improve drainage, and top it with a clean soil cap.
- Amend the soil cap with organic materials to stimulate plant growth and seed with native plants.
- Install storm water control features to protect the cap and minimize water infiltration.
- Divert mine water away from the waste pile and direct it into a lined ditch to reduce metal loading.
- Remove a mine road to allow the natural hydrologic flow into the lower wetland and willow complex.
- Re-plant the lower wetland with native sedges.
- Re-establish a series of pools and riffles in the stream.
- Construct a new bank of rock, willow material, and fiber matting.

Benefits: Restoration of five acres of wetland and 1/8 mile of stream benefits multiple wildlife species, aquatic life, and plant communities. Specifically, the willow riparian habitat provides nesting and feeding areas for migratory birds and a winter concentration area for white-tailed ptarmigan. An additional 1.75 miles of stream below the project area benefited from a reduction in metal loading and sedimentation, improving aquatic habitat. With improved water quality, this

stream section has been identified as a potential reintroduction site for the federally threatened greenback cutthroat trout.

Additional Information

Partners: The Phelps-Dodge Corporation through the Clear Creek Watershed Foundation, the U.S. Fish and Wildlife Service, and the U.S. Environmental Protection Agency

1. Doctor Mine Site prior to reclamation.
2. Consolidation of mine waste.
3. Cap material is placed on consolidated waste.
4. Cap material graded and soil amendments applied.

5. Construction of lined water diversion ditch.

6. Lined diversion ditch in foreground and waste pile with Cap, soil amendments, seed, and straw mulch cover.
7. Mine road in foreground has had waste removed.
8. Mine road graded to original wetland elevation. Sedge clumps have been replanted and water. Is now flowing from upper to lower wetland.
9. Stream bank has eroded resulting in overwide channel. Mine waste deposited along stream in wetland complex.
10. Stream morphology restored and stream bank Reconstructed using a vegetated geogrid. Waste removed from wetland and topsoil being graded.
11. Construction of vegetated geogrid.
12. Willow clumps being placed into geogrid.
13. Sedge plugs have been planted in lower wetland and water flow pattern reestablished.
14. Waste was removed from mill area and sedge plugs planted.
15. Reclaimed waste-pile and a portion of restored wetland.