

Return on Investment Study: Montana Conservation Corps

Submitted to:
AmeriCorps
250 E St., SW
Washington, DC 20024

Submitted by:
ICF Incorporated, LLC
1902 Reston Metro Plaza
Reston, VA 20190
<https://www.icf.com>

September 20, 2023

This report was commissioned by AmeriCorps' Office of Research and Evaluation under Contract # GS00Q14OADU209 and Order # 95332A20F0068. Information in this report is in the public domain. Please, direct communications related to this report to Lily Zandniapour at lzandniapour@cns.gov and Emily McDonald at emcdonald@cns.gov. Cite this report as follows: Voigt, G., Borgida, J., Clark, D., Miller, B., Modicamore, D., Pershing, J., Thompson, P. (2023). *Return on Investment Study: Montana Conservation Corps*. ICF.



CONTENTS

Executive Summary	ES-1
Program Description	ES-1
Overview of Benefits and Costs	ES-2
ROI Results	ES-3
ROI Study Limitations	ES-5
Introduction	1
Program Description	2
Population Served	3
MCC Evaluation History	3
Selection of MCC for the AmeriCorps ROI Project	7
Comparable ROI Estimates	8
ROI Methodology	11
Monetizing Program Benefits, Forgone Benefits (Opportunity Costs), and Program Costs	13
ROI Study Limitations	25
Program Benefits, Forgone Benefits (Opportunity Cost), Program Costs, and ROI Results	25
Program Benefits	25
Forgone Benefits (Opportunity Costs)	27
Program Funding	28
ROI Results	29
Recommendations for Further Research	32
Conclusion	34
Appendix A: Program Benefits, Forgone Benefits, and Program Costs Included in ROI Calculations	35
Appendix B: Additional Information on the Methodology	41
Methodology Overview	41
Measuring Program Benefits	42
Measuring Forgone Benefits (Opportunity Costs)	62
Measuring Program Costs	66
Calculating ROI	66

Appendix C: Results by Year 71
References 76

LIST OF FIGURES

Figure 1. Benefits Among Stakeholder Groups From MCC 12
Figure 2. Program Cost by Funding Source 29
Figure 3. Percentage of AmeriCorps Alumni Seeking Work, Providing Caregiving,
or Occupied Outside of the Workforce From Friedman et al. (2016) 43
Figure 4. Compound Interest Formula Used to Calculate Investment Opportunity
Cost 65

LIST OF TABLES

Table ES-1. ROI Estimates ES-4
Table 1. MCC AmeriCorps Member Demographics 3
Table 2. WCC's Treatment on Native Plant and Noxious Weed Coverage Results
After 1 Year..... 6
Table 3. Relevant Studies and Their Findings 10
Figure 1. Benefits Among Stakeholder Groups From MCC 12
Table 4. Benefits Realized From MCC by Stakeholder Group 13
Table 5. Value of Ecosystem Services Preserved Through BDA Installations (2023\$) 18
Table 6. Value of Carbon Sequestration Through BDA Installations (2023\$) 18
Table 7. Value of Extreme Event Moderation Through BDA Installations (2023\$) 18
Table 8. Value of Water Purification Through BDA Installations (2023\$) 18
Table 9. Value of Ecosystem Services Preserved Through Fuel Reduction Treatments
(2023\$) 20
Table 10. Value of Human Health Benefits From Reduced Air Particulates From Smoke
(2023\$) 20
Table 11. Value of Benefits from Reduced Carbon Dioxide Equivalent Emissions
(2023\$) 21
Table 12. Total Value of Ecosystem Restoration Services (2023\$) 22
Table 13. Total Value of Trail Maintenance and Creation Services (2023\$) 22
Table 14. MCC Program Costs, 2021–2022 Program Year..... 25
Table 15. Benefits by Recipient 26
Table 16. Percentage of Program Benefits by Stakeholder Group..... 26
Table 17. Forgone Benefits From Professional Opportunity Cost 27
Table 18. Investment Opportunity Cost by Scenario and Funding Stream..... 28

Table 19. Program Funding by Source for MCC.....	28
Figure 2. Program Cost by Funding Source	29
Table 20. Program Benefits, Net Benefits and Program Costs by ROI Scenario.....	29
Table 21. ROI Results for MCC	31
Table 22. Program Benefits, Forgone Benefits, and Program Costs Included in ROI Calculations	35
Table 23. MCC AmeriCorps Member Benefits From the Living Allowance and Education Award	43
Figure 3. Percentage of AmeriCorps Alumni Seeking Work, Providing Caregiving, or Occupied Outside of the Workforce From Friedman et al. (2016)	43
Table 24. Additional Pre-tax Earnings for MCC AmeriCorps Members From Reduced Unemployment Based on MCC AmeriCorps Member Demographics.....	44
Table 25. Cumulative Additional Post-tax Earnings Derived From Reduced Unemployment due to Serving With MCC by Scenario.....	45
Table 26. Average Total Cost of Education and Portion Attributable to Education Award by Degree Type.....	46
Table 27. Estimates of the Number of Postsecondary Degrees Pursued Using the Education Award by Degree Type.....	47
Table 28. Additional Earnings From AmeriCorps Members' Use of the Education Award	48
Table 29. Government Costs by Educational Attainment Level per Individual's Lifetime	53
Table 30. 2022 Tax Rates and Ratio of Taxable Expenditures for MCC AmeriCorps Members' Earnings, Living Allowances, and Education Awards	54
Table 31. State/Local and Federal Government Benefits by Stakeholder Group and by Scenario	55
Table 32. Ecosystem Services Restored From MCC BDA Installation	57
Table 33. Carbon Sequestration Benefits From MCC BDA Installation	58
Table 34. Drought and Flood Moderation From MCC BDA Installations	58
Table 35. Water Purification Benefits From MCC BDA Installation.....	58
Table 36. Preserved Ecosystem Services From MCC Fuel Reduction Activities	59
Table 37. Human Health Benefits From Reduced Wildfires From MCC Activities	59
Table 38. Carbon Dioxide Reduction Benefits From MCC Activities.....	60
Table 39. Habitat Improvement Benefits From MCC Activities.....	60
Table 40. Trail Maintenance and Creation Benefits From MCC Activities.....	61
Table 41. Societal Benefits by Impact Category and by Scenario.....	61
Table 42. Forgone Earnings of MCC AmeriCorps Members for a Service Term.....	63

Table 43. Forgone Taxes Associated With the Forgone Earnings of MCC AmeriCorps Members for a Service Term.....64

Figure 4. Compound Interest Formula Used to Calculate Investment Opportunity Cost65

Table 44. Forgone Benefits From Investment Opportunity Cost Calculation by Scenario and Funding Stream.....66

Table 45. Funding Sources and Amounts for MCC (2021–2022).....66

Table 46. ROI Calculations for Short-Term Scenario.....68

Table 47. ROI Calculations for Medium-Term Scenario69

Table 48. ROI Calculations for Long-Term Scenario.....70

Table 49. MCC Benefits and Costs per Year.....72

Table 49, cont. MCC Benefits and Costs per Year.....73

Table 49, cont. MCC Benefits and Costs per Year.....74

Table 49, cont. MCC Benefits and Costs per Year.....75

AUTHORS

This study was conducted by researchers from ICF and BCT Partners:

- George Voigt, ICF, Economics Analyst
- Julia Borgida, ICF, Public Policy Researcher
- Danny Clark, ICF, Research Analyst
- Benjamin Miller, ICF, Senior Director
- Dominic Modicamore, ICF, Lead Economist
- Janet Pershing, ICF, Vice President
- Phylicia Thompson, BCT Partners, Research and Evaluation Analyst

Executive Summary

Program Description

Montana Conservation Corps (MCC) is an environmental service program dedicated to promoting field research and direct conservation service. Founded in 1991, MCC has received AmeriCorps support since 1993. MCC supports communities and public lands in the Northern Rockies (including Montana, Wyoming, Idaho, North Dakota, and South Dakota) through the deployment of teams to develop beaver dam analogs (BDAs),¹ mitigate fire threats, reduce the spread of invasive species, and restore and redesignate trails. MCC's trained monitoring and assessment teams capture critical data on the condition of forest and rangeland health.

MCC's program activities include crew-based services that develop BDAs that improve drought and flood resilience, increase ecosystem services² of adjacent habitats, and reduce wildfire risk by preventing combustible material from drying out and posing a higher burn risk. MCC crew-based services also reduce wildfires through fuels reduction³ and habitat restoration. In addition, MCC members treat and abate noxious weeds, conduct post-fire re-seeding, and reintroduce native plants. MCC members also implement trail management measures, including the designation and restoration of trail routes, which also support reduction of fire threat by reducing fuels along trail corridors, maintaining fuel breaks, and offering improved access to fire locations. The primary anticipated outcomes of MCC program activities include increasing drought resilience of treated watersheds from the installation of BDAs, reducing the risk of catastrophic wildfire, and increasing accessibility and safe conditions of recreational trail systems.

AmeriCorps, the federal agency for national service and volunteerism, provides opportunities for Americans to serve their country domestically, address the nation's most pressing challenges, improve lives and communities, and strengthen civic engagement. Each year, the agency places more than 200,000 AmeriCorps members and AmeriCorps Seniors volunteers in intensive service roles; and empowers millions more to serve as long-term, short-term, or one-time volunteers. Learn more at [AmeriCorps.gov](https://www.americorps.gov).

¹ Beaver dam analogs refer to man-made structures that generate similar environmental engineering outcomes as natural beaver dams, such as water retention and filtering, improved flow duration during droughts, and increased riparian health of adjacent ecosystems.

² Ecosystem service values are the economic value to society for the various ecological outcomes that an ecosystem generates (e.g., carbon sequestration of a forest on an annual basis).

³ Fuel reduction treatments refer to actions that remove potential fuel from at-risk areas. These can include manual removal such as cutting down dead vegetation or thinning ground cover. Fuel reduction treatments can also include controlled burns to simulate a more natural reduction process with a much lower risk of the fire spreading.

To better understand the impact of the program in relation to costs, AmeriCorps commissioned a return on investment (ROI) analysis by ICF, an independent research firm. ROI analyses of national service programs estimate the monetary value of benefits that a program generates per dollar invested.

Overview of Benefits and Costs

To calculate the ROI, program benefits were identified, quantified, and compared to the program's costs. This ROI analysis used recently developed strategies for monetizing outcomes associated with preserved ecosystem services, for reduced carbon dioxide equivalents⁴ emissions from reduced wildfire acres burned, and for discounting ecosystem benefits over regrowth periods. Benefits of MCC include:

- **Benefits to various stakeholders of ecosystem services, reduced wildfire damage, other environmental benefits, and trail access.** MCC uses AmeriCorps members to construct BDAs, which revitalize degraded riparian and adjacent ecosystems, perform fuel reduction treatments⁵ on at-risk sites to reduce severity of wildfires, remove invasive species to increase benefits to society from ecosystems, and build and maintain trails that provide health and recreational benefits. The societal benefits of MCC can be attributed to three key functions of the organization: wildfire mitigation, habitat improvements, and maintenance of trail systems.
- **Additional earnings by AmeriCorps members.** Serving in AmeriCorps leads to increased wages and reduced unemployment post-national service through skill acquisition, as well as increased educational attainment post-service.
- **Living allowances, stipends, and education awards.** AmeriCorps members receive living allowances and stipends during their national service and receive Segal AmeriCorps Education Awards after successful completion.
- **Increased tax revenue for government.** Federal, state, and local governments receive more income tax revenue from increased AmeriCorps member earnings post-service, as well as additional sales tax revenue related to those earnings. Federal and state governments also realize tax revenue from the taxable living allowances, stipends, and education awards provided to AmeriCorps members.
- **Reduced lifetime spending on corrections, public assistance, and social insurance.** Because of the increase in secondary and postsecondary educational attainment for AmeriCorps members, federal and state governments spend less on these items.

⁴ Carbon dioxide equivalents refers to the total greenhouse gas warming impact from a varied source of emissions represented as an estimate of the comparable tonnage of carbon dioxide necessary to generate the same greenhouse gas warming effect. For example, 1 ton of methane has a carbon dioxide equivalent value over 100 years of 21 tons of carbon dioxide (Schimel et al., 1995).

⁵ MCC's fuel reduction treatments include mechanical thinning where potential fuel for wildfires is removed to increase ecosystems' resilience to wildfires.

In addition, federal government funding of MCC serves as a catalyst for other funding, specifically from state and local governments. This additional funding allows MCC to operate at a larger scale than otherwise would have been possible under the federal funding alone. Though match funding does not impact the ROI—because ROI is a per-unit metric—it increases investment in MCC, thereby increasing the program's total impact.

The analysis uses a combination of estimates from MCC and peer-reviewed literature to quantify the reduction of burned acres from wildfires, which are:

- Benefits that accrue from ecosystems that are preserved following program activity. This is estimated by using literature estimates for ecosystem services per acre based on ecosystem type and the characteristics of the treated acres.
- Benefits from reduction of wildfires being reduced over time as flammable material regrows following treatment. These are estimated using literature estimates on the regrowth of plants following wildfire reduction treatments.
- Due to environmental benefit changes over time following one-time program activities that occur.

These environmentally discounted benefits accommodate for the deterioration of benefits over subsequent years toward the prior status of the ecosystem.

Program costs for the MCC program totaled \$9,579,450 and came from the following sources:

- Federal government (AmeriCorps)
- Federal government (Non-AmeriCorps)
- State and local government
- Tribal governments
- Private

ROI Results

Table ES-1 shows the ROI results. Each row represents a different ROI calculation depending on which benefits are considered (all benefits or only benefits to the federal government) and which funding is considered (federal funding only or all funding).

The analysis used three different scenarios to estimate benefits under different assumptions. Specifically, the study assumed that increased earnings attributable to the programs last for 1 year (short-term scenario), 15 years (medium-term), or 30 years (long-term).

For the portion of the benefits analysis that measured ecosystem benefits, this study used low, average, and high estimates of those benefits based on the literature. Doing so addresses the uncertainty involved in monetizing ecosystem benefits.

The ROIs are presented as dollars returned for every dollar of investment.

Table ES-1. ROI Estimates

ROI calculation	ROI scenario		
	Short-term	Medium-term	Long-term
Total benefits per federal dollar*			
With low ecosystem benefits	\$0.73	\$7.75	\$11.66
With average ecosystem benefits	\$2.39	\$27.37	\$41.38
With high ecosystem benefits	\$7.81	\$92.69	\$144.32
Total benefits per funder dollar*			
With low ecosystem benefits	\$0.66	\$6.63	\$9.79
With average ecosystem benefits	\$2.11	\$23.83	\$35.84
With high ecosystem benefits	\$6.86	\$81.07	\$126.05
Federal government benefits per federal dollar	-\$0.02	\$0.18	\$0.49

*These ROI estimates are provided based on low, average, and high estimates of ecosystem benefits to society.

The program produces strong returns for the medium- and long-term scenarios when benefits to AmeriCorps members, program participants, and state/local governments are included. This is indicated by the results of the *total benefits per federal dollar* and the *total benefits per funder dollar* ROI calculations for these two scenarios. In the short-term scenario—which only includes benefits for 1 year post-program—all of the ROI results with average or high ecosystem benefits indicate a positive return on funding invested in the program. The ROI of \$0.66 for the *total benefits per funder dollar* calculation with the low set of ecosystem benefit estimates is below the break-even point on funding invested, as is the *total benefits per federal dollar* calculation under low ecosystem benefits. All other scenarios and ecosystem benefit levels show positive returns.

The *federal government benefits per federal dollar* calculations estimate losses for all three scenarios. As a program that is intended primarily to generate benefits to society, rather than benefits to the federal government, these results are consistent with the design of MCC. In addition, existing data and literature do not establish causal relationships between program activities such as BDA installation and wildfire reduction and federal expenditures. Following some wildfires, federal (and private) disaster recovery funds are spent to aid in recovery efforts. MCC's efforts on wildfire reduction treatments could result in the mitigation of those severe wildfires and lead to subsequent saving of those funds. MCC's BDA installations also provide wildfire reduction benefits as well as flood resilience. However, the current literature lacks the linkages to establish causality between treated acres and the saving of federal (and private) funds. This suggests that there may be additional savings as a result of MCC's activities that are not quantified in this methodology. Including federal disaster recovery expenditure savings, resulting from a reduction in wildfires and floods, would lead to a higher ROI for the federal government than this analysis estimates.

The magnitude of the positive ROI estimates is driven by the following factors:

- **Revitalized ecosystem services from BDA installation.** Societal benefits accrue and do not diminish over time due to the long-term drought resilience and riparian improvements associated with BDAs.
- **Reduction in wildfire-related costs.** Societal benefits from reduced severity of wildfires accrue but diminish over time as vegetation regrows and generates more potential fuel.
- **Increased benefits from ecosystems from reduced invasive species.** Societal benefits accrue but diminish over time as invasive species return.
- **Benefits from trail maintenance and creation.** Societal benefits from access and use of trails accrue over time but diminish as trails naturally deteriorate.
- **Educational attainment outcomes of AmeriCorps members.** After serving in the AmeriCorps program, AmeriCorps members receive an education award, which is used by a portion of members to help pay for postsecondary degrees post-service. The additional educational attainment resulting from the use of the education award generates additional earnings for AmeriCorps members.
- **Employment outcomes of AmeriCorps members.** Past studies establish that AmeriCorps members experience increased employment and increased earnings post-service.

ROI Study Limitations

Not all potential benefits of MCC were included in this analysis due to limitations of the data available. For example, MCC's wildfire reduction efforts likely avoided property loss and costs related to post-wildfire recovery typically borne by a combination of federal, state, and local government sources. Private homeowners, private insurance firms, and government agencies that engage in disaster recovery benefit from those avoided costs. However, due to the lack of data to demonstrate robust causal relationships between the treatments and damages that would have otherwise occurred, those benefits are not included in the analysis.

Introduction

AmeriCorps contracted with ICF Incorporated, LLC (hereafter ICF) to research and quantify the return on investment (ROI) of several programs that rely on national service—specifically AmeriCorps—as a major resource to sustain operations. ROI analyses measure the performance of programs and build the base of evidence for future resource allocation decisions. ROI study results demonstrate the value of AmeriCorps programming to relevant stakeholders.

This project's federal fiscal year 2023 activities began with a comprehensive literature review and preliminary assessments of whether ROI analyses were feasible for five national service programs. These feasibility studies included thorough reviews of these programs' recent evaluations, detailed logic models, proposed ROI analysis methodologies for each program, and a scorecard mechanism that determined the viability of conducting an ROI analysis for each selected program.

Upon completion of five feasibility studies, AmeriCorps selected four programs to be the subjects of ROI studies for fiscal year 2022: Montana Conservation Corps (MCC), Green City Force AmeriCorps, AmeriCorps Urban Safety (AMUS) Program, and the Parent Possible HIPPY program. This ROI study measures the benefits of MCC against its costs.

This study is organized into five sections:

- **Program Description** describes the program's design, activities, and objectives, along with the role that national service (specifically AmeriCorps) plays in its operation. This section also provides a brief history of past evaluations, outlines the factors that made this program a strong selection for an ROI study, underscores the population this program serves, and identifies a set of ROI estimates for programs that are similar to MCC.
- **ROI Methodology** outlines how this analysis used various data sources to monetize benefits derived from MCC activities, describes its associated program costs, and explains how opportunity costs were calculated.
- **Benefits, Forgone Benefits (Opportunity Cost), Program Costs, and ROI Results** provides a detailed description of the program benefits, forgone benefits (opportunity cost), and program costs that are inputs into the ROI analyses and presents the results of the three ROI calculations across different assumptions.
- **Recommendations for Further Research** explores ways AmeriCorps and others could further build the evidence base for this program and similar programs, including how to address limitations of this study.
- **Conclusion** summarizes key points from the ROI study overall.

Program Description

Montana Conservation Corps (MCC) is an environmental service program dedicated to promoting field research and direct conservation service. Founded in 1991, MCC has received AmeriCorps support since 1993. MCC supports communities and public lands in the Northern Rockies (including Montana, Wyoming, Idaho, North Dakota, and South Dakota) through the deployment of teams to develop beaver dam analogs (BDAs),⁶ mitigate fire threats, reduce the spread of invasive species, and restore and redesignate trails. MCC's trained monitoring and assessment teams capture critical data on the condition of forest and rangeland health.

MCC's program activities include crew-based services that develop BDAs that improve drought and flood resilience, increase ecosystem services⁷ of adjacent habitats, and reduce wildfire risk by preventing combustible material from drying out and posing a higher burn risk. MCC crew-based services also reduce wildfires through fuels reduction⁸ and habitat restoration. In addition, MCC members treat and abate noxious weeds, conduct post-fire re-seeding, and reintroduce native plants. MCC members also implement trail management measures, including the designation and restoration of trail routes, which also support reduction of fire threat by reducing fuels along trail corridors, maintaining fuel breaks, and offering improved access to fire locations. The primary anticipated outcomes of MCC program activities include increasing drought resilience of treated watersheds from the installation of BDAs, reducing the risk of catastrophic wildfire, and increasing accessibility and safe conditions of recreational trail systems.

AmeriCorps, the federal agency for volunteerism and national service, provides opportunities for Americans to serve their country domestically, address the nation's most pressing challenges, improve lives and communities, and strengthen civic engagement. Each year, the agency invests more than \$800 million in grants for local nonprofit, community, tribal, and state organizations; places more than 200,000 AmeriCorps members and AmeriCorps Seniors volunteers in intensive service roles; and empowers millions more to serve as long-term, short-term, or one-time volunteers. Learn more at AmeriCorps.gov.

⁶ Beaver dam analogs refer to man-made structures that generate similar environmental engineering outcomes as natural beaver dams, such as water retention and filtering, improved flow duration during droughts, and increased riparian health of adjacent ecosystems.

⁷ Ecosystem service values are the economic value to society for the various ecological outcomes that an ecosystem generates (e.g., carbon sequestration of a forest on an annual basis).

