

Executive Summary

In the 1980s, Lake County and the City of Leadville, Colorado, faced the shutdown of their largest employer, high unemployment, and the cleanup of mining, milling and smelting wastes spanning more than 18 square miles. Today, Lake County has bounced back, with a vibrant, increasingly diversified economy focused on the area's rich heritage and remarkable natural resources. Outdoor recreation and tourism are attracting visitors from across the country. Collaboration among EPA, other federal agencies, the Colorado Department of Public Health and the Environment (CDPHE), and potentially responsible parties (PRPs) made possible a cleanup that has protected human health and the environment. Because the cleanup plan was compatible with the community's goal to diversify the economy, tourism and recreational amenities have expanded. This case study explores the economic revitalization resulting from the cleanup, continued use and redevelopment of the California Gulch Superfund site. It focuses specifically on outdoor recreation tourism associated with the cleanup of the Arkansas River.

Beneficial Effects

- In 2012, over 100,000 anglers visited the area's recently designated Gold Medal Trout Waters, generating \$18.2 million in net annual economic benefits.
- Two fishing businesses in Leadville employ nine people, generating \$460,000 in annual sales and over \$240,000 in annual employment income for the local community.
- Site cleanup has been one of many important factors contributing to tourism and recreation growth in the area. In Lake County, overnight travel spending generated \$30.5 million in revenue, \$800,000 in local taxes, 360 jobs and \$8.8 million in wages in 2012.
- A series of endurance trail and bike races called the Leadville Race Series, generated \$15 million in local spending in 2012, drawing thousands of visitors to Leadville and Lake County.
- Remedial activities and redevelopment have bolstered efforts to diversify the area's economy and create a strong foundation for the future.



Figure 1. The site's location in Leadville, Lake County, Colorado.
 Sources: Esri, DeLorme, AND, Tele Atlas, First American, UNEP-WCMC, USGS.

Introduction

Superfund site cleanup and reuse results in restored value to site properties and surrounding communities. Once a site property is ready for reuse, it can revitalize a local economy with jobs, new businesses, tax revenues and local spending, as well as provide valuable wildlife habitat and recreational amenities. The California Gulch Superfund site covers 18 square miles in Lake County, Colorado. It included the City of Leadville, a portion of the site that was deleted from the National Priorities List in 2011, and includes an 11-mile stretch of the Upper Arkansas River, where cleanup work finished in 2013. This case study explores parts of this large-scale cleanup and redevelopment – the remediation and recovery of the river ecosystem, outdoor recreational reuse in the area, and revitalization of residential areas.

Site History

Leadville's rich mining history dates back to the 1859 discovery of gold at the mouth of California Gulch by prospectors working the tributaries of the Upper Arkansas River. The area's mining, mineral processing and smelting operations grew quickly. They yielded an estimated 26 million tons of gold, silver, lead, copper, molybdenum and zinc ore over 140 years. At its peak during the silver rush of the late 1800s, Leadville was the largest city between St. Louis and San Francisco, supporting dance halls, hotels, boarding houses and stores.

However, mining-based economies are subject to the boom-and-bust cycles of commodities markets. A crash in the silver market in 1893 decimated the local economy, closing mines and destroying fortunes. Leadville held on, transitioning to the mining of other ores using new extraction techniques. While the focus of mining activities has shifted over time with the values of metals, the fortunes of Leadville gradually declined. In 1987, the area's last mine, the Climax molybdenum mine, closed; the mine reopened in 2012 and currently employs 330 people.¹ Home to 30,000 people before the silver crash, Leadville now has 2,600 residents.²



Figure 2. Matchless Mine, Leadville, Colorado. [Matchless Mine](#) by Jeffrey Beall/CC BY 3.0



Figure 3. Leadville, circa 1901.

