

Burlington Conservation Board

645 Pine Street Burlington, VT
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Caryn Connolly, Vice Chair
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Ryan Crehan
Hannah Brislin
Kyle Tansley
Leslie Spencer
Ethan Ely
Elizabeth Cunningham, Student



Conservation Board Meeting Public Notice

Monday, February 3, 2025, 5:30 PM

311 North Avenue, Conference Room or Remote via Zoom

Zoom: <https://zoom.us/j/95590052709?pwd=MlhQcTVTNmUydW5qelBLeFUwZk9LZz09>

Webinar ID: 955 9005 2709

Password: 346560

Telephone: 1 929 205 6099

1. Minutes

1.1. Accept minutes from January 6, 2025 meeting

2. Board Comment

3. Public Comment

4. Update & Discussion

4.1. Conservation Board meeting locations

Discussion of meeting location

4.2. Conservation Legacy Fund Grant Applications 2025

Review of funding recommendations for the 2025 grant cycle

4.3. Northshore Wetland Property

Update as to potential city acquisition

5. Adjournment

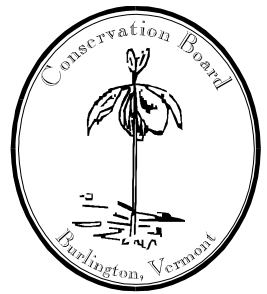
6. Informational and Non-Discrimination Statements

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Conservation Board Meeting Minutes

Monday, January 6, 2025 – 5:30 pm

Remote & In Person Meeting

Attendance

- **Board Members:** Zoe Richards (ZR), Caryn Connolly (CC), Rebecca Roman (RR), Leslie Spencer (LS), Don Meals (DM), Ryan Crehan (RC), Hannah Brislin (HB), Kyle Tansley (KT), Elizabeth Cunningham (EC)
- **Absent:** Ethan Ely (EE)
- **Public:** Owen Milne (Sailing Center), Susan Ogden, Sharon Bushor (Public Comment), Nick Larned, Nick Warner, Lauren Chicote (WVPD), Jill Dixon (Open Space Plan)
- **Staff:** Scott Gustin (Permitting & Inspections), Dan Cahill, Daniel Schmidt (Parks & Rec)

RR, chair, called the meeting to order at 5:31 p.m.

Minutes

October 7, 2024 minutes

A MOTION was made by KT and SECONDED by DM:

Approve the October 7 minutes as written.

Vote: 8-0-0, motion carried.

Board Comment

RC mentioned he's the Conservation Board member on the Long Range Planning Committee. We had our first meeting last week since joining the Committee. The city is doing a lot of planning – New North End, 127 Path Scoping Study, Preservation Burlington, Open Space plan, and Comprehensive Plan due by end of 2026.

Public Comment

Sharon Bushor mentioned the Land and Water Conservation Fund as something that was used for the Schmanska barn. It may be a consideration for the WVPD. She agrees with the need and value of WVPD's boardwalk project, but not with use of the Legacy Fund for it. She also mentioned the Community Sailing Center. She values the mission of the Sailing Center, but could not find dimensional info for the land being asked for. She's concerned with the other project for Derway Island shoreland erosion mitigation. Has the US Army Corps of Engineers looked at this? Is this a smart thing to invest in, in light of climate change? There's an upcoming discussion of the Conservation Legacy Fund as part of the Open Space Plan work. She thinks it would be prudent to have someone with financial expertise involved in this discussion. When talking about long term funds, it may be good to have an expert without any skin in the game to provide advice. When the Legacy Fund was established, there was consideration

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of funds needed for management. She'd like open space to provide balance for species other than just humans.

Susan Ogden (author of deer email sent to the Board) commented to the Board. The deer are here and are continuing to come into the city. We've seen their numbers and impacts increase with some pretty negative results. There are no predators here. She feels its only a matter of time before we see more deer/vehicle collisions and more pronounced impacts on other wildlife species. Is this item on the Board's radar? RR said the Board has talked about deer, especially as related to Intervale farms. The Board has talked to Intervale Center staff as to potential management strategies. City ordinance is currently an obstacle to some forms of management. The Conservation Board is advisory and cannot make any requirements. DM said its been on the Board's radar but has seemingly dropped off as of late. Something does need to be done. Public perception may generate substantial outcry unless management proposals are carefully developed and considered. Having conversations with neighbors may help make progress. ZR mentioned participation in the Open Space outreach process. Deer have potential to substantially impact the city's long term tree canopy health. Susan Ogden said we really need a public education campaign as to the pretty serious consequences of high deer densities. She mentioned the Rock Creek Park controlled hunt in Maryland used to control deer numbers there. RR said something similar has been done in Pittsburgh. RR, do you know what happened with the information from the UVM student project? Dan Cahill, we still have the data. It could be used to move forward with an effort here in Burlington. ZR mentioned the Cornell deer management strategy.

Open Space Subcommittee

No meeting today.

Update & Discussion

1. Community Sailing Center

Overview of zoning amendment request to enable boat storage in the Urban Reserve

Owen Milne appeared for this item.

Owen Milne said there have been a couple of events to inform and solicit public comment as to the Sailing Center's proposal to use an area of the Urban Reserve (UR) for boat storage. He noted community services provided by the Sailing Center such as floating class rooms, summer camps, lake stewardship, and kayak and boat rentals. One of the services that used to be provided was storage for folks to use for their boats. Up to 200 people used this service. The last year we could do it was 2019. With completion of the Moran FRAME project, the city made the former storage space lawn area. Our current storage area is limited just to the Sailing Center's fleet. There is a public desire for this service to be reestablished. We are considering an area in the UR just to the north of our facility. It is city property. We are looking to prioritize kayak and paddle board access. He noted the recent shoreline access improvements and showed a slide of the potential storage area in relation to the existing facility. We've had UVM Rubenstein students do an ecological assessment of this proposal. He noted there are two wetlands in this area. They are presently considered class 2 wetlands. We may have a reassessment done. VHB will do a hazardous materials assessment of the area. We don't anticipate doing any building or paving. The area would be surfaced with crushed rock.

DM, how large are the trees that would be removed? Owen Milne, there are two trees in particular that are mature. The rest is dense low growth. We would do new plantings to mitigate the clearing. DM, what do you envision as the final surface? Owen Milne, crushed rock, not sur-pac. We would keep the surface permeable. DM, have you evaluated alternatives to this site? Owen Milne, no. We would not provide the service if it were located on a different property. Its fine if the city wants to provide it elsewhere. DM, possibly make it smaller. DM, what would the plan be if a delineation confirms the class 2 wetlands? Owen Milne, does not yet know. DM, this is the UR. The intent is to preserve it for the future. We are at most 40 years from its establishment.

RC has worked in, and is familiar with, the Urban Reserve. He noted the lakeshore buffer zone in addition to the wetlands and their 100' wide buffers. This area is also affected by the lakeshore flood hazard zone. The UR district standards says that no additional lot coverage is permissible, along with no permitted or conditional uses. The area is public trust land because it is filled – brings with it requirements for public access. He noted the interim waterfront management plan. The UR was conserved with an easement requiring a 100' wide shoreline buffer. RC is not sure where to start among these concerns. SG noted that there is no application yet. The Sailing Center is aware that the rules need to change to allow for this. Owen Milne said that the project would be approvable per the conservation easement. RC said the city is the easement holder and would need to concur. ZR asked for clarification of the process here. SG replied that the Sailing Center has requested a zoning amendment to allow the boat storage use in the UR. The Planning Commission will consider it for the first time January 28. If they support the amendment request, then it would go to public hearing with the Planning Commission. From there it would go to the City Council and basically repeat the process. The Conservation Board can weigh in now and additionally in the future if it wishes. RR said she was surprised to hear the VHCB found this compatible with the easement. She thinks the service is great, but not at this location. RR recommended a motion.