⁸ Fuel reduction treatments refer to actions that remove potential fuel from at-risk areas. These can include manual removal such as cutting down dead vegetation or thinning ground cover. Fuel reduction treatments can also include controlled burns to simulate a more natural reduction process with a much lower risk of the fire spreading.

Population Served

Since 1993, MCC has operated as an AmeriCorps program. Currently, over 400 MCC volunteers are engaged in environmental and community service across Montana. MCC conducts its service through leadership development and young adult, youth, Indigenous, and individual placement programs. These programs offer service opportunities for individuals ages 14 and older, up to professional conservation experience for adults. Table 1 shows MCC AmeriCorps member demographic data for the 2021–2022 program year studied in this ROI analysis.⁹

Table 1. MCC AmeriCorps Member Demographics

Demographic category	Percentage of MCC AmeriCorps members
Gender	
Male	45.6%
Female	48.2%
Gender queer	6.2%
Race/ethnicity	
White	87.2%
African American	1.1%
Hispanic	2.1%
Asian	3.2%
Two or more races	1.8%
Other	4.6%
Age	
17–20	21.1%
21–25	61.5%
26–30	16.1%
30 and older	1.4%

Source: MCC

Note: Numbers may not sum due to rounding.

MCC Evaluation History

There have been no direct evaluation studies of MCC's BDA programs; however, there are sufficient data sources to estimate the impact of MCC's programs as detailed below.

⁹ Jono McKinney, President and CEO of MCC, personal communication, January 30, 2023. Hereafter, all instances of MCC referenced as a data source were retrieved from this communication.

Other Data Sources

*Ecosystem Services Provided by Beavers *Castor Spp.*¹⁰*

This study estimated the ecosystem service values from the presence of beavers on a per-hectare basis. The ecosystem services considered in this study are water purification, moderation of extreme events, habitat and biodiversity provision, nutrient cycling, greenhouse gas sequestration, recreational hunting and fishing, water supply, and non-consumptive recreation. To derive estimates for each of the listed ecosystem services, the authors conducted a comprehensive literature review of recent studies (since 2000) and other relevant criteria, which resulted in 105 studies that estimated valuation. After aggregating and modeling the various characteristics of the studies, researchers found that beavers generate roughly \$689 (2017\$) per hectare per year in ecosystem service values. The study then expands on an aggregate annual valuation estimate by utilizing geographic information system (GIS) mapping to identify the number of hectares impacted by beavers to generate the annual estimate of \$332.6 million per year. The ecosystem services estimated in this study provided a basis for estimating benefits of BDAs installed by MCC.

Analysis of Vegetation Recovery Surrounding a Restored Wetland Using the Normalized Difference Infrared Index (NDII) and Normalized Difference Vegetation Index (NDVI)¹¹

This study estimated the area of impacted ecosystems that surround BDAs. Using GIS data on vegetation health, the researchers studied the impact of five BDAs that had been installed between 2004 and 2008. Their findings suggest that BDAs create a corridor roughly 300 meters wide that extends 5 kilometers downstream and 1 kilometer upstream where positive impacts on vegetation occurred compared to reference sites. This result suggests that each BDA impacts roughly 180 hectares of riparian and adjacent ecosystems. These findings relate to the specific type of BDA that MCC is installing and provide a conversion from the number of BDAs installed to the spatial area impacted.

Estimation of Wildfire Size and Risk Changes due to Fuels Treatments¹²

This study estimated the impacts on the likelihood of wildfire occurrence from fuel reduction treatments. Researchers evaluated 72,000 hectares of wildland where fuel reduction had occurred and that were affected by 14 large wildfires that burned over 314,000 hectares between 2002 and 2010. Their findings suggest that fuel treatments

¹⁰ Thompson, S., Vehkaoja, M., Pellikka, J., & Nummi, P. (2020). Ecosystem services provided by beavers *Castor spp.* *Mammal Review*, 51(1), 25–39. <https://doi.org/10.1111/mam.12220>

¹¹ Wilson, N. R., & Norman, L. M. (2018). Analysis of vegetation recovery surrounding a restored wetland using the normalized difference infrared index (NDII) and normalized difference vegetation index (NDVI). *International Journal of Remote Sensing*, 39(10). <https://doi.org/10.1080/01431161.2018.1437297>

¹² Cochrane, M. A., Moran, C. J., Wimberly, M. C., Baer, A. D., Finney, M. A., Beckendorf, K. L., Eidenshink, J., & Zhu, Z. (2012). Estimation of wildfire size and risk changes due to fuels treatments. *International Journal of Wildland Fire*, 21(4), 357–367. <https://doi.org/10.1071/WF11079>

affected the chance of treated acres catching fire by changing the rate at which fire spreads across the surface and reducing the likelihood of crowning.¹³ These results suggest that strategic placement of fuel reduction treatments reduces the overall size of wildfires that occur.

The fuel reduction treatments analyzed in this report were similar to those used by MCC and provided a statistically significant reduction in burn probability as a result of treatments. Researchers estimated the effect of (a) only unplanned treatments (previous wildfires), (b) only planned treatments, and (c) a combination of both. While the combination of both previous wildfires and targeted treatments led to the greatest reduction in fire spread, the study found that planned fuel treatments (item b above) resulted in a 7.2 percent reduction in fire size.

Evaluation Report: Washington Conservation Corps Restoration Sites: Impact Evaluation 2014–2015¹⁴

An evaluation of the Washington Conservation Corps (WCC) conservation efforts provides data relevant to measuring the impact of similar efforts by MCC. The evaluation studied whether WCC effectively restored native plant cover and reduced invasive plant cover at 23 randomly selected restoration sites that were at least 1 acre in size. The study compared the restoration sites to 23 paired comparison sites. Each restoration site was similar to the pre-restoration conditions of its paired reference site. The study used Before-After, Control-Impact (BACI) statistical analysis to analyze the outcomes of WCC efforts. BACI is an effective method to evaluate natural and human-induced interventions on ecological variables when treatment sites cannot be randomly chosen (Conner et al., 2016).

The study found that due to the restoration efforts of WCC members, native coverage increased by 9.6 percent at restoration sites compared to 0.4 percent at reference sites the first year following planting.¹⁵ Moreover, noxious weed coverage decreased by 15.6 percent at restoration sites compared to a decrease of 1.4 percent at reference sites. Both results were statistically significant, as shown in Table 2.

¹³ Crowning refers to the movement of wildfire through shrubs and upper tiers of trees, rather than across the ground surface.

¹⁴ The Watershed Company. (2015). *Impact evaluation 2014-2015: Washington Conservation Corps restoration sites*. <https://americorps.gov/evidence-exchange/impact-evaluation-2014-2015-washington-conservation-corps-restoration-sites>

¹⁵ Average survival for native plants in the first year following the planting was 72 percent.

Table 2. WCC's Treatment on Native Plant and Noxious Weed Coverage Results After 1 Year

Coverage group	Restoration (treatment)	Reference (comparison)	Difference	P-value	Significant?
Native tree and shrub	9.6% increase	0.4% increase	9.2%	0.03	Yes
Noxious weed	15.6% decrease	1.4% decrease	14.2%	0.03	Yes

Determining Economic Benefits of Park Trails: Management Implications¹⁶

This study estimated the social benefits of trail networks on local populations. Of 543 surveyed recreational trail users at Table Rock State Park in South Carolina, 248 returned valid surveys that included responses to questions about how they valued their experience. Specifically, the survey asked about respondents' willingness to pay a certain fee to access the park and willingness to pay an additional fee for improved trail systems at the park. Analysis of the surveys used a contingent valuation method based on a bivariate probit model of the responses. As the bid amount shown to trail users increased, the proportion of users who reported being willing to contribute that amount decreased. At the lowest end, 82.14 percent of trail users reported being willing to pay \$0.50. At the upper end bid, only 20.59 percent of trail users reported being willing to pay \$10. When willingness-to-pay is estimated across the entire sample, the study authors found an economic benefit of between \$3.81 and \$5.71 for the maintenance of trails. They then compared the total benefit on an annual basis using the total number of visitors to the annual costs of maintenance to create an ROI for these services.

The Economic Impact of the 2013 Rim Fire on Natural Lands

Following the 2013 Rim Fire in northern California, Batker et al. (2013) estimated the environmental benefits that were lost in the first year following the fire. Their study estimated that, from the 254,654 acres burned, between \$100 million and \$736 million in ecosystem services were lost. Utilizing median home values for the burn area, they also estimated that the total impacted property value from the fire exceeded \$1.6 billion. They also estimated the cost of fighting the wildfire to be \$127.2 million and the lost recreation and tourism value to be between \$450,000 and \$211 million.

Wildfire Smoke and Health Impacts: A Closer Look at Fire attributes and Their Marginal Effects

Moeltner et al. (2013) studied the impacts on respiratory health from wildfire smoke and estimated the health costs per acre depending on the distance to the fire. Their results show that there is a causal link between respiratory patients and fires as far as 300 miles

¹⁶ Oh, C. & Hammitt, W. (2010). Determining economic benefits of park trails: Management implications. *Journal of Park and Recreation Administration*, 28(2), 94–107.

away. Depending on proximity to and severity of the fire, they estimate that health costs range between \$0.54–\$2.09 per acre burned.

Comparing Ecosystem Goods and Services Provided by Restored and Native Lands

Dodds et al. (2008) studied the impact of ecosystem services and the restoration index¹⁷ of those services on restored lands following disruption. Their analysis found that restored Western forested mountains and Wetlands had restoration index scores of 0.89 and 0.93, showing that restoration efforts return significant portions of the native ecosystem services. They evaluated that restored western forested mountains (54,000,000 hectares), generate \$57 billion per year in ecosystem services. Similarly, they assessed that restored wetlands (340,000 hectares) provide \$196 billion per year in ecosystem services throughout the U.S. This is equivalent to an estimated \$233,000 per restored acre per year.

None of the studies above directly examine the economic cost of CO₂ emissions that result from wildfires, from either a community health or environmental cost perspective. However, there are studies that can link prevented burn acres to avoided emissions. Both Guo et al. (2019) and Arora and Melton (2018) estimate the carbon dioxide equivalents released from an acre of land burning. Their estimates range from 0.023 tons to 1.75 tons of carbon dioxide equivalents based on ecosystem characteristics. Based on the updated social cost of carbon (SCC) of \$185 per ton (Rennert et al., 2022), carbon emissions prevented from burning can be quantified as social benefits. As with the other ecosystem service treatments, this analysis will utilize Bartels et al. (2016) which estimates the rate of regrowth for various ecosystems, providing a dynamic discounting of benefits over time as regrowth occurs. Previous ROI studies (Voigt et al., 2022) have utilized this approach to quantify the economic damages resulting from the emission of 1 ton of carbon dioxide equivalent. The current ROI study will further review literature to advance the methodology for incorporating the economic costs of CO₂ emissions from wildfires in the ROI calculation for MCC.

Selection of MCC for the AmeriCorps ROI Project

ICF recommended the MCC AmeriCorps program for a feasibility study to explore monetizing benefits and costs of an environmental stewardship program. The availability of data related to the program's evaluation and documented outcomes made it a strong candidate for estimating ROI.

The primary outcomes of MCC that would be monetized for an ROI analysis relate to BDA installation and the associated ecosystem services, wildfire fuel reduction treatments, restoration of native plants species, reduction of invasive species, and trail maintenance. Existing literature estimates the value of fuel reduction treatments, ecosystem service values, and the value of improved trails based on a variety of

¹⁷ The restoration index is the relative value of the restored ecosystem compared to the native ecosystem's value. For example: the dollar value of a restored wetland acre compared to the dollar value of the native wetland acre.

benefits. An ROI analysis for MCC will use the improved drought and climate resilience from the BDAs, reduced wildfire risk, environmental service values, and improved trail benefit values to monetize the benefits of MCC's outcomes.

The potential ROI methodology for MCC borrows elements from the 2022 study of Nevada Conservation Corps and the 2021 study of Washington Conservation Corps. This study of MCC advances ROI analysis in the conservation field by incorporating the value of drought resilience, especially related to BDA installation.

Comparable ROI Estimates

ROI studies of other programs that offer similar services provide context for a potential set of ROI estimates for MCC. Table 3 summarizes information across studies.

Beaver Dam Analog

At the time this report was produced, there were no comparable ROI studies related to BDA installation and its benefits.

Wildfire Mitigation

A number of studies estimate the effectiveness of conservation activities in mitigating wildfires. Specifically, Jones (2021) analyzed the costs and benefits of wildfire mitigation treatments related to the Forest to Faucet (F2F) program. The F2F program treatments were classified into groups: general canopy treatments (where potential fuels were mechanically thinned and clear cut)¹⁸ and surface fuel treatments (such as prescribed burns, lop and scatter, and mastication).¹⁹ To assess the benefits of the program, wildfire behavior was modeled to evaluate pre- and post-treatment.

The analysis found that every dollar invested in such treatments yielded benefits between \$0.67 and \$3.88. Benefits included reduced property loss, reduced recovery and rehabilitation costs, reduced suppression costs, increased recreation, and conservation of endangered species. The study estimated the value of natural resource goods and services based on ecosystem service values in the literature. Mason et al. (2006) found an ROI in a similar range, with mitigation efforts on low-risk areas returning \$1.04 for every dollar spent and high-risk areas returning \$2.42. The study estimated ROI of fuel reduction treatments by estimating the value of benefits that included reduced firefighting costs, fatalities avoided, facility losses avoided, and reduced loss of timber resources. ICF (Voigt et al., 2022) conducted an ROI study of Nevada Conservation Corps, finding an ROI of \$0.98 (short-term) to \$78.04 (long-term) for every funder dollar spent.

¹⁸ Canopy treatments of mechanical thinning and clear cutting are treatments where potential wildfire fuel is removed from the area by cutting off branches or cutting down trees.

¹⁹ Surface treatments of prescribed burns, lop and scatter, and mastication are methods whereby potential wildfire fuel at ground level is removed from the area by burning it, lowering density of fuel loads, and reducing fuels to small pieces, thereby increasing the health of remaining trees.

Reduction of Invasive Species

Past studies conducted cost–benefit analyses of habitat improvements for the removal of invasive species and renewal of native species. These studies provide context for a set of ROI estimates related to MCC's work.

Zavaleta (2000) examined the economic costs and benefits of controlling the invasive *Tamarix* plant species in the western United States. The analysis looked at the impact of *Tamarix* on water supplies, flood control, and wildlife, and developed a monetary estimate of the benefit to each category if *Tamarix* were replaced with native vegetation. Due to limited data availability, a regional estimate for each ecosystem service was derived from numerous sources, including direct cost measures and willingness-to-pay data. The study found that at a 3 percent discount rate, eradication of *Tamarix* will lead to an ROI range of \$1.36–\$2.12 for each dollar of cost. The Watershed Company (2015) also conducted an effectiveness study on a similar AmeriCorps program, the Washington Conservation Corps, and estimated the effectiveness of restoration activities, similar to those used by MCC. Their findings suggested that the treatments increased native tree and shrub presence by 9.2 percent and decreased noxious weed presence by 14.2 percent after 1 year. ICF (Munaretto et al., 2021) conducted an ROI study of Washington Conservation Corps, finding an ROI of \$0.20 (short-term) to \$33.90 (long-term) for every funder dollar spent.

Trail Maintenance

There are also social benefits derived from the maintenance of trail systems resulting from MCC's work. Past cost–benefit and economic analyses of recreational trails provide context for an ROI study of MCC's AmeriCorps program.

Wang et al. (2005) conducted a cost–benefit analysis of trail use in Nebraska and its relationship with health costs associated with inactivity. Per-capita annual costs of trail use included trail construction/maintenance and equipment and travel, while per-capita annual direct benefit examined the medical benefit of using the trails. The study found that every \$1 of investment in trails for physical activity led to \$2.94 in direct medical benefit.

Oh and Hammitt (2010) measured other use benefits of trails at a state park in South Carolina. Benefits were calculated based on the community's willingness to pay for park services using the double-bounded contingent valuation method. The study found that the economic benefit characterized by willingness to pay for entry to the recreation area was \$4.76 per visit. Oh and Hammitt compared the estimated value of visitor benefits to park costs, estimating the ROI for trail maintenance to be between \$1.15 and \$1.72.

Table 3. Relevant Studies and Their Findings

Study	Forest treatments/ study area	Benefits/cost savings evaluated	ROI estimate* (Return in dollars for every \$1 in cost)
Jones et al. (2021)	General canopy treatments (e.g., mechanical thinning) and surface fuel treatments (e.g., prescribed fire)	Source water protection, property loss, recovery and rehabilitation costs, suppression costs, recreation, and endangered species values	\$0.67 to \$3.88
Mason et al. (2006)	Wildfire fuel reduction through forest thinning	Firefighting, fatality, facility losses, cost of timber, willingness to pay for fire risk reduction	\$2.42 (high risk) \$1.04 (moderate risk)
Zavaleta (2000)	Ecosystem services lost as a result of noxious weed presence.	Avoided replacement costs from water provision and avoided flood damages	\$1.36 to \$2.12
The Watershed Company (2015)	Efficacy of restoration efforts to increase native species presence and decrease noxious weeds	9.2% increase in native vegetation and 14.2% decrease of noxious weeds following treatment	N/A
ICF – Munaretto et al. (2021)	Increasing native coverage and reducing noxious weed coverage	Increased ecosystem service valuation per acre of restoration sites, benefits to AmeriCorps and other stakeholders of national service	\$0.20 to \$33.90
ICF – Voigt et al. (2022)	Wildfire reduction treatments, habitat restoration, invasive species removal, and trail maintenance	Reduced damages from wildfires, increased ecosystem service valuation per acre of restoration sites, value of trail maintenance, benefits to AmeriCorps and other stakeholders of national service	\$0.98 to \$78.04

Study	Forest treatments/ study area	Benefits/cost savings evaluated	ROI estimate* (Return in dollars for every \$1 in cost)
Wang et al. (2005)	Nebraska	Costs: trail construction/ maintenance and equipment and travel	\$2.94
Oh and Hammitt (2010)	A state park in South Carolina	Willingness to pay for recreational resources	N/A

*Where studies did not report ROIs, they were calculated based on the net benefits and net costs, where available.

ROI Methodology

The methodology for estimating MCC's ROI consisted of the following components:

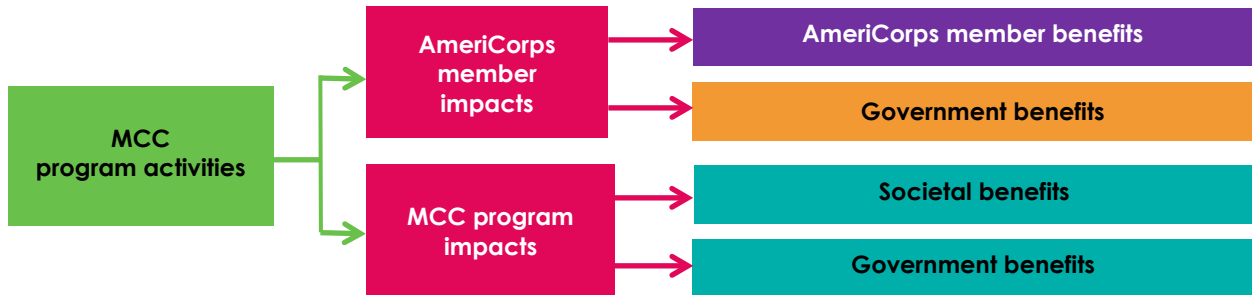
- 1. Measuring and monetizing program benefits.** This included using program data provided by MCC, publicly available data, and other third-party sources to determine the benefits to MCC AmeriCorps members; federal, state, and local governments; and society.
- 2. Estimating forgone benefits (opportunity costs).** This ROI analysis estimated two types of forgone benefits. The first was the professional opportunity cost to MCC AmeriCorps members for their period of national service, during which they could have earned more pay by doing other work. The second was the investment opportunity cost for MCC AmeriCorps program funding that could have been used for other purposes.
- 3. Assessing program costs.** MCC provided program costs for the 2021–2022 program year. MCC costs for the 2021–2022 program year include operating costs, AmeriCorps member expenses, non-AmeriCorps member expenses, and other indirect costs. AmeriCorps member expenses included the living allowance amounts received during service.
- 4. Calculating the ROI.** The ROI analysis includes three ROI calculations, each assessed under three scenarios representing different assumptions about the persistence of program outcomes:
 - Total benefits per federal dollar
 - Total benefits per funder dollar²⁰

²⁰ The different funder groups whose investment is in this calculation include the federal government (i.e., AmeriCorps, federal government [non-AmeriCorps]), tribal governments, private, and other, as well as match funding from state and local governments.

- Federal government benefits per federal dollar

This analytical framework includes only those benefits that could be reasonably monetized given the available data and that likely would not have occurred without MCC activities. Figure 1 shows how MCC program activities can result in benefits to MCC AmeriCorps members; federal, state, and local governments; and society.

Figure 1. Benefits Among Stakeholder Groups From MCC



Available data establishes that MCC AmeriCorps members enjoy earnings impacts as a result of serving with MCC. However, the data do not establish the duration of those benefits. To address a range of possible durations for those benefits, the analysis includes three scenarios:²¹

- **Short-term.** This scenario assumes short-term earnings impacts. The assumption is that earnings impacts are limited to a single year after program exit. This scenario also assumes no lifetime benefits are realized.
- **Medium-term.** This scenario assumes a longer duration of earnings impacts. The assumption is that earnings impacts last 15 years. A 3 percent discount rate is applied each year to represent net present value in 2022 dollars.²² This scenario also assumes only half of the net present value of lifetime benefits is realized.

²¹ These three scenarios consider varying durations of how long increased employment and earnings benefits last for MCC AmeriCorps members. They also consider varying durations for lifetime benefits that stem from MCC. For example, lifetime benefits in terms of decreased public assistance, social insurance, and corrections costs result from MCC AmeriCorps members' higher educational attainment post-service. The analysis estimates lifetime benefits differently in the three scenarios. Specifically, the net present value of the entire lifetime benefit is realized for the long-term scenario, half of the net present value of the lifetime benefit is realized for the medium-term scenario, and no lifetime benefit amount is realized for the short-term scenario.