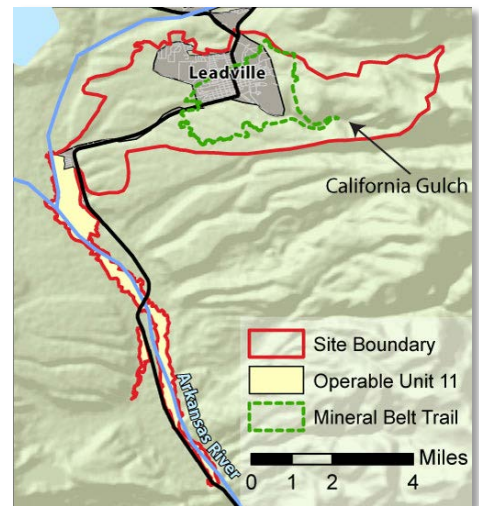
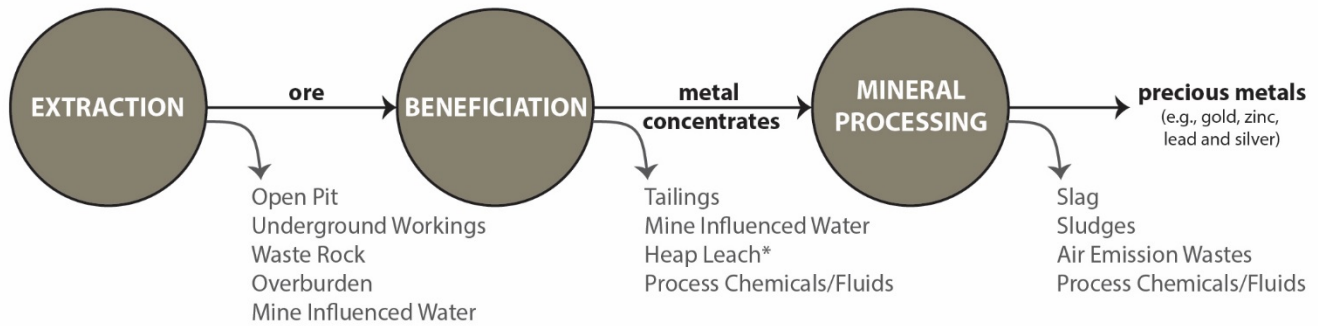


Figure 4. Site map.

Sources: Esri, DeLorme, AND, Tele Atlas, First American, UNEP-WCMC, USGS.

¹ Data from 2012 newspaper article: Leadville's historic Climax mine restarts molybdenum production. Steve Raabe. The Denver Post. May 11, 2012. Available at http://www.denverpost.com/ci_20598027/leadvilles-historic-climax-mine-restarts-molybdenum-production.

² From the 2008-2012 American Community Survey 5-Year Estimate.



**Heap leaching is a mining process to extract precious metals, copper, uranium, and other compounds from crushed ore by spraying a leach solution to dissolve metals for economic recovery. The crushed ore is generally placed on a liner or a layer of compacted clay and is sprayed with chemicals to extract out the valuable metals for recovery.*

Figure 5. The mining, milling and smelting process that transforms ores into precious metals creates many types of wastes, which contaminated land and waters in and around Leadville.

Over 140 years of mining, milling and smelting operations took a toll on the area’s environment. Mining operations created over 2,000 waste piles of waste rock, tailings and slag (Figure 5). These wastes and associated acid rock drainage and flue emissions contaminated area soils, surface water, ground water and sediments throughout Leadville and the surrounding area with contaminants such as arsenic and lead. High blood lead levels in area children were of particular concern.

Mine wastes flowed into the Upper Arkansas River, contaminating the streambed, riparian areas and sediment with high levels of heavy metals and low-pH water. This contamination reduced biological diversity and stressed the ecosystem, resulting in diminished trout populations.

EPA placed the site on the Superfund program’s National Priorities List (NPL) in 1983 in response to concerns about threats to human health and the environment posed by heavy metals contamination and mine drainage to California Gulch and the Upper Arkansas River.

Assessing Environmental Damages

In 1999, the Department of the Interior (DOI), the Department of Justice (DOJ), the State of Colorado, two primary PRPs and EPA signed a Memorandum of Understanding (MOU) to restore the Upper Arkansas River Basin. This process involved calculating the value of damages to natural resources in the area, developing restoration alternatives, negotiating a financial settlement and using settlement proceeds to restore the same types of resources as the ones injured.

The 2006 preliminary estimate of damages for the site valued total damages to aquatic and terrestrial environments at between \$53 million and \$68 million.³ In 2008, the parties reached a \$20.5 million natural resource damages settlement, the second largest such settlement in Colorado history.



Figure 6. Leadville, circa 1909.

³ The estimate is not inclusive of all damages associated with the site. It did not include values such as recreational use of the river, damage to California Gulch tributaries, damage to land resources from smelting, or damages to wildlife and birds. For more information, visit <http://www.fws.gov/mountain-prairie/nrda/LeadvilleColo/CaliforniaGulch.htm>.

Site Cleanup and Transformation

Cleanup of the California Gulch Superfund site has been an extensive project involving many technologies and approaches. Efforts included removal of lead-contaminated soil from residential yards, institutional controls, surface water and ground water treatment, drainage controls to prevent acid rock runoff, consolidation and capping of mining wastes, soil amendments, stabilization of fluvial deposits along stream banks, and reuse of slag. To manage the large and complex cleanup, EPA divided the site into 12 operable units (OUs).

Arkansas River Remediation (part of OUs 1, 11 and 12)

The recovery of the trout population in the Upper Arkansas River illustrates the success of the California Gulch site's cleanup. In the early 1990s, heavy metal pollution and low-pH, mining-influenced waters heavily impacted the river. Some areas were not capable of supporting any trout at all. The trout that did survive were small and did not live long. Today, the trout population is thriving. The Upper Arkansas River is one of the most popular trout-fishing destinations in Colorado.