A MOTION was made by RC and SECONDED by DM:

The Conservation Board does not support a zoning change in the Urban Reserve because it is not in keeping with the intent of the Natural Resource Overlay District, the Urban Reserve District, PlanBTV, Waterfront Urban Reserve Interim Use & Stewardship Plan, or the intent of the conservation easement or public trust standards.

Vote: 8-0-0, motion carried.

2. Open Space Plan

Project update and solicitation of comment

SG provided a status update and overviewed the history of the Open Space Plan and some of the major related accomplishments. The effort to comprehensively rewrite the plan began this past summer. It includes the formerly separate Urban Forest Plan and includes a team of UVM's Spatial Analysis Lab, Agency Landscape & Planning, Dan Cahill, Sophie Sauve, Sarah Morgan, myself, and Zoe Richards. We hosted stakeholder meetings this past November and are gearing up for a first round of public outreach and engagement this month and next. We'll have a presence at the January 25 winter farmers market and also at the January 23 New North End plan event. We're aiming for an ad hoc event such as skating at the ice caves and also to have a presence at Wintervale. The initial outreach is aimed at gathering public input to help build a framework for the new Open Space Plan. This coming spring and summer, we'll host a second round of stakeholder meetings and public outreach and engagement. The second round is aimed at fleshing out a draft and, ultimately, a final Open Space Plan for adoption by the City Council.

Based on initial outreach and stakeholder discussions, emerging themes include:

- Connectivity and supportive frameworks
- Communities of care
- Balance and flexibility to do the work
- Challenges to successful open space

Some key considerations that have been identified include:

- Whether and how to revamp the Conservation Legacy Fund to support conservation infrastructure
- How best to shape our changing landscape in the coming years
- Climate change and resiliency
- Basis for a new Tree Ordinance

- Green design standards

SG, what comments does the Board have at this time?

DM said we should have some open spaces to be largely natural, not to emphasize public access and use. ZR noted the robust conversation that needs to be had in figuring that out. Jill Dixon said Kim Chapman, ecologist, is on the project team. His work will help to balance these needs of conservation and accessibility across the community. RR to DM, what do you mean by unmanaged? DM, areas that are not organized for human access. DC, Arms is a great example of an area with spaces for wildlife that had informal trails. It took active management to modify the trail network and to improve its natural function. RC, thinks its great and looks forward to seeing some of the connections. Connect more kids with nature and natural areas in and around their schools. LS, how were location outreach locations decided? Jill Dixon, the Farmers Market is likely a better way to connect with the community than a stand-alone event. We'll have info boards and activities for folks to engage with. Daniel Schmidt asked about the website. SG replied that its up and running. It will be updated with information as the project moves ahead. Currently, there's a way to sign up for project updates and events on the website. Dan Cahill mentioned an online component for outreach may be worthwhile as well. It worked well for the Open Space Addendum during Covid. CC, will there be an online survey? Jill Dixon, yes. RR emphasized the importance of engaging with the Conservation Board. ZR, especially as a draft emerges.

3. Winooski Valley Park District

Continued consideration of Conservation Legacy Fund application

Nick Larned overviewed the boardwalk reconstruction project. It involves infrastructure. He's hoping as the Open Space Plan changes, then projects like this one can become fundable. He knows of the Nature Based Climate Solutions grant program. Burlington is one of 8 municipalities within the Park District. In a way, the subject property (with the boardwalk) is city land. We've applied 2 or 3 times for the recreational trails grants and were denied. Its an expensive project due to its location within a wetland. The area is high visibility right off Rte. 127 and the bike path with a number of community garden plots nearby.

RR, the original Legacy Fund language is prescriptive and makes consideration of this request challenging. This application hits on the education and stewardship pieces. There's not an easy, clear path forward with the current language. Long term, we would like to develop a framework to enable funding of conservation infrastructure projects.

DM looks favorably on the application but wants to know how this aligns with the standards. RR said that the project is not acquisition. Stewardship standards refer to lands conserved with the Legacy Program. Consideration of a variance may be warranted due to the project's alignment otherwise with stewardship. (ZR mentioned that we should really revisit Urban Wilds as part of the Open Space Plan). RR mentioned thirdly the Legacy Fund's support of conservation education supported by the Legacy Program. CC, does it connect to an educational area? Nick Larned said it's a 300' long boardwalk through a wetland that is publicly accessible. CC said its an important access point. DM said he's uncomfortable with asking for a variance from the policy standards. He'd rather see a comprehensive reevaluation of the role of the Legacy Fund. CC, we don't want to see much infrastructure built in these areas. In this case, an existing pathway would be repaired. DM said there would still be Conservation Board and Parks Commission oversight. RR said she's looking for a motion to bring this application forward with a request for variance and to continue policy discussion around conservation infrastructure. SG summed up the prior Open Space Subcommittee discussions that the project does not really fit into the "box" of the current Legacy Fund standards but also that the Subcommittee felt that it doesn't hurt to ask now, especially in light of the continuing policy discussions that will take place with the Open Space Plan. ZR said that there is a lot of activity and educational opportunities at the Homestead right here in Burlington. The project will be great if we do it now or if we wait ~18 months for the Open Space Plan and possible Legacy Fund changes.

A MOTION was made by DM and SECONDED by CC:

The Conservation Board supports an exception for the Conservation Legacy Fund to fund this particular project and to proceed to the Parks Commission and the City Council.

Vote: 8-0-0, motion carried.

Dan Cahill said he'd like to see a resolution from the Conservation Board to support/articulate addressing the conservation infrastructure concept of this item in the new Open Space Plan. He supported Sharon Bushor's suggestion to bring a financial professional into the discussion and evaluation. We are in a city without a whole lot more land to conserve, but we are seeing progress in conservation education and seeing a need for conservation infrastructure in the community.

A MOTION was made by RR and SECONDED by ZR:

Conduct a comprehensive review of the Conservation Legacy Fund as it is written with periodic consultation with a conservation finance advisor to review how to achieve a healthy balance for fund acquisition and also to support conservation infrastructure and conservation education programs (not limited to Urban Wilds).

Discussion: DM, what do we want a financial advisor to do? Dan Cahill, to advise on how to support conservation infrastructure initiatives while also keeping sufficient reserve for acquisition. CC, maybe its just periodic advice – now and maybe every 5 years from now.

Vote: 8-0-0, motion carried.

4. 2025 Board Meeting Schedule

Review and approve 2025 meeting schedule

A MOTION was made by RR and SECONDED by ZR:

Approve the 2025 meeting schedule as presented.

Vote: 8-0-0, motion carried.

Adjournment

7:32 PM.



BURLINGTON
PARKS
RECREATION
WATERFRONT



MEMO

Date: January 29, 2025

To: Conservation Board & Parks Commission

From: Dan Cahill, City Land Steward, Scott Gustin, Principal Planner

RE: Conservation Legacy Fund Nature Based Solutions (CLF NBS) Grant: recommendation for funding

On December 17 and January 8 a review committee composed of Conservation Board members and a Parks Commission member met to review applications for the 2025 CLF NBS Grant. The committee reviewed applications from five organizations. The results of the review process and recommendations for funding by the committee are enumerated in the table below.