²² The Office of Management and Budget (1992) defines a discount rate as, "The interest rate used in calculating the present value of expected yearly benefits and costs" (p. 18). Regarding the 3 percent discount rate, see Office of Management and Budget (2003).

- Long-term.** This scenario assumes sustained earnings impacts throughout MCC AmeriCorps members' working years. The assumption is that earnings impacts last 30 years. A 3 percent discount rate is applied each year to represent net present value in 2022 dollars. This scenario also assumes the entire net present value of lifetime benefits is realized.

The long-term scenario (i.e., 30 years of sustained employment and earnings benefits) represents roughly a lifetime of working years for a given person while the short-term scenario assumes benefits for only the year after program participation or service is completed. The medium-term scenario (i.e., 15 years of sustained employment and earnings benefits) represents the midpoint between these two scenarios.

Monetizing Program Benefits, Forgone Benefits (Opportunity Costs), and Program Costs

This analysis monetized an array of benefits and included MCC program costs and expected opportunity costs—all in 2022 dollars—to assess the ROI of MCC. Additional details on the methodology employed and the calculations used for this analysis are in Appendix B.

Program Benefits

Outcomes of MCC result in monetizable benefits to MCC AmeriCorps members; federal, state, and local governments; and society. Table 4 summarizes these benefits and data sources by stakeholder group.

Table 4. Benefits Realized From MCC by Stakeholder Group

Stakeholder group	Benefits
MCC AmeriCorps members	<ul style="list-style-type: none"> Additional earnings from reduced unemployment Post-tax living allowances
Federal, state, and local governments	<ul style="list-style-type: none"> Tax revenue from increased earnings by MCC AmeriCorps members post-program and sales tax revenue from the induced increased economic activity Tax revenue from living allowances Reduced lifetime spending on corrections, public assistance, and social insurance from increased educational attainment by MCC AmeriCorps members There are likely other benefits to federal agencies from reduced spending on wildfire and flood disaster relief funding; however, limitations exist to incorporating those benefits currently.

Stakeholder group	Benefits
Society	<ul style="list-style-type: none"> • Ecosystem service values associated with improved ecosystem health resulting from the installation of BDAs at impaired riparian sites • Wildfire reduction benefits, including: 1) ecosystem services preserved, 2) reduced human health impacts, and 3) reduced carbon dioxide emissions • Increased benefits from ecosystem services due to unburned areas as well as ecosystem restoration activities • Increased health outcomes from access to trails • There may be other benefits to private insurers/individuals from reduced spending on recovery following wildfire disasters; however, limitations exist to incorporating those benefits currently.

ICF conducted a multi-step methodology for estimating the ROI for MCC, beginning with estimation of program benefits, forgone benefits (opportunity costs), and program costs. Program benefits include benefits to society, as well as benefits to AmeriCorps members and federal, state, and local governments.

Benefits to AmeriCorps Members

MCC AmeriCorps members benefit from increased likelihood of employment post-national service and from living allowances.²³

Post-Tax Living Allowances (Benefits to MCC AmeriCorps Members)

MCC AmeriCorps members receive living allowances during their national service. The living allowances are taxable income and thus result in increased government revenue.²⁴ The post-tax living allowance was included in the ROI analysis as a direct one-time benefit to MCC AmeriCorps members.

Additional Earnings From Reduced Unemployment (Benefit to MCC AmeriCorps Members)

Evaluations have shown that serving in AmeriCorps fosters higher skill acquisition, increased educational attainment, and higher income from increased employment post-national service.²⁵ Freidman et al. (2016) found that unemployment among

²³ Relevant studies include Markovitz et al., 2008; Spera et al., 2013; Friedman et al., 2016; Zeidenberg et al., 2016.

²⁴ The tax implications of the AmeriCorps member education award are stated here: AmeriCorps. (n.d.). Segal AmeriCorps Education Award. <https://americorps.gov/members-volunteers/segal-ameri-corps-education-award/find-out-more>

²⁵ Relevant studies include Markovitz et al., 2008; Spera et al., 2013; Friedman et al., 2016; Zeidenberg et al., 2016.

AmeriCorps members 6 months after their period of national service was 5 percentage points lower compared to 6 months before serving.²⁶ To monetize this decrease in unemployment, the analysis first collected data on the demographic distribution of MCC AmeriCorps members who served during the most recent program year in terms of race/ethnicity, gender, and age pre-service using data provided by MCC. The analysis then proceeded to:

1. Estimate MCC AmeriCorps members' per-person average annual earnings (weighted by the above demographics) using data from the Current Population Survey's Annual Social and Economic (ASEC) Supplement for 2020 (U.S. Census Bureau, 2020)
2. Multiply the 5-percentage-point reduction in unemployment from Freidman et al. (2016) by the number of MCC AmeriCorps members who served during the most recent program year to estimate the number of *additional* MCC AmeriCorps members employed post-service
3. Multiply the demographically weighted per-person average annual earnings by the number of additional MCC AmeriCorps members employed to estimate the total increased earnings attributable to national service

The earnings metrics for MCC AmeriCorps members were applied and discounted based on the short-term, medium-term, and long-term scenarios to represent net present 2022 dollars. The post-tax MCC AmeriCorps members' projected earnings represent the additional income earned by AmeriCorps members attributable to serving with the MCC program.

Benefits to Government

The benefits to MCC AmeriCorps members result in benefits to the various levels of government.

Tax Revenue From Increased Earnings by MCC AmeriCorps Members

State, local, and federal governments benefit from increased earnings by MCC AmeriCorps members. Those benefits include:

- **Income tax revenue from increased earnings by MCC AmeriCorps members post-service.** Federal income taxes, state income taxes, Medicare taxes, and Social Security taxes were estimated for the additional pre-tax earnings of MCC AmeriCorps members based on 2022 rates. For both federal and state income taxes, the analysis estimated proportional tax rates representing the share of earnings paid in taxes.

To estimate proportional tax rates that reflect federal- and state-level progressive tax brackets and standard deductions, the amount of total taxes paid was divided by the pre-tax earnings per MCC AmeriCorps member. For the state income tax rate, the analysis weighted individual state-level rates by their

²⁶ See page 56 of Friedman et al. (2016).

respective state populations to estimate a weighted national tax rate to apply program-wide. A weighted national tax rate was used because MCC AmeriCorps members may disperse to various locations nationwide following their service terms and continue to migrate over the course of their working years.

- **Sales tax revenue from the increased economic activity that results from increased earnings by MCC AmeriCorps members post-service.** To estimate the additional sales tax revenue generated due to the additional post-tax earnings of MCC AmeriCorps members, the combined state and average local sales tax rate for the United States—weighted by states' populations—was calculated. This analysis applied that rate to the estimated taxable expenditures of MCC AmeriCorps members based on their post-service pre-tax earnings using Consumer Expenditure Survey data (U.S. Bureau of Labor Statistics, 2021).²⁷ The resulting product was then applied to the share of post-tax earnings attributable to serving with MCC to estimate state and local government sales tax revenue.

Tax Revenue From Living Allowances Received by MCC AmeriCorps Members

The living allowance provided to MCC AmeriCorps members during their service term is taxable income. This analysis applied a proportional federal income tax rate as well as Medicare and Social Security tax rates to the pre-tax living allowance amount received by MCC AmeriCorps members for the most recent program year. The analysis also applied a sales tax rate to the estimated taxable expenditures of MCC AmeriCorps members based on their post-tax living allowance amount to estimate additional state and local government revenue.

Benefits to Society

The societal benefits of MCC can be attributed to four key functions of the organization: ecosystem service improvements from BDAs, wildfire mitigation, habitat improvements, and maintenance of trail systems.

BDA Ecosystem Service Improvements Attributable to MCC

Evaluations and peer-reviewed literature show that BDA installations like those constructed by MCC create a variety of ecosystem service benefits that accrue to society, which range from \$1,138 to \$99,761 per year (Thompson et al., 2020; Wilson and Norman, 2018).²⁸ To monetize this societal benefit, the analysis multiplied the number of

²⁷ To calculate the estimated taxable expenditures, Consumer Expenditure Survey (CE) Table 1203 was used from the U.S. Bureau of Labor Statistics (2021). This table lists the annual expenditure means by pre-tax income tax brackets. Thus, the pre-tax earnings of MCC AmeriCorps members were used instead of their post-tax earnings to calculate this metric. Please visit this site for more details: <https://www.bls.gov/cex/tables/calendar-year/mean-item-share-average-standard-error.htm#cu-income>

²⁸ Ecosystem service values are typically produced within a range due to uncertainty of impacts and the overall societal benefits from the services. In order to internalize those ranges into the model, this methodology uses the low, average, and high estimates from the range to present three scenarios of ecosystem service values for every ROI.

acres that experienced ecosystem restoration as a result of the BDA by the ecosystem service values per acre of land restored.

The analysis estimated the number of acres restored from the installation of the BDA by multiplying the number of BDAs installed during the 2021–2022 program year by the area of impact provided by MCC.²⁹ Due to the nature of the BDA in restoring and preserving the health of the riparian habitat, these values do not decrease over time. The analysis then calculated the societal benefits related to those restored acres as well as flat per BDA societal benefits using various other literature that establishes ecosystem service values, carbon sequestration benefits, extreme event moderation likelihood, and water purification benefits:

1. **Ecosystem services preserved through riparian habitat restoration.** MCC specifically targets impaired riparian habitats for BDA installation, resulting in significant ecosystem service benefits following the installation and restoration of the habitat. The value of a single acre of riparian habitat being restored is estimated to be between \$3,029 and \$288,752 (2022\$) (ESSRTI, 2021).
2. **Benefits from carbon sequestration value through riparian restoration.** Every acre of riparian habitat that is restored from a BDA being installed sequesters carbon dioxide at a higher rate than prior to the installation. Thompson et al. (2020) estimated this to be roughly 1.7 tons of carbon dioxide annually per acre. To monetize this value, the analysis utilized the updated SCC from Rennert et al. (2022) of \$212 (2022\$) per ton.
3. **Benefits from extreme event moderation.** Every BDA installed creates a buffer for water retention, which reduces the likelihood and impact of drought and flood events. Thompson et al. (2020) estimated that the per-acre BDA benefit on an annual basis would be \$59.94 (2022\$), the societal benefit of this reduction in extreme events is quantified by multiplying the number of BDAs and their impacted acreages by this per-BDA benefit.
4. **Benefits from water purification.** Installed BDAs also provide purification for downstream water. These benefits are accrued on the basis of acres impacted per BDA, and Thompson et al. (2020) estimated the annual benefit to be \$52.20 (2022\$) per acre. To monetize these benefits, the total acres impacted by installed BDAs are multiplied by the benefit.

²⁹ The estimate of 175 acres of riparian habitat being restored from BDA installation is lower on a per-BDA basis than estimates from Wilson and Norman (2018). This analysis will utilize MCC's lower estimates to ensure that this study uses conservative estimates when calculating ecosystem benefits from BDAs.

Each of these is a distinct benefit with no overlap that would result in double counting of benefits. For instance, the ecosystem service values specifically measure benefits of restored ecosystems following BDA installation and are distinct from the carbon sequestration, extreme event moderation, or water purification that the BDA causes.

Table 5 presents the discounted benefits of ecosystem services to society over the three scenarios and three environmental impact levels due to BDA installations during the 2021–2022 program year.

Table 5. Value of Ecosystem Services Preserved Through BDA Installations (2023\$)

Value of ecosystem services	Short-term	Medium-term	Long-term
Low*	\$530,084	\$5,429,863	\$7,666,895
Average*	\$9,914,571	\$101,558,945	\$143,399,885
High*	\$50,531,676	\$517,616,324	\$730,867,396

*These impact levels represent low, average, and high estimates of the amount of carbon released per acre from wildfire.

Table 6 presents the discounted benefits of carbon sequestration due to BDA installations during the 2021–2022 program year.

Table 6. Value of Carbon Sequestration Through BDA Installations (2023\$)

Value of carbon sequestration	Short-term	Medium-term	Long-term
All impact levels	\$27,295	\$279,589	\$394,776

Table 7 presents the discounted benefits of extreme event moderation due to BDA installations during the 2021–2022 program year.

Table 7. Value of Extreme Event Moderation Through BDA Installations (2023\$)

Value of extreme event moderation	Short-term	Medium-term	Long-term
All impact levels	\$10,489	\$107,443	\$151,708

Table 8 presents the discounted benefits of water purification due to BDA installations during the 2021–2022 program year.

Table 8. Value of Water Purification Through BDA Installations (2023\$)

Value of water purification	Short-term	Medium-term	Long-term
All impact levels	\$9,136	\$93,579	\$132,133

Wildfire Reduction Benefits Attributable to MCC

Evaluations and peer-reviewed literature show that fuel reduction treatments like those conducted by MCC reduce the likelihood of an area burning by 7 percent (Cochrane et al., 2012; Center for Program Evaluation, 2020). To monetize this reduced likelihood of burning, the analysis first determined the number and composition of acres treated based on MCC data.

The analysis estimated the number of acres prevented from burning each year using the number of acres treated by MCC and multiplying them by the estimates of burn reduction from Cochrane et al. (2012). The analysis then calculated societal benefits related to those preserved acres using various other literature that establishes ecosystem services values, avoided health damages, and avoided carbon dioxide equivalents emission costs from wildfires on a per acre basis:

1. **Ecosystem services preserved through fuel reduction treatments.** The Rim Fire report (Batker et al., 2013) establishes a range of ecosystem services that are lost from each acre burned during a wildfire, which range in aggregate value from \$392.76 to \$2,890.25. To reflect that burned acres regrow following wildfires, the analysis reduced ecosystem service benefits incrementally with the estimated amount of regrowth (Bartels et al., 2016). The analysis assumes that the value of this benefit decreases by 84 percent by the end of the study period (roughly 1.2 percent per year for the first 10 years and roughly 3.7 percent per year thereafter).³⁰
2. **Human health benefits from reduced air particulates from smoke.** Moeltner et al. (2013) estimated that the health impacts from wildfires range from \$51 per acre to \$708 per acre based on location and severity of the burn. This analysis uses their estimate of \$467 per acre for zone 3 based on the similar geographic location to MCC's activities. To reflect that fuel reduction treatment effectiveness decreases over time as fuel accumulates naturally, the analysis reduced health benefits with the estimated amount of regrowth (Bartels et al., 2016). The analysis assumes that the value of this benefit decreases by 84 percent by the end of the study period (roughly 1.2 percent per year for the first 10 years, and roughly 3.7 percent per year thereafter).
3. **Benefits from reduced carbon dioxide equivalents emissions.** Carbon dioxide equivalents emissions result in costs to society measured by the social cost of carbon of \$47.76 in 2020 dollars (Interagency Working Group, 2013), which estimates the value of lost benefits to global society from the emission of 1 ton of carbon dioxide equivalents. (These lost benefits include impacts to agricultural productivity, human health, property damage from flood risk, and ecosystem services due to climate change.) Total carbon dioxide equivalents emissions

³⁰ Bartels et al. (2016) found that areas burned have 10 percent regrowth by year 10 and 84 percent regrowth by year 30. This analysis used constant values of roughly 1.2 percent per year for the first 10 years and roughly 3.7 percent per year thereafter to reach those regrowth values in years 10 and 30. This method was applied to all three wildfire reduction benefits outlined in this section.

were estimated from a range of values based on varying assumptions of the ground cover and ecosystem type, from 0.023 tons of carbon per acre burned (Guo et al., 2019) to 1.75 tons of carbon per acre burned (Arora and Melton, 2018). For example, a forest has significant potential emissions and a desert less potential emissions. Using a set of low, average, and high estimates of carbon dioxide emissions per acre allows this analysis to incorporate uncertainty about the specific mix of land types treated by MCC. To reflect that the fuel reduction treatment effectiveness decreases over time as fuel accumulates naturally, the analysis reduced benefits from avoided carbon dioxide equivalent emissions with the estimated amount of regrowth (Bartels et al., 2016). The analysis assumes that the value of this benefit decreases by 84 percent by the end of the study period (roughly 1.2 percent per year for the first 10 years and roughly 3.7 percent per year thereafter).

Table 9 presents the discounted benefits of ecosystem services to society over the three scenarios and three environmental impact levels due to wildfire reduction treatments during the 2021–2022 program year.

Table 9. Value of Ecosystem Services Preserved Through Fuel Reduction Treatments (2023\$)

Value of ecosystem services	Short-term	Medium-term	Long-term
Low*	\$122,419	\$1,063,881	\$1,086,678
Average*	\$496,446	\$4,314,359	\$4,406,805
High*	\$900,859	\$7,828,911	\$7,996,666

*These impact levels represent low, average, and high estimates of the amount of carbon released per acre from wildfire and the persistence of ecosystem services from habitats that weren't burned.

Table 10 presents the discounted health benefits to society over the three scenarios due to wildfire reduction treatments during the 2021–2022 program year.

Table 10. Value of Human Health Benefits From Reduced Air Particulates From Smoke (2023\$)

Value of health benefits	Short-term	Medium-term	Long-term
All impact levels*	\$168,199	\$1,461,733	\$1,493,054

*This benefit is estimated based on a single value per acre, rather than low, average, and high per acre impact levels.

Table 11 presents the discounted benefits from reduced carbon dioxide equivalent emissions over the three scenarios and three potential carbon dioxide equivalent emission levels due to wildfire reduction treatments during the 2021–2022 program year.

Table 11. Value of Benefits from Reduced Carbon Dioxide Equivalent Emissions (2023\$)

Value of emission reduction benefits	Short-term	Medium-term	Long-term
Low*	\$1,203	\$10,457	\$10,681
Average*	\$46,576	\$404,772	\$413,445
High*	\$91,949	\$799,087	\$816,209

*These impact levels represent low, average, and high estimates of the amount of carbon released per acre from wildfire.

It should be noted that not all potential benefits of MCC were included in this analysis due to limitations of the data available. For example, MCC's wildfire reduction efforts likely avoided property loss and costs related to post-wildfire recovery typically borne by a combination of federal, state, and local government sources. Private homeowners, private insurance firms, and government agencies that engage in disaster recovery benefit from those avoided costs. However, due to the lack of data to demonstrate robust causal relationships between the treatments and damages that would have otherwise occurred, those benefits are not included in the analysis.

Habitat Improvement Benefits Attributable to MCC

Restoration of habitats, which reduces invasive species presence and increases native species presence, increases ecosystem services to society (The Watershed Company, 2015; Zavaleta, 2000). To monetize the increase in ecosystem services due to MCC programming, the analysis first determined the number and composition of acres restored based on MCC-provided data. The analysis then proceeded to:

1. Estimate the value per acre of various ecosystem types, by including varying ranges of ecosystem services in each of the low, average, and high estimates (ESSRTI, 2021)
2. Multiply the estimated value per acre by the MCC-provided ecosystem acres treated
3. The stream of benefits was then discounted based on regrowth estimates (Bartels et al., 2016). The cumulative decrease is 84 percent by the end of the study period (roughly 1.2 percent per year for the first 10 years, and roughly 3.7 percent per year thereafter).

Table 12 presents the discounted benefits to society over the three time scenarios and three environmental impact levels generated by the ecosystem restoration activities during the 2021–2022 program year.

Table 12. Total Value of Ecosystem Restoration Services (2023\$)

Value of ecosystem services	Short-term	Medium-term	Long-term
Low*	\$4,223,821	\$47,085,516	\$61,731,638
Average*	\$10,262,031	\$114,397,138	\$149,980,785
High*	\$20,965,005	\$233,709,724	\$306,405,986

*These impact levels represent low, average, and high estimates of the ecosystem service values per acre from restoration activities.

Trail Maintenance and Creation Benefits Attributable to MCC

Trails are associated with increased health (Wang et al., 2005) and enjoyment (Oh and Hammitt, 2010) for individuals who use them. To monetize this aspect of MCC's work, the analysis first determined the number of miles and state in which those trails were located based on MCC-provided data. The analysis then proceeded to:

1. Estimate per-mile total benefits for trails using health outcome values (Wang et al., 2005) and recreational use values (Oh and Hammitt, 2010)
2. Estimate per-year maintenance costs for backcountry hiking and biking trails (Echelberger and Plumley, 1986) to be used as a flat discount rate for benefits accrued following the maintenance or construction year to generate a net benefit value
3. Multiply the number of miles of trail in each state maintained or created by the net benefits

Table 13 presents the discounted benefits to society from trail maintenance and creation activities during the 2021–2022 program year over the three scenarios.

Table 13. Total Value of Trail Maintenance and Creation Services (2023\$)

Source of benefit	Short-term	Medium-term	Long-term
Health benefits	\$4,448	\$55,623	\$110,452
Recreation benefits	\$499	\$6,243	\$12,398

Forgone Benefits (Opportunity Costs)

The analysis incorporated two forgone benefits (opportunity costs) into each of the three ROI calculations for MCC: a professional opportunity cost to MCC AmeriCorps members and an investment opportunity cost to funders. The forgone benefits are subtracted from the program benefits to calculate the net benefits of the program. Those net benefits are then compared to program cost to calculate the ROI. These forgone benefits are referred to as the *professional and investment opportunity costs*.

Professional Opportunity Cost to MCC AmeriCorps Members

The first forgone benefit (opportunity cost) was the professional opportunity cost to MCC AmeriCorps members for their period of national service, during which they could otherwise be working and earning higher pay. To calculate this, this analysis estimated what MCC AmeriCorps members would have earned if they did not serve in MCC. Specifically, this analysis estimated the weighted average annual earnings of this group as well as their weighted unemployment rate using the demographic distribution of MCC AmeriCorps members for the 2021–2022 program year and ASEC data. The demographics included were gender, age, race/ethnicity, and pre-service highest level of education. The weighted average annual earnings represent the expected earnings of the MCC AmeriCorps members if they were employed, not serving in MCC. The weighted unemployment rate represents how many of the MCC AmeriCorps members would have been unemployed if they did not serve in MCC. These weighted metrics were first used to estimate the portion of MCC members who would have been employed and then to calculate the aggregate earnings those employed individuals would have made without serving in MCC. Namely, they are used to calculate the aggregate post-tax earnings this population would forgo due to serving with MCC for 1 year.

