2024 GREEN INFRASTRUCTURE GRANT PROPOSAL

Montessori Radmoor School, 2745 Mt Hope Rd, Okemos MI 48864

Thank you so much for this wonderful opportunity to promote the environment! Listed below are the project plans that we hope to complete this year.

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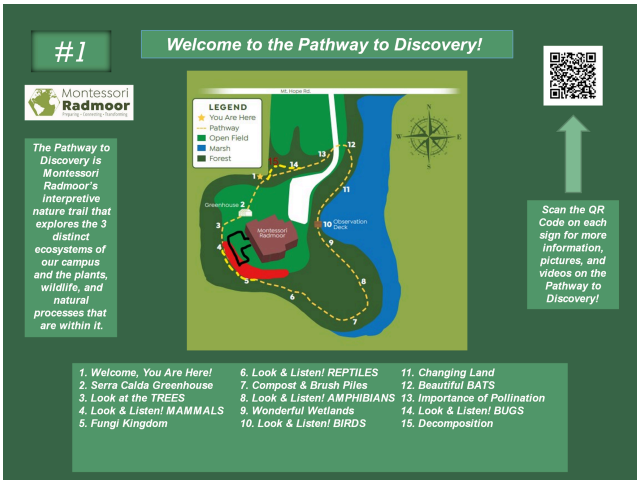
1) PROJECT DESCRIPTIONS, LOCATIONS, AND GOALS

Our proposal has four parts: First, is the addition of a new sign to our Pathway to Discovery nature trail and an update to our Pathway welcome sign. Second, is the large-scale planting of native trees, shrubs, and perennials to replace invasive species and to reforest storm damaged areas. Third, is the establishment a 16' x 16' fungi study garden ("Mycology Garden") to be located in a construction-disturbed area of our woods near the elementary wing. Fourth, is the purchase of a CNC router specifically for students to engrave plant/fungi ID tags onto natural wooden signs to be placed along our nature trail, around our greenhouse, and in our fungi garden.

Part 1 – Additional Pathway to Discovery Signs

Along our "Pathway to Discovery" nature trail, there are 14 interpretive signs and three solar powered, motion-activated trail cameras that were purchased through the 2021 Meridian Green Grant. They have all become a beloved part of our campus and an everyday staple activity for our classrooms! The students, parents, and staff walk the trails daily and the students love looking for game trails, placing the cameras, and gathering the results! Pictures and videos of wildlife captured on the cameras are then uploaded to the QR code on the pathway signs, including those of fox, coyote, skunk, possum, and more! We would like to add another interpretive sign – "Decomposition" - and re-do our welcome sign to incorporate the new sign and reflect our recent building addition.

Below is a rough outline of the changes needed to our welcome sign and a draft of a 15th sign for "Decomposition". If funds allow, we would like to make minor changes and repairs to other existing signs as well.





Part 2 - The Native Plant Diversity Project

Our campus is approximately 9.5 acres and features a large wetland, a mature forest, grass fields, and dense thickets. In the past few years, after consulting with arborists, naturalists, and The Audubon Society, we have begun a large-scale effort to remove the invasive species of plants from our understory and to plant new native trees, shrubs, and perennials to take their place. A recent wind storm also caused heavy damage to many of our mature trees across campus resulting in their removal. These areas have now been left bare and are in need of replanting.

In addition to installing a large and diverse amount of native plants campus wide, we also plan to dedicate a few areas for specific native gardens and groves. For example, we would like to install a small hillside native fern garden with each species labeled for identification. Another would be a huckleberry grove, an aspen clonal grove, and so on. Our focus will be to plant native species that will best suit our needs as a school and the wildlife that share our campus. We believe that featuring beautiful native plants will inspire our students, visitors, and staff to consider installing native species on their own property instead of ornamental and potentially invasive species.

The invasive species we are specifically targeting for removal:

- Garlic Mustard
- Dame's Rocket
- Jetbead
- Bush Honeysuckle (non-native variety)
- Buckthorn
- Tree of Heaven

Part 3 - The Mycology Garden

Our small fungi study area of inoculated logs and soil was destroyed during the construction of our new building wing. We are planning to recreate it in the form of a 16' by 16' mycology garden. Our goal is for the students to grow an assortment of fungi in this area by inoculating logs and terrain, maintaining the growing environment, analyzing the results, and harvesting any yields. All fungi grown will be edible for human consumption.