		Total Score	Request Amount	Award Amount	% of request awarded	Partial Funding Conditions
Vermont Garden Network		326	\$ 78,500.00	\$ 75,125.00	95.70%	adjustment for worksheet discrepancy (otherwise full funding)
VYCC		319	\$ 30,000.00	\$ 30,000.00	100.00%	
Intervale Center		324.5	\$ 79,813.00	\$ 39,375.00	49.33%	Community Food \$20,858.61, Regenerative Land Stewardship \$9,254.74, Garden Expansion \$9261
Burlington Wildways		372.5	\$ 47,500.00	\$ 35,500.00	74.74%	Re-establishing Native Plants on the Landscape \$20,500, School-Based Tree Nurseries \$15,000
Rock Point Commons		274.5	\$ 70,217.00	\$ -	0.00%	
Total			\$306,030	\$180,000		

Proposed Action: Recommend slate of funding as identified by the review committee to be moved forward to City Council for adoption.



Review Criteria	Weight	Maximum Points	Weighted Points
Demonstration of Need: Does the proposal address urgent environmental challenges included in the framework of the Nature-Based Climate Solutions Addendum?	5	4	20
Alignment: Does the proposal align with the implementation strategies outlined in the Nature-Based Climate Solutions Addendum.	4	4	16
Project Plan: Does the proposal provide strong evidence of careful planning, thought and research?	4	4	16
Community Support: What partnerships or collaborations strengthen your proposal? Do you have matching funds or other evidence of community support?	4	4	16
Community/Ecosystem Impact: Will the project benefit a large and diverse segment of the community? What are the metrics/ measurements of success?	3	4	12
Project Feasibility: What is the likelihood of successful project planning, implementation, and completion?	3	4	12
Timeline: Will the project be completed within the grant time limit?	2	4	8
Total			100

Vermont Garden Network

Project Type* Operational Work for Sustained Implementation

If applicable, project location (must be within Burlington). Some projects, such as planning efforts, may not have a particular location. Starr Farm Community Garden, Winooski Valley Community Garden, The Intervale

Please provide or upload a description of the proposed project (2 page limit)*

Vermont Garden Network (VGN) proposes a 2025 Collective Gardening project which builds on the success and lessons learned from 2024's Climate Legacy Fund project. In addition to the proven legacy of Seedsong Collective Garden in the Intervale, 2024 launched two new Collective Gardens; one at Starr Farm and the other at the Winooski Valley Park District (in partnership with the Janet S. Munt Family Room). VGN proposes continuing with the three existing garden spaces while improving their climate resiliency through deeper understanding of methods to garden in a changing climate. We will convene the community in March 2025 for a conference addressing actionable approaches to climate resilient gardening.

We also plan to implement a new hub and spoke management model that can improve the efficiencies of Collective Gardening across an increased number of sites. In order to continue to scale, VGN plans to organize staffing with a Garden Manager ("the hub"), a FT year round staff position and have this dedicated member communicate with Garden Mentors ("the spokes"), seasonal PT volunteers and/or paid interns at multiple Collective sites.

Due to consecutive years of flooding at the Intervale, VGN must address those community members who want to move away from the Intervale flood plain. Those members seeking higher ground will be supported through our new hub & spoke model. Volunteer and/or member-led Seedsong alumni will be supported as they replicate the model by contracting for our support services, but selecting their own locations within the City of Burlington. This frees up existing staff to do more community engagement workshops that support the growing of vegetables with companion garden education like pollinator pocket gardens, edible landscapes, specialty group plots (i.e. An Outright or Pride garden, New Farms for New Americans engagement, other BIPOC groups and affordable housing resident gardens).

In addition to the Collective Gardens for 2025, VGN believes in the accessibility and inclusiveness of public workshops. We want to activate our mobile classroom, Veducation Van, to offer gardening education events throughout the year by partnering with City of Burlington libraries and community gardening locations.

VGN's Thrive teaching garden site located at Ethan Allen Homestead will need to undergo extensive soil fertility testing and diagnosis in 2025. Concerns over fertility have forced us to leave the garden site fallow for one year, which represents significant program revenue cuts. However, we are committed to improving soil health through more in depth soil testing using Cornell lab tests, consulting with UVM Extension, and a year-long remediation plan (cover cropping, tillage, nutrient management plan). We believe this diagnosis is a teachable moment and we will offer workshops detailing our soil health improvement steps.

In order to be climate resilient, VGN believes we must invest in existing garden sites to allow for season extension, increase ecological services and design educational spaces. Specifically, we will address:

- Water conservation: install rainwater catchment systems off of existing VGN sheds at Seedsong, Starr Farm, Thrive. We need access to water the first week of April and into late November, but the City can't turn on water until mid-May and turns off water in early October. Access to early/late water represents 8+ weeks of season extension for increased food production.
- Pollinator habitat: restore and expand pocket gardens by focusing on native, edible, medicinal plants - all three sites would benefit from improved maintenance, additional plantings, signage
- Edible perennials: similarly, existing perennials need to be better managed, additional perennials well suited for collective gardens planted where possible (aronia, serviceberry, thornless raspberries, nanking cherry)

VGN centers on the Climate Legacy Fund ***Agriculture*** grant theme using Climate Resilient practices but also incorporates the themes of ***Forest & Tree Canopy*** through use of Edible Landscapes/Fruit & Nut Trees, ***Open Spaces*** through use of pollinators and raised bed gardening, and ***Equity, Inclusion & Relationships*** through our diverse member participation groups. VGN worked to diversify lessons with language translation and incorporate both adult and young children programming at The Family Room and will seek to include other minority populations as we continue to develop relationships and build community.

Strengthening existing community gardens through educational programming is a nature-based solution that we believe will position the City to meet community demand in a sustainable manner for years to come. We are excited that we can partner to be at the forefront of this transition enabling more gardening education for all residents.

What is the grant amount you are requesting? (\$30,000 minimum / \$80,000 maximum)*

\$78500

If you are not applying as a 501 (c) 3 nonprofit, you will likely need a fiscal agent.
Please specify your fiscal agent for this project. *

N/A

Please specify matching funds or in-kind work, if any.*

EEvernorth - \$5000

UUVM Institute of Agroecology - \$5000 pending

LLand Access Opportunity Board - \$4000 pending

Gardener's Supply - \$1000

Please provide or upload a budget and budget narrative explaining how funding will be used. (2 page limit) Note that written estimates for proposed work may be required for awarded projects.

Vermont Garden Network 2025 Collective Gardening Budget	
Expenses	
Garden Management (hub and spoke model and overall program mgmt)	\$41,600
Seasonal staff	\$11,700

Administration overhead - Indirect cost	\$13,325
Education Materials (i.e. van operation and teaching supplies)	\$5,200
Garden Materials to enhance climate resilience (i.e. deer fence, water catchment, verticle trellises)	\$7,500
Equity garden scholarships (Family Room members participation and workshops)	\$12,000
Public workshop scholarships at Thrive and community centers	\$10,000
Thrive garden soil tests and consulting services	\$4,500
Spring climate conference sponsorship	\$2,500
Total Expenses	\$108,325
Revenues	
Sliding scale program participation fees	\$3,800
Collective Garden member fees	\$14,400
Climate Legacy Fund Grant Award	\$78,500
Corporate sponsorships	\$15,000
Total Revenues	\$111,700

Please provide or upload a project schedule and, as applicable, specify individual project milestones (phases). Projects should generally be completed within 1 year.

Winter (January-April) - Off season staffing, planning and training

Greenhouse grand opening March 22, 2025 in parallel with the Garden for Good climate conference hosted by VGN at Beta Technologies in Burlington.

