EVIDENCE BRIEF

Effective AmeriCorps-Funded Environmental Stewardship Programs

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AmeriCorps, the federal agency leading service and volunteering in the United States, helps millions of Americans improve their lives and the lives of their fellow citizens through service. Through AmeriCorps and AmeriCorps Seniors, national service members and volunteers serve hand-in-hand with local communities to tackle their most pressing challenges. AmeriCorps has made sustained investments in conservation, resource management, and environmental education across the country. Among the interventions and national service programs AmeriCorps has funded in the environmental stewardship area, those with positive results from high-quality, independent, and rigorous impact studies, as assessed through external systematic evidence reviews are featured in this brief. All featured interventions are AmeriCorps State and National-supported Programs.[1]

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[1] "AmeriCorps State and National." AmeriCorps.gov. https://americorps.gov/serve/fit-finder/americorps-state-national

The evidence base around environmental stewardship is an emerging field; this brief provides an overview of evaluations conducted on various AmeriCorps programs relating to Environmental Stewardship. The evaluations highlighted in this brief primarily used quasi-experimental designs (QED) and demonstrate how AmeriCorps environmental stewardship programs have positively impacted communities, ecosystems, and service members/host agencies themselves.

Where did these programs serve?

These AmeriCorps interventions spanned a range of ecosystems and environmental settings across the country, including:

- Subalpine meadows
- Watersheds
- Riparian corridors
- Wetlands
- Creeks and rivers
- Lands prone to wildfire
- State and national park trails

What did these programs accomplish?

Environmental stewardship-focused programs supported by AmeriCorps have produced favorable and measured outcomes in the areas of:

- Trail reconstruction
- Natural habitat restoration
- Native species propagation
- Stormwater runoff management
- Fuels management and wildfire risk mitigation
- Dissemination of natural resource management knowledge and best management practices
- Noxious weed removal and invasive species coverage reduction

Additionally, one report examined how hosting AmeriCorps programs enhanced host organizations' capacity to accomplish greater amounts of trail maintenance and fuels management.

One last evaluation detailed the impact of environmental AmeriCorps programs on participating members' intent to pursue natural resource management, attitudes towards public lands, and proclivity for environmental activism.

How did these programs do it?

Deeply engaged with the communities and environments in which they served, these evidence-based AmeriCorps programs employed a variety of conservation and resource management models. Program activities included:

- Educating residents about resource management programs occurring in their neighborhoods
- Coordinating with members of the community to monitor changes in stormwater runoff and in overall tree health
- Planting new trees, shrubs, and other native species to propagate healthy species coverage and improve stormwater runoff
- Eradicating and suppressing invasive plants through the usage of power tools, hand tools, and herbicides
- Bringing trail to grade by adding fill material to ruts and other eroded areas
- Mitigating the risk of wildfire through fuels reduction and native habitat restoration

Effective Interventions Funded by Americorps and Their Impacts

INTERVENTIONS	THEIR IMPACT
Washington Conservation Corps (WCC) members planted native species, applied restoration methods including solid tube tree protectors and deer repellant, and then tested the effectiveness of each method on plant survival rates.	Results from the 2018 study showed that plant survival rates significantly improved following the use of solid tube protectors (covers placed on bases of plants to guard against deer browse and other maintenance activities) and deer repellant (*Plantskydd*). Crews initially installed plants during the winter, randomly assigning treatments. That following summer after one growing season, crews observed the following: • Plants with tube protectors survived at a significantly greater rate (86%) compared to reference (68%) and *Plantskydd*-treated (64%) plants. • Plants with tube protectors experienced less string trimmer damage after regular upkeep and maintenance (6% of plants) compared to reference (22%) and *Plantskydd*-treated (26%) plants. • Although not statistically significant, damage from deer browse was lowest among plants with tube protectors (1% of plants), second lowest for *Plantskydd*-treated plants (2%), and highest for reference plants (3%).
Washington Conservation Corps (WCC) focused on design and implementation of environmental restoration projects, including wetland and riparian corridor enhancement and restoration.	Results from the 2015 study showed that restoration activities conducted by WCC crews successfully achieved the goals of establishing a diverse assemblage of native plants and reducing the presence of invasive species. A statistical analysis confirmed that restoration actions significantly increased native cover and reduced the cover of noxious weeds. Based on *transect* (recording the number of occurrences in a given plot of land) data, diverse collections of native trees and shrubs were also established: • Native plant cover increased by 9.6% at restoration sites compared to an increase of 0.4% at untreated reference sites • Noxious weed coverage decreased by 15.6% at restoration sites compared to a decrease of 1.4% at reference sites • Average plant survival improved to 72%; 9 of 23 sites met the 80% survival rate goal, but 16 of 23 still met diversity standards • Although not statistically significant, the cover of *reed canarygrass* decreased at restoration sites by 8.6% compared to a decrease of 0.4% at restoration sites