Some of the forgone earnings would have been paid in the form of taxes. To appropriately allocate opportunity costs between MCC AmeriCorps members and state and federal governments, the analysis estimated the reduced tax revenue for federal income, state income, Social Security, and Medicare taxes. The analysis also estimated the reduction in sales tax from reduced consumption. These taxes combined represent what the various levels of government are forgoing in tax revenue when these individuals decide to serve in MCC instead of working for higher pay. The summation of all forgone taxes and the forgone post-tax earnings of MCC AmeriCorps members is called the *total professional opportunity cost*.

It is important to note that in the *federal government benefits per federal dollar* ROI calculation, only federal government (not total) benefits are included. Given this, only federal components of the professional opportunity cost are subtracted from all federal government benefits (i.e., forgone federal income, Social Security, and Medicare taxes) realized as a result of MCC in this ROI calculation. The parts of the professional opportunity cost removed from these total federal government benefits include the federal income, Social Security, and Medicare taxes forgone due to MCC AmeriCorps members forgoing earnings during their service year. The summation of these forgone federal taxes is called the *federal professional opportunity cost*.

Investment Opportunity Cost to Funders

The forgone benefit used in this ROI analysis is an investment opportunity cost. It estimates the expected forgone return if all funds used to support MCC during the 2021–2022 program year were invested in U.S. Treasury bonds instead. To calculate this, the analysis matched the 2021 real interest rates provided by the Office of Management and Budget (2020) to each of the scenarios leveraged in this ROI

analysis: short-term, medium-term, and long-term.³¹ The rates of return for U.S. Treasury bonds provide a market-based estimate of return for low-risk investments. The real interest rate for the 3-year maturity is used for the short-term scenario, the average between the 10-year and 20-year maturity rates is used as the rate for the medium-term scenario, and the 30-year maturity rate is used for the long-term scenario. These real interest rates are -1.8, -0.8, and -0.3 percent, respectively (Office of Management and Budget, 2020). Also, the number of time periods elapsed on these bonds is equal to the number of years the short-term, medium-term, and long-term scenarios assume MCC AmeriCorps members' employment and earnings gains are sustained: 1 year, 15 years, and 30 years, respectively. These bonds compound bi-annually according to the U.S. Department of the Treasury (2019). The forgone accrued interest was calculated for each of the three scenarios if the funding amount used to support MCC was instead invested. Note that for 1) the *federal government benefits per federal dollar* ROI calculation and 2) the *total benefits per federal dollar* ROI calculation, the investment opportunity cost subtracted from the benefits in these calculations is the forgone accrued interest from investing only the federal funds into these U.S. Treasury bonds. This is called the *federal investment opportunity cost*. This is because these ROI calculations only include federal government (not total) program costs. For the other ROI calculation estimated in this analysis, the investment opportunity cost subtracted from the benefits realized is the accrued interest from investing all MCC funds (both federal and non-federal) into these U.S. Treasury bonds. This is called the *total investment opportunity cost*. See Appendix B for details.

Program Costs

The costs used in this analysis are specific to the 2021–2022 MCC program year. MCC costs for the 2021–2022 program year include operating costs, AmeriCorps member expenses, and other costs (shown in Table 14). Operating costs capture the majority of expenses, which include construction-related expenses, in-kind labor, and other program staff costs. AmeriCorps member expenses include the living allowance and other benefits members receive during service. Non-AmeriCorps member expenses and other costs are indirect costs incurred by MCC from engaging volunteers not associated with AmeriCorps.³²

³¹ The analysis used 2021 real interest rates for U.S. Treasury bonds because the MCC AmeriCorps program year analyzed began in 2021.

³² MCC (2023)

Table 14. MCC Program Costs, 2021–2022 Program Year

Cost category	Value
Operating	\$4,350,150
AmeriCorps member expenses	\$4,399,271
Non-AmeriCorps member expenses	\$100,000
Other	\$730,029
Total	\$9,579,450

Source: MCC (2023)

ROI Study Limitations

Study limitations include the inability to capture all benefits that stem from MCC due to the lack of data to demonstrate robust causal relationships between the treatments and damages that would have otherwise occurred. Without robust evidence of a causal link, the ROI cannot account for reductions in private costs (homeowner and private insurer) or costs to the federal government (federal disaster recovery spending following wildfires or floods).

Insufficient Data to Attribute Post-Wildfire/Post-Flood Recovery Savings to Government and Private Sector Entities

Post-wildfire recovery is typically funded by a combination of federal, state, and local government sources. These sources of savings could include private homeowners, private insurance firms, and federal disaster recovery spending that result from their activities following severe wildfires and floods. In addition, there is insufficient data to determine the per-acre cost of recovery funding by funding source. This is due to a lack of data defining the causal relationship between the acres prevented from burning and flooding by MCC and savings to the federal government on disaster relief. Because of these limitations, the analysis could not break out federal government savings on post-wildfire and post-flood recovery due to MCC's work. To provide conservative ROI estimates, the analysis assumed *there are no* government savings on post-wildfire and post-flood recovery either to state and local or the federal government. The resulting ROI calculations are likely underestimates given the exclusion of that benefit.

Program Benefits, Forgone Benefits (Opportunity Cost), Program Costs, and ROI Results

This section provides estimates of program benefits, forgone benefits (opportunity costs), and program costs, along with the ROI results.

Program Benefits

Table 15 shows MCC benefits by stakeholder group for each of the three scenarios. Benefits to society are provided based on low, average, and high estimates of ecosystem benefits.

Table 15. Benefits by Recipient

Recipient		Benefits by scenario		
		Short-term	Medium-term	Long-term
AmeriCorps members		\$2,186,738	\$13,148,672	\$24,166,702
Federal government		\$97,836	\$3,569,056	\$6,095,052
State & local governments		\$144,727	\$217,813	\$263,616
	Low*	\$5,099,981	\$57,513,734	\$77,776,610
Society	Average*	\$20,942,078	\$244,892,999	\$361,613,621
	High*	\$72,711,943	\$868,650,524	\$1,344,609,086
Total	Low*	\$7,185,974	\$72,278,706	\$106,651,813
	Average*	\$23,028,071	\$259,657,971	\$390,488,824
	High*	\$74,797,936	\$883,415,496	\$1,373,484,289

*These benefit estimates include ecosystem benefits based on low, average, and high estimates from the literature.

Table 16 shows the percentage breakdown of program benefits by stakeholder group over the three scenarios examined in this report. As a result of the large ecosystem service benefits to society that accrue over time, a majority of benefits for the medium- and long-term scenarios are attributed to society.

Table 16. Percentage of Program Benefits by Stakeholder Group

Recipient		Benefits by scenario		
		Short-term*	Medium-term*	Long-term*
AmeriCorps members		9.36% (29.04%, 2.91%)	5.02% (17.66%, 1.48%)	6.16% (22.31%, 1.76%)
Federal government		0.42% (1.30%, 0.13%)	1.36% (4.79%, 0.40%)	1.55% (5.63%, 0.44%)
State & local governments		0.62% (1.92%, 0.19%)	0.08% (0.29%, 0.02%)	0.07% (0.24%, 0.02%)
Society		89.61% (67.74%, 96.77%)	93.53% (77.25%, 98.09%)	92.22% (71.81%, 97.78%)

*The percentage values are presented for an average ecosystem service value. Low to high ecosystem service value ranges are presented in parentheses.

Forgone Benefits (Opportunity Costs)

Table 17 shows the breakdown of the forgone benefits from the professional opportunity cost to MCC AmeriCorps members and state and federal governments in net present 2023 dollars. It provides the amount of post-tax earnings that members forgo—and the associated taxes forgone—to serve with MCC. This is called the *total professional opportunity cost*. For the *federal government benefits per federal dollar ROI* calculation, the forgone federal income, Social Security, and Medicare taxes were subtracted from the total federal benefits that are realized due to the MCC program. The sum of forgone federal taxes is called the *federal professional opportunity cost*.

Table 17. Forgone Benefits From Professional Opportunity Cost

Forgone category	Professional opportunity cost amount across all scenarios (2023\$)
Post-tax earnings	\$3,367,080
Federal income, Social Security, and Medicare taxes	-\$728,825
State income taxes	-\$133,205
State sales taxes	-\$266,411
Total	\$2,238,639

Table 18 lists the forgone benefits from the investment opportunity cost incurred by scenario. The table shows two versions of the investment opportunity cost, based on:

- a) Total MCC program funds invested in U.S. Treasury bonds. This version was used in the *total benefits per federal dollar* and *total benefits per funder dollar ROI* calculations.
- b) Only federal MCC program funds (both program and education award funding) invested in U.S. Treasury bonds. This version was used in the *federal government benefits per federal dollar ROI* calculation.

Table 18 column headers list the 2021 real interest rates for U.S. Treasury bonds and the number of years elapsed (with two payments a year). These values were used to calculate the forgone accrued interest value for each scenario.

Table 18. Investment Opportunity Cost by Scenario and Funding Stream

Funding stream	Forgone accrued interest by scenario		
	Short-term (-1.80% interest rate and 1 year elapsed)	Medium-term (-0.80% interest rate and 15 years elapsed)	Long-term (-0.30% interest rate and 30 years elapsed)
Total MCC program funding	-\$195,257	-\$1,234,512	-\$938,533
Federal MCC program funding only	-\$171,113	-\$1,081,865	-\$822,484

Program Funding

Table 19 shows the funding sources of MCC for the 2021–2022 program year provided by the program. MCC is partly funded through fees charged to federal agencies other than AmeriCorps and other non-federal groups for its services, and funding does not directly match costs in a given program year. During the 2021–2022 program year, MCC ran a small surplus.

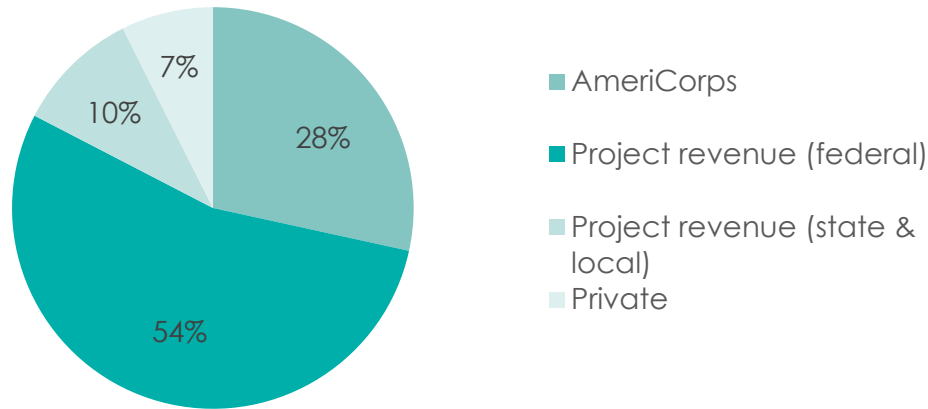
Table 19. Program Funding by Source for MCC

Funder	Funding provided for the program year
AmeriCorps	\$2,842,634
Project revenue (federal)	\$5,417,366
Project revenue (state & local)	\$1,000,000
Private	\$740,000
Total	\$10,000,000

Note: Numbers may not sum due to rounding.

Figure 2. Program Cost by Funding Source, shows the breakdown of program funding by source shown in Table 14.

Figure 2. Program Cost by Funding Source



Note: Percentages may not sum to 100 percent due to rounding.

ROI Results

This analysis developed three ROI estimates using the three scenarios (short-term, medium-term, and long-term). As noted above, the ROI calculations compare the net benefits of MCC activities with program costs to calculate the ROI. Table 20 shows the program gross benefits, forgone benefits, net benefits, and costs of MCC programming that are used in three ROI calculations.

Table 20. Program Benefits, Net Benefits and Program Costs by ROI Scenario

Costs/benefit	ROI scenario		
	Short-term	Medium-term	Long-term
Program cost	\$10,896,636	\$10,896,636	\$10,896,636
Federal government cost	\$9,549,273	\$9,549,273	\$9,549,273
Non-federal government cost	\$1,347,363	\$1,347,363	\$1,347,363
Total program gross benefits*	\$23,613,942	\$265,615,409	\$398,497,659
Environmental benefits to society – low	\$5,099,981	\$57,513,734	\$77,776,610
Environmental benefits to society – medium	\$20,942,078	\$244,892,999	\$361,613,621
Environmental benefits to society – high	\$72,711,943	\$868,650,524	\$1,344,609,086
Member benefits	\$2,429,301	\$16,935,541	\$30,525,370
Federal government benefits	\$97,836	\$3,569,056	\$6,095,052
State/local government benefits	\$144,727	\$217,813	\$263,616
Total forgone benefits (opportunity costs)	-\$3,501,032	-\$2,461,777	-\$2,757,755
Forgone benefits to members (forgone earnings post-taxes)	-\$3,367,079.63	-\$3,367,079.63	-\$3,367,079.63
Forgone tax revenue from members earnings	-\$329,209.21	-\$329,209.21	-\$329,209.21
Forgone tax revenue federal government	-\$728,824.98	-\$728,824.98	-\$728,824.98

Costs/benefit	ROI scenario		
	Short-term	Medium-term	Long-term
Forgone tax revenue state/local government	\$399,615.77	\$399,615.77	\$399,615.77
Forgone benefits from total investment interests/returns (all funders)	\$195,257	\$1,234,512	\$938,533
Forgone benefits from federal government investment/returns	\$147,511	\$932,638	\$709,034
Total program net benefits (total program gross benefits – total forgone benefits)			
Net benefits members (member benefits – forgone benefits members)	\$2,429,301	\$16,935,541	\$30,525,370
Net benefits federal government (federal government benefits – forgone tax revenue federal government – forgone benefits from federal government investment/returns)	\$97,836	\$3,569,056	\$6,095,052
Net benefits state/local government and other funders (state/local government benefits – forgone tax revenue state/local government)	\$144,727	\$217,813	\$263,616
ROI for total benefits per federal dollar ([net benefits federal government + environmental benefits] / federal government cost)**			
With low ecosystem benefits	\$0.73	\$7.75	\$11.66
With average ecosystem benefits	\$2.39	\$27.37	\$41.38
With high ecosystem benefits	\$7.81	\$92.69	\$144.32
ROI for total benefits per funder dollar ([total program net benefits + environmental benefits] / program cost)**			
With low ecosystem benefits	\$0.66	\$6.39	\$9.90
With average ecosystem benefits	\$1.70	\$23.58	\$35.95
With high ecosystem benefits	\$6.45	\$80.83	\$126.16
Federal government benefits per federal dollar (net benefits federal government / federal government cost)	-\$0.02	\$0.18	\$0.49

*Total program gross benefits utilize the average ecosystem service values.

**These ROI estimates are provided based on low, average, and high estimates of ecosystem benefits to society.

Table 21 shows the ROI results. Each row represents a different ROI calculation depending on which benefits are considered (all benefits or only benefits to the federal government) and which funding is considered (federal funding only or all funding).

For the portion of the benefits analysis that measured ecosystem benefits, this study used low, average, and high estimates of those benefits based on the literature. Doing so allowed for the uncertainty involved in monetizing ecosystem benefits.

The analysis used three different scenarios to estimate benefits under different assumptions. Specifically, the study assumed that increased earnings attributable to the programs last for 1 year (short-term scenario), 15 years (medium-term), or 30 years (long-term).

The ROIs are presented as dollars returned for every dollar of investment.

Table 21. ROI Results for MCC

ROI calculation	ROI scenario		
	Short-term	Medium-term	Long-term
ROI for total benefits per federal dollar ([net benefits federal government + environmental benefits] / federal government cost)*			
With low ecosystem benefits	\$0.73	\$7.75	\$11.66
With average ecosystem benefits	\$2.39	\$27.37	\$41.38
With high ecosystem benefits	\$7.81	\$92.69	\$144.32
ROI for total benefits per funder dollar ([total program net benefits + environmental benefits] / program cost)*			
With low ecosystem benefits	\$0.66	\$6.39	\$9.90
With average ecosystem benefits	\$1.70	\$23.58	\$35.95
With high ecosystem benefits	\$6.45	\$80.83	\$126.16
Federal government benefits per federal dollar (net benefits federal government / federal government cost)	-\$0.02	\$0.18	\$0.49

*These ROI estimates are provided based on low, average, and high estimates of ecosystem benefits to society.

The program produces strong returns for the medium- and long-term scenarios when benefits to AmeriCorps members, program participants, and state/local governments are included. This is indicated by the results of the *total benefits per federal dollar* and the *total benefits per funder dollar* ROI calculations for these two scenarios. In the short-term scenario—which only includes benefits for 1 year post-program—all of the ROI results indicate a positive return on funding invested in the program. The ROI of \$0.66 for the *total benefits per funder dollar* calculation with the low set of ecosystem benefit estimates is below the break-even point on funding invested, as is the *total benefits per federal dollar* calculation under low ecosystem benefits. All other scenarios and ecosystem benefit levels show positive returns.

The *federal government benefits per federal dollar* calculations estimate losses for all three scenarios. As a program that is intended primarily to generate benefits to society, rather than benefits to the federal government, these results are consistent with the design of MCC. In addition, existing data do not make it possible to attribute post-wildfire and post-flood event recovery savings to the federal government, such as savings in federal disaster recovery expenditures. (See ROI Study Limitations on page 25.) Including these potential savings in expenditures would lead to a higher ROI for the federal government than this analysis estimates.

The magnitude of the positive ROI estimates is driven by the following factors:

- **Increased ecosystem service values from installation of BDAs.** Societal benefits from the installation of BDAs accrue and do not diminish over time due to the continued drought prevention and ecosystem improvement services they provide.
- **Reduction in wildfire-related costs.** Societal benefits from reduced severity of wildfires accrue but diminish over time as potential fuel reaccumulates.
- **Increased ecosystem service values from reduced invasive species.** Societal benefits from increased ecosystem services accrue but diminish over time as invasive species return.
- **Benefits from trail maintenance and creation.** Societal benefits from access and use of trails accrue over time, but diminish as trails naturally deteriorate.
- **The educational attainment outcomes of AmeriCorps members.** After serving in the AmeriCorps program, AmeriCorps members receive an education award, which is used by a portion of members to help pay for postsecondary degrees post-service. The additional educational attainment resulting from the use of the education award generates additional earnings for AmeriCorps members.
- **The employment outcomes of AmeriCorps members.** Past studies establish that AmeriCorps members experience increased employment and increased earnings post-service.

Government funding serves as a catalyst for private funding of evidence-based social services programs. For the ROI calculations of 1) *total benefits per federal dollar* and 2) *total benefits per funder dollar*, AmeriCorps's requirement of match funding also contributed to the magnitude of outcomes. Federal government funding of MCC serves as a catalyst for other funding, specifically that from state and local governments. This additional funding—amounting to about \$1,740,000 for MCC for the studied program year—allowed MCC to operate at a larger scale than otherwise would have been possible under the federal funding alone. Though it may not impact the ROI, because it is a per-unit metric, match funding leads to greater investment in MCC and thus to greater impact.

Recommendations for Further Research

Future ROI studies for national and community service programs, such as the MCC program, can be strengthened in several ways.

Recommendation 1: Determine the persistence of short- and long-term impacts for program participants and AmeriCorps members. The persistence of impacts, such as earnings or employment, is often not measured in evaluations because it requires long-term tracking. Although a scenario-based approach that accounts for variations in the persistence of impacts can be used, as was completed in this ROI analysis, rigorous research on the long-term impact of programming will enable AmeriCorps to determine a single value for ROI calculations and avoid relying on the scenario-based approach.

For example, Friedman et al. (2016) reported the unemployment status of AmeriCorps member alumni 6 months before service, 6 months after service, and during the summer of 2016. The authors indicate that data for the latter timepoint was collected anywhere from 3 to 11 years after service completion, depending on the AmeriCorps member alumni cohort (i.e., 2005, 2010, or 2013). Thus, instead of collecting outcome measures at a time that varies by AmeriCorps member or program participant, studies should track outcomes of interest at the same intervals, multiple times after program or service completion, to provide greater insight into the duration and consistency of benefits.

Recommendation 2: Document outcomes using third-party data sources. Using third-party data, along with or in place of self-reported data, can also improve the accuracy of program outcome measurements. While self-reported data are easier to obtain—especially via the use of survey instruments—they have several disadvantages. Some answers may be exaggerated, respondents may not answer honestly, and response biases could affect results. AmeriCorps programs should—where possible—leverage data from third-party sources either to provide data for their program evaluation or to corroborate findings from self-reported data. For example, if employment and earnings outcomes are of interest, unemployment insurance data—which are submitted by employers—could be used to verify members' wages or employment status post-service. Additionally, if degree completion data are of interest, such as in the case of this ROI analysis, data from the National Student Clearinghouse (NSC) could be used to verify what portion of MCC AmeriCorps members pursued higher education and which degrees were completed post-program with the help of the education award. Were degree or employment outcomes data from third-party data sources (like NSC) available, those data may make more precise ROI estimates possible.

Recommendation 3: Quantify federal disaster funding from wildfire and flood events. Federal disaster recovery spending has been significant following wildfires and flood events in recent years. These funds are primarily allocated for temporary and recovery housing for individuals whose homes were destroyed. Additional research on relationship between federal disaster funding and wildfire/flood characteristics (such as acreage impacted and proximity to population centers) would allow researchers to estimate the extent to which MCC's wildfire reduction and BDA installation results in federal cost savings in the form of reduced federal disaster recovery spending.