Jackie Artuso, a lower elementary guide, our greenhouse manager and in-house mushroom expert has written the following regarding the importance of a mycology garden:

"Mycology is an attractive subject to an elementary student's curious mind. When giving botany lessons, it is often a surprise telling students that we are more related to mushrooms than plants. The truth is, animals and fungi branched away from plants more than one billion years before they finally split up. Plants make their own food, while animals and fungi have to find their food to eat. There is also a similarity between fungi and an animal's cell structure opposing the structure of plants. Looking at a mushroom, one would never think!

Children are fascinated by the unique out of this world growth that appears in our forests and fields. They love to pick and examine specimens, discussing and observing their characteristics. Dr. Montessori believed that observing the natural world could teach humans a lot about themselves and how to live with each other. The natural world can teach us more from experience rather than stringent studying.

Creating a mycology garden will support students in their growth of understanding more about a forest's life cycle by witnessing decomposition, different uses of substrates, soil science, scientific classification and the needs of a different branch of eukaryote. Some students may also benefit from learning about the positive effects fungi have. Not only are they nutritious (some being the highest content of vitamin D) but they are repairing the land on our earth. Mushroom farming has expanded greatly in the last couple decades. We are more aware now of the benefits fungi has and are studying this material as a solution to many health issues and global warming.

When working with fungi, the skill of classification opens another world for students. They now have the power to discuss and defend their reasoning for their claim of species. Healthy debates, along with analysis of reasoning can lead to discoveries and honoring teamwork. The root of science is to predict and explain, it is about working together for the better. Gifting children the

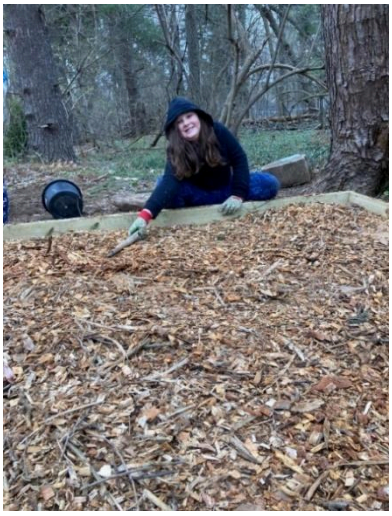
opportunity to strengthen their interconnectedness through nature benefits their long-lasting contributions to society."

The challenge of a dedicated fungi study garden will be the exclusion of deer, foot traffic, and other pests from the plot. We intend to use wooden fence posts sided with natural fiber cargo netting. Additionally, we would like to plant several native trees/shrubs as a visual screen along its borders and to shade the area naturally. All screen trees/shrubs for this will be a part of, and budgeted into, the Native Plant Diversity Project listed above.

Here is a picture of the proposed new garden area behind our Pathway to Discovery fungi sign as well as pictures of our students working on their fungi studies!








Part 4 - The Plant ID Sign Project

Plant identification and function is a large and popular part of our elementary biology curriculum. Drawing inspiration from the plant identification signs found throughout Michigan State University's campus, we would like to incorporate this tangible aspect to our curriculum by having the students create unique wooden signs for specified plants using a CNC router. These

ID signs would include common name, genus, species, habitat requirements, native/non-native, and any special attributes it may have (wildlife friendly, edible to humans, pretty blooms, etc.).

This on-going project would be assigned to our sixth-year students (the oldest students in their final year at Radmoor), who form our Student Environmental Council.

Our project goal is to have these students complete the following:

- research specific plants/fungi

- create a sign design on a computer with the specified plant/fungi nomenclature and traits

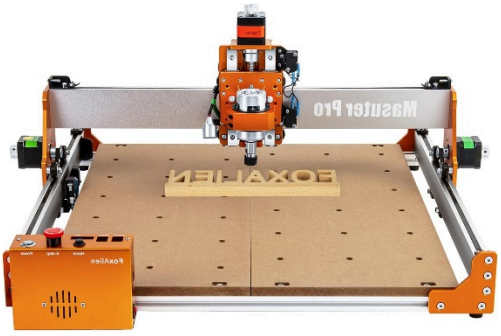
- etch the sign onto small, unique 8” x 8” natural boards with a CNC router

- finish the signs with stain/polyurethane

- place the signs next to the specific plant/fungus

Pictures: router-etched sign from MSU Botanical Gardens and a CNC router machine













Given the scope of plant diversity on our campus, this project can be on-going for many years. All agricultural plants within our greenhouse/native agriculture garden and future Mycology Garden will be labeled for identification.