Recovery of the fish population required three important steps: water quality improvements to improve fish survival rates, stream flow management at critical growth and reproduction times to improve fish size, and habitat restoration. To improve water quality, one of the PRPs, Resurrection Mining, built the Yak Water Treatment Plant in 1992. The system captures and treats mining-influenced waters contamination from Yak Tunnel, one of the two major drainages from the mining area. Also releasing water to the Arkansas River, the Leadville Mine Drainage Tunnel (LMDT) Treatment Plant began treating mine-influenced water from the underground mine working on the southeast side of Leadville in 1991. Both the Yak Tunnel and LMTD capture and treatment systems significantly reduced the metal loadings and low-pH water discharges. Water quality in the Upper Arkansas River improved substantially.

Cleanup of the 11-mile reach of the Upper Arkansas River included soil amendments and seeding of surrounding meadows, treatment and reestablishment of vegetation on tailings deposits, stabilization of fluvial deposits along stream banks, and institutional controls. The goals were to minimize heavy metals exposure, control leaching and migration of metals into ground water, improve plant life, and

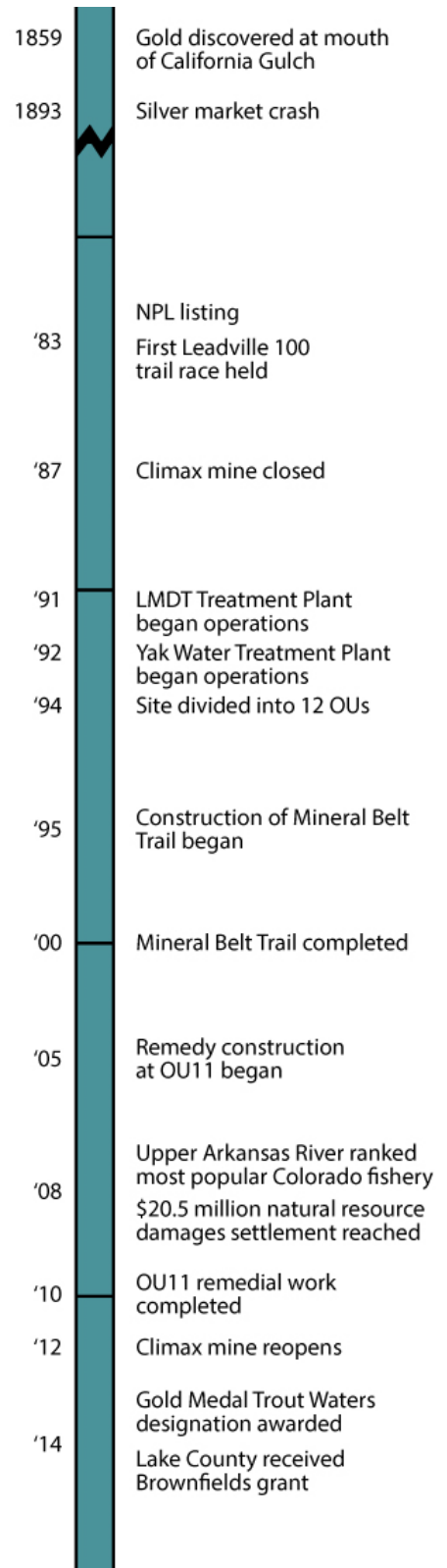


Figure 7. Timeline of activities at the California Gulch Superfund site.

minimize erosion. EPA completed remedial construction work in 2013 and continues to monitor and maintain the re-vegetated areas and stream banks.

Operation of the Yak Water Treatment Plant and LMDT Treatment Plant, sitewide cleanup efforts, and the remediation and restoration of areas along the Upper Arkansas River dramatically improved water quality and trout survival rates. Next up was a collaborative effort by local stakeholders including Colorado Parks and Wildlife. This led to a voluntary agreement to manage river flows in a way that provides good conditions for fish reproduction and growth. Today, work along the 11-mile reach focuses on habitat restoration.

Residential Area Remediation (OU9)

Through Lake County's Community Health Program (LCCHP), EPA, CDPHE, the Lake County Commissioners and PRP ASARCO Mining worked with the community to address soil contamination in residential areas. Affected areas included residential yards, vacant lots, parks, schoolyards, playgrounds and community areas. The program sought to reduce overall lead-related risk for children and pregnant and nursing women in Leadville, incorporating an extensive institutional controls program, which includes education and blood lead monitoring, investigation and remediation where needed. EPA and ASARCO remediated hundreds of residential properties, taking the City of Leadville and surrounding residential areas off the NPL in 2011. LCCHP allows for future residential cleanups when a child has a high blood lead level, as determined by the LCCHP Workgroup.