Recommendation 4: Quantify the change in value of regrowth due to carbon sinks. As forests and other ecosystems regrow following a wildfire, the carbon consumed in plants growth is drawn out of the atmosphere. Currently, this analysis assumes that after a full period of regrowth, there would be a net-zero impact on carbon dioxide equivalents emissions in the atmosphere. Future additions to this methodology should examine the nuances of regrowth carbon storage to determine if this assumption is valid.

Recommendation 5: Quantify private funds used for wildfire and flood restoration. Private funds from property owners and insurance companies are used to restore property damage caused by wildfires and floods. Additional research on the relationship between private funding and wildfire/flood characteristics (such as population density near the locations, as well as causal links from specific acres

impacted to property damage occurring) would allow researchers to estimate the impact of MCC's activities on private funds spent on wildfire or flood recovery efforts.

Conclusion

Based upon these findings, investment in the MCC program results in favorable impacts, especially under the medium- and long-term scenarios as benefits accumulate. Despite the large societal benefits, the federal government does not experience a break-even ROI from MCC at any time frame.

Appendix A: Program Benefits, Forgone Benefits, and Program Costs Included in ROI Calculations

In Table 22, the three columns on the right indicate by an “X” if the program benefits, forgone benefits (opportunity cost), or program cost is included in the numerator or denominator of an ROI calculation.

Table 22. Program Benefits, Forgone Benefits, and Program Costs Included in ROI Calculations

Benefit or cost			Total benefits per federal dollar	Total benefits per funder dollar	Federal government benefits per federal dollar
Benefit	Stakeholder group	Data sources	X indicates inclusion in the ROI numerator		
Improved ecosystem services from BDA installation	Society	<ul style="list-style-type: none"> MCC Thompson et al. (2020) Wilson and Norman (2018) 	X	X	
Improved carbon sequestration from BDA installation	Society	<ul style="list-style-type: none"> MCC Thompson et al. (2020) 	X	X	
Benefits from extreme event moderation from BDA installation	Society	<ul style="list-style-type: none"> MCC Thompson et al. (2020) 	X	X	
Improved water quality benefits from BDA installation	Society	<ul style="list-style-type: none"> MCC Thompson et al. (2020) Rennert et al. (2022) 	X	X	

Benefit or cost			Total benefits per federal dollar	Total benefits per funder dollar	Federal government benefits per federal dollar
Avoided costs to society from wildfires	Society	<ul style="list-style-type: none"> MCC Cochrane et al. (2012) 	X	X	
Avoided costs to government from wildfires	Federal, state, and local governments	<ul style="list-style-type: none"> MCC Batker et al (2013) Moeltner et al. (2013) 	X	X	
Increased ecosystem services	Society	<ul style="list-style-type: none"> Dodds et al. (2008) The Watershed Company (2015) 	X	X	
Health and recreational benefits of trails	Society	<ul style="list-style-type: none"> MCC Oh et al. (2010) Wang et al. (2005) 	X	X	
Increased earnings of national service members due to increased employment and education of AmeriCorps members	AmeriCorps members	<ul style="list-style-type: none"> MCC Friedman et al. (2016) U.S. Census Bureau (2021-a) U.S. Bureau of Labor Statistics (2019-a) U.S. Bureau of Labor Statistics (2019-b) 	X	X	

Benefit or cost			Total benefits per federal dollar	Total benefits per funder dollar	Federal government benefits per federal dollar
Increased federal and state income tax revenue due to increased earnings of AmeriCorps members	Federal and state governments	<ul style="list-style-type: none"> • MCC • Friedman et al. (2016) • U.S. Census Bureau (2021-a) • U.S. Bureau of Labor Statistics (2019-a) • Tax rate data on Bankrate.com and Loughead (Tax Foundation, 2020) 	X	X	X
Increased Social Security and Medicare tax revenue due to increased earnings of AmeriCorps members	Federal government	<ul style="list-style-type: none"> • MCC • Friedman et al. (2016) • U.S. Census Bureau (2021-a) • U.S. Bureau of Labor Statistics (2019-a) • Social Security Administration (2020) 	X	X	X

Benefit or cost			Total benefits per federal dollar	Total benefits per funder dollar	Federal government benefits per federal dollar
Increased sales tax revenue due to increased earnings of AmeriCorps members	State and local governments	<ul style="list-style-type: none"> MCC Friedman et al. (2016) U.S. Census Bureau (2021-a) U.S. Bureau of Labor Statistics (2019-a) U.S. Bureau of Labor Statistics (2021) Loughead (Tax Foundation, 2020) 	X	X	
AmeriCorps member living allowances and education awards	AmeriCorps members	<ul style="list-style-type: none"> MCC 	X	X	
Reduced spending on lifetime public assistance, corrections, and social insurance due to increased educational attainment of AmeriCorps members	Federal, state, and local governments	<ul style="list-style-type: none"> Trostel (2015) Zeidenberg et al. (2016) U.S. Census Bureau (2021-a) 	X	X	X
Forgone benefits (opportunity costs)	Stakeholder group	Data sources	X indicates inclusion in the ROI denominator		
Opportunity costs of forgone market wages for AmeriCorps members	AmeriCorps members	<ul style="list-style-type: none"> MCC U.S. Census Bureau (2021-a) U.S. Bureau of Labor Statistics (2019-b) 	X	X	X

Benefit or cost			Total benefits per federal dollar	Total benefits per funder dollar	Federal government benefits per federal dollar
Opportunity costs of federal taxes on forgone market wages for AmeriCorps members (e.g., federal income and social security taxes)	Federal government	<ul style="list-style-type: none"> MCC U.S. Census Bureau (2021-a) U.S. Bureau of Labor Statistics (2019-a) U.S. Bureau of Labor Statistics (2019-b) Tax rate data on Bankrate.com and Loughead (Tax Foundation, 2020) Social Security Administration (2020) 	X	X	X
Opportunity costs of state and local taxes on forgone market wages for AmeriCorps members (e.g., state income and state/local sales taxes)	State and local governments	<ul style="list-style-type: none"> MCC U.S. Census Bureau (2021-a) U.S. Bureau of Labor Statistics (2019-a) U.S. Bureau of Labor Statistics (2019-b) U.S. Bureau of Labor Statistics (2021) Loughead (Tax Foundation, 2020) 	X	X	X

Benefit or cost			Total benefits per federal dollar	Total benefits per funder dollar	Federal government benefits per federal dollar
Opportunity costs of federal funders	Federal government	<ul style="list-style-type: none"> AmeriCorps U.S. Treasury Department 	X	X	X
Opportunity costs of other program funders	Non-government funders	<ul style="list-style-type: none"> MCC U.S. Treasury Department 		X	
Program cost	Payer	Data sources	X indicates inclusion in the ROI denominator		
AmeriCorps grant costs (excluding living allowances and education awards provided to AmeriCorps members)	Federal government (AmeriCorps)	<ul style="list-style-type: none"> AmeriCorps 	X	X	X
AmeriCorps member living allowances and education awards	Federal government (AmeriCorps)	<ul style="list-style-type: none"> AmeriCorps 	X	X	X
Montana Conservation Corp (MCC) costs	MCC	<ul style="list-style-type: none"> MCC 		X	
Other federal government funding (not provided by AmeriCorps)	Federal government	<ul style="list-style-type: none"> MCC 	X	X	X
State and local government funding	State and local governments	<ul style="list-style-type: none"> MCC 		X	
Other non-government costs	Non-government funders	<ul style="list-style-type: none"> MCC 		X	

Appendix B: Additional Information on the Methodology

This appendix provides additional details on the methodology used for this study, as a supplement to the methodology section in the main report. It describes the steps used to calculate the ROI, the results of interim calculations that contribute to the ROI calculations, and assumptions that underlie the analysis.

Methodology Overview

Calculating the ROI for MCC included the following steps:

- Measuring and monetizing program benefits to MCC program participants, MCC AmeriCorps members, and the different levels of government
- Estimating forgone benefits (opportunity costs)
- Assessing program costs
- Calculating the ROI

This ROI analysis included only those benefits that could be reasonably monetized given the available data and that likely would not have occurred without MCC.

Although MCC AmeriCorps members experience positive benefits from MCC in terms of increased employment and earnings (described below), available data do not establish how long these specific impacts are sustained over time. To address a range of possible durations for those benefits, three scenarios were developed for this ROI study:

- **Short-term.** This scenario assumes short-term earnings impacts. The assumption is that earnings impacts are limited to a single year after program exit. This scenario also assumes no lifetime benefits are realized.
- **Medium-term.** This scenario assumes a longer duration of earnings impacts. The assumption is that earnings impacts last 15 years. A 3 percent discount rate is applied each year to represent net present value in 2020 dollars.³³ This scenario also assumes only half of the net present value of lifetime benefits is realized.
- **Long-term.** This scenario assumes sustained earnings impacts throughout MCC AmeriCorps members' working years. The assumption is that earnings impacts last 30 years. A 3 percent discount rate is applied each year to represent net present value in 2020 dollars. This scenario also assumes the entire net present value of lifetime benefits is realized.

There are some differences between the three scenarios. One is the length of time that increased employment—and earnings associated with that employment—are

³³ The Office of Management and Budget (1992) defines a discount rate as, "The interest rate used in calculating the present value of expected yearly benefits and costs" (p. 18). Regarding the 3 percent discount rate, see Office of Management and Budget (2003).

sustained. The other is what portion of lifetime benefits, when applicable, are realized.³⁴ For each ROI calculation, three estimates using the three scenarios were developed, which is shown in greater detail in the Calculating ROI section.

Measuring Program Benefits

The first step in calculating the ROI for MCC is to measure and monetize the program benefits. MCC program participants, MCC AmeriCorps members, and various levels of government benefit from MCC activities. These benefits were identified through an extensive literature review and data collection process. The methods used to measure benefits for each of these stakeholder groups are described below.

Benefits to the MCC AmeriCorps Members

The MCC AmeriCorps members who provide services as part of MCC benefit from their national service. This analysis estimated the following benefits:

- Living allowance
- Increased earnings due to reduced unemployment

Living Allowance and Education Award

Living allowances are given to AmeriCorps members during their 1-year service term to pay for various living expenses—such as housing and groceries—and it sometimes includes members' workers' compensation and health insurance when applicable. Regarding education awards, according to Friedman et al. (2016), a significant portion (i.e., 46 percent) of AmeriCorps State and National member alumni use them to pay for additional postsecondary education at colleges, graduate schools, and technical/vocational schools, while others (i.e., 33 percent) use them to pay off outstanding student loans. The remaining 21 percent do not use their education awards.

Both the living allowances and education awards (considered one-time benefits that are not discounted or spread over time) are taxable and represent member benefits. However, only the portion of education awards used by members to pay off existing student loans is considered a direct member benefit. The portion that is utilized to pursue further postsecondary education is only used in calculating members' additional lifetime earnings due to the increased educational attainment they experience post-service from using the education award. This is done to avoid double counting. This analysis included the post-tax values of the living allowance and the portion of the education award used to repay student loans as MCC AmeriCorps member benefits,

³⁴ These three scenarios consider varying durations of how long increased employment and earnings benefits last for MCC AmeriCorps members. They also consider varying durations for lifetime benefits that stem from MCC. For example, lifetime benefits in terms of decreased public assistance, social insurance, and corrections costs result from MCC AmeriCorps members' higher educational attainment post-service. The analysis estimates lifetime benefits differently in the three scenarios. Specifically, the net present value of the entire lifetime benefit is realized for the long-term scenario, half of the net present value of the lifetime benefit is realized for the medium-term scenario, and no lifetime benefit amount is realized for the short-term scenario.

which are listed in Table 23. The portion of the education award used to fund additional postsecondary education is discussed in the following section.

Table 23. MCC AmeriCorps Member Benefits From the Living Allowance and Education Award

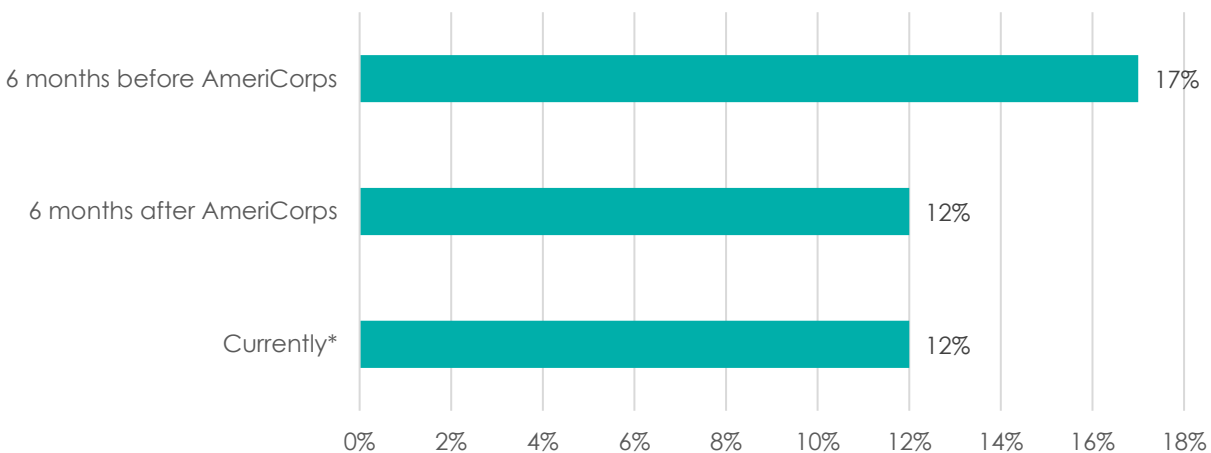
Benefit	Post-tax value	Notes
Living allowance	\$3,744,385	Post-tax living allowances members receive during service
Education award used to pay off student loans	\$520,315	Post-tax education award amount used to pay off outstanding student loans
Total	\$4,264,700	

Sources: Friedman et al. (2016) and MCC (2023)

Increased Earnings due to Reduced Unemployment

According to Friedman et al. (2016), the percentage of AmeriCorps members unemployed was 5 percentage points lower 6 months after serving in AmeriCorps compared to 6 months before serving. The study did not provide actual employment rates for AmeriCorps members pre- and post-service but instead provided the unemployment rates shown in Figure 3 (17 percent vs. 12 percent) in which the change between them represents a 5-percentage-point decrease.

Figure 3. Percentage of AmeriCorps Alumni Seeking Work, Providing Caregiving, or Occupied Outside of the Workforce From Friedman et al. (2016)



*"Currently" refers to the summer 2016 survey. Respondents were from the 2005, 2010, and 2013 AmeriCorps cohorts, so respondents varied in how much time had elapsed since their AmeriCorps service.

A direct member benefit from being employed post-service is additional income earned. To monetize this 5-percentage-point decrease in unemployment, ICF requested that MCC provide the gender, age, pre-service educational attainment, and race/ethnicity distribution of AmeriCorps members who served with the MCC program for the most recent program year. Based on those demographics, the analysis used annual average earnings data from the Current Population Survey's Annual Social and Economic (ASEC) Supplement for March 2019 to estimate MCC AmeriCorps members' additional earnings due to the reduced unemployment (U.S. Census Bureau, 2019).

Specifically, the analysis used ASEC data to calculate the per-person pre-tax average annual earnings for 18- to 34-year-olds weighted by the demographic distribution of MCC AmeriCorps members who served during the 2021–2022 program year. This value was \$35,195, as shown in Table 24. The analysis then multiplied the 5-percentage-point decrease in unemployment from Friedman et al. (2016) by the number of MCC AmeriCorps member full-time equivalents (FTEs) who served during the most recent program year (i.e., 238). This estimated the number of *additional* MCC AmeriCorps member FTEs employed due to national service (i.e., 12). To estimate the additional pre-tax earnings that stemmed from the reduced unemployment, the \$418,824 annual earnings amount was multiplied by the additional number of MCC AmeriCorps members employed post-service. This represents the additional income earned by MCC AmeriCorps members due to serving with MCC.

Table 24. Additional Pre-tax Earnings for MCC AmeriCorps Members From Reduced Unemployment Based on MCC AmeriCorps Member Demographics

Metric	Value (2023\$)
Average per-person pre-tax annual earnings of employed 18- to 34-year-olds weighted by MCC AmeriCorps member demographics (e.g., gender, race/ethnicity, and pre-service education level)	\$35,195
Reduction in AmeriCorps members' unemployment	5%
Total expected increase in earnings, per member	\$1,760
MCC AmeriCorps member FTEs	238
Cumulative additional pre-tax earnings*	\$418,824
Cumulative additional post-tax earnings*	\$396,063

*This value is undiscounted; thus, the values do not sum in the table.

Sources: MCC (2023), Friedman et al. (2016), and U.S. Census Bureau (2019)

To avoid double counting, the additional *post-tax* earnings is used to calculate the direct benefit to MCC AmeriCorps members, rather than the additional *pre-tax* earnings. The post-tax annual earnings in Table 24 excludes payroll taxes (e.g., federal and state income, Social Security, and Medicare). The payroll tax rates used are described in more detail in the Benefits to Government section.

Based on these calculations, the cumulative additional post-tax earnings for MCC AmeriCorps members for the three different scenarios—discounted to 2022 dollars using

data from Office of Management and Budget (2003)—are shown in Table 25. These monetary amounts represent the additional post-tax earnings realized due to the employment gain that is solely attributed to MCC.

Table 25. Cumulative Additional Post-tax Earnings Derived From Reduced Unemployment due to Serving With MCC by Scenario

Scenario	Cumulative additional post-tax earnings due to serving with MCC (2022\$)
Short-term	\$2,429,301
Medium-term	\$16,935,541
Long-term	\$30,525,370

Sources: MCC (2023), Friedman et al. (2016), U.S. Census Bureau (2019), and Office of Management and Budget (2003)

Increased Lifetime Earnings due to Increased Postsecondary Education Derived From the Use of Education Awards

The AmeriCorps education award pays for some portion of members' increased postsecondary educational attainment, and the future earnings derived from that educational attainment is treated as a direct benefit to MCC AmeriCorps members. To calculate the portion of members' increased educational attainment that is attributable to MCC, this analysis used cost data from the National Center for Education Statistics (NCES). Table 26 details the average total cost for each degree type and the portion of the cost that the post-tax education award amount (i.e., \$5,234 represents \$6,155³⁵ before taxes). The analysis used these percentages to estimate the lifetime benefits of postsecondary educational attainment that can be attributed to the education award. For instance, according to NCES (2020), the average annual cost of

Additional earnings derived from AmeriCorps members' *reduced unemployment* were calculated annually and then discounted based on the short-term, medium-term, and long-term scenarios in net present 2020 dollars.

For additional earnings derived from AmeriCorps members' *increased postsecondary educational attainment*—due to using education awards—Trostel (2015) did not provide data on how earnings accrue over time. Therefore, this analysis treated the increases in earnings as lifetime values expressed in 2020 dollars. The analysis assumed 100 percent of those lifetime earnings accrued by year 30 (i.e., in the long-term scenario), 50 percent accrued by year 15 (i.e., in the medium-term scenario), and nothing accrued 1 year post-program (i.e., in the short-term scenario).

³⁵ This analysis used the 2020 to 2021 AmeriCorps education award amount (\$6,345) but discounts it to net present 2020 dollars using the Consumer Price Index. For more information about this education award, please see <https://americorps.gov/members-volunteers/segal-americorps-education-award/find-out-more>.

a public, in-state, 4-year academic institution during the 2019–2020 academic year was \$24,869. This amounts to over \$100,000 for 4 years if expressed in 2019 dollars. The \$5,234 post-tax education award only represents 5 percent of the cost of that degree, so MCC, accordingly, could only be credited with 5 percent of the completion of MCC AmeriCorps members' bachelor's degrees post-service.

Table 26. Average Total Cost of Education and Portion Attributable to Education Award by Degree Type

Degree type ³⁶	Average cost (2019\$)*	Percentage of degree total cost covered by post-tax education award
Associate degree	\$30,824	22.7%
Bachelor's degree	\$101,948	6.9%
Graduate degree	\$24,342	28.8%

*Costs were provided for the 2019 to 2020 academic year by NCES (2020) for associate degree, bachelor's degree, and graduate degree types. Costs are expressed in 2019 dollars.

Sources: AmeriCorps (n.d.) and NCES (2020)

To determine the future lifetime earnings (and later, the associated lifetime taxes, which are described in the Benefits to Government section) realized due to the use of the education award post-service, the analysis first determined the number of additional postsecondary degrees estimated to be completed by degree type. The 238 MCC AmeriCorps member FTEs who served during the 2021–2022 program year were distributed by the education award use findings listed in Friedman et al. (2016) across the degree types. Specifically, Friedman et al. (2016) reported 46 percent of AmeriCorps State and National member alumni used their education award to pursue postsecondary degrees after program completion. This makes the number of MCC AmeriCorps member FTEs expected to use the education award to pursue additional postsecondary education roughly equal to 110. Specifically, Friedman et al. (2016) indicated that the 46 percent comprises 2 percent using the education award to attend a technical or vocational training program, 21 percent using it to obtain a bachelor's degree, and 23 percent using it for graduate school.³⁷ This results in the number of MCC AmeriCorps members estimated to *pursue* an associate degree, a bachelor's degree, and a graduate degree post-service to be roughly 5, 50, and 55, respectively, due to using the education award. These values are shown in Table 27.

³⁶ Costs for an associate degree include tuition, required fees, books, and supplies for a public, in-state, 2-year program; costs for a bachelor's degree include tuition, required fees, books, supplies, and on-campus housing for a public, in-state, 4-year program; costs for a graduate degree include tuition and required fees for a public, in-state, 2-year graduate program.

³⁷ This analysis considers the use of the education award to attend a technical or vocational training program from Friedman et al. (2016) to be synonymous with using it to pursue an associate degree.

Table 27. Estimates of the Number of Postsecondary Degrees Pursued Using the Education Award by Degree Type

Degree type	Total MCC AmeriCorps member FTE count	Percentage estimated to pursue postsecondary education according to Friedman et al. (2016)	Number of degrees pursued using the education award
Associate degree	243	2%	5
Bachelor's degree	243	21%	50
Graduate degree	243	23%	55
All degrees	—	46%	110

Note: Numbers may not sum due to rounding.