INTERVENTIONS	THEIR IMPACT
Student Conservation Association (SCA) improved the *micro-environment* of the subalpine Tuolumne Meadows in Yosemite National Park by restoring the natural hydrology and soils for 4,200 ft of the *Glen Aulin Trail*. Addressing the trail damage that likely led to the vegetation, diversity, and soil loss in wilderness areas, SCA helped bring the topography to grade.	SCA members contributed to the restoration of 4,200 feet of trail topography, surface hydrology, and soils over a four-year span. Specifically: • Bringing 1,350 ft of trail up to grade in dry meadow • Bringing 330 ft of trail up to grade in wet meadow, and restoring another 720 ft of trail in this area • Restoring 2,000 ft of trail in meadow-forest *ecotone* (transition between environments) to its natural habitat Five years after restoration activities, the entire restored area had maintained the topographic level of the natural meadow without any soil loss occurring. Vegetation cover in the restored area increased to 77% of the amount of cover in adjacent, undisturbed meadow, showing that restoration activities had largely improved and restored the treatment areas to their natural levels.
Conservation Corps Minnesota & Iowa utilized AmeriCorps members to reduce residential stormwater flow to storm sewers through the construction of "Best Management Practices" (BMPs). The construction of BMPs in in an older neighborhood of Duluth, MN was also meant to enhance homeowner understanding of stormwater runoff and individual responsibility pertaining to watershed health. Part of this program was to train conservation corps members as well as local stakeholders on rainwater reduction and how to install BMPs.	Native vegetation and 46 stormwater BMPs were installed on 22 residential and city properties in the treatment neighborhood/sub-watershed: • 250 trees and shrubs • 4 stormwater ditch checks • 20 rock sump storage holes • 22 rain barrels • 5 rain gardens • 2 stormwater swales • 16 aerated lawns Comparison of runoff amounts between control and treatment streets indicated a reduction in peak stormwater flow on the treatment street for rainstorms of 1.3 inches or less. The treatment street experienced 3% less stormwater runoff after BMP installation than experienced by the control street, therein outperforming expectations. Pre- and post-project surveys showed that residents that received BMPs increased their understanding of stormwater issues by about 10%. Additionally, after participating in this intervention, 17% more residents said property owners should take at least some responsibility for stormwater runoff (an increase from 66 to 83%). 30 crew members were trained in various aspects of BMP installation, including rain garden and ditch check construction. 15 members of the general public and 2 landscape professionals were additionally trained in rain garden construction.