Leadville Today

Leadville rebounded slowly from the closure of Climax mine and resulting high unemployment in the late 1980s. Community leaders and residents in Leadville and Lake County have worked hard over the past several decades to diversify the area's economy and build a strong, resilient foundation for the future. Plans focus on supporting small businesses as well as mining activities, attracting residents and new jobs with educational resources and amenities, revitalizing the area's historic downtown, and diversifying the area's economy through increased tourism.⁴ Remedial

Facilitating Reuse in Leadville

Throughout cleanup, EPA has worked with stakeholders to facilitate safe continued use and reuse at the site. Beginning in the early 1990s, EPA, site PRPs, community residents, local officials, and other state and federal agencies worked together to explore options for reuse at the site. The results of this effort include a \$1.5 million public sports complex built on a former zinc smelter, a 21,000-square-foot skate park, increased access to open space near the Arkansas River, and 2,300 acres of rangeland purchased by state and local governments for wildlife habitat and recreational space. The crowning jewel of these achievements is the 12.5-mile Mineral Belt Trail, which traverses former contaminated mining areas and offers up-close views of historical mining artifacts for walkers, runners, bikers and cross-country skiers.

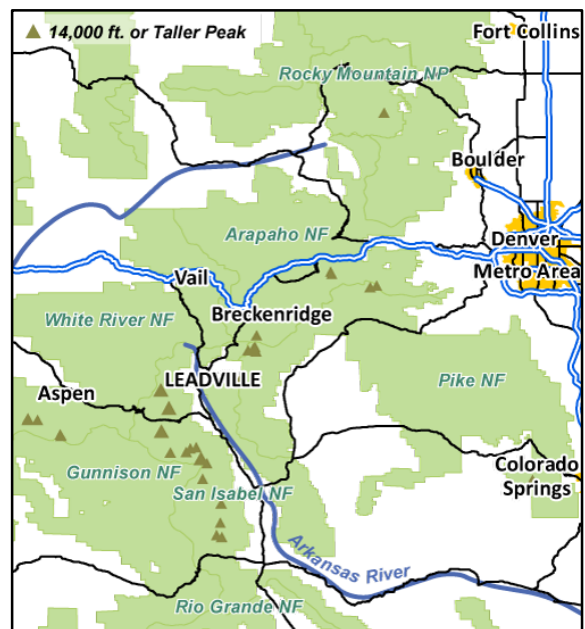


Figure 8. Recreation areas around Leadville. Sources: Esri, DeLorme, AND, Tele Atlas, First American, UNEP-WCMC, USGS.

⁴ Lake County 2010 Comprehensive Economic Development Strategy. Prepared by Southern Colorado Economic Development District. Available at http://www.uaacog.com/images/Lake_County_2010_CEDS.pdf.

activities and redevelopment have bolstered these efforts, creating unique outdoor recreation resources in place of contaminated waste piles and impaired waterways.

Leadville is well situated with major urban areas and other recreation destinations located nearby. The community is just two hours from the Denver metropolitan area, which is home to 51 percent of Colorado's population.⁵ The area is home to many 14,000-foot mountain peaks – or “Fourteeners” – that are a strong draw for hikers and climbers; an estimated 100,000 people visit these peaks each year. These climbers place a high economic value on their access to the peaks.⁶ Vail, Breckenridge, Keystone, Ski Cooper and Copper Mountain ski resorts are about an hour or less away. Finally, Leadville is surrounded by extensive public lands, including the White River and Pike-San Isabel National Forests, which together attract more than 13 million visitors annually.⁷ Leadville has sought to capitalize on its location, unique climate and elevation, and rugged terrain, marketing itself as a destination for outdoor recreation and heritage tourism.

Recreation Opportunities

Outdoor recreation is a promising way to support economic growth in the area. In 2012, outdoor recreation in the United States contributed \$646 billion to the national economy. Spending on outdoor recreation increased 5 percent annually between 2005 and 2011, a time when spending in many sectors declined. This spending includes not just the purchase of gear, but trips and travel-related spending as well, generating revenue in finance and insurance, professional services, warehousing, manufacturing and other areas. Nationwide, outdoor recreation supports 6.1 million jobs and recreation-related spending generates \$39.9 billion in national tax revenue and \$39.7 billion in state and local tax revenue.⁸



Figure 9. White River National Forest.
[White River](#) by Sascha Brück/[CC BY 3.0](#)



Figure 10. Mineral Belt Trail above Leadville.



Figure 11. Leadville, Colorado.

⁵ From the 2008-2012 American Community Survey 5-Year Estimate.

⁶ As of 2007. Willingness to pay for access to popular “Fourteeners” was calculated at around \$307, six times as much as other popular outdoor activities like rock climbing. Keske, Catherine M., and John B. Loomis. "High economic values from high peaks of the West." Western Economics Forum. Vol. 6. No. 1. 2007. Available at <http://www.waeonline.org/WEForum/WEF-Vol.6-No.1-Spring2007.pdf>.

