Biodiversity Project

School grounds provide an excellent opportunity to introduce students to biodiversity through hands-on experiential learning opportunities. Biodiversity projects enable schools to address issues such as invasive species proliferation, habitat restoration, and ecological diversity though targeted biodiversity projects.

Projects will vary, based on the species and issues addressed by the school. The ultimate goal is to ensure that indigenous flora and fauna can continue to thrive within the school grounds. Example projects may include establishing a native species garden, replacing impervious surfaces with green space suitable for habitats, or creating food sources such as pollinator gardens or breeding habitats, ponds, or nesting boxes.

To earn points for this action, schools must have installed biodiversity projects on their grounds, involved students in the installation, and included a classroom learning component, either as part of the science curriculum or as a special school or class project in partnership with the school community. Biodiversity projects that have been installed and maintained anytime within the previous three years are eligible for points under this action. Biodiversity projects installed more than three years ago that have been maintained and are still providing wildlife biodiversity benefits are eligible for points. The biodiversity plan must identify the project's target wildlife species.

Why is it important?

A fundamental component of science education is to provide students with an understanding of the ecological building blocks that support life on the planet. A large part of this education comes through a cross-curricular approach applying scientific, mathematical, and technological skills to deepen student learning. Improving the school grounds biodiversity index will elevate school pride, improve animal health, preserve biodiversity and ecological integrity, and engage students in an ecological project that encompasses scientific, mathematical and technical skills.

Completing this action may also count towards Eco-Schools Biodiversity Pathway, National Wildlife Federation's Schoolyard Wildlife Habitat and NJ DEP’s Fish and Wildlife Wild School Sites certification programs. This action also compliments Project Learning Tree and Bridges to the Natural World environmental education programs. Schools applying for the US Department of Education Green Ribbon School Award may also use this action to receive credit under the “Effective Environmental and Sustainability Education” pillar.

Who should lead and be involved with this action?

This action could be led by the school green team, a particular class or club, or integrated as an activity across a specific grade level. The biodiversity project is a particularly good project for environmental science or biology classes to take on as part of the curriculum. The school buildings and grounds staff will be important team members when devising workable long-term maintenance plans. Excellent technical resources are available from nonprofit organizations, as well as state and federal agencies committed to wildlife, land stewardship, and conservation issues (see the resource organizations and program listing in the Resources section of this action). Community members and consulting professionals could also be invited to provide expertise and guidance.

Timeframe

Implementation of a biodiversity project could take twelve to eighteen months to complete secure needed approvals, and
complete project planning, fundraising, project design, installation, and evaluation. Project monitoring and maintenance will be needed on an ongoing basis. Prior to installing a biodiversity project schools are strongly encouraged to complete the Biodiversity Audit and Plan action, which may take six to twelve months to complete. This survey and early action planning process will provide much needed background information and data needed to design a successful biodiversity project.

**Project costs and resource needs**

Overall costs will depend on the extent of the biodiversity project. Implementing the project will require time for research, planning, evaluation, and implementation. Project costs for establishing native species gardens, removing invasive species, and building birdhouses or other habitats will vary.

Extensive free or low-cost technical assistance from wildlife and conservation professionals in county, state, or federal government agencies, or through nonprofit conservation or environmental organizations, is widely available to assist with the design and installation phase. Schools could also reach out to the Municipal Environmental Commission, master gardeners, or private environmental consultants for free advice and technical support.

Limited grant funding may be available from US Fish and Wildlife Service, Alliance for NJ Environmental Education, and other conservation organizations. Local businesses, community service organizations, and your local parent-teacher organization may also be willing to contribute supplies, equipment, or funding.

**What to do, and how to do it (“How to”)**

This section provides guidance and recommendations for implementing the action. A school does not need to follow this guidance exactly as long as it meets the requirements for earning points for this action.