Sources: AmeriCorps (n.d.), MCC (2023), U.S. Bureau of Labor Statistics (2019-a), Friedman et al. (2016), and NCES (2020)

Next, the difference in the additional lifetime pre-tax earnings from one degree type to the subsequent degree type was estimated using data provided by Trostel (2015), which is shown in the fifth column of Table 28.³⁸ For instance, using Trostel (2015) data, the lifetime earnings of someone with an associate degree is about \$875,000, while that of someone with a bachelor's degree is almost \$1.3 million. The difference between these two metrics (roughly \$417,000 as show in Table 28) represents the additional lifetime earnings realized as a result of gaining a bachelor's degree if an associate degree was already completed. This process was completed for all postsecondary degree types to conservatively estimate the additional lifetime earnings realized by MCC AmeriCorps members due to an increase in postsecondary educational attainment. Trostel (2015) also included data on lifetime taxes paid, which was then used to estimate the post-tax lifetime earnings that would be realized per additional postsecondary degree received. Specifically, the lifetime taxes paid amounts were subtracted from the pre-tax additional lifetime earnings amounts to estimate the additional post-tax lifetime earnings, a direct benefit to MCC AmeriCorps members.

³⁸ For an associate degree, comparisons were made between metrics for a high school diploma and those for an associate degree. For a bachelor's degree, comparisons made were between metrics for an associate degree and those of a bachelor's degree. For a graduate degree, comparisons made were between metrics for a bachelor's degree and those of a master's degree.

Table 28. Additional Earnings From AmeriCorps Members' Use of the Education Award

Degree type	Percentage of MCC AmeriCorps members expected to pursue postsecondary education	FTE MCC AmeriCorps members	Percentage of degree tuition covered by education award	Additional lifetime earnings of the degree (pre-tax)	Additional lifetime earnings from education award (pre-tax)	Additional lifetime earnings from education award (post-tax)
Expected to not use award for postsecondary education	54%	129	N/A	N/A	N/A	N/A
Associate degree	2%	5	22.7%	\$194,926	\$210,878	\$107,280
Bachelor's degree	21%	50	6.9%	\$602,342	\$2,068,729	\$1,115,806
Graduate degree	23%	55	28.8%	\$534,670	\$8,423,202	\$5,238,392
Total	100%	238			\$10,702,810	\$6,461,477

Note: Numbers may not sum due to rounding.

Sources: AmeriCorps (n.d.), U.S. Bureau of Labor Statistics (2019-a), MCC (2023), Friedman et al. (2016), NCES (2020), and Trostel (2015)

To isolate the increase in additional lifetime earnings specific to members using the education award, the number of MCC AmeriCorps members who used the education award for this purpose by degree type was reduced by the percentage of the degree cost that can be covered by the post-tax education award received post-service, displayed in the fourth column of Table 28. Then, this amount is applied to the 2022 additional lifetime earnings by degree type to calculate the additional lifetime earnings realized by AmeriCorps members from their increase in postsecondary educational attainment that is credited to the use of the education award post-service. The additional lifetime earnings amount is roughly \$6.46 million across the FTE MCC AmeriCorps members. Of note, these lifetime earnings are in addition to the earnings derived from MCC AmeriCorps members' gains in employment as delineated in the subsequent section. To reiterate, the earnings from MCC AmeriCorps members' reduced unemployment differs depending on the scenario (i.e., short-term, medium-term, and long-term) since it is uncertain how long these earnings will persist. For the net lifetime earnings—and all lifetime benefits in this ROI analysis—the entire amount is realized in the long-term, half of it is realized in the medium-term, and no amount is realized in the short-term.

Benefits to Government

State and Local Government

State and local governments benefits from:

- Additional state income tax revenue from MCC AmeriCorps members' increased earnings due to reduced unemployment
- Additional lifetime state and local taxes due to MCC AmeriCorps members' increased postsecondary educational attainment³⁹
- Additional lifetime state and local taxes due to MCC program participants' increased secondary educational attainment⁴⁰
- Additional state and local taxes from the living allowance and education award received by these members
- Additional state and local sales tax revenue from MCC AmeriCorps members' increased consumption due to reduced unemployment
- Reduced lifetime spending on social insurance and corrections⁴¹ due to MCC AmeriCorps members' increased postsecondary educational attainment

Additional tax revenue derived from AmeriCorps members' *reduced unemployment, living allowances, and education awards* were calculated using tax rates specific to each per-person monetary amount.

For additional tax revenue derived from AmeriCorps members' *increased postsecondary educational attainment*—due to using education awards—as well as from program participants' *increased secondary educational attainment*, Trostel (2015) did not provide specific tax rates. Therefore, this analysis treated the increases in tax revenue as lifetime values expressed in 2020 dollars. The analysis assumed 100 percent of those lifetime tax revenues accrued by year 30 (i.e., in the long-term scenario), 50 percent accrued by year 15 (i.e., in the medium-term scenario), and nothing accrued 1 year post-program (i.e., in the short-term scenario).

State income tax revenue: To measure income tax revenue generation that stems from reduced unemployment for state governments (any local income taxes are not included), the additional pre-tax earnings of MCC AmeriCorps members that are solely attributed to MCC are taxed by a weighted, estimated proportional state income tax rate. This tax rate considers state-specific progressive tax brackets and standard deduction amounts.

³⁹ This benefit was calculated using lifetime tax revenue data from Trostel (2015). These values summed lifetime state income taxes, lifetime property taxes, and lifetime sales taxes by education level.

⁴⁰ Ibid.

⁴¹ Reduced spending on public assistance due to MCC AmeriCorps members' increased postsecondary educational attainment is included as a federal government benefit, not a state and local government benefit. This is because public assistance includes programs funded at the federal level (e.g., TANF, etc.).

Based on the taxable income, the analysis estimated the proportional state income tax for each state as the amount of state income taxes paid per MCC AmeriCorps member divided by their pre-tax earnings. This analysis then calculated the weighted average of these state-specific tax rates—using these states' population from the 5-year estimates of the 2021 American Community Survey—to estimate a weighted national tax rate (U.S. Census Bureau, 2021-a). A weighted national tax rate was used because MCC AmeriCorps members may disperse to various locations nationwide following their service terms and continue to migrate over the course of their working years.

Lifetime state income tax revenue values are also provided by Trostel (2015) by education level. Based on the number of postsecondary degrees estimated to be obtained due to the use of the education award received after serving with the MCC program, additional lifetime state income taxes are realized. Thus, the additional lifetime state income taxes paid values—informed by data from Trostel (2015)—were first converted to 2022 dollars. The analysis then multiplied them by the inferred number of degrees obtained with using the education award.

State governments also receive state income taxes from the education awards MCC AmeriCorps members receive post-service. The analysis estimated the pre-tax education award amount in 2022 dollars (i.e., \$7,006).⁴² Then the analysis multiplied it by the number of MCC AmeriCorps member FTEs expected to redeem the award and use it to pursue postsecondary education or to repay outstanding student loans based on findings from Friedman et al. (2016). The result represents the pre-tax cumulative education award amount expected to be received by MCC AmeriCorps members. The portion of this value taxed by state income taxes was estimated using a weighted state income tax rate specific to the per-person education award amount. Additionally, state income taxes were estimated for the living allowance amount received by MCC AmeriCorps members during their service term using tax rates specific to the per-person value. The different rates used for these member benefits are enumerated in Table 30.

State and local sales tax revenue: To measure sales tax revenue generation for state and local governments that stems from reduced unemployment, a weighted state and local sales tax rate was applied to the amount of MCC AmeriCorps members' cumulative additional *post-tax* earnings that are available to be spent on taxable goods. To establish a weighted state and local sales tax, this analysis first summed the state sales tax rate and the average local sales tax rate for each state using data from Fritts (2021). Then using 2021 data from the American Community Survey (U.S. Census Bureau, 2021-a), these state-level combined state and local sales tax rates were weighted based on the population of each state. The resulting weighted average sales tax rate used in this analysis was 7.44 percent.

To estimate the additional post-tax earnings as a result of reduced unemployment that was spent on taxable goods, data from the Consumer Expenditure Survey (U.S. Bureau

⁴² This analysis used the 2020 to 2021 AmeriCorps education award amount (\$6,345) but discounts it to net present 2020 dollars using the Consumer Price Index. For more information about this education award, please see <https://americorps.gov/members-volunteers/segal-amicorps-education-award/find-out-more>.

of Labor Statistics, 2021) were used. These data show the amount of spending on a number of different goods and services by national consumers across several different pre-tax income brackets.⁴³ The proportion of earnings that is spent on taxable goods (such as alcoholic beverages, housekeeping supplies, apparel, etc.) was then calculated for consumers with incomes that matched the per-person average pre-tax earnings of MCC AmeriCorps members. This value was 43 percent. This proportion was then applied to MCC AmeriCorps members' cumulative additional post-tax earnings to calculate the post-tax monetary amount they spend on taxable goods. Then the sales tax rate (i.e., 7.44 percent) was applied to estimate the resulting sales tax revenues that go to state and local governments due to MCC AmeriCorps members' reduced unemployment post-service.

Trostel (2015) also provides additional lifetime state and local sales tax values by education level. Using these values, the analysis calculated the additional sales tax revenue realized by state and local governments as a result of MCC AmeriCorps members using their education award to achieve higher postsecondary educational attainment post-service. These values represent a direct benefit to state and local governments in the form of increased tax revenue.

State and local government cost savings: State and local governments also benefit from MCC programming through lifetime savings in social insurance and corrections—as reported in Trostel (2015)—due to the increase in MCC AmeriCorps members' postsecondary educational attainment after program exit. Of note, social insurance includes unemployment insurance and workers' compensation. To calculate these lifetime non-federal government savings, the analysis first calculated the decrease in social insurance and corrections costs (and thus savings) from one education level to the subsequent education level using data from Trostel (2015) and then multiplied these monetary amounts by the number of additional postsecondary degrees estimated to be obtained due to the use of the education awards.

To determine what portion of this differential represents lifetime cost savings to state or local governments versus the federal government, a different method was employed for each of these cost savings areas. For social insurance, 50 percent of lifetime unemployment insurance cost savings and all the lifetime cost savings for workers' compensation are apportioned to state and local governments (Oswald, 2018). Regarding reductions in lifetime corrections spending, the portion between the federal and state or local governments was determined based on data from Hyland (2015). Specifically, this report found that 8.4 percent of U.S. correction costs is paid by the federal government and the remaining 91.6 percent is paid by state and local governments. Therefore, almost 92 percent of the lifetime cost savings in corrections

⁴³ To calculate the estimated taxable expenditures, Consumer Expenditure Survey (CE) Table 1203 was used from the U.S. Bureau of Labor Statistics (2021). This table lists the annual expenditure means by pre-tax income tax brackets. Thus, the pre-tax earnings of MCC AmeriCorps members were used instead of their post-tax earnings to calculate this metric. Please visit this site for more details: <https://www.bls.gov/cex/tables/calendar-year/mean-item-share-average-standard-error.htm#cu-income>.

due to MCC AmeriCorps members experiencing an increase in postsecondary educational attainment post-service are allocated to state and local governments.

Federal Government

The federal government benefits from:

- Additional federal income, Social Security, and Medicare tax revenue from MCC AmeriCorps members' increased earnings due to reduced unemployment
- Additional federal income, Social Security, and Medicare taxes from the living allowance and education award received by these members
- Additional lifetime federal taxes due to MCC AmeriCorps members' increased postsecondary educational attainment
- Additional lifetime federal taxes due to MCC program participants' increased secondary educational attainment
- Reduced lifetime spending on public assistance, social insurance, and corrections due to MCC AmeriCorps members' increased postsecondary educational attainment

Federal income tax revenue: To measure federal income tax revenue that stems from reduced unemployment, the additional pre-tax earnings of MCC AmeriCorps members that are solely attributed to MCC—as well as the pre-tax living allowance and education award amounts received by MCC AmeriCorps members—are taxed by a federal income tax rate. The rates used are estimated proportional tax rates that consider the standard deductions and progressive tax brackets specific to federal income taxes as provided by El-Sibaie (2019). To reiterate, an estimated proportional tax rate equals the total amount of taxes estimated to be paid divided by the pre-tax amount of the value to be taxed (e.g., per-person average pre-tax earnings). The specific federal income tax rates used for these different benefits are enumerated in Table 30. Of note, different tax rates were used because they were specific to the per-person pre-tax earnings, living allowance, and education award amounts.

For the additional lifetime earnings of MCC AmeriCorps members that are based on their increase in postsecondary educational attainment—fueled by the use of the education award—Trostel (2015) provides additional lifetime federal income tax values.

Social Security and Medicare tax revenue: Social Security and Medicare tax revenue are measured as fiscal gains as a result of the additional pre-tax earnings of MCC AmeriCorps members from their reduced unemployment and as a result of the pre-tax living allowances and education awards amounts received by members. However, tax rates specific to each revenue source are used. Social Security and Medicare use flat tax rates, 6.2 percent and 1.45 percent, respectively; thus, these rates are applied to the additional pre-tax earnings of MCC AmeriCorps members to calculate the additional amount of revenue the federal government receives. These same rates are also applied to the living allowance and education award amounts received by MCC AmeriCorps members to calculate additional tax revenue. Moreover, additional lifetime Social Security tax revenue realized for the federal government—as a result of MCC

AmeriCorps members using their education award to complete a higher education degree type post-service—is provided by Trostel (2015).

Federal government cost savings: The federal government realizes cost savings in public assistance, social insurance, and corrections due to the increased postsecondary educational attainment of MCC AmeriCorps members after program exit. Specifically, the number of additional postsecondary degrees estimated to be earned by MCC AmeriCorps members post-service as well as data from Trostel (2015) were used to estimate the federal government portion of lifetime cost savings on social insurance (which is composed of workers' compensation and unemployment insurance, as noted earlier), public assistance (e.g., SNAP, Medicaid, TANF, etc.), and corrections.

Table 29 shows the lifetime costs to the federal versus the state and local governments for each of these areas—where applicable—by education level in 2012 dollars as presented in Trostel (2015). The differences in these lifetime costs from one education level to the next represent cost savings per degree obtained.

Table 29. Government Costs by Educational Attainment Level per Individual's Lifetime

Source of government cost	Associate degree (2012\$)	Bachelor's degree (2012\$)	Graduate degree (2012\$)
Public assistance	\$38,617	\$14,480	\$9,394
Social insurance	\$8,897	\$5,863	\$4,732
Federal	\$3,652	\$2,660	\$2,090
State/local	\$5,246	\$3,204	\$2,643
Corrections	\$4,055	\$1,190	\$725
Federal	\$341	\$100	\$61
State/local	\$3,714	\$1,090	\$664

Note: Numbers may not sum due to rounding.

Source: Trostel (2015)

As mentioned earlier in this appendix, as a result of MCC, the analysis estimated an additional 110 MCC AmeriCorps members would redeem the education award to pursue additional postsecondary education. Based on the portion of degree costs covered by the post-tax education award, this analysis calculated that an additional associate degree, bachelor's degree, and graduate degree would be obtained due to MCC. To conservatively calculate the federal government's lifetime savings associated with these education gains, the differences between the public assistance, federal social insurance, and federal corrections lifetime costs for these education levels and those that precede them are calculated and then expressed in 2022 dollars. These values are then multiplied by the number of additional postsecondary degrees estimated to be obtained—where appropriate—to represent the total cost savings realized by the federal government due to the MCC program. As previously mentioned

where discussing the state and local governments' allocation of the reduction in lifetime social insurance and corrections expenditures, the federal government receives 50 percent of the lifetime cost savings in unemployment insurance (part of social insurance; Oswald, 2018), and more than 8 percent of the lifetime cost savings in corrections (Hyland, 2015). These federal government savings are shown in Table 29.

Table 30 shows the tax rates applied to MCC AmeriCorps members' additional pre-tax and post-tax earnings (derived from reduced unemployment), depending on the type of revenue being calculated. It also enumerates the tax rates used for the pre-tax living allowance and education award amounts received by MCC AmeriCorps members during their service term or upon service completion, respectively.

Table 30. 2022 Tax Rates and Ratio of Taxable Expenditures for MCC AmeriCorps Members' Earnings, Living Allowances, and Education Awards

Metric	Rate for additional earnings & education award*	Rate for living allowance & education award**	Notes
Estimated proportional federal income tax	7.51%	3.08%	<ul style="list-style-type: none"> Tax rates are used that consider the progressive tax brackets and standard deductions specific to federal income taxes. These rates are dependent on and applied to the pre-tax value of each metric being taxed.
Estimated proportional state income tax	-9.73%	-22.70%	<ul style="list-style-type: none"> Tax rates are used that consider the progressive tax brackets and standard deductions specific to each state's income taxes. Each state's tax rate is weighted based on the state's population and summed to estimate a weighted national average. These rates are dependent on and applied to the pre-tax value of each metric being taxed.
Social Security tax	6.20%	6.20%	<ul style="list-style-type: none"> Social Security tax rate for employees and employers. These rates are applied to the pre-tax value of each metric being taxed.
Medicare tax	1.45%	1.45%	<ul style="list-style-type: none"> Medicare tax rate for employees and employers. These rates are applied to the pre-tax value of each metric being taxed.

Metric	Rate for additional earnings & education award*	Rate for living allowance & education award**	Notes
Sales tax	7.44%; N/A to the education award	6.39%; N/A to the education award	<ul style="list-style-type: none"> The combined state and average local tax rate for each state was summed and weighted based on states' population to calculate a national weighted average sales tax rate. The rate is applied to the additional post-tax earnings of members as well as their post-tax living allowance amount.
Ratio of taxable expenditures per national consumer	43.22%	57%; N/A to the education award	<ul style="list-style-type: none"> Percentage of post-tax earnings spent on taxable goods and services that is used to calculate sales tax from post-tax earnings. Ratio is dependent on the pre-tax value of members' additional earnings or the pre-tax living allowance amount.

*These rates are only used for the portion of the education award used to repay outstanding student loans.

**These rates are only used for the portion of the education award used for additional schooling.

Sources: Fritts (2021), Social Security Administration (2021), U.S. Bureau of Labor Statistics (2021), and El-Sibaie (2019)

Summary of Benefits to Government

Table 31 shows the amount of tax revenue generated and savings in expenditures for state and local versus federal government that are solely credited to MCC and calculated using the methods described above. These government revenue and savings amounts are benefits that are included in the three ROI calculations, and they are derived from MCC program impacts.

Table 31. State/Local and Federal Government Benefits by Stakeholder Group and by Scenario

Benefit type	Benefit		
	Long-term	Medium-term	Short-term
State/local government benefits	\$358,120	\$88,259	-\$236,884
State income tax revenue	\$239,468	\$128,439	\$24,812
State and local sales tax revenue	\$944,006	\$472,003	\$31,467
State income, sales, and property taxes from postsecondary	\$864,087	\$432,043	\$0

Benefit type	Benefit		
	Long-term	Medium-term	Short-term
educational attainment (lifetime)			
State savings in reduced social insurance and corrections spending from postsecondary educational attainment (lifetime)	\$46,004	\$23,002	\$0
Federal government benefits	\$6,136,269	\$3,479,664	\$741,120
Federal income tax, Social Security, and Medicare tax revenue from living stipend and education award*	\$615,643	\$615,643	\$615,643
Federal income, Social Security, and Medicare tax revenue from employment	\$1,905,207	\$952,604	\$63,507
Federal income, Social Security, and Medicare Tax revenue from postsecondary educational attainment (lifetime)	\$21,426	\$114,421	\$61,969
Federal savings in reduced social insurance, corrections, and public assistance spending from postsecondary educational attainment (lifetime)	\$3,593,992	\$1,796,996	\$0
Total	\$6,494,389	\$3,567,923	\$504,235

*Living allowances and education awards are one-time taxable payments. The resulting tax revenue does not vary by scenario.

Note: Numbers may not sum due to rounding.

Benefits to Society

Society benefits from MCC's activities in the form of these distinct benefits:

- BDA benefits attributable to MCC
- Wildfire reduction benefits attributable to MCC

- Habitat improvement benefits attributable to MCC
- Trail maintenance and creation benefits attributable to MCC

Beaver Dam Analog Benefits Attributable to MCC

Society benefits from MCC's BDA installation in four ways:

- Ecosystem services restored through riparian habitat improvements following BDA installation
- Carbon sequestration from restored riparian habitats
- Drought and flood moderation from BDA presence
- Water purification from BDA presence

Each of these is a distinct benefit with no overlap that would result in double counting of benefits. For instance, the ecosystem service values specifically measure benefits of restored ecosystems following BDA installation and are distinct from carbon sequestration, extreme event moderation, or water purification resulting from the BDA.

Based on the number of BDAs installed by MCC during the 2021–2022 program year (507), a total impact area of 175 acres of riparian habitat were restored as a result of MCC's efforts.

Ecosystem services restored through riparian habitat improvements following BDA installation

The literature provides varying estimates of the value of ecosystem services. This analysis used low, average, and high estimates of those benefits to allow for the uncertainty involved in monetizing ecosystem benefits, as shown in Table 32.

Table 32. Ecosystem Services Restored From MCC BDA Installation

Ecosystem service level	Riparian ecosystem service values per acre (A)	Acres impacted (B)	Aggregate value per year before discounting (A * B)
Low	\$3,029	175	\$530,084
Average	\$56,655	175	\$9,914,571
High	\$288,752	175	\$50,531,676

Carbon sequestration from restored riparian habitats

Based on Thompson et al. (2020) and Rennert et al. (2022) estimates on the carbon sequestered and the social cost of carbon, as well as the provided acres impacted by BDA installation, annual benefits are estimated in Table 33.

