



Economic Impacts of Restoration in National Parks

Natural Resource Report NPS/NRSS/EQD/NRR—2019/1860



ON THE COVER

Meadow restoration in Rocky Mountain National Park

Photo credit: National Park Service

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Abstract

The National Park Service's (NPS) Resource Protection Branch (RPB) works with parks under the authority of the System Unit Resource Protection Act (SURPA) and the Oil Pollution Act, among others, to conduct damage assessment and restoration activities for NPS resources that have been injured. Funds used for restoration support jobs in local economies across the Nation. This report demonstrates the economic impacts associated with RPB-administered restoration projects through an analysis of small-scale (< \$1,000,000 spent per project) and large-scale (> \$1,000,000 spent per project) projects. Using a national-level economic input-output model, direct and secondary job-years, labor income, value added, and total economic output were estimated for a sample of restoration projects; impacts from these sampled projects were used to estimate average economic-impacts-per-million-dollars-spent on RPB restoration. In 2017 RPB administered 49 small-scale projects; expenditures for these projects ranged in cost from \$200 to \$800,000 and totaled \$1,686,000 (\$923,000 in cultural resource projects, \$618,000 in natural resource projects, and \$145,000 in facilities projects). Based on the economic-impacts-per million estimates, small-scale RPB projects were found to support an estimated total of 29 job-years, \$1,963,000 in labor income, \$2,690,000 in value added, and \$4,458,000 in total economic output within the national economy in 2017. Economic impacts were also calculated for two large-scale projects: one a \$3,900,000 (2017\$) hillside stabilization project and the other a \$5,574,000 (2017\$) ferries (two) fabrication project.

Introduction

National Park Service lands, waters, and facilities receive and support millions of visitors each year. In addition to normal wear and tear, parks sometimes experience incidents that injure park resources. Parks are also often located near urban, commercial, and industrial areas, which can also lead to resource injuries. Examples include motor vehicle accidents, fires, vandalism, looting, off-road-vehicle damage, boundary encroachments, boat groundings, and oil spills. Restoration projects return injured landscapes and habitat, lost or damaged cultural resources, and lost or diminished visitor use and experience back to their “baseline” or “pre-injury” condition. The NPS Resource Protection Branch works with parks to restore injured resources. Funds used for restoration support jobs in local economies across the Nation. This report demonstrates the economic impacts associated with RPB restoration projects.

Overview of Economic Impact Analyses

Economic impact analyses measure the jobs and economic activity generated through new expenditures in an economy, including the ripple effects resulting from businesses and consumers purchasing goods and services from one another. Economic input-output models capture the interactions between producers and consumers in an economy and describe the secondary impacts of project spending using regional economic multipliers. This study uses multipliers derived from the IMPLAN¹ input-output model, 2016 national economy data. The impacts described in this report reflect the direct effects of expenditures on restoration activities and the ripple effects throughout the national economy. All dollar values are reported in 2017 dollars.

Types of Economic Impacts Measured

- **Jobs and job-years** measure the total number of annualized full and part-time jobs accumulated over the duration of a restoration project.
- **Labor income** measures the wages and salaries earned through the jobs that are supported by project expenditures. Labor income includes employee wages and payroll benefits, as well as the incomes of sole proprietors.
- **Value added** is an equivalent measure to gross domestic product (GDP), which measures the value of the goods and services produced by the U.S. economy each year, and is thus the most appropriate measure to explain how restoration projects contribute to GDP. Value added is equal to the value of the production of goods and services (gross output) minus the cost of intermediate inputs (goods and services purchased from other industries).
- **Economic output** measures the total value of the production of goods and services supported by project expenditures and is equal to the sum of all intermediate sales (business to business sales) and final demand (sales to consumers).

¹ Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Methods

To estimate the economic impacts of restoration projects administered by RPB, projects were divided into two sets based on project scope and cost. The first set represents the majority of projects undertaken by the branch: small-scale projects (projects that cost less than \$1,000,000) that are typically funded through SURPA. SURPA allows NPS to collect damages from parties who have injured park resources and to retain these funds so that the injuries can be restored. The second set of projects occurs less frequently: large-scale projects (projects that cost more than \$1,000,000) that are sometimes funded through SURPA but more often through other authorities such as OPA and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Small-Scale Projects

To demonstrate the economic impacts of common small-scale RBP projects, average economic-impacts-per-million-dollars of restoration spending were estimated using a sample of 12 small-scale projects. Sampled projects were selected from the set of small-scale projects that occurred between 2013 and 2017. Projects were divided into natural resource, cultural resource, and facilities projects. Selected projects included four natural resource, three cultural resource, and five facilities projects. The selected projects were chosen to represent typical SURPA projects, and although many SUPRA projects are unique, the restoration activities reflected in the 12 selected projects are generally representative of the scale and complexity of the small-scale restoration projects that RPB typically funds. Impacts were estimated for each of the 12 projects, summed across project types, and normalized to impacts-per-million-dollars of restoration spending.