Please note that the program also has the Green Infrastructure Assessment and Plan and Green Infrastructure Installation actions, whose primary focus is on addressing water quality, flooding, and stormwater runoff issues on your school campus. It should be noted that some green infrastructure projects (like raingardens) also provide wildlife habitat benefits, but points for the installation of a specific practice will only be eligible to earn points under one action. The program also has a School Garden action that awards points for school gardens that produce food. It is recognized that food gardens can provide wildlife habitat benefits, but gardens that primarily focus on growing food will be awarded points under the School Garden action.

**Completing a Biodiversity Project.**

1. Convene members of the biodiversity team as well as school and community members to gather ideas and identify resources available to support the selected biodiversity project implementation. This will create an enriching experience for students and community members alike. Schools may find assistance from a variety of sources such as landscape architects, conservation organizations, and local businesses willing to donate their technical expertise, equipment, and supplies to support the project installation.

2. Extensive and detailed guidance on creating schoolyard habitats are available from National Wildlife Federation’s "How-To Guide" for Schoolyard Habitats,® which goes through the steps to creating a successful and sustainable wildlife garden, provides information on teaching in an outdoor classroom, and offers resources to help create and maintain your habitat.

The guide is broken out into seven sections that walk you through the process and provide lesson plans. Topics include:

- Background on the schoolyard habitats program.
- Gardening for Wildlife.
- Teaching with Schoolyard Habitat Sites.
- Gathering Information (site assessment and planning).
- Assembling the Elements covers topics ranging from design considerations, discouraging vandalism, accessibility guidelines, project planning, creating a budget, fundraising, volunteers, to planting your site.
- Ensuring Continued Success covers the development of a maintenance plan and monitoring.
Appendix and Resources.

Additional planning and design guidance can be found in the Resources section of this action. Choose a final project to install and develop a comprehensive project plan using the guidance provided in the “Assembling the Elements” section highlighted above. Projects can include native species garden, birdhouses, ponds or water features, invasive species removal, or any other habitat elements necessary to support specific wildlife species. It is important to consider the physical elements (soil, water sources, drainage patterns, and sun and wind exposure), ecological components (animal, insect and plant populations), human influences (buildings, sidewalks, play grounds, hard spaces), and accessibility when planning a site.

3. Identify curriculum linkages to the selected biodiversity project. The biodiversity project must be used by at least one class as part of a classroom activity or curriculum component. Extensive examples of lesson plans and activities linked to curriculum standards are available on the NJ SEEDS, EcoSchools Biodiversity Pathway, National Wildlife Federation, Project Learning Tree, and North American Association for Environmental Education websites.

4. The biodiversity team leader should provide regular updates to the school principal, facilities director, and other school leadership (if they are not part of the planning process) to assure that the necessary approvals and support are obtained.

5. While the project design, work plan, and budget are being finalized, the project team should begin to identify funding sources (grants or donations), fundraising activities, and donation opportunities for materials and equipment, as well as student and community volunteers needed to successfully implement the biodiversity project. Project teams may want to consider using a Kickstarter-type fundraising website called ioby to raise funds for the project. Once all funding and/or donations are in place, mobilization efforts to implement the project can begin.

6. Promote the installation of the biodiversity project to the school community as well to the entire community to build support and awareness for the project. Remember to take photos of the project installation, as at least two photos need to be submitted as part of the action documentation. Conduct a school-wide awareness campaign to inform students, faculty, and the broader school community of the school’s efforts to expand school site biodiversity.

7. Develop a process for integrating the biodiversity action plan goals and specific biodiversity projects into the district grounds management guidelines. Work with the school facilities director to coordinate ongoing project maintenance needs.

8. Determine how the project impact will be monitored and evaluated. Set a date to revisit the project as a group. Analyze how far the school has come and identify what else can be done. Regular updates to the biodiversity audit of the schools grounds (at least every three years) supported by good recordkeeping will allow students to document changes in the school biodiversity index as more schoolyard habitat projects are initiated over time.

9. Progress on the biodiversity plan should be shared, and educating students on local habitats, native and endangered species, and the history of the school grounds land use may also be addressed. School assemblies, bulletin boards, morning announcements, newsletters, and the school website could be utilized for publicizing progress. If additional projects are planned in the future, use the project outreach communications to solicit support from the entire community.