INTERVENTIONS	THEIR IMPACT
EarthCorps engaged AmeriCorps members to scale-up green infrastructure to better manage stormwater and decrease pollution into the Puget Sound watershed. Removing invasive species from the watershed improved natural habitat health, providing a greater barrier to stormwater runoff.	After one year of restoration activities paired with a follow-up maintenance treatment, the average percent cover of invasive species dropped from 93.2% to 16.3%, with a standard deviation of 24.8%. Comparatively, average percent cover of invasive species in the control plots was 98.8% at the beginning of the study and 96% at the end of the study, with standard deviations of 2% and 5% respectively.
Montana State Parks AmeriCorps deployed AmeriCorps members to state park properties to implement various weed treatments. Members additionally educated the public about the "threats posed by noxious weeds to Montana's economy, culture and recreational opportunities".	Montana State Parks AmeriCorps' weed treatments proved to be successful as statistically significant changes were found in all measured objective fields: • Invasive *spotted knapweed* coverage decreased by 6% as a result of treatments and increased by 19% at the control sites. • Total noxious weed cover was reduced by 25% when treated by AmeriCorps members yet increased by 9% at control sites. • Beneficial plant cover increased in treatment sites by 13% and decreased in control sites by 8%. • The mean beneficial plant coverage increased by 13%, meeting the 10% objective.
Nevada Conservation Corps (NCC) organized AmeriCorps members into forestry teams to mitigate fire threat, reduce the spread of invasive species, and restore and re-designate trails.	The NCC treatment of public lands was effective in reducing the fire regime condition class (FRCC) of treated lands, therein reducing the risk of catastrophic wildfire. The higher the FRCC, the greater departure from the central tendency of an area's reference conditions. The greater the departure from an area's historic range of variability, the greater the risk for wildfire. Controlling for pre-intervention FRCC levels, the lands treated by NCC experienced a statistically significant decrease in their mean FRCC levels compared to untreated comparison plots of land.

INTERVENTIONS	THEIR IMPACT
Public Lands Service Coalition (PLSC) examined the impact AmeriCorps members on the capacity of host agencies. Members participated with conservation agencies to build and maintain trails, campgrounds, boat docks, and recreation facilities; eliminate invasive species; remove hazardous fuels; and restore critical ecosystem and habitats at national and state forests.	Conservation corps were identified as vital partners for land management agencies in activities related to trail upkeep, invasive species removal, and fuels management. Land management personnel who partnered with conservation corps programs: • Created or maintained 30 percentage points more of the trail miles they planned to accomplish (total of 68%) compared to the personnel who did not partner with conservation corps (38%). • Completed 42 percentage points more of the fuel acres work they planned to accomplish (total of 72%) compared to comparison group who did not partner with conservation corps (30%). 33% of sampled land management personnel that partnered with conservation corps suggested that much of their planned work would simply not have been completed had they not partnered with said corps.
Public Lands Service Coalition (PLSC) measured the impact of conservation corps experiences on its members by examining changes in members': • Intent to pursue natural resource management careers • Attitudes towards public lands • Inclination towards environmental activism Changes were measured through pre- and post- surveys gauging respondents' attitudes on a five-point Likert scale.	Those that participated in conservation corps appeared to foster the following positive developments at greater levels compared to those who did not participate in such programs: • Higher intent to pursue natural resource management related education and careers • Increased positive attitudes towards public lands • Increased environmental activism These results remained statistically significant even after controlling for higher rated baseline characteristics of those self-selecting into conservation corps programs compared to the lower-rated baseline levels of the comparison group. These three characteristics improved more for members than any increases seen by those who did not serve.

How Environmental Stewardship Programs Relate to Climate Change

Climate change impacts communities in numerous ways including threatening wildlife and natural ecosystems, damaging infrastructure, impairing transportation, impacting human health and wellness, diminishing food and water supplies, and increasing the number and strength of extreme weather events including wildfires and hurricanes.[2]

Individuals can aid in mitigating the effects of climate change by preserving resources and promoting *community resilience* through environmental stewardship. Community resiliency is defined by the ability of a community to utilize and preserve available resources to prepare for, combat, withstand, and recover from adverse situations caused by climate change.[3] The evaluation reports detailed in this brief outline environmental stewardship projects that have increased an understanding of environmental issues, preserved and supported natural habitats, and improved water reclamation, all of which can contribute to building community resilience in the face of climate change.