⁷ White River data from 2007; Pike-San Isabel data from 2006. USDA Forest Service National Visitor Use Monitoring. Available at http://apps.fs.usda.gov/nrm/nvum/results/ReportCache/Rnd2_A02015_Master_Report.pdf and http://apps.fs.usda.gov/nrm/nvum/results/ReportCache/Rnd2_U0201201_Master_Report.pdf.

⁸ The Outdoor Recreation Economy. Outdoor Industry Association. Available at http://outdoorindustry.org/pdf/OIA_OutdoorRecEconomyReport2012.pdf.

In Colorado, outdoor recreation is the state's second largest industry, contributing \$34.5 billion to the economy and \$4.9 billion in federal, state and local taxes.⁹ The field supports 313,000 jobs, 13.2 percent of Colorado's labor force, generating \$12.4 billion in salaries and wages annually.¹⁰ In Lake County, overnight travel spending generated \$30.5 million in revenue, \$800,000 in local taxes, 360 jobs and \$8.8 million in wages in 2012.¹¹ These numbers do not reflect the additional revenue from day-trip visitors from nearby cities and towns.

Outdoor recreation tourism can help rural areas successfully diversify their economies. It requires less investment and infrastructure than manufacturing and other sectors, and is a good base for small, local firms.¹² In addition, outdoor recreation tourism can provide stability and consistency during challenging economic times: outdoor recreation spending and national park visitation have remained stable or increased during national recessions.¹³

The primary challenge posed by a reliance on outdoor recreation tourism revenue is the potential for business to be highly variable over the course of a year. This can lead to large swings in seasonal employment and heavy demands on public infrastructure such as roads and sewers during peak times. Emphasizing diverse recreation activities can even out this variability, attracting visitors at different times of the year. For example, trout fishing peaks during spring and fall, while endurance races and whitewater rafting peak during the summer. Such "shoulder season" business helps to smooth out the boom-and-bust tourism cycle.

Trout Fishing

Efforts to improve water quality, manage flows and improve habitat in the Arkansas River have paid off: in January 2014, Colorado Parks and Wildlife designated a 102 mile-long reach of the river downstream from Leadville as Gold Medal Trout Waters, one of the best trout fisheries in the state. To achieve Gold Medal status, water must support 60 pounds of trout and a



Figure 12. Ski Cooper facility north of Leadville.

Photo by Matthew Trump/[CC BY 3.0](https://creativecommons.org/licenses/by/3.0/)



Figure 13. Upper Arkansas River near Leadville.



Figure 14. Greenback Cutthroat Trout.

⁹ The Colorado state sales tax rate is 2.9 percent and the Lake County sales tax rate is 4 percent. More information available at <http://www.colorado.gov/cms/forms/dor-tax/dr1002.pdf> and <http://www.lakecountyco.com/clerkandrecorder/node/5>.

¹⁰ 2014 Colorado Statewide Comprehensive Outdoor Recreation Plan. Colorado Parks and Wildlife. Available at <http://cpw.state.co.us/Documents/Trails/SCORP/SCORPOnlineReport.pdf>.

¹¹ Colorado Travel Impacts 1996-2012. Dean Runyan Associates. Prepared for the Colorado Tourism Office. Available at http://www.deanrunyan.com/doc_library/COImp.pdf.

¹² Wilson, Suzanne, et al. "Factors for success in rural tourism development." *Journal of Travel Research* 40.2 (2001): 132-138.

¹³ Keske, Catherine MH. "High Mountain Ecosystems: How Much Love Can They Sustain?" *SCIYO.COM* (2010): 189. Available at <http://cdn.intechweb.org/pdfs/11851.pdf>. The Outdoor Recreation Economy. Outdoor Industry Association. Available at http://outdoorindustry.org/pdf/OIA_OutdoorRecEconomyReport2012.pdf.

minimum of 12 quality trout (larger than 14 inches) per acre.¹⁴ This designation increased the miles of Gold Medal waters in the state by 50 percent; only 322 of the state's 9,000 miles of streams are Gold Medal Trout Waters. Nationwide, 55 percent of river and stream miles do not support healthy populations of aquatic life.¹⁵

The economic benefits associated with these water quality improvements are impressive: Colorado Parks and Wildlife calculates that over 100,000 anglers fished the waters between Leadville and Parkdale in 2012, up from around 70,000 in 1995 and 2007. These anglers contributed an estimated \$7.6 million in total direct economic benefits and \$18.2 million in net economic benefits per year.¹⁶ In Hayden Meadows alone, an area once so heavily affected by heavy metals contamination that few trout survived and where trout recovery is entirely attributable to remediation efforts, fishing contributed \$1.9 million to the local economy in 2012.¹⁷ This is a promising area for future growth as well: 36 percent of Colorado residents and 14 percent of Americans participate in fishing each year.^{18,19} In 2011, fishing expenditures contributed \$41.8 billion to the national economy and \$649 million to the Colorado economy.²⁰

Trout habitat restoration work provides economic benefits beyond those associated with fishing. Restoration projects create between 10.4 and 39.7 jobs per \$1 million invested. This is a much higher jobs creation rate than other sectors, including the oil and gas sector (5.3 jobs per \$1 million invested).²¹ In addition, this type of job is local by nature and cannot be outsourced. A study found that, in Oregon, "an average of 90 percent of money

Fishing Business Highlights

Below are just two examples of businesses that benefit from improved water quality conditions on the Arkansas River. Many more businesses operate in Leadville and the surrounding community.