**What to submit to earn points for this action**

In order to earn points for this action, the following documentation must be submitted as part of the online certification application in order to verify that the action requirements have been met.

1. **Description of Implementation:** In the text box provided on the submission page for this action, provide a short summary (about 300 words or less) of the biodiversity project, including when the project was installed on school grounds, what has been accomplished, and the impact it has had on students and the school community.

2. **Upload the biodiversity project plan and budget along with at least two photos of the final project installation that occurred in the past three years. Biodiversity projects installed more than three years ago that have been maintained and are still providing wildlife biodiversity benefits are eligible for points. The biodiversity plan must identify the project’s target wildlife species.**

3. **Upload summary of annual project maintenance activities completed by facilities management, students, or volunteers. Identify type of maintenance and the person(s) responsible for completing the maintenance.**

4. **Upload lesson plans or activities used by at least one teacher that utilized the biodiversity project as part of the classroom learning.**

5. **Optional: Include outreach materials used to promote the project. These may include media reports, newsletter articles, etc.**

**IMPORTANT NOTES:**
There is a limit of six uploaded documents per action and individual files must not exceed 20 MB. Excerpts of relevant information from large documents are recommended.

All action documentation is available for public viewing after an action is approved. Action submissions should not include any information or documents that are not intended for public viewing.

**Spotlight: What NJ Schools are doing**

**Allamuchy Township Elementary School, Allamuchy NJ**

Partnering with a neighboring farmer, the United States Department of Agriculture (USDA), NJ Audubon Society (NJAS), and the US Fish and Wildlife Service (USFWS), Allamuchy Township Elementary School has transformed an unproductive field into a crucial ecosystem designed to protect critical habitat for native wildlife species on the school's ground. The area was a "wet" unproductive field that the USDA-Farm Service Agency's State Acres for Wildlife Enhancement (S.A.F.E.) Program helped receive restoration assistance. After enrollment, Allamuchy Elementary then entered into an agreement with the USFWS under their Partners for Fish and Wildlife Program to obtain free native warm-season grass and wildflower seed for the project, as well as several bird's nest boxes and native trees and shrubs for installation on the grounds. They then planted two acres of meadows that have provided important refuge for native pollinators, which in turn benefits the health and productivity of local agriculture and local plant communities. In addition, the fields are also outdoor classrooms for students, showing them first-hand how stewardship and sustainability can positively impact their community. For more information click [here](#).

**County Vo-Tech High School: Old Bridge, NJ and Delaware Township School: Sergeantsville, NJ**

"Houses for Hawks—Providing Nesting Boxes for American Kestrel" is funded by a State Wildlife Grant. The Endangered Species and Nongame Species Program (ESNS) have maintained a nest box program since 2006; they have partnered with various schools and scouting troops to assemble over 250 nesting boxes. Opdyke Lumber in Frenchtown, NJ donated the wood, and the boxes are maintained by ENSP staff and trained volunteers. The efforts are to keep this once common native species from declining any further and to restore its habitat. For more information click [here](#).

**NJ Department of Environmental Protection**

"Building Ecological Solutions for Coastal Community Hazards"

**Egg Harbor Township High School, Egg Harbor Schools District**

Protecting a Pond Ecosystem by Installing a Perimeter Garden

Areas within this coastal community in Atlantic County are affected by flooding, especially during weather events like the 2016 Winter Storm Jonas. The school property is often impacted by flooding. Students noticed that cold water from rainwater runoff, would run into the pond, which is part of the school's garden. By monitoring dissolved oxygen, ammonia, nitrogen and pH levels in the pond, the students found a build-up of nutrients at certain times. Through their investigation they determined that rainwater runoff from the road and field near the pond were contributing to these increased nutrient levels. Students also studied coastline changes and compared coastal erosion to the shoreline changes they noticed in the pond. The students wanted to protect the pond ecosystem because it was home to the bull frogs that they loved to watch. Students identified and drew a map of the areas on school property that experienced flooding during bad weather events. Students then decided to install plants around the edge of the pond, either in the garden or on the perimeter of the garden. Plants were selected for their ability to absorb water and provide native habitat; seeds were planted. As the plants grow and mature in the seasons to come, the students will continue to test the pond's water quality and monitor the frog inhabitants.