Restoration activities reflected in the 12 selected small-scale projects

- planting vegetation
- thinning and mulching trees
- analyzing water quality
- stabilizing and re-attaching broken coral
- removing human-deposited litter and debris from marine benthic habitat
- re-constructing a historical stone archway
- cleaning and repairing a historical wooden ship
- conducting archaeological surveys
- replacing a building heating and cooling system
- repairing and replacing highway guardrails and gates
- purchasing and installing new road signs

Large-Scale Projects

To demonstrate the economic impacts associated with large-scale projects, impacts were estimated for two example projects: a slope stabilization project in Rocky Mountain National Park to repair injuries from a landslide (Large Project Example 1), and a project to build two new passenger ferries for use in Gulf Island National Seashore (Large Project Example 2). Primary expenditure data were collected to determine the mix of products and services required to accomplish each project.

Results

Average Economic-Impacts-per-Million for Small-Scale Projects

Based on the 12 sampled small-scale projects, average economic-impacts-per-million-dollars-in-restoration-spending were estimated for cultural resource, natural resource, and facilities restoration projects (Table 1). Average impacts-per-million values can be used to estimate impacts of spending for small-scale projects. The impacts-per-million estimates reflect ripple effects throughout the national economy and therefore do not represent impacts at smaller, local-economy levels.

Table 1. Estimated national economic-impacts-per-\$1,000,000-spent on typical SURPA projects (2017 dollars)

Restoration Project Type	Job-years	Labor Income	Value Added	Economic Output
Cultural Resource Projects	16.7	\$1,176,900	\$1,593,400	\$2,687,300
Natural Resource Projects	17.7	\$1,205,200	\$1,643,200	\$2,571,100
Facilities Projects	15.9	\$913,400	\$1,410,700	\$2,682,900
Average, All Projects	16.8	\$1,098,500	\$1,549,100	\$2,647,100

Economic Impacts of Expenditures on Small-Scale Projects in 2017

In 2017 RPB administered 49 small-scale SURPA projects (projects with budgets of less than \$1,000,000 each). Restoration expenditures for these projects totaled \$1,686,000 (\$923,000 in cultural resource projects, \$618,000 in natural resource projects, and \$145,000 in facilities projects). Individual projects ranged in cost from \$200 to \$800,000 with an average cost of \$34,000 per project. Based on average economic-impacts-per-million reported in Table 1, expenditures on small-scale RPB projects supported an estimated total of 29 job-years, \$1,963,000 in labor income, \$2,690,000 in value added, and \$4,458,000 in total economic output within the national economy in 2017.

Large Project Example 1. Hillside Stabilization – Rocky Mountain National Park

The Grand Ditch is a water diversion canal located in the northwest corner of Rocky Mountain National Park. Built by the Larimer County Ditch Company and opened in stages beginning in 1890, the canal carries water from the Never Summer Mountains east across the Continental Divide and into the Cache La Poudre River. Its right-of-way also includes a road used for maintenance and as a hiking trail. In March of 2003, the ditch breached, causing a major landslide that damaged 22 acres of parkland and 1.5 miles of stream, riparian, wetland, and upland habitat. Trees were killed and scarred, the Colorado River was heavily affected by excess sediment, wilderness areas were aesthetically damaged, and the slide area adjacent to the ditch was destabilized.

The United States sued the Ditch Company for damages and NPS is conducting a major restoration project using funds from a 2008 settlement with the Company. This first phase of the project was

completed in 2016 and stabilized the slope by constructing a retaining wall alongside the road and installing anchor wire mesh on the exposed slope below the original breach area (Figure 1). These actions will limit further erosion of the bank, helping to prevent another catastrophic landslide and keeping excess sediment out of the Colorado River below. Future restoration work downstream will involve replanting vegetation, removing debris, and restoring the Colorado River to its historic channel, allowing for the recovery of injured wetlands and restoring important habitat and wilderness aesthetics.