Alpine Ski & Sport

Open since 2006, *Alpine Ski & Sport*, a family owned and operated business, is located in downtown Leadville. The firm provides winter sports equipment rentals as well as guided fishing adventures during the summer. With three employees, the firm generates \$240,000 in revenue each year.



Figure 15. Fishing in the Upper Arkansas River.

Halfmoon Packing & Outfitting, LLC

In addition to leading guided fishing expeditions, *Halfmoon Packing & Outfitting* offers stagecoach rides, hunting and camping trips, extended backcountry trips, and training clinics. The firm has six employees and reports \$220,000 in annual sales.

¹⁴ Press Release: Colorado doubles Gold Medal stream miles. Colorado Parks and Wildlife. January 10, 2014. Available at <http://dnr.state.co.us/newsapp/press.asp?pressid=8716>.

¹⁵ The National Rivers and Streams Assessment 2008-2009: A Collaborative Survey. EPA. Available at http://water.epa.gov/type/rsl/monitoring/riverssurvey/upload/NRSA200809_FactSheet_Report_508Compliant_130314.pdf.

¹⁶ Greg Policky, Aquatic Biologist, Colorado Parks and Wildlife. June 2014 interview.

¹⁷ Ibid.

¹⁸ 2014 Colorado Statewide Comprehensive Outdoor Recreation Plan. Colorado Parks and Wildlife. Available at <http://cpw.state.co.us/Documents/Trails/SCORP/SCORPOnlineReport.pdf>.

¹⁹ In 2011. 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. U.S. Fish & Wildlife Service. <https://www.census.gov/prod/2012pubs/fhw11-nat.pdf>.

²⁰ 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. U.S. Fish & Wildlife Service. <https://www.census.gov/prod/2012pubs/fhw11-nat.pdf>.

²¹ BenDor, Todd K., T. William Lester, Avery Livengood, Adam Davis, and Logan Yonavjak. 2014. Exploring and Understanding the Restoration Economy. Final report to Walton Family Fund. Also UNC Center for Urban and Regional Studies white paper. Available at <https://curs.unc.edu/files/2014/01/RestorationEconomy.pdf>.

invested in restoration stays in the state, and 80 percent stays in the county where a project is located.”²²

Endurance Racing

Anglers are not the only group benefiting from a remarkable resource in the Leadville area. The community’s 10,000-foot elevation has also attracted endurance athletes seeking to test their limits. Remediation of the California Gulch site’s mining areas surrounding Leadville and the subsequent development of the Mineral Belt Trail, built through a collaborative community effort along a retired mining railroad grade, have created great venues for running, biking and Nordic skiing. Leadville experienced a 19 percent increase in sales tax revenue in the months following the Mineral Belt Trail’s 2000 opening.²³ Today, Leadville hosts endurance events throughout the year, from the summer’s three-month Leadville Race Series to the winter’s Leadville Loppet, a 10K, 22K and 44K Nordic ski race. This niche market holds promise: demand for adventure racing in the United States increased by 35 percent between 2009 and 2012.²⁴



Figure 16. The Mineral Belt Trail.

Started as a single 100-mile trail run in 1983 with 45 runners, the initial goal of the Leadville Race Series was to bring visitors and revenue to Lake County at a time when mining was in steep decline.^{26,27} That single race has grown into a three-

Leadville’s Enduring Tradition

The Leadville area’s 10,000-foot elevation and rugged terrain have long been a draw for endurance athletes and mountaineers. During World War II, the U.S. Army’s 10th Mountain Division trained in skiing, mountain climbing and winter warfare at Camp Hale, located just outside of Leadville. Recruited by the American Ski Patroller’s Association, the 8,000-man division was made up of skiers, forest rangers and outdoorsmen. The division went on to win victories against Hitler’s forces high in the Italian Alps, playing an important role in liberating northern Italy.²⁵



Figure 17. Cape Hale field house ruins.
[Camp Hale Ruins](#) by Matthew Trump/CC BY 3.0

“Leadville’s starting line is twice as high as the altitude where planes pressurize their cabins, and from there you only go up.”

Christopher McDougall

*Born to Run: A Hidden Tribe, Superathletes,
and the Greatest Race the World Has Never Seen*

²² Habitat Restoration Creates Jobs, Boosts Local Economies. National Oceanic and Atmospheric Administration. Available at <http://www.habitat.noaa.gov/highlights/orrestorationjobs.html>.