**NJ Department of Environmental Protection**

"Building Ecological Solutions for Coastal Community Hazards"

**Frog Pond Elementary School, Little Egg Harbor School District**

Creating a Wetland Garden to Manage Stormwater Runoff

Little Egg Harbor is located near the Great Bay and Little Egg Harbor. The township includes forested areas and wetlands, which provide protection against flooding and extreme storm events. Students identified an area on their playground that floods after storms. Students were first visited by a representative from the Barnegat Bay Partnership Project.
and were presented a model that demonstrated the impact of rainwater runoff and flooding, while learning about the importance of native plants and wetlands. Students then toured their school grounds after a storm and identified a flooded area for placement of a wetland garden. In teams, the students then selected from native plants, bushes, grasses or trees suitable for wet sites and drew their garden plans on graph paper. The students completed their project by installing plants to create their wetland garden.

**Resources**

The following resources may be helpful in completing this action.

**RESOURCE ORGANIZATIONS AND PROGRAMS**

**Association of NJ Environmental Educators** provides a learning network for formal and informal environmental educators in NJ. PALS grants are available in environmental education for students and teachers in grades K-5.  
http://www.anjee.net

**The Bee Cause Project** provides youth with opportunities to understand, engage, and learn from honey bees in order to connect with the natural environment while developing STEAM skills.  
http://thebeecause.org/index.php/resources

**Conserve Wildlife Foundation of NJ** works to preserve rare and imperiled species of wildlife that live in, breed in, and migrate through New Jersey. Their *Species on the Edge Art & Essay Contest* is a great way to engage and excite fifth-graders in learning about New Jersey’s eighty-two endangered and threatened wildlife species.  
http://www.conservewildlifenj.org/protecting/backyard

**Duke Farms Biodiversity:** Education programs for teachers and students.  
http://dukefarms.org/classes--events/

**Native Plant Society of New Jersey** is a statewide non-profit organization dedicated to the appreciation, protection, and study of the native flora of New Jersey.  
http://www.npsnj.org/

**New Jersey Audubon** fosters environmental awareness and a conservation ethic among New Jersey’s citizens; protects New Jersey's birds, mammals, other animals, and plants, especially endangered and threatened species; and promotes preservation of New Jersey's valuable natural habitats. Exceptional programming and educational resources are available for schools.  
http://www.njaudubon.org

**NJ Department of Environmental Protection, Division of Fish Game and Wildlife**

- **Endangered and Non-Game Species Program**  
http://www.state.nj.us/dep/fgw/ensphome.htm

- **Wild Schools Program (K-12):** The WILD School Sites program is an offshoot of Project WILD. The goal of WILD School Sites is to assist educators and their students in taking responsible actions to improve their communities for people and wildlife—beginning on school or educational grounds. This program highlights an A-to-Z process of understanding the basic steps involved in creating or enhancing schoolyard habitats and outdoor classrooms.  
http://www.state.nj.us/dep/fgw/pwsites.htm

- **Wild School Site Projects**  
http://www.state.nj.us/dep/fgw/schoolsites.htm

**National Wildlife Federation** has the premier "How-To Guide" for schoolyard habitats that walks through the steps to creating a successful and sustainable wildlife garden, provides information on teaching in an outdoor classroom, and offers resources to help create and maintain your habitat.  
https://www.nwf.org/sitecore/content/Home/Garden-for-Wildlife/Create/Schoolyards/Resources

**National Wildlife Federation Eco-Schools** USA program via the Biodiversity Pathway has excellent guidance on completing a biodiversity audit and plan.  
- Biodiversity Pathway Guidance  
http://www.nwf.org/Eco-Schools-USA/Become-an-Eco-School/Pathways/Biodiversity.aspx