Figure 1. Workers stabilize a hillside in Rocky Mountain National Park below the Grand Ditch.

Economic Impacts

Expenditures for this project totaled \$3,900,000 (2017\$) with 89 percent of project expenditures spent within the state of Colorado. Expenditures included project design, construction of the retaining wall, installation of wire mesh anchors, and project management and contractor oversight by NPS staff. Within the national economy, project expenditures supported an estimated total of 64 job-years, \$3,972,000 in labor income, \$5,800,000 in value added, and \$10,289,000 in economic output. A large percentage of these impacts were local: within the Colorado state economy, project expenditures supported 45 job-years, \$2,693,000 in labor income, \$3,803,000 in value added, and \$6,419,000 in economic output.

Large Project Example 2. Restoring Visitor Access – Gulf Islands National Seashore

Gulf Islands National Seashore (“Seashore”) includes 135,000 acres of barrier islands and coastal lands along the Gulf of Mexico. The Seashore is home to miles of white sand beaches, campgrounds, hiking trails, wilderness areas, and waters for fishing and boating. Over 3.9 million visitors came to the park in 2017.

In April of 2010, the Deepwater Horizon disaster resulted in the largest oil spill ever in U.S. waters, releasing an estimated 210 million gallons of oil into the Gulf of Mexico. This spill caused extensive contamination of beaches, wetlands, and wildlife habitat throughout the Gulf Coast region, including the Seashore. Visitor access to the park was seriously curtailed: visitors were kept away from active cleanup areas, rangers discouraged swimming, and negative media reports dissuaded many from visiting the Seashore at all during that time.

To partially restore this lost visitor use, Deepwater Horizon restoration funds were used to purchase passenger ferries that would improve visitor access to Gulf Islands National Seashore. The project involved designing, fabricating, and delivering two ferry boats (Figure 2). The ferries were launched in June 2018 and offer ferry service between the City of Pensacola, Pensacola Beach, and the Fort Pickens area of the Seashore. Fort Pickens was previously only accessible by road from Pensacola Beach; the ferry service improves visitor access and provides a key alternative when the road is closed or damaged due to severe weather.



Figure 2. Workers assemble one of two ferries. The ferries will carry visitors between points in Pensacola Bay, Florida, including Gulf Islands National Seashore.

Economic Impacts

Expenditures for this project totaled \$5,574,000 (2017\$). Technical specifications and bid criteria for the ferries were developed by a contractor in 2015. The ferry boats themselves were fabricated by a U.S. shipbuilding firm over the course of 2015-2017. Within the national economy, project expenditures supported an estimated total of 79 job-years, \$5,359,000 in labor income, \$7,822,000 in value added, and \$16,217,000 in economic output.

Discussion

This report demonstrates the economic impacts associated with RPB restoration projects. The analysis is focused on the immediate economic impacts generated through expenditures on restoration activities. However, restoration can also result in longer-term economic impacts if the restored resources increase recreation, tourism, or other business activity. Restored resources can provide substantial economic values through improved resource and ecosystem services that both directly and indirectly impact human welfare.

Expenditures on RPB restoration activities vary from year to year, and so it follows that the economic impacts of these expenditures also vary annually. Between 2013 and 2017, total annual small-scale RPB project expenditures ranged from a low of \$180,000 (19 projects) in 2015 to a high of \$1,686,000 (49 projects) in 2017, with average annual expenditures over those five years of \$827,000 (33 projects). Large-scale projects are highly variable and are dependent on the occurrence of random events that cause large injuries, such as the Deepwater Horizon oil spill. Between 2013 and 2019, RPB will have initiated seven large-scale restoration projects in excess of \$1,000,000 funded by Deepwater Horizon spill settlement funds.

The economic impacts of restoration projects vary based on differences in restoration types, the diversity and size of the affected economic area, and the costs and availability of inputs and labor. Impacts-per-million estimates for small-scale RPB projects represent average impacts based on a small set of selected projects. These projects are generally representative of the scale and complexity of the restoration projects that RPB typically funds and, therefore, provide a sound basis for approximating the impacts of small-scale RPB projects. See Cullinane Thomas et al. (2016) for guidance on transferring economic impact estimates.

References

Cullinane Thomas, Catherine; Huber, Christopher; Skrabis, Kristin; and Sidon, Joshua, 2016, Estimating the economic impacts of ecosystem restoration—Methods and case studies: U.S. Geological Survey Open-File Report 2016–1016, 98 p., <http://dx.doi.org/10.3133/ofr20161016>.

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