Gardening Season: May- October Using a hands-on educational approach, teach bed prep, planting, weeding, pest mgmt and seasonal climate resilient techniques for season long garden through harvest. Public workshops using Veggie Van or other demonstration method.

Closing/documenting/reflecting: Nov-Dec

Please provide or upload an explanation of how your project's results or effectiveness can be measured.*

VGN measures our impact in areas of Education, Innovation, Community Building and Support. VGN will utilize post-participation surveys to gather data on program effectiveness using weighted responses to questions that encompass the above areas.

Questions to be included in 2025 surveys
On a scale of 1-5 Did you....
Gain practical experience in organic gardening?
Better understand how organic gardening impacts climate change?
Try a new vegetable or recipe?
Eat more fresh produce?
Eat more foods that are culturally meaningful to your family?
Deepen your understanding about where your food comes from?
Save money on groceries?
Spend more time outdoors?
Improve your mental and emotional wellbeing?
Share your vegetables and/or gardening skills with others?
Strengthen community relationships?

Is there any other information you would like us to know? (2 page limit)

VGN has been teaching Vermonters how to grow food for over 20 years. Historically, our bottleneck to growth has been staffing. To address capacity issues in 2024, VGN's board launched a new shared leadership model, internally promoting Carolina Lukac to Co-Executive Director of Programs & Partnerships and completing an external hire for T Hanson, Co-Executive Director of Philanthropy & Communications. See [staff bios here](#). In 2025, VGN plans to continue this staffing growth with dedicated resources offering a community of practice and garden consultancy to support an increased number of Collective gardens. We believe this is essential to meeting the community demands for gardening. With the recent Vermont Outdoor Recreation Economic Collaborative (VOREC) [study](#) showing gardening as a top 5 preferred outdoor activity, VGN will be able to harness this momentum and provide the City of Burlington with proven climate resilient, gardening education programs to serve more residents.

In addition to aligning with the Climate Legacy Fund themes, VGN has also aligned with state legislature sponsored [Vermont Farm to Plate](#) strategic plan through use of nature-based climate solutions to build increased agricultural sustainability and resilience.

VYCC

Project Type* Implementation Work

If applicable, project location (must be within Burlington). Some projects, such as planning efforts, may not have a particular location. VYCC will be working at Rock Point Commons and Arms Forest.

VYCC seeks to use these grant funds to run four weeks of Youth Crew programming in Burlington in summer 2025. We will collaborate with Burlington Wildways partners to recruit local youth participants, complete high-priority conservation projects, facilitate experiential learning opportunities through our educational curriculum, and introduce participants to local organizations working on nature-based climate solutions.

Who We are:

VYCC is a service corps that enrolls over 200 young adults each year to work on public service projects. Our mission is to take action and build community by working and learning together with the land. Since 1985, over 7,000 Corps Members have completed projects that strengthen Vermont's communities and conserve natural resources.

Burlington Wildways is a partnership of organizations that connects and protects the wild places and paths of Burlington. Burlington Wildways mission is to build a strong partnership of many organizations working together to maintain a world-class shared trail network; conserve the rare plants and diverse animals that make their homes in the Queen City; and provide equitable and inviting access to our many natural areas for the benefit of all our city's citizens and visitors. While 2025 project partners only include City of Burlington and Rock Point Commons, continued partner engagement with other Wildways partners (Intervale and Winooski Valley Park District) for crew member recruitment and job exposure to VYCC alum continues to be a key strategy. This connects to strategy 6C.2 *"Increase partnerships with community organizations for the completion of NBCS projects city-wide."*

VYCC plans to leverage existing systems, tools, and personnel to run a summer season within Burlington. VYCC brings a 35-year history of engaging youth in conservation work which includes systems for recruitment and hiring, comprehensive leader and member training and staff support to assist leaders and members in the field.

Service and Education:

Youth Crews offer paid summer service positions for participants between the ages of 15 and 18. Participants work on conservation projects and learn a variety of skills including problem solving, communication with both the crew and community partners, and time management; they also develop technical conservation skills like safe use of tools, strategies for land management, erosion control, and technical trail building skills. Youth members receive training and guidance from Crew Leaders and receive additional support from VYCC Staff.

VYCCC is currently revamping its education curriculum in order to strengthen learning outcomes for youth members. Throughout the season, crew leaders will facilitate engaging learning activities that create opportunities for youth participants to learn transferrable job skills and build connections between the projects they complete and the environmental impact of nature-based climate solutions. There will also be a focus on leadership development activities throughout the season. This ties into the NBCS strategy of 6B.2 *“Ramp up NBCS related educational programs and resources for residents of all ages and find new ways to engage the New Americans and frontline communities.”* VYCC hopes the new educational program will allow for greater growth for its members while creating a pathway for youth to continue working and learning within the field of conservation.

Recruitment:

VYCC has long-standing relationships with public schools and youth-development organizations in the City of Burlington. Examples of community connections include relationships with Simon Parlante (Employment Specialist at Burlington High School), Jim Shields (Student-centered Learning Coordinator at Eagle Bay Academy), Dov Stucker (Lead Instructor of the Burlington City & Lake Semester program), and Noah Kass (Program Manager at Burlington YouthBuild).

VYCC takes a grassroots approach to recruitment. Emphasis is placed on relationship-building and creating several touchpoints over the course of a school year, so students have multiple opportunities to learn more about our organization. VYCC engages schools, educators and student populations in a variety of ways. VYCC hosts field trips on our Richmond campus where student groups learn about programs through a hands-on project. VYCC's Community Engagement Manager also attends local job fairs, networks with career counselors in the Burlington School District and gives presentations to classrooms and school-wide assemblies.

VYCC will prioritize the recruitment of Burlington residents for this crew. VYCC will focus on recruiting and hiring a crew that reflects the diverse demographics of Burlington, including the New American community. The crew will work alongside conservation professionals, making this a valuable opportunity for career exploration. This connects to strategy 6B.3 *“Create more opportunities to bring school aged children and university students into the urban wilds to experience and learn about NBCS.”*

Project Proposal:

The main goal of a youth crew is to offer opportunities for participants to learn, grow and establish connections with the land with a secondary focus on efficiency and project completion. As such we have created a list of projects for the crew to work on supported by the recommendations of a third-party assessment. Projects will be executed in order of priority, but not all may be completed. This structure allows VYCC and the Wildways partners flexibility to make changes throughout the summer based on crew skill level and interest while still dedicating the most crew time to the highest priority projects.

The highest priority project focuses on replacing damaged boardwalk and puncheon on the Rock Point Trail Network. The Rock Point trail network in Burlington connects many outdoor spaces such as North Beach, Arms Forest, community gardens, outdoor classrooms and the Burlington Greenway bike path, supporting a wide variety of outdoor recreational opportunities. This connects to goal 4B.1 *"Increase pocket parks and connected open spaces"*. As the trail network develops, it has experienced an increase in use, highlighting the need to implement sustainable maintenance to reduce the erosive impact of users. Timber and Stone LLC performed an assessment of the Rock Point trail network and identified sections where user impact is the most profound and in need of higher standard trail structures. Rehabilitating the existing boardwalk and adding length to it preserves the surrounding landscape by reducing erosion and allowing regeneration. Additionally, it discourages braided social paths by making the trails more easily navigable and accessible. Timber and Stone's assessment recommends prioritizing many different improvements on the trail system. Within the scope of our crew season, we identified 3 priorities in consultation with staff from Rock Point and City of Burlington:

Priority 1: Puncheon rehabilitation for improved pedestrian access to green spaces

Priority 2: Construction of new, seasonally mobile puncheon

Priority 3: Trail closure and puncheon removal (if time allows)

Roles:

VYCC will provide training to leaders and members, will supply a standard cache of tools, maintain vehicles, and offer operational support during project weeks. Wildways Partners will provide materials and design plans, and some in-field technical assistance during the season.