Table 33. Carbon Sequestration Benefits From MCC BDA Installation

Ecosystem service level	Carbon sequestered per acre (A)	Acres impacted (B)	Social cost of carbon (C)	Aggregate value per year before discounting (A * B * C)
All	1.7	175	\$212	\$27,295

Drought and flood moderation from BDA presence

Based on Thompson et al. (2020), the presence of BDAs reduces the likelihood of both droughts and floods through their hydrologic characteristics, which generate annual benefits estimated in Table 34.

Table 34. Drought and Flood Moderation From MCC BDA Installations

Ecosystem service level	Annual benefits per acre (A)	Acres impacted (B)	Aggregate value per year before discounting (A * B)
All	\$59.94	175	\$10,489

Water purification from BDA presence

Based on Thompson et al. (2020), the presence of BDAs causes notable water purification effects for downstream sources, which create benefits estimated in Table 35.

Table 35. Water Purification Benefits From MCC BDA Installation

Ecosystem service level	Water purification benefits per acre (A)	Acres impacted (B)	Aggregate value per year before discounting (A * B)
All	\$52.20	175	\$9,136

Wildfire Reduction Benefits Attributable to MCC

Society benefits from the reduction in wildfires resulting from MCC’s fuel reduction treatments in three distinct ways:

- Ecosystem services preserved through fuel reduction treatments
- Human health benefits from reduced air particulates from smoke
- Benefits from reduced carbon dioxide equivalents emissions

Using the 7.2 percent estimate in burn reduction from fuel reduction treatments presented in Cochrane et al. (2012), and the 3,446 acres treated from MCC (2023), this analysis estimated that in the first year 248.11 acres are prevented from burning as a result of MCC’s efforts.

Ecosystem services preserved through fuel reduction treatments

The literature provides varying estimates of the value of ecosystem services. This analysis used low, average, and high estimates of those benefits to allow for the uncertainty involved in monetizing ecosystem benefits, which are presented in Table 36. These annual estimates were then reduced using the Bartels et al. (2016) regrowth metrics (10 percent regrowth during the first 10 years and 84 percent total regrowth over 30 years). These values were then discounted with other streams of benefits to generate the net present values presented in Table 9 of the main report.

Table 36. Preserved Ecosystem Services From MCC Fuel Reduction Activities

Ecosystem service level	Preserved ecosystem services (A)	Acres prevented from burning (B)	Aggregate value per year before discounting (A * B)
Low	\$493	248.11	\$122,419
Average	\$2,001	248.11	\$496,446
High	\$3,631	248.11	\$900,859

Human health benefits from reduced air particulates from smoke

Using the per-acre health costs from wildfire burning and the acres preserved, this analysis estimated annual health benefits from reduced air particulates from smoke, presented in Table 37. These annual estimates were then reduced using the Bartels et al. (2016) regrowth metrics (10 percent regrowth during the first 10 years and 84 percent total regrowth over 30 years). These values were also discounted with other streams of benefits to generate the net present values presented in Table 10 of the main report.

Table 37. Human Health Benefits From Reduced Wildfires From MCC Activities

Ecosystem service level	Health cost per acre (A)	Acres preserved (B)	Aggregate value per year before discounting (A * B)
All	\$678	248.11	\$168,199

Benefits from reduced carbon dioxide equivalents emissions

The literature provides varying estimates of the quantity of carbon dioxide equivalents emissions produced when an acre of similar composition to those MCC treats is burned. Carbon dioxide equivalents emissions are avoided due to 248.11 acres not burning as a result of MCC's efforts. This analysis used low, average, and high estimates from the literature to allow for the uncertainty involved in monetizing those avoided costs. To place a dollar value on these benefits, this analysis multiplies the variable carbon dioxide equivalents emissions under each scenario by the SCC. This analysis utilized the \$212 in 2022\$ reported in Rennert et al. (2022) and estimated the annual benefits presented in Table 38. These annual estimates are then reduced using the Bartels et al. (2016) regrowth metrics (10 percent regrowth during the first 10 years and 84 percent

total regrowth over 30 years). These values are then discounted with other streams of benefits to generate the net present values presented in Table 11 of the main report.

Table 38. Carbon Dioxide Reduction Benefits From MCC Activities

Ecosystem service level	Tons of carbon prevented from releasing per acre (A)	Acres prevented from burning (B)	Aggregate value per year before discounting (212 * A * B)
Low	0.03	248.11	\$1,578
Average	1.02	248.11	\$53,651
High	2.00	248.11	\$105,199

Habitat Improvement Benefits Attributable to MCC

Society benefits from the ecosystem service values resulting from MCC's ecosystem restoration activities. MCC reported treatment of 6,291 acres in forested mountains and 423 acres of other ecosystem designations. The ecosystem service value per acre for each of those types of ecosystems was applied to the number of acres treated for each of the three ecosystem levels in Table 39. These annual estimates are then discounted using the Bartels et al. (2016) regrowth metrics (10 percent regrowth during the first 10 years and 84 percent total regrowth over 30 years). These values are then discounted with other streams of benefits to generate the net present values presented in Table 12.

Table 39. Habitat Improvement Benefits From MCC Activities

Ecosystem service level	Forested mountains (A) (6,291 acres)	Other ecosystem designations (B) (423 acres)	Aggregate value per year before discounting (6,291 * A + 423 * B)
Low	\$8,810	\$7,654	\$4,223,821
Average	\$20,776	\$27,952	\$10,262,031
High	\$40,238	\$89,941	\$20,965,005

Trail Maintenance and Creation Benefits Attributable to MCC

Society enjoys health and recreational benefits from MCC's trail maintenance and creation. Using MCC's reported 1,513 miles of trails created or maintained and the sum of the health and recreation value per mile of trails \$4.85 (\$4.36 in 2022\$ per mile in health benefits from Wang et al., 2005; and \$0.49 in 2022\$ per mile in recreation benefits from Oh and Hammitt, 2010), this analysis calculates annual benefits of \$7,336. This estimate is reduced in subsequent years by the annual maintenance cost for backcountry trails of \$822 (Echelberger and Plumley, 1986). These values are then discounted with other streams of benefits to generate the net present values presented in Table 13.

Table 40. Trail Maintenance and Creation Benefits From MCC Activities

Ecosystem service level	Health benefits per mile(A)	Recreation value per mile (B)	Aggregate value per year (1,513 (A+B))
All	\$4.36	\$0.49	\$7,336

Summary of Benefits to Society

Table 41 shows the benefits to society that are solely credited to MCC and calculated using the methods described in the main report.

Table 41. Societal Benefits by Impact Category and by Scenario

Benefit type	Benefit		
	Short-term	Medium-term	Long-term
BDA impacts			
With low ecosystem benefits	\$577,003	\$7,094,871	\$11,648,799
With average ecosystem benefits	\$9,961,490	\$122,487,208	\$201,107,086
With high ecosystem benefits	\$50,578,595	\$621,918,104	\$1,021,103,669
Wildfire reduction			
With low ecosystem benefits	\$291,821	\$3,253,109	\$4,265,001
With average ecosystem benefits	\$711,221	\$7,928,416	\$10,394,578
With high ecosystem benefits	\$1,161,007	\$12,942,460	\$16,968,259
Ecosystem restoration			
With low ecosystem benefits	\$4,223,821	\$47,085,516	\$61,731,638
With average ecosystem benefits	\$10,262,031	\$114,397,138	\$149,980,785
With high ecosystem benefits	\$20,965,005	\$233,709,724	\$306,405,986
Trail access			
Health benefits	\$4,448	\$55,623	\$110,452
Recreation benefits	\$499	\$6,243	\$12,398

Benefit type	Benefit		
	Short-term	Medium-term	Long-term
Total – with low ecosystem benefits	\$5,099,981	\$57,513,734	\$77,776,610
Total – with medium ecosystem benefits	\$20,942,078	\$244,892,999	\$361,613,621
Total – with high ecosystem benefits	\$72,711,943	\$868,650,524	\$1,344,609,086

Measuring Forgone Benefits (Opportunity Costs)

The analysis included two types of forgone benefits, referred to as *opportunity costs*, into each of the three ROI calculations to conservatively estimate the return of the MCC program. The two types are forgone benefits from a professional opportunity cost to MCC AmeriCorps members and forgone benefits from an investment opportunity cost to funders. Each of these forgone benefit (opportunity cost) types is subtracted from the total program benefits—that stem from MCC—to calculate net benefits. Net benefits are then compared to the program cost to calculate each ROI. The methodologies used to calculate these two forgone benefits (opportunity costs) are described below.

Forgone Benefits From Professional Opportunity Cost to MCC AmeriCorps Members

There is a professional opportunity cost to MCC AmeriCorps members for their period of national service, during which they could have been otherwise employed. This includes both the forgone earnings of MCC AmeriCorps members for their service term and the forgone taxes associated with those lost earnings. To calculate this, the analysis first used the demographic distribution of MCC AmeriCorps members for the 2021–2022 program year—in terms of gender, age, race/ethnicity, and pre-service education level—and ASEC data to estimate the weighted unemployment rate for this population (i.e., 5.8 percent). This represents how many of these MCC AmeriCorps members would have been unemployed if they did not serve with MCC. Using the weighted unemployment rate and the number of MCC AmeriCorps member FTEs who served during the 2021–2022 program year (i.e., 238), the analysis estimated the number of members that would have been unemployed without serving with MCC based on their demographic characteristics (i.e., 14). Then the analysis multiplied this value by the weighted post-tax annual earnings. This is derived from the pre-tax annual earnings listed in Table 42. The methodology used to calculate this latter monetary amount is described in the previous Increased Earnings due to Reduced Unemployment section. The post-tax amount subtracts all applicable payroll taxes (e.g., federal income, state income, Medicare, and Social Security). The product of multiplying 14 by the weighted post-tax annual earnings represents what MCC AmeriCorps members would have earned if they did *not* serve with MCC. Separately, the analysis then multiplied the number of MCC AmeriCorps member FTEs who served by the amount they earned during their national service in the form of a post-tax living allowance (i.e., \$17,623 per person). This represents the aggregate amount MCC AmeriCorps members earned

during their service term. The difference between what they would have earned if they did not serve and what they did earn because they served equals the total post-tax earnings forgone due to serving with MCC. These values and the formula used to calculate the forgone post-tax earnings are shown in Table 42.

Table 42. Forgone Earnings of MCC AmeriCorps Members for a Service Term

Row	Component	Value	Source
A	MCC AmeriCorps member FTEs	238	MCC (2022)
B	Weighted unemployment rate	5.8%	U.S. Census Bureau (2021-b)
C	Weighted post-tax annual earnings per person (2022\$)	\$35,195	U.S. Census Bureau (2021-b)
D	Post-tax living allowance per person	\$17,623	AmeriCorps (2020)
E	Total post-tax earnings forgone (2022\$)	\$3,696,289	$[A \times (1 - B) \times C] - (A \times D)$

Note: Numbers may not sum due to rounding.

The second portion of this professional opportunity cost was the forgone taxes associated with the earnings of MCC AmeriCorps members lost for this year of service. Federal income, state income, Social Security, and Medicare taxes specific to the per-person weighted pre-tax earnings amount were calculated. Specifically, the estimated proportional federal and state income tax rates used were 7.5 and 1.77 percent, respectively. The analysis also estimated the sales taxes lost based on the per-person post-tax earnings forgone by the MCC AmeriCorps members. Using data from the Consumer Expenditure Survey (U.S. Bureau of Labor Statistics, 2021), the analysis estimated that based on the per-person weighted pre-tax earnings of MCC AmeriCorps members (i.e., \$38,791), 43.22 percent of their income would have been spent on taxable goods, as opposed to 53.1 percent of the living allowance. Then the weighted combined state and local sales tax rate (i.e., 7.44 percent)—used earlier in this analysis to calculate government benefits—was applied to the difference in expected spending on taxable goods to represent the resulting sales tax revenue lost due to individuals serving with MCC instead of working for higher pay. The totals for these taxes are listed in Table 43.

Table 43. Forgone Taxes Associated With the Forgone Earnings of MCC AmeriCorps Members for a Service Term

Forgone taxes	Taxes without service term (2023\$)	Taxes realized from living allowance (2023\$)	Net taxes forgone (2023\$)
Federal forgone taxes (i.e., federal professional opportunity cost)	\$1,178,763	\$449,938	\$728,825
Federal income taxes	\$575,131	\$129,072	\$446,059
Social Security and Medicare taxes	\$603,632	\$320,866	\$282,766
Non-federal forgone taxes	\$389,304	\$161,770	\$227,534
State income taxes	\$135,667	\$0	\$135,667
Sales taxes	\$253,637	\$161,770	\$91,867
Total taxes	\$1,568,067	\$611,708	\$956,359

Note: Numbers may not sum due to rounding.

For the *federal government benefits per federal dollar* ROI calculation, only federal government (not total) benefits are included. Because of this, only federal components of the professional opportunity cost are subtracted from all federal government benefits—realized due to MCC—in this ROI calculation. The parts of the professional opportunity cost subtracted from these total federal government benefits include the forgone net federal income taxes (i.e., \$446,059) and the net forgone Social Security and Medicare taxes (i.e., \$282,766). The sum of these two values is called the *federal professional opportunity cost*. The sum of all the values listed in Table 43 and the forgone post-tax earnings of MCC AmeriCorps members is called the *total professional opportunity cost*. These naming conventions are referenced in the Calculating ROI section.

Forgone Benefits From the Investment Opportunity Cost to Funders

The investment opportunity cost estimates the expected forgone return if funds used to support the activities and positions of MCC AmeriCorps members during the most recent program year were invested in U.S. Treasury bonds instead. An investment opportunity cost is calculated for two different funding streams: 1) all MCC program funding for the 2020–2021 program year and 2) only federal funding for the same program year. This is done because two of the three ROI calculations only have federal (not total) program costs included. Thus, for 1) the *federal government benefits per federal dollar* and 2) the *total benefits per federal dollar* ROI calculations, the investment opportunity cost subtracted from the benefits in these calculations is the forgone accrued interest from investing *only* the federal funds into these U.S. Treasury bonds. For the other ROI calculation, the investment opportunity cost subtracted from the benefits realized is the forgone accrued interest from investing *all* MCC program funds (both federal and non-federal) into these U.S. Treasury bonds. Therefore, the analysis estimated forgone accrued interests across all three scenarios when 1) all MCC

program funds and 2) only federal MCC program funds are invested in U.S. Treasury bonds.

To calculate these forgone accrued interest values, the analysis first matched 2021 real interest rates provided by the Office of Management and Budget (2020) to each of the scenarios included in this ROI analysis. The analysis used 2021 real interest rates for U.S. Treasury bonds because the MCC program year analyzed began in 2021. The real interest rate for the 3-year maturity was used for the short-term scenario, the average between the 10-year and 20-year maturity rates was used as the rate for the medium-term scenario, and the 30-year maturity rate was used for the long-term scenario. These real interest rates were -1.8, -0.8, and -0.3 percent, respectively. Also, the number of years elapsed on these U.S. Treasury bonds was equal to the number of years the different scenarios assumed MCC AmeriCorps members' employment and earnings gains were sustained. These values are 1 year, 15 years, and 30 years for the short-, medium-, and long-term scenarios, respectively. Given that U.S. Treasury bonds compound biannually according to the U.S. Department of the Treasury (2019), the formula used to calculate the forgone accrued interest for each of the three scenarios for the two funding streams is listed in Figure 4, where A equals the forgone accrued interest (e.g., the investment opportunity cost), P equals the amount of one of the funding streams, r equals the 2021 real interest rate, and t equals the number of years elapsed.

Figure 4. Compound Interest Formula Used to Calculate Investment Opportunity Cost

$$A = P \left(1 + \frac{r}{2} \right)^{t*2} - P$$

Based on this formula, the forgone benefits from the investment opportunity cost calculated by scenario and funding stream are listed in Table 44, along with their associated inputs. The forgone accrued interest amounts for all funding are called *the total investment opportunity costs*, while that for federal funding only are called the *federal investment opportunity costs*. These naming conventions are referenced in the Calculating ROI section.

Table 44. Forgone Benefits From Investment Opportunity Cost Calculation by Scenario and Funding Stream

Metric	Short-term		Medium-term		Long-term	
	All funding	Federal funding only	All funding	Federal funding only	All funding	Federal funding only
Real interest rate	-1.80%		-0.80%		-0.30%	
Years elapsed	1		15		30	
Funding amount	\$10,896,636	\$9,549,273	\$10,896,636	\$9,549,273	\$10,896,636	\$9,549,273
Forgone return (accrued interest)	-\$938,533	-\$822,484	-\$1,234,512	-\$1,081,865	-\$195,257	-\$171,113

Note: The real interest rates used are the 2021 real interest rates because the MCC program year commenced in 2021.

Measuring Program Costs

Table 45 shows the costs of MCC by funding source.

Table 45. Funding Sources and Amounts for MCC (2021–2022)

Funding Source	Amount	Percentage of total
Cost categories	\$9,479,450	
Operating	\$4,350,150	45.9%
AmeriCorps member expenses	\$4,399,271	46.4%
Non-AmeriCorps member expenses	\$730,029	7.7%
Funding sources	\$10,000,000	
AmeriCorps	\$2,842,634	28%
Project revenue (federal and non-federal)	\$6,417,366	64%
Private	\$740,000	7%

Note: Numbers may not sum due to rounding.

Source: MCC (2023)

Calculating ROI

To complete the three ROI calculations for MCC, the sum of applicable program benefits is reduced by the forgone benefits, or the professional and investment opportunity costs (where appropriate) and then compared to the cost of the program. As described previously, these three ROI calculations are calculated for each of the three scenarios: short-term, medium-term, and long-term.

Since two of the calculations include benefits to society (e.g., MCC AmeriCorps members, children of MCC program participants, etc.), the results are expressed as cost-benefit ratios, while maintaining the ROI terminology. Specifically, these ratios take the form of the sum of monetized benefits over the sum of applicable program costs. The ROIs expressed as cost-benefit ratios in this study can be interpreted as the amount of dollars returned for every dollar of investment (or program cost).⁴⁴

The formulas used to calculate each of the three ROIs are shown below:⁴⁵

$$\text{Total Benefits per Federal Dollar} = \frac{(\text{Benefits to Non-government Stakeholders} + \text{Benefits to Government}) - (\text{Forgone Benefits From Total Professional Opportunity Cost} + \text{Forgone Benefits From Federal Investment Opportunity Cost})}{(\text{AmeriCorps Federal Funding})}$$

$$\text{Total Benefits per Funder Dollar} = \frac{(\text{Benefits to Non-government Stakeholders} + \text{Benefits to Government}) - (\text{Forgone Benefits From Total Professional Opportunity Cost} + \text{Forgone Benefits From Total Investment Opportunity Cost})}{(\text{AmeriCorps Federal Funding} + \text{Non-Federal Match Funding})}$$

$$\text{Federal Government Benefits per Federal Dollar} = \frac{(\text{Benefits to the Federal Government}) - (\text{Forgone Benefits From Federal Professional Opportunity Cost} + \text{Forgone Benefits From Federal Investment Opportunity Cost})}{(\text{AmeriCorps Federal Funding})}$$

⁴⁴ ROIs can be expressed in percentages or as ratios, such as in this study. Although not shown as a ratio in the results, the ROIs in this study show the amount of return for every dollar invested.

⁴⁵ Non-government stakeholders in this ROI analysis include MCC AmeriCorps members and the children of MCC program participants.

Table 46, Table 47, and Table 48 show the total benefits, opportunity costs, program costs, and ROI results for the short-, medium-, and long-term scenarios, respectively.

Table 46. ROI Calculations for Short-Term Scenario

Components	Total costs and benefits per federal dollar (2020\$)	Total costs and benefits per funder dollar (2020\$)	Federal government costs and benefits per federal dollar (2020\$)
Total benefits by range of impact			
With low ecosystem benefits	\$6,988,788	\$7,185,974	-\$197,185
With average ecosystem benefits	\$22,830,885	\$23,028,071	
With high ecosystem benefits	\$74,600,750	\$74,797,936	
Total forgone benefits (opportunity costs)	-\$876,336	-\$3,844,340	-\$876,336
Total program costs	\$9,549,273	\$10,896,636	\$9,549,273
ROI			
Result – low	\$0.73	\$0.66	-\$0.02
Result – average	\$2.39	\$2.11	
Result – high	\$7.81	\$6.86	

Table 47. ROI Calculations for Medium-Term Scenario

Components	Total costs and benefits per federal dollar (2020\$)	Total costs and benefits per funder dollar (2020\$)	Federal government costs and benefits per federal dollar (2020\$)
Total benefits by range of impact			
With low ecosystem benefits	\$73,982,486	\$72,278,706	\$1,703,780
With average ecosystem benefits	\$261,361,751	\$259,657,971	
With high ecosystem benefits	\$885,119,277	\$883,415,496	
Total forgone benefits (opportunity costs)	-\$1,661,463	-\$4,632,345	-\$1,661,463
Total program costs	\$9,549,273	\$10,896,636	\$9,549,273
ROI			
Result – low	\$7.75	\$6.63	\$0.18
Result – average	\$27.37	\$23.83	
Result – high	\$92.69	\$81.07	

Table 48. ROI Calculations for Long-Term Scenario

Components	Total costs and benefits per federal dollar (2020\$)	Total costs and benefits per funder dollar (2020\$)	Federal government costs and benefits per federal dollar (2020\$)
Total benefits by range of impact			
With low ecosystem benefits	\$111,328,796	\$106,651,813	\$4,676,983
With average ecosystem benefits	\$395,165,808	\$390,488,824	
With high ecosystem benefits	\$1,378,161,272	\$1,373,484,289	
Total forgone benefits (opportunity costs)	-\$1,437,859	-\$4,407,922	-\$1,437,859
Total program costs	\$9,549,273	\$10,896,636	\$9,549,273
ROI			
Result – low	\$11.66	\$9.79	\$0.49
Result – average	\$41.38	\$35.84	
Result – high	\$144.32	\$126.05	

Appendix C: Results by Year

Table 49 shows the breakdown of costs and benefits over a 30-year period. Program activities create a stream of benefits over time to AmeriCorps members, the federal government, state and local governments, and society. Opportunity costs that occur from participation in the program apply to the first year, and forgone benefits to funders accrue over time. Program costs are expended in the first year only.