While climate change affects communities in different ways, marginalized and impoverished communities face the impacts of climate change on a greater scale.[4] *Climate resilient* communities have the resources and knowledge to anticipate, plan for, and react to extreme weather events and environmental disturbances related to climate change.[5] AmeriCorps programs that increase a community's understanding of environmental issues through environmental stewardship can aid in addressing the current and future impacts of climate change and increase resiliency throughout communities in the United States.

Suggested Citation

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[2] "Climate Impacts on Society." EPA. Environmental Protection Agency, December 22, 2016. https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-society_.html

[3] "Climate Change and Social Inequality." Department of Economic and Social Affairs. United Nations, October 2017. https://www.un.org/esa/desa/papers/2017/wp152_2017.pdf

[4] "Community Resilience." RAND Corporation. https://www.rand.org/topics/community-resilience.html

[5] "Climate Resilience Portal." Resilience Solutions. Center for Climate and Energy Solutions. https://www.c2es.org/content/climate-resilience-overview/

Programs by Components, Outcomes, Targeted Environments, and AmeriCorps Member Roles

PROGRAM (SITE EVALUATED)	PROJECT ACTIVITIES	OUTCOMES	TARGETED ECOSYSTEM(S)	AMERICORPS MEMBERS' ROLES
Washington Conservation Corps (Bellingham, WA)	• Planting native vegetation • Protecting newly planted species with protection tubes • Applying deer repellent • Regular plant environmental maintenance and upkeep	• Improved survival rate of planted native species	• Wetland	AmeriCorps members installed native plants, mounted plant protection tubes, administered deer repellent, performed plant maintenance, and observed plant survival rates.
Washington Conservation Corps (WA)	• Planting native vegetation in a combination of bare-root, potted, and live-stake plantings • Mulching, fabric sheeting, and tree protection • Trimming, hand removal, and grubbing weeds • Applying herbicide	• Increased native species cover and diversity • Decreased invasive species cover • Improved survival rate of installed native trees and shrubs	• Wetlands • Riparian corridor	AmeriCorps members participate in the implementation of environmental restoration projects including wetland and riparian corridor enhancement.
Student Conservation Association (SCA) (Yosemite National Park, CA)	• Removing old rock check dams and salvaging topsoil • Importing cubic yards of fill material from nearby ephemeral drainages to level topography of trail • Replanting natural vegetation	• Improved soil levels • Increased plant coverage percentage • Increased amount of trail brought to grade (in feet)	• Subalpine meadow • River valley • National park lands	AmeriCorps members participate in environmental education trainings and trail restoration projects.

PROGRAM (SITE EVALUATED)	PROJECT ACTIVITIES	OUTCOMES	TARGETED ECOSYSTEM(S)	AMERICORPS MEMBERS' ROLES
Conservation Corps Minnesota & Iowa (Duluth, MN)	• Installing stormwater "Best Management Practices" (BMPs) • Increasing residents' understanding of stormwater issues/individual responsibility • Demonstrate effectiveness of stormwater BMPs to homeowners • Train AmeriCorps members, local landscapers, and general public in BMP installation	• Improved stormwater flow, temperature, conductivity, and turbidity (relative clarity of the water) in the storm sewers of the sub-watersheds before and after intervention • Increased residents' knowledge of runoff issues, solutions, and responsibilities at the beginning and end of the project	• Watershed and sub-watershed	AmeriCorps members help construct and install BMPs. Members additionally conduct door-to-door pre- and post-BMP construction surveys to participating neighbors.
EarthCorps (Greater Seattle, WA)	Suppressing invasive plants by: • Using power and hand tools • Applying herbicide • Brush-cutting • Using foliar spray	• Decreased invasive plant cover	• Watershed	AmeriCorps members complete invasive plant treatments to improve natural health of watershed environment
Montana State Parks AmeriCorps (MT)	• Organizing hand pulls with volunteers • Applying chemicals • Biological control collections and releases	• Decreased spotted knapweed cover • Decreased total noxious weed cover • Increased total beneficial plant cover	• Montana state park lands	AmeriCorps members implement weed and invasive species treatments and educate public on effects of noxious weeds

