



Greening STEM Case Study:

Engaging Students in Outdoor Education
Through a Unique Invasive Species Project

The Problem

If you're an educator, or work with one, you know it takes more than just imagination to get your good ideas for school projects off the ground. You need to have a clear plan of action that fits your curriculum and meets the goals of your school district while providing opportunities for students to learn in [new and exciting ways](#). Of course, even the most thoroughly planned projects can still falter.

Common Challenges to Creating High-Quality Learning Projects



Funding

Implementing high-quality and collaborative educational programming is costly.



Time

Federal agencies, nonprofits, and school district staff have limited time and capacity due to many duties and responsibilities.



Partnerships

A lack of connections and/or relevant project experience can make it difficult to attract and maintain strong partnerships.



Alignment

Federal agencies, nonprofits, and schools each have separate organizational missions and educational goals to satisfy.

The Solution

NEEF's [Greening STEM initiative](#) helps formal and informal educators engage students in STEM (science, technology, engineering, and math) activities to solve real-world challenges outside of the classroom. By working together to establish [partnerships](#) with school districts, friends groups, and land management agencies across the country, we help provide educators with the [resources they need](#) to realize their ideal student projects.

KEY PLAYERS

NEEF Program Director, Robert Sendrey: expert in grantmaking and the Greening STEM model.

BLM Ecologist, Dr. Nikki Grant-Hoffman: expert in land management, biological control, and educational programming.

CCA River Program Director Dawn Cooper: skilled on-river educator experienced delivering programs at CCA's existing outdoor classroom, access to CCA's rafting equipment, expert in developing learning activities.

Palisade Insectary staff: responsible for rearing and colonizing organisms for control of weeds and pests.

Central High School AP Environmental Science teacher, Spencer Powell: experienced classroom teacher with knowledge of the course curriculum and rapport with students.

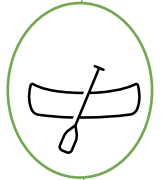


The Project

In 2020, NEEF partnered with the Bureau of Land Management (BLM), [Colorado Canyons Association](#) (CCA), and Mesa County Valley School District 51 to sponsor a Greening STEM project at McInnis Canyons National Conservation Area in western Colorado. The \$10k sponsorship award from NEEF enabled BLM to expand its existing partnership with CCA by dedicating funds to the development of place-based learning and environmental monitoring activities for Central High School students.

Project Highlights

- AP Environmental Science students from Central High School established a monitoring site for **invasive Russian knapweed** during an overnight river rafting trip in partnership with BLM, CCA, the Palisade Insectary, and with support from NEEF.
- BLM partnered with local business Palisade Insectary to supply Russian knapweed gall wasps as a form of **biological control**. The students aided in the process of releasing and monitoring their establishment in the affected area.
- BLM and CCA plan to expand this river rafting field experience program to all students in the district, but initially partnered with Central High School's AP Environmental Science program as a **pilot** program.
- 44% of students at Central High School are considered **economically disadvantaged**. This opportunity enabled many of the students on the trip to experience the canyons that would not have had the chance to otherwise.
- This project was an opportunity to engage students from a **rural community** in learning about nearby public lands.
- The project included pre-field, in field, and post-field learning activities about adverse **impacts on biodiversity** through human-induced threats, including the introduction of invasive species.



What is the NEEF Greening STEM Model?

The Greening STEM model is an interdisciplinary and collaborative approach to teaching STEM subjects that includes learning styles that are:

Place-based



Three-dimensional



Project-based



Community-based



BLM, CCA, and Central High School educators collaborated to develop fully Greening STEM-aligned experiential curricula that exposed students to public lands and authentic science practices.

Why Use the Greening STEM Model?

NEEF's Greening STEM sponsorship award filled the need for dedicated funds for this collaborative education project. The funds supported costs associated with personnel, field trip fees, travel, and supplies.

The Greening STEM project at McInnis Canyons was a win-win for leveraging the skills and contributions of each partner to reach beneficial outcomes. By taking a holistic approach, NEEF was able to attain several agency-specific goals:

- ✓ **Develop environmental literacy**
- ✓ **Deliver meaningful and robust educational programming**
- ✓ **Boost community engagement**
- ✓ **Reach high-needs communities**
- ✓ **Natural resource management**

"Invasive species are part of the environmental science curriculum, so we've talked about it quite a bit throughout the year. And it's pretty special to actually get to come out and see the science in action and have the students getting their hands dirty, and [see] what's really happening in the natural world."

Spencer Powell, AP Environmental Science Teacher at Central High School

How to Get Involved with Greening STEM

Check out NEEF's [Greening STEM Hub](#), a collection of tools and resources to help engage learners of all ages with practical lessons in STEM that focus on real-world challenges within the natural environment, to download or use these resources.

Watch our [Greening STEM video series](#) highlighting the McInnis Canyons Greening STEM project and hear directly from the students and partner groups involved.

Sign up for [NEEF's email list](#) to stay on top of current funding opportunities and apply for a grant.

Interested in learning more about implementing a Greening STEM project? Reach out to **NEEF's Environmental Education Program Director, Robert Sendrey**, at rsendrey@neefusa.org for consultation.