What is the grant amount you are requesting? (\$30,000 minimum / \$80,000 maximum)*

30000

If you are not applying as a 501 (c) 3 nonprofit, you will likely need a fiscal agent.
Please specify your fiscal agent for this project. *

We are a 501 (c) 3 nonprofit.

Please specify matching funds or in-kind work, if any.*

The actual operating cost of running a VYCC youth crew is more than the amount we charge to partners. VYCC raises the remaining funds through philanthropy and other grants. We will use these funds to offer \$7,500 of match to the project (25% of funding request).

Please provide or upload a budget and budget narrative explaining how funding will be used. (2 page limit) Note that written estimates for proposed work may be required for awarded projects.*

4 weeks of VYCC youth crew at \$6,500 per week = \$26,000

3.5 weeks of VYCC staff facilitated leader training to prepare leaders to lead the youth crew and complete the projects = \$2,500

8 days of leader capacity (2 leaders for 4 Fridays during the youth crew season). Those days will include continued project work and time to plan and prepare for educational activities for the following week = \$1,500

Total grant request = \$30,000

What does the \$6,500 fee-for-service rate include?

- Stipends for crew leaders and members
- Worker's Comp and Insurance
- Transportation
- Use and maintenance of tools
- Staff support for crew dynamics and project quality

The actual cost of running a VYCC youth crew is more than \$6,500 per week. VYCC raises the remaining funds through philanthropy and other grants. We will use these funds to offer \$7,500 of match to the project.

The Wildways Partners have committed to covering the expenses of building materials and other supplies from their own budgets.

Please provide or upload a project schedule and, as applicable, specify individual project milestones (phases). Projects should generally be completed within 1 year.*

Recruiting Phase:

January through May, VYCC staff working with Burlington partners on direct outreach.

Most crew member hiring occurs April and May, 2025

Training:

Crew leaders are trained from May 21 through June 13, 2025

Operational Phase:

The 2025 Burlington Youth Crew will operate for one four-week session: June 16 - July 11.

The full crew works Monday-Thursday, 8am-4:30pm.

On Fridays, the two crew leaders prepare and plan for the next week's project and educational activities.

The youth crew will have two crew leaders and five-seven youth crew members.

Project Close-out Phase:

September through December 2025

End of season reflection with partners, reporting, and planning for future partnerships.

Specific milestones for each project priority are as follows:

First Priority: Puncheon rehabilitation for improved pedestrian access to green spaces

This priority connects to goal 4B.1 *"Increase pocket parks and connected open spaces"* by addressing sections of Burlington walking trails in need of rehabilitation. The primary task is to update a significant section of the old puncheon that is in disrepair to increase pedestrian access to Rock Point and elevate foot traffic from wet tread. This involves replacing the decking and installing step stones between gaps in the puncheon, as well as brushing out the corridor, and removing invasives. Improving this section of trail connects Rock Point, Arms Forest, and Burlington Greenway Path, encouraging increased pedestrian and bike access.

Goal:

- Rehabilitate 0.14 miles of walking trail via the following:
 - Remove 154 puncheon decking pieces in poor condition
 - Replace 77 sections of puncheon with 8 and 12ft decking (≈1,312 linear ft)
 - Brush out corridor including removal of invasive buckthorn and honeysuckle
 - Install step stones between gaps in boardwalk

Locations:

- Rock Point Trail
- Arms Forest

Second Priority: Construction of new, seasonally mobile puncheon

The second priority is to construct a new section of puncheon that can be moved seasonally. This design will allow puncheon to be moved out of the way during the winter season when the trail is used by skiers. This maximizes the trail's year-round accessibility and user safety while simultaneously providing erosion control and protection of the surrounding vegetation throughout the rest of the year.

Goal: Construct and stage 140ft of new seasonally mobile puncheon

Location: Rock Point Trails

Third Priority: Trail closure and puncheon removal (if time allows)

The third priority is to disassemble and haul out a short stretch of puncheon that is in disrepair. The trail frequently floods and is seldom utilized. Removing the old material and brushing in the trail will have a positive environmental impact by minimizing further erosion and allowing the area to recover.

Goal: Close & renaturalize 300ft of trail

Location: Rock Point Trails

Please provide or upload an explanation of how your project's results or effectiveness can be measured.*

People Metrics:

- # of crew leaders (goal: 2)
- # of youth participants who gain hands-on experience completing conservation projects (goal: 5-7)
- Increased % of participants who are Burlington residents
- Participants complete 16 thirty-minute educational sessions led by crew leaders accomplishing course learning objectives

Project Metrics

- Crew Hours (goal: 750 hours)
- # Puncheon repaired/replaced (goal: 77)
- # New puncheon constructed (goal: 140 feet, if time allows)
- Area renaturalized (goal: 300ft of trail renaturalized, if time allows)
- Linear feet of public walking trail improved (goal: 2,000 feet)

Is there any other information you would like us to know? (2 page limit)

This is VYCC's second consecutive year applying for the Conservation Legacy Grant. VYCC was thrilled to receive funding in 2024 to operate two youth crews in Burlington and there is a lot of momentum to build on for the 2025 program. In a 2025 iteration, VYCC is excited to focus recruitment and hiring efforts on Burlington residents and to continue building connections between young people and the places they live. VYCC is excited to strengthen learning outcomes through a revamped educational component and to continue introducing young people to careers in conservation. VYCC is excited to do all of that while also completing valuable conservation projects in Burlington. With the heightened emphasis on local recruitment and piloting a new education curriculum, we are choosing to reduce our scope to 4 weeks instead of 8 weeks in order to attain high-quality program and project outputs.

Burlington Wildways

Project Type* Implementation Work

If applicable, project location (must be within Burlington). Some projects, such as planning efforts, may not have a particular location. **Many locations throughout Burlington**

Please provide or upload a description of the proposed project (2 page limit)*

Burlington Wildways is seeking support for our efforts to plant more native plants on the landscape in Burlington. Our work supports many of the core themes identified in the Burlington Conservation Legacy Grant Program and is helping to achieve many of the goals and tasks described in the city's Nature-Based Climate Solutions Plan.

These include growing native trees and plants with school children; a UVM partnership to grow locally sourced, ecotypic natives plants free for the community; targeted floodplain forest restoration projects; creating and maintaining a network of interested growers, ecologists and volunteers; and other efforts.

Our hands-on and educational approach across a diverse set of community members and programs is a grassroots effort to both get more plants on the landscape and more people and institutions involved in this critical work.

Restoring and establishing native plants on the landscape is one of the most promising, cost-effective and doable nature-based climate actions our city can undertake. Native plants and trees are the foundation of any ecosystem and support countless other species, especially insects, which in turn support the rest of our food web and urban agriculture. In a time of dramatic species loss and climate inconsistency, communities of locally adapted native plants are considered to be the most stable and resilient, especially when compared to communities of introduced, non-native invasive species. As one of the top-10 fastest warming cities in the country, Burlington can gain local resilience by investing in healthy natural systems which will help us to stay cool, sequester carbon, slow stormwater, grow food, and benefit the community.