²³ Tweetsie Trail Economic Impact Study. Available at [http://www.floridagreenlodging.org/gwt/community/PDF/Tweetsie%20Trail %20EconomicImpactStudy.pdf](http://www.floridagreenlodging.org/gwt/community/PDF/Tweetsie%20Trail%20EconomicImpactStudy.pdf).

²⁴ 2014 Colorado Statewide Comprehensive Outdoor Recreation Plan. Colorado Parks and Wildlife. Available at <http://cpw.state.co.us/Documents/Trails/SCORP/SCORPOnlineReport.pdf>.

²⁵ Pennington, Bill. “The Legacy of Soldiers on Skis.” The New York Times, 10 March 2006. Available at <http://www.nytimes.com/2006/03/10/travel/escapes/10ski.html>.

²⁶ Leadville Race Series website. Available at <http://www.leadvilleraceseries.com/>.

²⁷ Nicole Thompson, Executive Director, Lake County Economic Development Corporation. June 2014 interview.

month series of trail and bike races and training camps. The highlight of the series remains the Leadville 100, also known as the “Race Across the Sky,” which is held in mid-August and ranges from elevations of 9,200 to 12,600 feet. The series’ marathon and 50-mile race pass through the biggest parts of the California Gulch site. In 2012, racers spent an average of \$1,795 over their average 6.77-day stay in Lake County, bringing 3.65 people with them, for a total of \$7.9 million in visitor spending. Economic benefits of that increased revenue include \$1.6 million in spending by local businesses and \$5.7 million in spending by their employees at other nearby businesses.²⁸



Figure 18. Skijoring competition in Leadville.

Supporting Recreation through Federal Grants

EPA grants have supported several redevelopment projects in Lake County. Planning and fundraising for the development of the Lake County Community Park and Sports Complex on an old smelter site in OU5 began in 2005. A \$10,000 grant secured by the Lake County Recreation Advisory Board with support from EPA’s Return to Use Initiative funded the development of the park’s conceptual plans. Completed in 2009, the facility features the highest elevation lighted, synthetic turf field in the world, and is enjoyed by local high school and middle school students as well as a variety of outdoor sports leagues. In addition to the soccer field, park amenities include a playground, a rodeo arena, an aquatic center, restrooms and additional parking. Other grants have funded Mineral Belt Trail development, historic preservation planning, historic mining district interpretation, Hayden Meadows Reservoir development and the redevelopment of properties in OU 3.



Figure 19. Lake County Community Park and Sports Complex.

Other Recreation Opportunities

Leadville and Lake County also offer a host of other recreation opportunities, including rafting, skiing, golf and snowshoeing. Downstream, the Arkansas River offers some of the best whitewater rafting in the state and is one of the most rafted rivers in the country, generating more than twice the economic output per acre-foot than other rivers in the state.²⁹ Mount Massive Golf Course offers the highest elevation golfing in the country, and Lake County’s Comprehensive Economic Development Plan highlights it as an expansion opportunity.³⁰ The historic Ski Cooper facility, acquired by Lake County in the 1980s, incorporates slopes where the U.S. Army’s 10th Mountain Division troops trained in preparation for World War II. Each winter, Leadville draws participants from around the country to its skijoring competition, in which horses and riders pull skiers down a snow-packed road over jumps while spearing rings.³¹ Leadville is even host to one of three races that make up the

²⁸ Lake County sees \$15 million in economic activity from Leadville Race Series. Jason Blevins. Available at <http://blogs.denverpost.com/thebalancesheet/2013/04/11/lake-county-sees-15-million-in-economic-activity-from-leadville-race-series/9197>.

²⁹ Upper Arkansas River Watershed Restoration Plan and Environmental Assessment. Available at <http://www.fws.gov/mountain-prairie/nrda/LeadvilleColo/FinalRPEAChapter4.pdf>.

³⁰ Lake County 2010 Comprehensive Economic Development Strategy. Prepared by Southern Colorado Economic Development District. http://www.uaacog.com/images/Lake_County_2010_CEDS.pdf.

³¹ http://www.visitleadvilleco.com/ski_joring.

International Pack-Burro Race Triple Crown, a local tradition that dates back to the 19th century. The Colorado legislature designated the event a Colorado summer heritage sport in 2012.³²

Revitalization of Leadville’s Residential Areas

The 1980s were a challenging time in the Leadville housing market; several major events negatively affected the area’s property values. Contamination was widespread, with lead-contaminated soil on hundreds of private properties. The Climax mine closed, putting many people out of work. According to local real estate agent Amy Morrison, mortgages were nearly impossible to get; banks saw the lending risk in the area as too high. As a result, it was not uncommon to see a house sold for as little as \$10,000 in cash. Now that cleanup is complete, the picture is much different. Buyers are interested in local real estate, looking at homes to live in as well as for vacation homes and investment properties. Homes that sold for tens of thousands of dollars in the late 1980s sell for hundreds of thousands of dollars today.