PROGRAM (SITE EVALUATED)	PROJECT ACTIVITIES	OUTCOMES	TARGETED ECOSYSTEM(S)	AMERICORPS MEMBERS' ROLES
Nevada Conservation Corps (NV)	• Fuel reduction and habitat restoration • Treatment and removal of noxious weeds • Post-fire re-seeding and native plant re-introduction • Trail management and restoration; improving trail access to fire locations	• Reduced risk of catastrophic wildfires through the reduction of fire fuels and the propagation of native species	• Nevada public lands and communities	AmeriCorps members treat and abate noxious weeds, perform tasks including a post-fire reseeding and native plant reintroduction, reduce fuels on trail corridor, maintain fuel breaks, and improve trail access to fire locations.
Public Lands Service Coalition (PSLC) (National)	• Trail management and restoration • Invasive species management • Fuels management	• Maintained miles of trails • Reduced wildfire risk Contributed to host agency: • Community engagement • Resource enhancement • Agency efficiency	• National and state public lands throughout the country	AmeriCorps members build and maintain trails, campgrounds, boat docks, and recreation facilities, eliminate invasive species, remove hazardous fuels, and restore critical ecosystems and habitats.
Public Service Lands Coalition (PSLC) (UT, CA, AZ, NM, MT, CO)	• Participation in a variety of conservation activities as corps members partnered with PSLC	Observed positive changes in members': • Intent to pursue natural resource management careers • Attitudes towards public lands • Inclination towards environmental activism	• Public lands throughout the Western United States	AmeriCorps members in this study participated in a variety of natural resource management activities across six Western states

Key Studies That Form Basis for Evidence

INTERVENTION	DOCUMENT	EVALUATOR
Washington Conservation Corps	The Watershed Company (2018). Impact Evaluation Report: Washington Conservation Corps Restoration Methods.	The Watershed Company
Washington Conservation Corps	The Watershed Company (2015). Impact Evaluation 2014-2015: Washington Conservation Corps Restoration Sites.	The Watershed Company
Student Conservation Association	Eagan, S., Newman, P., Fritzke, S., & Johnson L. (2004). Subalpine Meadow Restoration in Yosemite National Park. Wisconsin: *Ecological Restoration*, 22(1), 24-29.	Sean Eagan, Peter Newman, Sue Fritzke, and Louise Johnson
Conservation Corps Minnesota & Iowa	Kleist, C., Brady, V., & Schomberg J. (2011). Duluth Residential Stormwater Reduction Demonstration Project for Lake Superior Tributaries.	City of Duluth Utility Operations and University of Minnesota Duluth
EarthCorps	The Watershed Company (2019). Impact Evaluation Report: EarthCorps Restoration Methods.	The Watershed Company
Montana State Parks AmeriCorps	Maiman-Sessions, J., & Shteir S. The Efficacy of AmeriCorps Weed Treatments in Montana State Parks 2019 Impact Evaluation.	Montana State Parks AmeriCorps
Nevada Conservation Corps	Christiansen, E. (2020). Great Basin Institute-Nevada Conservation Corps- Evaluation Report 2019-2020.	Center for Program Evaluation – Community Health Sciences, University of Nevada, Reno
Public Lands Service Coalition	McCreary, A., Edwards, M., Mckenna, M., Seekamp, E., and Lockwood, S. (2020). 2019 Public Lands Service Coalition Partnership Impact Evaluation Interim Report.	North Carolina State University and Western Kentucky University
Public Lands Service Coalition	Duerden, M., Edwards, M., and Lizzo, R. (2015). Participant Impact of the Conservation Corps Experience. *Journal of Outdoor Recreation, Education, and Leadership*, 7(1), 35-47.	Mat D. Duerden, Michael B. Edwards, and Robin Lizzo

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