There are three main project areas for which we are seeking support from the Burlington Conservation Legacy Grant Program:

1. Provide plants, demonstration gardens, and resources to citizens, supporting native plantings across the city.
2. Expand our school-based native tree nursery program to Flynn Elementary School.
3. Train Wildways Trail Stewards to remove non-native Japanese knotweed, so that natives can be restored to these areas.

Project One: Reestablishing Native Plants Across Public and Private Lands

Grant funds would be used to sustain and expand our ongoing partnership with UVM Plant Biology professor Dr. Laura Hill to grow native plants from local seed sources (ecotypic plants). Currently, Wildways partners and students gather seed in the fall from around the city and from a seed source garden in the Intervale. Then they are grown out as part of a class in UVM greenhouses over the winter. A diversity of plants are grown that succeed in the diverse soil types across Burlington. These plants are given away, mostly at our Spectacular Nature Day event at the Intervale Center in the spring. (Last year, over 400 people came to the event and over a 1000 plants were given away. A line formed before the event started for the free plant giveaway!) Additionally, at Spectacular Nature Day, participants learn to forage edible non-natives and we work with volunteers to do restoration work, replanting native Ostrich ferns which are sourced from Vermont Wetland Supply. Support from the Conservation Legacy Grant Program will allow us to grow more plants than we have in previous years, increase the variety of species available, and continue to develop the reach of Spectacular Nature Day as an outlet for these plants to a wide range of citizens and families.

We also plan to expand interest in native plantings by planting a new public demonstration garden. Grow Wild (a network of gardeners, ecologists and growers supported as a program of Burlington Wildways) aided Burlington Parks Recreation & Waterfront staff in converting a grassy slope at Lakeview Cemetery to a demonstration garden of self-sustaining native plant species. The site at Lakeview is dry and sandy. Funding from the Legacy Fund would help us start another demonstration garden in a wetter site, possibly in Oakledge Park. It is important to have successful demonstration lawn conversions on public land so other public and private land owners can have models to look towards as they consider lawn-to-natives conversions on their own lands.

Project Two: School-Based Tree Nurseries

The Burlington Wildways partnership has been growing native trees, providing nature connection, and planting pocket forests at three elementary schools in Burlington: Champlain Elementary, CP Smith Elementary, and Sustainability Academy. Last year, 658 students participated in growing native plants and

trees, 600 plants and trees were added to the landscape, and an acre of habitat was planted. Support from the Legacy Fund would allow us to expand the program to a fourth school: JJ Flynn Elementary. Burlington School District owns dozens of acres of land in the city, much of it in mowed lawn. Growing trees and native plants instead of lawn and having them available for restoration projects has been a simple, inclusive and local way to empower youth and grow much-needed tree stock locally. For example, last month, Burlington High School students helped Champlain Elementary School children dig out 145 trees grown in their nursery. The high school students then used those trees in an ongoing floodplain restoration project at the Ethan Allen Homestead. Instead of buying trees grown in the Midwest and shipped to the Northeast, the Wildways partners are working inclusively to help our city's youth grow trees in and for our city. This allows young people to be part of the solution and helps grow a new set of leaders with deep connections to Burlington's local plants and landscapes.

Project Three: Non-native Invasive Removal and Habitat Restoration

We are also seeking support to launch a second level for our successful Trail Stewards Program. Currently, we have over 400 trails stewards who pick up trash, do light trail maintenance, and report trail repair needs across the city. Trail stewards who are City Market members receive member worker hours for their volunteer time. Support from the Conservation Legacy Grant Program will allow us to train trail stewards to remove Japanese knotweed at a number of enrolled sites across the city. Trail stewards who are interested in this program will participate in an online and in-person training at the site and can work on their own time as well as in group work days. We have created an app that tracks knotweed treatments and the areas treated. Once the areas are mostly cleared of knotweed, restoration plantings of native plants will occur on all sites.

Burlington Wildways' three planned projects strongly address the themes—and their related strategies, and actions—outlined in the implementation matrix of the city's Nature-Based Climate Solutions Plan. These include Forest and Tree Canopy; Wetlands and Watersheds; Lawns Fields and Small Open Spaces; Equity and Inclusion; and Other Ideas (particularly “education” and “silo busting and community involvement.”)

What is the grant amount you are requesting? (\$30,000 minimum / \$80,000 maximum)*

\$47500

If you are not applying as a 501 (c) 3 nonprofit, you will likely need a fiscal agent. Please specify your fiscal agent for this project. *

Winooski Valley Park District (a 501c3) is our Fiscal Sponsor

Please specify matching funds or in-kind work, if any.*

Matching Funds and In-Kind for 2025

*Staff hours from partners 150 in-kind hours.

*Vermont Urban and Community Forestry Grant supporting the ongoing school-based nursery work (\$10K)

*Lake Champlain Basin Program Education and Outreach Grant for ongoing school-based nursery work (\$34K).

Please provide or upload a budget and budget narrative explaining how funding will be used. (2 page limit) Note that written estimates for proposed work may be required for awarded projects.*

Burlington Wildways NBCS Funding Request			
January-December 2025 Project Period			
Funding Request			
1. Re-establishing Native Plants on the Landscape			
Demonstration garden		\$8,500	
Community events,education and outreach		\$4,000	
Native plant partnership giveaway		\$4,000	
Community-engaged floodplain restoration		\$4,000	
Total Item 1. Request		\$20,500	
2. School-Based Tree Nurseries			
School-based tree nursery		\$15,000	
		\$15,000	
3. Trail Stewardship Program Expansion			
Professional services		\$2,000	
Capacity Funds		\$10,000	
Total Trail Steward Expansion Request		\$12,000	

Total Burlington Wildways Funding Request			\$47,500

Budget Justification

Item 1. Re-establishing Native Plants on the Landscape

Demonstration garden \$8,500 ~800 plants grown from seed to plug size by partnering nursery: \$7,000. Project design, outreach and implementation capacity: \$1,500 (staff time \$25/hr x 60hrs).

Community education and outreach \$4000 public educational tabling events throughout the season (staff time \$28/hr x ~25hrs). Four public walking or biking tours with the community at restoration sites (staff time \$28/hr x ~25hrs). Volunteer planting days throughout the season, outreach and communication via the established Grow Wild newsletter, Conservation newsletter and Trails stewards newsletter (staff time \$28/hr x ~90)hrs

Native plant partnership giveaway \$4,000 Soil media for greenhouse trays \$1,500. Growing containers for over 1000 plants \$1,200. Coordination support and giveaway event days capacity (staff time \$28/hr x ~45hrs).

Community engaged floodplain restoration \$4,000 Sourcing plugs of species appropriate for Silver maple ostrich floodplain forest natural community from VT Wetland Plant Supply or other similar retailer \$2,500. Organizing and staffing volunteer restoration days (\$28/hr x 50hrs)

Item 2. School-Based Tree Nurseries

School-based tree nursery \$15,000 Nursery supplies, infrastructure, growing media, and seeds when applicable \$7,500. Nursery management and staff time \$7,500 (staff time \$25/hr x 300hrs).

Item 3. Trail Stewardship Program Expansion

Professional service \$2,000 to upgrade and edit non-native invasive species video training module.

Trails stewards expansion \$10,000 maintain online reporting systems, create online next level training, in person trainings, group work days, restoration of sites where removal has occurred. (\$33/hr x ~300hrs).