Figure 20. Leadville home.

Conclusion

The success of Leadville’s ongoing transformation illustrates the power of collaborative efforts among federal, state and local governments and other stakeholders. Site cleanup has been one of many important factors contributing to the growth of tourism and recreation in the area. Through the efforts of local governments and community members working with EPA, state and federal agencies, and site PRPs, once-toxic waters now support a thriving, award-winning trout population that draws anglers from around the state and country. Endurance athletes train and compete on foot, bike and ski year round, bringing first-time visitors, revenues, tax dollars and jobs with them. Today, redevelopment work in Leadville continues. In 2012, the Lake County Economic Development Corporation (LCEDC) formed to integrate the efforts of the City of Leadville and Lake County, the local chamber of commerce, Colorado Mountain College Leadville, the Climax mine, and other local businesses in planning for the area’s future. In May 2014, Lake County received a \$400,000 EPA Brownfields grant for site assessments in Lake County, redevelopment along County Road 36, development of a brownfields inventory and community outreach. These collaborative efforts and the cleanup, outdoor recreational reuse and revitalization of residential areas at the California Gulch Superfund site have helped start a new chapter in Leadville’s rich history.

*For more information about EPA’s Superfund Redevelopment Initiative (SRI), visit:
<http://www.epa.gov/superfund/programs/recycle>.*

³² <http://www.packburroring.com>.



www.epa.gov

Recreation and Tourism Reuse and the Benefit to Community

California Gulch Superfund Site

Technical Appendix

Cleanup of the California Gulch Superfund site occurred throughout the entire community of Leadville. However, EPA determined that studying the jobs and sales volume for all on-site businesses would not be appropriate for this economic case study, as much of the downtown business area was not directly affected. The approach for this case study was to focus on specific areas of source material remediation and at the current time, the source areas focused on at the site are not in commercial reuse. Instead, EPA studied Leadville-based fishing businesses, to illustrate economic benefits of water quality improvements in the Upper Arkansas River; EPA identified two such businesses.

Employment Information

EPA obtained information on the number of employees and sales volume for businesses of interest from the Hoovers/Dun & Bradstreet (D&B) database. EPA also gathered information on businesses and corporations from D&B. D&B maintains a database of over 179 million companies globally and over 53 million professional contact names using a variety of sources, including public records, trade references, telecommunication providers, newspapers and publications, and telephone interviews. The Data Universal Numbering System (DUNS) number is a unique nine-digit identification number assigned by D&B to each business and its location within the D&B database for identifying each business.

Wage and Income Information

EPA obtained wage and income information from the U.S. Bureau of Labor Statistics (BLS). The BLS is a governmental statistical agency that collects, processes, analyzes and disseminates essential statistical data to the American public, the U.S. Congress, and other federal agencies in the broad field of labor economics and statistics. The data EPA obtained from the BLS has high standards of accuracy and consistently high statistical quality, and impartiality in both subject matter and presentation.

EPA used the BLS Quarterly Census of Employment and Wages database to obtain average weekly wage data for selected businesses located at the California Gulch Superfund site. Average weekly wage data were identified by matching the North American Industry Classification System (NAICS) codes corresponding with each type of business with weekly wage data for corresponding businesses in Lake County. If not available at the county level, wage data were sought by state or national level, respectively. In cases where wage data were not available for the six-digit NAICS code, higher level (less detailed) NAICS codes were used to obtain the wage data.

To determine the annual wages (mean annual) earned from jobs generated by each of the selected businesses located at the California Gulch Superfund site, the average weekly wage figure was multiplied by the number of weeks in a year (52) and by the number of jobs (employees) for each of the businesses.

For more information on reuse at Superfund sites, please visit: <http://www.epa.gov/superfund/programs/recycle>.

Table 1. California Gulch Superfund Site Studied Businesses: NAICS Code and Title, Average Weekly Wage, Employees, Annual Wages, Total Annual Wage per Employee and Annual Sales

Business	NAICS Code ^a	NAICS Title	Number of Employees ^b	Average Weekly Wage (2012) ^c	Annual Wage (Mean Annual) per Employee	Total Annual Wages ^d	Annual Sales (2012) ^b
Alpine Ski & Sport LLC	451110	Sporting Goods Stores	3	\$424	\$22,048	\$66,144	\$240,000
Halfmoon Packing and Outfitting, LLC	114210	Hunting and Trapping	6	\$568	\$29,536	\$177,216	\$220,000
Total			9			\$243,360	\$460,000

^a NAICS code obtained from the D&B database.

^b Data are from the D&B database.

^c Average weekly wage per employee is based upon BLS 2012 Average Weekly Wage data.

^d Total annual wage figures were derived by multiplying "Number of Employees" by "Annual Wage (Mean Annual) per Employee."