- **Biodiversity Audit Sample**  

- **Biodiversity Plan Sample**  
https://www.nwf.org/Eco-Schools-USA/Become-an-Eco-School/Pathways/Biodiversity/Action-Plan.aspx and Template  
http://www.nwf.org/~/media/PDFs/Eco-schools/Biodiversity_ActionPlan_blank.ashx
New Jersey Eco-Schools in Partnership with NJ Audubon contains New Jersey-specific resources and program information. [http://www.njaudubon.org/SectionEducation/ProvidingfortheEducationCommunity/NWF Eco-SchoolsUSA.aspx](http://www.njaudubon.org/SectionEducation/ProvidingfortheEducationCommunity/NWF Eco-SchoolsUSA.aspx)

[NJ Audubon](http://www.njaudubon.org/SectionEducation/BridgestotheNaturalWorld.aspx) contains New Jersey-specific resources and program information.

**NJ Conservation Foundation** can assist with habitat and wildlife management and land conservation issues. [http://www.njconservation.org](http://www.njconservation.org)

**NJ Environmental Digital Library** maintains a list of New Jersey environmental organizations. [http://njedl.rutgers.edu/environmental_organizations](http://njedl.rutgers.edu/environmental_organizations)

**NJ Department of Environmental Protection** Outdoor Classroom Network website has extensive resources ranging from wildlife and plant listings, grant opportunities, PowerPoints, outdoor classroom links, and links to training opportunities. [http://www.nj.gov/dep/seeds/syhart/index.htm](http://www.nj.gov/dep/seeds/syhart/index.htm)

**NJ Department of Environmental Protection Landscape Project** is a pro-active, ecosystem-level approach for the long-term protection of imperiled species and their important habitats in New Jersey. The NJ Division of Fish and Wildlife’s Endangered and Nongame Species Program (ENSP) began the project in 1994 to protect New Jersey’s biological diversity by maintaining and enhancing imperiled wildlife populations within healthy, functioning ecosystems. [http://www.state.nj.us/dep/fgw/ensp/landscape/index.htm](http://www.state.nj.us/dep/fgw/ensp/landscape/index.htm)

**NJ Department of Environmental Protection—State Environmental Education Directory (SEED)** website contains extensive information and includes program links to Project WET, Project WILD, Project WILD Aquatic, and Project Learning Tree. [http://www.nj.gov/dep/seeds/topical.htm](http://www.nj.gov/dep/seeds/topical.htm)

**Rutgers Cooperative Extension—Master Gardeners Program** operates in many counties in New Jersey and can offer free technical assistance when developing wildlife habitat projects. A complete list of New Jersey counties that offer the Rutgers Master Gardener program is listed. [http://njaes.rutgers.edu/mastergardeners/counties.asp](http://njaes.rutgers.edu/mastergardeners/counties.asp)

**USDA Natural Resources Conservation Service:** This page contains information on how to create pollinator habitat and food source recommendations in New Jersey. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/nj/newsroom/features/?cid=nrcs141p2_018986](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/nj/newsroom/features/?cid=nrcs141p2_018986)


**US Fish and Wildlife Service** is charged with protecting and restoring plants and animals that the federal government classifies as endangered or threatened. They also work with private landowners as well as schools and municipalities to enhance the habitat value of specific sites. [http://www.fws.gov/northeast/njfieldoffice](http://www.fws.gov/northeast/njfieldoffice)

**Biodiversity Audit**

**National Wildlife Federation Eco-Schools - What is Biodiversity?** [http://www.nwf.org/Eco-Schools-USA/Become-an-Eco-School/Pathways/Biodiversity.aspx](http://www.nwf.org/Eco-Schools-USA/Become-an-Eco-School/Pathways/Biodiversity.aspx)  ·  **Sample Biodiversity Audit:** [http://www.nwf.org/Eco-Schools-USA/Become-an-Eco-School/Pathways/Biodiversity/Audit.aspx](http://www.nwf.org/Eco-Schools-USA/Become-an-Eco-School/Pathways/Biodiversity/Audit.aspx)  ·  **Biodiversity resources:** [http://www.nwf.org/Eco-Schools-USA/Become-an-Eco-School/Pathways/Biodiversity/Resources.aspx](http://www.nwf.org/Eco-Schools-USA/Become-an-Eco-School/Pathways/Biodiversity/Resources.aspx)


**Species Diversity** provides guidance through the Simpson Index and the Shannon-Weiner Index for calculating community diversity. Best suited for 4-12. Saved as PDF in Folder.