Please provide or upload a project schedule and, as applicable, specify individual project milestones (phases). Projects should generally be completed within 1 year.*

Burlington Wildways NBCS Funding Request				
January-December 2025 Project Period				
Funding Request		Timeline	Project Milestones	
1. Re-establishing native plants on the landscape				
Demonstration garden		Winter 2025-Fall 2025	*Coordination with grower winter 2025 *Plants matured in plugs summer 2025 *Plants hardened off and ready for planting fall 2025	
Community events, education and outreach		All 2024		
Native plant partnership giveaway		Spring 2024	*Plants sown in UVM greenhouses winter 2025 *Plants hardened off and ready for distribution April 2025 *Plant giveaway events April-June 2025	
Community-engaged floodplain restoration		All 2024		
2. School-Based Tree Nursery				
School-based tree nursery		All 2024	*Expand programming and tree nursery to Flynn Elementary.	
3. Trail Stewardship Program Expansion				
Professional services		Spring 2024	*Creation of a new online knotweed non-native invasive training module.	

Capacity Funds	Early Winter, Spring 2024	*More stewards including youth, connection with BHS, King Street Youth Center, Boys & Girls Club. *Trail stewards removing Japanese knotweed and engaged in restoration plantings.		
Please provide or upload an explanation of how your project's results or effectiveness can be measured.*				
Measurable Results by Project				
1. Re-establishing native plants on the landscape				
Demonstration garden	*Quantity of plants installed Square footage of garden coverage *Number of events, volunteers educated and involved, and local organizations and individuals using garden as educational tool and resource			
Community events, education and outreach	*Number of events held for community education *Number of tabling events attended for community outreach *People reached via newsletters and social media *Attendees of Spectacular Nature Day			
Native plant partnership giveaway	*Number of species with successful germination & growth *Quantity of plants grown for giveaway *Plants given away			
Community-engaged floodplain restoration	*Quantity of plants added to the landscape *Number of volunteers engaged in the restoration process			
2. School-based Tree Nursery Expansion				
School-based tree nursery	*Children taught/schools served *Trees and plants grown *Area restored or coveted to native plants			
3. Trail Stewardship Program Expansion				
Professional services	*Professional quality video training module			
Capacity Funds	*Area of Japanese knotweed removed *Volunteer hours put towards Japanese knotweed removal.			

Is there any other information you would like us to know? (2 page limit)

Burlington Wildways is a partnership group between most of the large, public-facing landowners within the city. The partners are Rock Point, the Intervale Center, Burlington Parks, Recreation & Waterfront and Winooski Valley Park District, who is our fiscal sponsor. We also work closely with UVM, both faculty and planning staff. We were formed by a City Council resolution in 2017 to bolster conservation efforts across the city and to assure long-term equitable access to our natural areas. Our steering committee meets monthly to discuss our priorities and strategic direction.

Our partnership is efficient. We are a group of groups each with staff. For example:

1. Our school-based tree nursery is partially staffed by an educator and grower who is housed in the Parks Department. Her position is fully funded through grants written by Wildways but being housed with one of the partners allows access to trucks, insurance, and equipment already owned by the city.
2. Similarly, in our building relationship with UVM, professors in the plant biology department bring expertise in growing locally adapted native plants—but we are limited by shelf space in the UVM greenhouse. Now there are emerging plans to collaborate with the Intervale Conservation Nursery, which owns large-scale seed processing machines and is a grower at scale. We're aiming to have a greenhouse wholly dedicated to growing locally-sourced native plants, combining the two organizations' strengths.
3. Our Trail Stewards Program occurs across multiple ownerships. For citizens this approach is welcoming and sensible: one program, one training, one reporting system that extends across many natural areas. But this program takes coordination, agreement on goals, communication, and planning across multiple organizations. The program is run by Wildways and Intervale Center staff, but the data that runs our apps is all held by the Parks Department so we are in close communication to keep this stewardship program running smoothly. Wildways' partnership work is silo busting. We plan for projects that each partner has an interest in doing, but could not do alone.

In-vessel Composting; on-site at Rock Point

Introduction

At the nexus of urban farming, watershed health, and waste management; neighborhood-scale, in-vessel composting offers a unique infrastructure for building organic matter across Burlington's cityscape. Low permeation and minimal space are challenges often associated with on-site compost within the built environment due to the risk of nonpoint-source pollution and vector attraction. In-vessel designs address these challenges with a technology appropriate for the urban landscape, with potential to model processes of decentralized composting, including the benefit of automation for most bodies to access and operate.

Once applied, compost will enhance the soil's water infiltration & holding capacity to buffer the impact of intensifying rain events, sequester carbon within the immediate microclimate, and provide habitat for life at every scale. Further, we see an opportunity to divert surplus food scraps generated by local schools to regenerate fertility on-site for the benefit of future generations communing with the landscape.



Image provided by Compost for Good: Community-scale Composter Operator Manual (2021)

To manage organics produced by schools on the land of Rock Point (RP), we propose a program collaboration with a local composting organization, Soil Cycle BTV, to install and operate a rotating drum based on the design and guidance provided by Compost for Good, a nonprofit organization.

Mission

Build biologically dynamic organic matter across RP and the surrounding area

Collect organic 'waste' from local schools to recirculate nutrients on-site

Pilot automated systems of appropriate technology with potential to scale for decentralized organics recycling across a temperate urban landscape

Practice self-reliant food & fertility strategies and build methods toward a regenerative nutrient economy

Reduce the spread of invasive species that travel via outsourced compost

Offer safe gathering spaces for skill sharing & eco-somatic therapy

Objective

Install an [in-vessel composting drum](#) that allows for year-round composting within walking distance of a school (ie surplus)

Coordinate with a source of food surplus to intercept compost prior to depackaging

Offer place-based workshops regarding food safety & rescue, soil observation & analysis, edible perennial planting, bicycle hauling and urban compost management

Conduct community-based field trials and facilitate public space for skill-sharing

Partner with a local compost organization to support household organic diversion

Design & plant perennials based on food forest principals with the RP homestead

In-vessel Composting; on-site at Rock Point

Collaborators and Stakeholders

Rock Point Commons

- Site location for on-site composting
- Compost application & planting

Rock Point Community Homestead

- Skill-sharing & public programming

Rock Point School & Eagle Bay

- Primary sources for compost feedstock



Proposed site location: Northern lot of Eagle Bay

Soil Cycle BTV

- Compost Hauling & Processing
- Public Programming

People's Kitchen & Food Not Bombs

- Food Redistribution

Cold Hollow Contracting

- 20' drum installation & part sourcing

Compost for Good (NYS)

- Troubleshooting & retrofitting

Radical Adventure Riders

- Rides/gatherings & mechanic support

Programming & Social Infrastructure

Weekly Service Opportunities: bicycle hauling & food redistribution

Monthly Skill Shares: gardening, composting, microscopy, mushroom inoculation

Seasonal Events: group ride with RAR, pumpkin smashing, Rot & Soul, spring planting

Equipment & Capacity

Soil Cycle BTV is currently processing scraps from RP School in a small-batch, vertical drum, however the capacity of this system is unable to meet the weekly flux of organics. As detailed in the operating manual, a 20 ft drum¹ is able to 'process up to 50,000 lbs of food scraps per year' and '13,750 lbs of carbon bulking materials.' Given the capacity to process close to 1,000 lbs per week, a 20' drum could receive organic surplus generated at Rock Point School (200 lbs/wk) as well as Eagle Bay (estimated to be 400-600 lb/wk). These sources generated on-site can be composted in tandem with 25 - 50 nearby households.