2) <u>TEAM LEADERS</u>

<u>Staff Leaders</u>

Davis Coye – Buildings and Grounds Manager

Jackie Artuso – Lower Elementary Guide and Greenhouse Manager

Christine Russell – Elementary Program Director

<u>Student Leaders – Radmoor Sixth Year, Student Environmental Council</u>

Sabine Liu, Vera Babcock, Anastasia Nazarova

Jamie Cheruvelil, Ronan Guild, Severen Anderson

3) PROJECT TIMELINES

March 2024: Continued removal of invasive species. New native tree and shade garden planting locations will be determined. Fungi garden area to be cleared and prepped. Some trees to be planted if weather and vendor inventory are suitable.

April/May 2024: Native plant shade gardens will be prepared (soil amended, plants purchased or ordered). Some tree/shrub species will be planted. Enclosure materials for fungi garden purchased and installed. The Radmoor community will be invited to participate in the annual campus wide garlic mustard removal event in celebration of Earth Day, April 22nd. Plant ID sign project to begin and continue as an on-going initiative, with Native Agriculture Garden and Mycology Garden prioritized.

June 2024 – Fall 2024: Native plantings on-going as vendor inventory and funding allows.

Fall 2024 - Project completion

4) COMMUNITY OUTREACH PLAN

The Radmoor community is a tight-knit group that stretches back decades. Radmoor middle and high school alumni continually return to help improve our school with a dedicated mindfulness to environmental conservation and appreciation. Alumni Eagle Scouts have returned to build an overlook, they've constructed benches for our outdoor garden classroom (the "Radmoor Peace Garden"), and a foot bridge over a designated erosion area. Girl Scouts have constructed and installed dozens of colorful birdhouses along our Pathway for our native forest birds. We have over 200 current students and families that we involve in our greenhouse programs and special events, including the garlic mustard pull!

5) MAINTENANCE PLANS

Radmoor's full time buildings and grounds manager, Davis Coye, and lower elementary guide, Jackie Artuso, are responsible for the design and construction of the Mycology Garden. Davis Coye is responsible for all surrounding grounds, including the purchase and installation of all plant and construction material. Additionally, Davis Coye is responsible for the removal of invasive plant species or will oversee those who do so. Davis Coye and Elementary Program Director, Christine Russell, will oversee the student's use of the CNC router and the Plant ID Project content.

Jackie Artuso is responsible for the planning, instruction, and supervision of all student fungi activities, including planting, propagation, garden maintenance, and the harvesting and use of all fungi garden products and plant sales.

6) <u>MATERIALS NEED AND ESTIMATED BUDGET - $8,000</u>

<u>PART 1</u> – Additional Pathway to Discovery Signs, estimated budget $350

Sign #1 map graphic redesign - $100

New sign #1 printing - $125

New sign #15 printing - $125

(Any additional sign repair/redesign - $125/ea)

<u>PART 2</u> - Native Plant Diversity Project, estimated budget: $6,000

All plants subject to change due to availability and price changes

5x river birch, $200 – fast growing, beautiful bark, versatile

LOCATION: campus wide forest recovery tree

1x crabapple, $40 – wildlife friendly, beautiful blooms

LOCATION: storm damage reforestation tee

10x huckleberry, $200 – adaptable, wildlife friendly.

LOCATION: planted in single grove with ID marker next to observation deck, replaces jetbead and bush honeysuckle thicket.

10x maple-leaf viburnum, $200 – shade tolerant, wildlife friendly.

LOCATION: planted campus wide storm damage and reforestation, replaces bush honeysuckle

25x quaking aspen seedlings, $140 – fast growing, wildlife friendly.

LOCATION: Planted in clonal grove with ID marker, south wetland woods, storm damage repair

5 seven-gallon quaking aspen, $450 – larger specimen trees for clonal grove.