**Identification**
Native Species


**NJ Division of Fish Game and Wildlife** Field Guide for Reptiles and Amphibians is an online source for identification of and facts on all seventy-one species of New Jersey’s amphibians and reptiles. [http://www.nj.gov/dep/fgw/ensp/fieldguide_herps.htm](http://www.nj.gov/dep/fgw/ensp/fieldguide_herps.htm)

**NJ Division of Fish Game and Wildlife, Endangered and Nongame Species Program’s** Endangered and Threatened Wildlife website contains a list of all the endangered wildlife of New Jersey, what habitats they are suited for, how to identify them, and conservation efforts. [http://www.nj.gov/dep/fgw/tandespp.htm](http://www.nj.gov/dep/fgw/tandespp.htm)

Additional resources are available at [http://www.nj.gov/dep/fgw/ensphome.htm](http://www.nj.gov/dep/fgw/ensphome.htm).

**New Jersey’s Special Concern Species Status Listing** includes a list of species that require special attention due to their inherent vulnerability to environmental deterioration or habitat modification that would threaten the species if the conditions were to continue. [http://www.njfishandwildlife.com/ensp/pdf/spclspp.pdf](http://www.njfishandwildlife.com/ensp/pdf/spclspp.pdf)

**Wildlife Resources for Students** contains species glossary of terms used in identification, a field guide on endangered species of New Jersey, and a gallery of photos of rare species. Appropriate for students K-12. [http://www.conservewildlifenj.org/education/students/](http://www.conservewildlifenj.org/education/students/)

Invasive Species

**New Jersey Invasive Species Strike Team:** The Strike Team is a statewide nonprofit-led cooperative effort to prevent the spread of emerging invasive species across the state of New Jersey. The site includes great resources (videos, guides, links) on all types of invasive species that impact New Jersey [http://www.njisst.org](http://www.njisst.org). They also offer NJ Invasives, a free, web-based smartphone/tablet app that enables people to identify, collect, inventory, use, track, and transmit digitized data on invasive species of concern. The app is available in two platforms—one for Apple and one for Android—and is being made available to all users free of charge. [http://www.njisst.org/NRCSGrant.htm](http://www.njisst.org/NRCSGrant.htm)

**NJ Department of Environmental Protection Invasive Species Council** website has two reports: New Jersey Strategic Management plan for Invasive Species, and An Overview of Nonindigenous Plant Species in New Jersey. The site contains factsheets for identification. [http://www.nj.gov/dep/njisc/](http://www.nj.gov/dep/njisc/)

Wildlife Management

**Northeast Wildlife Damage Management Coop** guide to Human-Wildlife Conflict Management is a good resource on best practices for engaging stakeholders to address human-wildlife conflicts in local communities. [https://pdfs.semanticscholar.org/2661/5c307de7797ca81b712e6357e5e4082e8099.pdf](https://pdfs.semanticscholar.org/2661/5c307de7797ca81b712e6357e5e4082e8099.pdf)

**Rutgers Cooperative Extension Wildlife Management Publications** ranging from geese to deer management can be found at [http://njaes.rutgers.edu/pubs/subcategory.asp?cat=6&sub=51](http://njaes.rutgers.edu/pubs/subcategory.asp?cat=6&sub=51)

**US Fish and Wildlife Service** is charged with protecting and restoring plants and animals that the federal government classifies as endangered or threatened. They also work with private landowners, as well as schools and municipalities, to enhance the habitat value of specific sites. [http://www.fws.gov/northeast/njfieldoffice](http://www.fws.gov/northeast/njfieldoffice)