Table 49. MCC Benefits and Costs per Year

Benefits and costs	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Benefits – low	\$5,724,460	\$1,066,479	\$1,074,944	\$1,083,856	\$1,093,227	\$1,103,072	\$1,113,405	\$1,124,240
Benefits – medium	\$15,108,947	\$10,346,694	\$10,250,887	\$10,155,527	\$10,060,626	\$9,966,199	\$9,872,259	\$9,778,822
Benefits – high	\$55,726,052	\$50,512,498	\$49,965,390	\$49,418,728	\$48,872,526	\$48,326,798	\$47,781,558	\$47,236,819
AmeriCorps member benefits	\$4,613,147	\$431,389	\$444,331	\$457,660	\$471,390	\$485,532	\$500,098	\$515,101
Federal government benefits	\$513,445	\$32,411	\$33,383	\$34,385	\$35,416	\$36,479	\$37,573	\$38,700
State and local government benefits	\$20,865	\$32,087	\$33,050	\$34,041	\$35,062	\$36,114	\$37,198	\$38,314
Society benefits – low	\$577,003	\$570,592	\$564,181	\$557,770	\$551,358	\$544,947	\$538,536	\$532,125
Society benefits – medium	\$9,961,490	\$9,850,807	\$9,740,123	\$9,629,440	\$9,518,757	\$9,408,074	\$9,297,391	\$9,186,707
Society benefits – high	\$50,578,595	\$50,016,611	\$49,454,626	\$48,892,642	\$48,330,658	\$47,768,673	\$47,206,689	\$46,644,704
Forgone benefits (opportunity costs)	\$5,295,353	\$144,137	\$144,137	\$144,137	\$144,137	\$144,137	\$144,137	\$144,137
Forgone benefits to members	\$3,696,289	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Forgone tax revenue	\$1,279,899	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<i>Federal taxes</i>	\$728,825	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<i>State/local taxes</i>	\$551,074	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Forgone benefits from total investments (all funders)	\$171,654	\$77,520	\$77,520	\$77,520	\$77,520	\$77,520	\$77,520	\$77,520
Forgone benefits from federal investments	\$147,511	\$66,617	\$66,617	\$66,617	\$66,617	\$66,617	\$66,617	\$66,617
Program costs	\$9,579,450	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Federal government costs	\$8,870,571	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Non-federal costs	\$708,879	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Table 49, cont. MCC Benefits and Costs per Year

Benefits and costs	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16
Benefits – low	\$1,135,592	\$1,147,477	\$1,144,973	\$1,143,035	\$1,141,679	\$1,140,922	\$1,140,784	\$1,141,281
Benefits – medium	\$9,685,902	\$9,593,516	\$9,243,786	\$8,894,621	\$8,546,039	\$8,198,056	\$7,850,692	\$7,503,964
Benefits – high	\$46,692,598	\$46,148,910	\$44,296,347	\$42,444,350	\$40,592,935	\$38,742,120	\$36,891,922	\$35,042,361
AmeriCorps member benefits	\$530,554	\$546,470	\$562,865	\$579,751	\$597,143	\$615,057	\$633,509	\$652,514
Federal government benefits	\$39,861	\$41,057	\$42,289	\$43,558	\$44,864	\$46,210	\$47,596	\$49,024
State and local government benefits	\$39,463	\$40,647	\$41,866	\$43,122	\$44,416	\$45,749	\$47,121	\$48,535
Society benefits – low	\$525,714	\$519,303	\$497,954	\$476,604	\$455,255	\$433,906	\$412,557	\$391,208
Society benefits – medium	\$9,076,024	\$8,965,341	\$8,596,766	\$8,228,191	\$7,859,616	\$7,491,040	\$7,122,465	\$6,753,890
Society benefits – high	\$46,082,720	\$45,520,736	\$43,649,328	\$41,777,920	\$39,906,511	\$38,035,103	\$36,163,695	\$34,292,287
Forgone benefits (opportunity costs)	\$144,137	\$144,137	\$144,137	\$144,137	\$144,137	\$144,137	-\$32,254	-\$32,254
Forgone benefits to members	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Forgone tax revenue	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<i>Federal taxes</i>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<i>State/local taxes</i>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Forgone benefits from total investments (all funders)	\$77,520	\$77,520	\$77,520	\$77,520	\$77,520	\$77,520	-\$17,347	-\$17,347
Forgone benefits from federal investments	\$66,617	\$66,617	\$66,617	\$66,617	\$66,617	\$66,617	-\$14,907	-\$14,907
Program costs	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Federal government costs	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Non-federal costs	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Table 49, cont. MCC Benefits and Costs per Year

Benefits and costs	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24
Benefits – low	\$1,142,435	\$1,144,263	\$1,146,786	\$1,150,026	\$1,154,003	\$1,158,740	\$1,164,260	\$1,170,586
Benefits – medium	\$7,157,891	\$6,812,493	\$6,467,790	\$6,123,804	\$5,780,555	\$5,438,066	\$5,096,360	\$4,755,460
Benefits – high	\$33,193,455	\$31,345,224	\$29,497,689	\$27,650,870	\$25,804,788	\$23,959,466	\$22,114,927	\$20,271,194
AmeriCorps member benefits	\$672,090	\$692,252	\$713,020	\$734,411	\$756,443	\$779,136	\$802,510	\$826,586
Federal government benefits	\$50,495	\$52,010	\$53,570	\$55,177	\$56,833	\$58,538	\$60,294	\$62,103
State and local government benefits	\$49,991	\$51,490	\$53,035	\$54,626	\$56,265	\$57,953	\$59,692	\$61,482
Society benefits – low	\$369,859	\$348,510	\$327,161	\$305,812	\$284,462	\$263,113	\$241,764	\$220,415
Society benefits – medium	\$6,385,315	\$6,016,740	\$5,648,165	\$5,279,590	\$4,911,015	\$4,542,439	\$4,173,864	\$3,805,289
Society benefits – high	\$32,420,879	\$30,549,471	\$28,678,063	\$26,806,655	\$24,935,247	\$23,063,839	\$21,192,431	\$19,321,023
Forgone benefits (opportunity costs)	-\$32,254	-\$32,254	-\$32,254	-\$32,254	-\$32,254	-\$32,254	-\$32,254	-\$32,254
Forgone benefits to members	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Forgone tax revenue	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<i>Federal taxes</i>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<i>State/local taxes</i>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Forgone benefits from total investments (all funders)	-\$17,347	-\$17,347	-\$17,347	-\$17,347	-\$17,347	-\$17,347	-\$17,347	-\$17,347
Forgone benefits from federal investments	-\$14,907	-\$14,907	-\$14,907	-\$14,907	-\$14,907	-\$14,907	-\$14,907	-\$14,907
Program costs	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Federal government costs	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Non-federal costs	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Table 49, cont. MCC Benefits and Costs per Year

Benefits and costs	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30
Benefits – low	\$1,177,742	\$1,185,753	\$1,194,645	\$1,204,444	\$1,215,178	\$1,226,874
Benefits – medium	\$4,415,390	\$4,076,175	\$3,737,841	\$3,400,414	\$3,063,922	\$2,728,392
Benefits – high	\$18,428,291	\$16,586,243	\$14,745,076	\$12,904,817	\$11,065,491	\$9,227,128
AmeriCorps member benefits	\$851,383	\$876,925	\$903,232	\$930,329	\$958,239	\$986,986
Federal government benefits	\$63,966	\$65,885	\$67,861	\$69,897	\$71,994	\$74,154
State and local government benefits	\$63,327	\$65,227	\$67,183	\$69,199	\$71,275	\$73,413
Society benefits – low	\$199,066	\$177,717	\$156,368	\$135,019	\$113,670	\$92,320
Society benefits – medium	\$3,436,714	\$3,068,139	\$2,699,564	\$2,330,989	\$1,962,414	\$1,593,838
Society benefits – high	\$17,449,615	\$15,578,207	\$13,706,799	\$11,835,391	\$9,963,983	\$8,092,575
Forgone benefits (opportunity costs)	-\$32,254	-\$32,254	-\$32,254	-\$32,254	-\$32,254	-\$32,254
Forgone benefits to members	\$0	\$0	\$0	\$0	\$0	\$0
Forgone tax revenue	\$0	\$0	\$0	\$0	\$0	\$0
<i>Federal taxes</i>	\$0	\$0	\$0	\$0	\$0	\$0
<i>State/local taxes</i>	\$0	\$0	\$0	\$0	\$0	\$0
Forgone benefits from total investments (all funders)	-\$17,347	-\$17,347	-\$17,347	-\$17,347	-\$17,347	-\$17,347
Forgone benefits from federal investments	-\$14,907	-\$14,907	-\$14,907	-\$14,907	-\$14,907	-\$14,907
Program costs	\$0	\$0	\$0	\$0	\$0	\$0
Federal government costs	\$0	\$0	\$0	\$0	\$0	\$0
Non-federal costs	\$0	\$0	\$0	\$0	\$0	\$0

References

- AmeriCorps. (n.d.). *Education Award find out more*. AmeriCorps.
<https://americorps.gov/members-volunteers/segal-americorps-education-award/find-out-more>
- Arora, V. K. & Melton, J. R. (2018). Reduction in global area burned and wildfire emissions since 1930s enhances carbon uptake by land. *Nature Communications*, 9.
<https://doi.org/10.1038/s41467-018-03838-0>
- Bartels, S. F., Chen, H. Y.H., Wulder, M. A., & White, J. C. (2016). Trends in post-disturbance recovery rates of Canada's forests following wildfire and harvest. *Forest Ecology and Management*, 361, 194–207.
<https://doi.org/10.1016/j.foreco.2015.11.015>
- Batker, D., Christin, Z., Schmidt, R., & de la Torre, I. (2013). *The economic impact of the 2013 Rim Fire on natural lands*. Earth Economics. https://www.hcd.ca.gov/grants-funding/docs/earth_economics_rim_fire_report_11.27.2013.pdf
- Blagg, K., & Blom, E. (2018, September). *Evaluating the return on investment in higher education: An assessment of individual- and state-level returns*. Urban Institute.
https://www.urban.org/sites/default/files/publication/99078/evaluating_the_return_on_investment_in_higher_education.pdf
- Center for Program Evaluation. (2020). *Great Basin Institute – Nevada Conservation Corps – Evaluation Report 2019 – 2020*. Reno, NV.
https://americorps.gov/sites/default/files/document/GreatBasinInstitute.21ES231073.Evidencedoc3_EDITED_508.pdf
- Cochrane, M. A., Moran, C. J., Wimberly, M. C., Baer, A. D., Finney, M. A., Beckendorf, K. L., Eidenshink, J., & Zhu, Z. (2012). Estimation of wildfire size and risk changes due to fuels treatments. *International Journal of Wildland Fire*, 21(4), 357–367.
<https://doi.org/10.1071/WF11079>
- Conner, M. M., Saunders, W. C., Bouwes, N., & Jordan, C. (2016). Evaluating impacts using a BACI design, ratios, and a Bayesian approach with a focus on restoration. *Environmental Monitoring and Assessment*, 188(10), 555.
<https://doi.org/10.1007/s10661-016-5526-6>
- Dodds, W. K., Wilson, K. C., Rehmeier, R. L., Knight, G. L., Wiggam, S., Falke, J. A., Dagleish, H. J., & Bertrand, K. N. (2008). Comparing ecosystem goods and services provided by restored and native lands. *Bioscience*, 58(9), 837–845.
<https://doi.org/10.1641/B580909>
- Echelberger, H. E., & Plumley, H. J. (1986). *Anatomy of backcountry management costs*. United States Department of Agriculture Forest Service. Research Paper NE-575.
<https://www.fs.usda.gov/research/treesearch/21721>
- El-Sibaie, A. (2019, November 14). *2020 tax brackets*. Tax Foundation.
<https://taxfoundation.org/2020-tax-brackets/>

- Eastern Sierra Sustainable Recreation and Tourism Initiative (ESSRTI). (2021). *A changing climate: Vulnerability in California's Eastern Sierra*.
https://mltpa.org/images/downloads/703_02_AChangingClimate_2021-05-13_FINAL.pdf
- Friedman, E., Freeman, B., Phillips, B., Rosenthal, L., Robinson, D., Miller, H., & Porowski, A. (2016). *AmeriCorps alumni outcomes: Final survey technical report*. Corporation for National and Community Service (now AmeriCorps).
https://americorps.gov/sites/default/files/evidenceexchange/FR_AmeriCorpsAlumniOutcomesFinalTechReport_1.pdf
- Fritts, J. (2021, January 6). *State and local sales tax rates, 2021*. Tax Foundation.
<https://taxfoundation.org/data/all/state/2021-sales-taxes/>
- Guo, M., Li, J., Wen, L., & Huang, S. (2019). Estimation of CO₂ emissions from wildfires using OCO-2 data. *Atmosphere*, 10(1), 581. <https://doi.org/10.3390/atmos10100581>
- Hyland, S. S. (2015). *Justice expenditure and employment extracts, 2015 - final*.
<https://bjs.ojp.gov/library/publications/justice-expenditure-and-employment-extracts-2015-final>
- Interagency Working Group on Social Cost of Carbon, United States Government. (2013). *Technical support document – technical update of the social cost of carbon for regulatory impact analysis – under Executive Order 12866*.
- Jones, K. W. (2021, November 24). Estimating the societal benefits from wildfire mitigation activities in a payments for watershed services program in Colorado.
<https://doi.org/10.32942/osf.io/z9skm>
- Loughead, K. (2020, February 4). *State individual income tax rates and brackets for 2020*. Tax Foundation. <https://taxfoundation.org/state-individual-income-tax-rates-and-brackets-for-2020/>
- Markovitz, C., Schneider, G., Jastrzab, J. A., & Frumkin, P. (2008, April). *Improving lives and communities: Perspectives on 40 years of VISTA service*. Corporation for National and Community Service (now AmeriCorps).
https://americorps.gov/sites/default/files/evidenceexchange/FR Imprv LivesComm_40YrsVISTASvc_2008_1.pdf
- Mason, C. L., Lippke, B. R., Zobrist, K. W., Bloxton Jr, T. D., Ceder, K. R., Cornick, J. M., ... & Rogers, H. K. (2006). Investments in fuel removals to avoid forest fires result in substantial benefits. *Journal of Forestry*, 104(1), 27–31.
- Moeltner, K., Kim, M. K., Zhu, E., & Yang, W. (2013). Wildfire smoke and health impacts: A closer look at fire attributes and their marginal effects. *Journal of Environmental Economics and Management*, 66(3), 476–496.
<https://doi.org/10.1016/j.jeem.2013.09.004>

- Munaretto, C., Ryder, D., Modicamore, D., Naugler, A., Miller, B., & Pershing, J. (2021). Return on Investment Study: Washington Conservation Corps. ICF. https://americorps.gov/sites/default/files/document/ROI_WCC%20a_RELEASE.pdf
- National Center for Education Statistics (NCES). (2020). *IPEDS Data Explorer. Average costs (in constant 2019 dollars) associated with attendance for full-time, first-time degree/certificate-seeking undergraduates at Title IV institutions operating on an academic year calendar system, and percentage change, by level of institution, type of cost, control of institution, residency, and student housing: United States, academic years 2017–18 and 2019–20.* https://nces.ed.gov/ipeds/Search?query=&query2=&resultType=all&page=1&sortBy=date_desc&overlayTableId=27425
- Office of Management and Budget. (1992, October 29). *Circular A-94: Guidelines and discount rates for benefit–cost analysis of federal programs, transmittal memo no. 64.* https://www.whitehouse.gov/wp-content/uploads/legacy_drupal_files/omb/circulars/A94/a094.pdf
- Office of Management and Budget. (2003, September 17). *Circular A-4.* https://www.whitehouse.gov/wp-content/uploads/legacy_drupal_files/omb/circulars/A4/a-4.pdf
- Office of Management and Budget. (2020, November 19). *Budget assumptions. Nominal treasury interest rates for different maturities (from annual budget assumptions for the first year of the budget forecast).* <https://www.whitehouse.gov/wp-content/uploads/2020/12/discount-history.pdf>
- Oh, C. & Hammitt, W. (2010). Determining economic benefits of park trails: Management implications. *Journal of Park and Recreation Administration*, 28(2), 94–107.
- Oswald, J. (2018, March 29). *What does an unemployment claim cost an employer?* Unemployment Insurance Services. <https://www.unemployment-services.com/unemployment-claim-cost-employer/>
- Rennert, K., Errickson, F., Prest, B. C., Rennels, L., Newell, R. G., Pizer, W., Kingdon, C., Wingenroth, J., Cooke, R., Parthum, B., Smith, D., Cromar, K., Diaz, D., Moore, F. C., Muller, U. K., Plevin, R. J., Raftery, A. E., Sevcikova, H., Sheets, H. Stock, J. H., Tan, T., Watson, M., Wong, T. E., & Anthoff, D. (2022). Comprehensive evidence implies a higher social cost of CO₂. *Nature*, 601, 687–692. <https://doi.org/10.1038/s41586-022-05224-9>
- Schimel, D., Alves, D., Enting, I., Heimann, M., et al. (1995). Radiative forcing of climate change. In *Climate Change 1995: The Science of Climate Change*, (pp. 65-132). Contribution of Working Group I. Second Assessment Report of the Intergovernmental Panel on Climate Change. <https://www.ipcc.ch/report/ar2/wg1/>
- Social Security Administration. (2020). *Fact sheet: 2020 Social Security changes.* <https://www.ssa.gov/news/press/factsheets/colafacts2020.pdf>

- Spera, C., Ghertner, R., Nerino, A., & DiTommaso, A. (2013). *Volunteering as a pathway to employment: Does volunteering increase odds of finding a job for the out of work?* https://americorps.gov/sites/default/files/evidenceexchange/FR_2013_VolunteeringasaPathwaytoEmployment_1.pdf
- Trostel, P. (2015). *It's not just the money: The benefits of college education to individuals and to society*. Lumina Foundation. <https://www.luminafoundation.org/files/resources/its-not-just-the-money.pdf>
- Thompson, S., Vehkaojia, M., Pellikka, J., & Nummi, P. (2020). Ecosystem services provided by beavers *Castor spp.* *Mammal Review*. https://beavertrust.org/wp-content/uploads/2020/10/Thompson_et_al-2020_Mammal_Review.pdf
- U.S. Bureau of Labor Statistics. (2019-a). *Consumer Price Index*. <https://www.bls.gov/cpi/>
- U.S. Bureau of Labor Statistics. (2019-b). *Occupational employment and wage statistics*. <https://www.bls.gov/oes/tables.htm>
- U.S. Bureau of Labor Statistics. (2021, May 27). *Consumer Expenditure Surveys tables (CE)*. <https://www.bls.gov/cex/tables/calendar-year/mean-item-share-average-standard-error.htm#cu-income>
- U.S. Census Bureau. (2019). *Current Population Survey's Annual Social and Economic (ASEC) Supplement for March 2019*. <https://www.census.gov/data/datasets/time-series/demo/cps/cps-asec.2019.html>
- U.S. Census Bureau. (2020). *Current Population Survey's Annual Social and Economic (ASEC) Supplement for 2020*. <https://www.census.gov/data/datasets/time-series/demo/cps/cps-asec.2020.html>
- U.S. Census Bureau. (2021-a). *American Community Survey (ACS)*. <https://www.census.gov/programs-surveys/acs/news/data-releases.2021.html>
- U.S. Census Bureau. (2021-b). *2021 Current Population Survey (CPS)*. <https://www.census.gov/programs-surveys/cps.html>
- U.S. Department of the Treasury. (2019). *Interest rate statistics*. <https://home.treasury.gov/policy-issues/financing-the-government/interest-rate-statistics>
- Voigt, G., Borgida, J., Clark, D., Kulka, L., Miller, B., Modicamore, D., Pershing, J., Thompson, P., & Sarwana, M. (2022). *Return on Investment Study: Nevada Conservation Corps*. ICF. https://www.americorps.gov/sites/default/files/document/36039_NCC_2022_AmeriCorps_ROI_Study_RELEASE_508.pdf
- Wang, G., Macera, C. A., Scudder-Soucier, B., Schmid, T., Pratt, M., & Buchner, D. (2005). A cost-benefit analysis of physical activity using bike/pedestrian trails. *Health Promotion Practice*, 6(2), 174–179. <https://doi.org/10.1177/1524839903260687>

- The Watershed Company. (2015). Impact evaluation 2014–2015: Washington Conservation Corps restoration sites. <https://americorps.gov/evidence-exchange/impact-evaluation-2014-2015-washington-conservation-corps-restoration-sites>
- Wilson, N. R., & Norman, L. M. (2018). Analysis of vegetation recovery surrounding a restored wetland using the normalized difference infrared index (NDII) and normalized difference vegetation index (NDVI). *International Journal of Remote Sensing*, 30(10), 3243–3274. <https://doi.org/10.1080/01431161.2018.1437297>
- Zavaleta, E. (2000). Valuing ecosystem services lost to Tamarix invasion in the United States. In H. A. Moody and R. J. Hobbs (Eds), *Invasive Species in a Changing World* (Chapter 12). Washington, D.C.: Island Press.
https://books.google.com/books?hl=en&lr=&id=hCoJiTo7I3wC&oi=fnd&pg=PA261&ots=OOonzoGwJt&sig=4DJXDAwE6bREcfxiSriOzZv_6ss#v=onepage&q&f=false
- Zeidenberg, M., Freeman, B., Friedman, E., & Porowski, A. (2016). *Results from the National Student Clearinghouse data match: New methods for assessing AmeriCorps alumni outcomes*. Abt Associates.
https://americorps.gov/sites/default/files/evidenceexchange/FR_NatlStudent_ClearinghouseMatch_AlumniOutcomes_2016_1.pdf