LOCATION: clonal grove in south wetland woods, replaces heavily storm damaged area.

3x serviceberry, $60 - wildlife friendly, pretty spring blooms.

LOCATION: along observation deck, opposite side of huckleberry grove

10x Paw Paw, $200 – wildlife friendly, tropical appearance, edible for human consumption

LOCATION: planted in grove along primary playground fence, storm damage replacement

7x Musclewood, $630 – important understory tree, versatile and beautiful

LOCATION – campus wide, excellent replacement for buckthorn and bush honeysuckle areas

3x Red Maple, $120 – important and hardy native tree, wildlife staple tree

LOCATION - storm damage replacement trees campus wide

3x Sycamore, $120 – fast growing shade tree, attractive bark

LOCATION - storm damage replacement trees in Peace Garden

10x Eastern red cedar, $200 – wildlife friendly, tough, evergreen, salt tolerant, deer resistant

LOCATION – front garden bed behind mailbox, storm damage replacement

5x Eastern redbud 5-gallon pot, $200 – tough, versatile, pretty blooms and leaves

LOCATION – campus wide storm damage replacement trees, replaces buckthorn/honeysuckle

10 x Eastern redbud 1 gallon pot, $200 – tough, versatile, pretty blooms and leaves

LOCATION – campus wide storm damage replacement trees, replaces buckthorn/honeysuckle

10x Red osier dogwood 1 gallon pot, $200 – wildlife friendly, beautiful bark and blooms

LOCATION – planted campus wide storm damage and reforestation

10x Highbush cranberry, $200 – wildlife friendly, edible fruit, tough and versatile

LOCATON – planted campus wide storm damage and reforestation

10x Nannyberry, $200 – wildlife friendly, edible fruit

LOCATION – planted campus wide storm damage and reforestation

2x Red Oak, $100 – wildlife staple tree, shade tree

LOCATION: storm damage replacement trees in Peace Garden

20x Arborvitae, $1,000 – wildlife friendly evergreen, screen tree, versatile

LOCATION: campus wide storm replacement tree, screen tree

30x native ferns, $600 – beautiful, wildlife friendly native spreading ferns

LOCATION: shade fern garden

2x Palm sedge flats, $180 – native sedge ground cover

LOCATION: 1 flat in storm damage area behind mailbox, 1 on elem playground

10x Wood Poppy, $70 – beautiful, spreading forest floor perennial

LOCATION: campus wide

3x Turtlehead flats, $270 – deer resistant, pollinator friendly perennial

LOCATION: 1x under aspen grove, 1 each in bee and bat gardens

1x Black-eyed susan flat, $90 – native favorite, hardy and spreading

LOCATION: campus wide

1x Columbine flat, $90 – native favorite, hardy and spreading

LOCATION: campus wide

1x Prairie phlox flat, $90 – versatile and hardy, forest floor ground cover

LOCATION: campus wide

1x Bee balm flat, $90 – fast growing, pollinator friendly favorite

LOCATION: bee garden and campus wide

1x Purple coneflower, $90 – hardy, spreading native favorite

LOCATION: bee garden and campus wide

PART 3 – Mycology Garden, estimated budget: $1,000

Outdoor sawdust spawn bag x 1 bag - $30

Lions mane (Hericium erinaceus) x 1 bag - $30

Oysters (Pleurotus spp.) x 2 bags - $60

Shiitake (Lentinula edodes) x 2 bags - $60

Wine caps (Stropharia rugoso-annulata) x 2 bags - $60

Wood Blewit (Clitocybe nuda) x 2 bags - $60

Turkey tail (Trametes versicolor) 5 lbs. x 1 - $26

Yellow Morel (Morchella esculentoides) 5 lbs. x 1 - $26

Wax daubers 4 pack x 4 - $6.40

Cheese wax 5 lbs. - $19.50

PART 4 – Plant ID Sign Project, estimated budget: $650

CNC Router - $650

7) PROJECT SUBTOTALS AND TOTAL ANTICIPATED GRANT FUNDS NEEDED

Part 1 – New Pathway to Discovery sign: $350

Part 2 – Native Plant Diversity Project - $6,000

Part 3 – Mycology Garden - $1,000

Part 4 – Plant ID Project - $650

TOTAL ANTICIPATED BUDGET = $8,000