Processing time (continuous): 25-45 days until stable, then stored for finishing (~3 mo)

Annual compost production: 10,000 lbs/yr (~10 cubic yards)

Sustained Engagement

At this scale of production, compost application at Rock Point could locally sequester up to 2.5 tonnes of CO₂ by 2027. If operated at this rate for 5 years, application of OM has the potential to locally sequester 25 tonnes of CO₂ by 2030. A localized process independent from the reliance of motor vehicles substantially reduces the carbon spent on hauling. Beyond the initial investment in equipment & programming, operation will be sustained with value derived from compost production & hauling services provided by Soil Cycle BTV.

¹ As suggested in the [operating manual](#), this composting drum design could be modified to accommodate a 5-foot diameter drum, increasing the volume inside of the drum more than 1.5x

Total Request		\$70,217		Matched funds		\$15,242	
Compost Mgmt & Programming		\$ 35,280.00		In Kind (RPC)		per month	rate
	hrs/month	rate (\$/hr)	annual \$				annual \$
Bo	48	26.25	\$ 15,120.00	Kelly Kimball	8.00	48.56	\$ 4,661.76
Andy	32	26.25	\$ 10,080.00	Event fees	1.00	200.00	\$ 2,400.00
Tyler	16	26.25	\$ 5,040.00	Perrenials	--	--	\$ 2,000.00
Sarah	16	26.25	\$ 5,040.00	Matched	per month	rate	annual \$
*one year of work, with hourly expectaitons varying seasonally based on program				BSD	1.00	225.00	\$ 2,700.00
Bookkeeping & Payroll		\$ 1,381.44		RPS	1.00	100.00	\$ 1,200.00
	hrs/month	rate (\$/hr)	rate				
Karen	4.00	28.78	\$ 1,381.44	CFG	2.00	95	\$ 2,280.00
In-vessel system		\$ 27,965.86					
Bill of Materials	\$	15,965.86					
Labor for install	\$	12,000.00					
Outsourced support		\$ 1,890.00					
compost analysis (U of ME)	\$	840.00					
131 Microbial Analysis Training	\$	350.00					
Community workshops	\$	700.00					
misc equipment		\$ 1,700.00					
PPE	\$	300.00					
Data loggers	\$	855.00					
Scale	\$	45.00					
Tools	\$	380.00					
Dropbox	\$	120.00					
Shelter Materials		\$ 2,000.00					

Total Request: \$ 70,217

Budget Breakdown

A. Equipment

Material parts for In-vessel system (\$ 15,966)

✚ Composter Bill of Materials (BOM)

Drum Installation (\$ 12,000.00)

Shelter (\$ 2,000)

Tools (\$ 1,700)

scale, data loggers, PPE, shovels, totes, dropbox

Compost Analysis - University of ME (\$ 840)

B. Operation

Soil Cycle BTV (\$ 30,240)

Bo Meisl (Compost Management, Data Collection & Reporting)

Andy Bainton (Compost Management & Agroecological Design)

Sarah Hobson (Food Safety, Rescue, & Redistribution)

Rock Point Commons (\$ 5,413)

Tyler Pastorok (Land Steward and Programs Coordinator)

Karen Robinson (Bookkeeper)

C. Programming

Soil Cycle BTV (\$ 3,024)

Rock Point Commons (\$ 1,008)

Community Support (\$ 700)

Radical Adventure Riders

Food Not Bombs

People's Kitchen

D. Team Training

131° Microbial Analysis Training with Soil Wise LLC (\$ 350)

E. In-kind & Matched funds

Rock Point Commons (\$ 9,062)

Kelly Kimball (Executive Director)

Space Rental: 12 events & workshops

Perennials for 2026 planting at Rock Point

Matched Funds (\$ 6,180)

Compost for Good (Consultation)

Eagle Bay and Rock Point School (Hauling services)

Metrics & Deliverables

Operation

Lbs/wk of organics diverted from the landfill

Lbs/wk of food rescued for redistribution

Residential support (households/month)

Production

Lbs/month of compost produced

Perennials planted

Organic Matter applied

Further analysis metrics for trials

Temperature in drum; recorded by data logger (continuous) and when opening the hopper
Bi-monthly Compost Analysis from [University of ME](#): *bulk density, pH, conductivity, TS, TVS, NO3-N, NH4-N, total C, total N, total P,K, Mg, Ca, B, Cu, Fe, Mn, Zn & maturity level*

Outcomes

Continue to explore school diversion systems from kitchen to bin

- Establish routine for carbon storage & hauling frequency at Rock Point
- Student or community led initiatives to sort food prior to depackaging

Pilot an in-vessel design to process all food scraps on-site at Rock Point

- Operation & production metrics reported at 5 mo (Aug '25) and 10 mo (Jan '26)

SOPs for operation, review on recipe and product analysis, compost application in 2026

Place-based programming for organics recycling, biological analysis & ecological design

Impact & Reverberations

Burlington has the opportunity to demonstrate and pilot an appropriate technology for decentralized organics management across the urban landscape. This effort is intended to build upon Vermont's culture of local self-reliance by exploring infrastructure that could enhance accessibility toward a localized nutrient economy within the city of Burlington. Decomposition – the breaking down of organic material – connects people to place, to the moment, and to each other. The enrichment from safe gathering spaces is not adequately quantified by time shared nor attendees present, though such spaces are invaluable.

Carbon Sequestration after 5 years of organic nutrient cycling

0.5 tonnes of CO₂ sequestration in 1 year per tonne of compost applied

Assuming we can produce 5 tonnes of compost per year, OM accumulation in

2026: 5 tonnes applied; **2.5 T CO₂** sequestered

2027: 10 tonnes applied; 5 T CO₂ sequestered

2028: 15 tonnes applied; 7.5 T CO₂ sequestered

2029: 20 tonnes applied; **10 T CO₂** sequestered

25 tonnes of CO₂ sequestered after 5 years of building compost – approximately the equivalent sequestration impact of 4 acres of forested land across the same period of time

PROJECT TIMELINE: ROCK POINT COMMONS X SOIL CYCLE BTV

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Parts												
Install												
Onboard												
Trial 1												
Trial 2												
Food Rescue												
Trial 3												
SOPs												
Training												
School Prog												
Labs												
Events												
Skill share												
Reports												

PROJECT TIMELINE: ROCK POINT COMMONS X SOIL CYCLE BTV

Parts	Source & acquire parts for assembly
Install	Assemble drum frame, deadline: May 16
Onboard	Establish diversion process with Eagle Bay, continue with RPS
Trial 1	Food Scraps, Spent Mushroom Substrate, & Wood Chips
Trial 2	Food Scraps, Spent Brewer's Grain, & Wood Chips
Food Rescue	Intercept edible food prior to depackaging for mutual redistribution
Trial 3	Food Scraps, Spent Brewer's Grain & Mushroom Substrate
SOPs	Diversion & hauling, operation, sorting, and data collection
Training	Training volunteers on food safety & operation
School Prog	Project-based learning opportunities for students
Labs	Compost sample analysis conducted by University of Maine
Events	RAR ride (June), Rot & Soul (Oct), Pumpkin Smash (Nov), May Plant
Skill share	gardening, composting, microscopy, and mushroom inoculation
Reports	Report 1: Fund allocations, Installation, Onboarding, and Trial 1 Report 2: Food Rescue, School Programming, SOPs and Trial 2 & 3

Additional Context

State of Organics in Burlington, VT

- Due to regulatory changes, CSWD moved the Burlington site to Williston in 2011
- All materials are now trucked to Williston from city drop-off sites & private haulers
- Backyard & community garden compost sites are dormant throughout the winter
 - ◆ Material bottleneck for residents willing to manage their own organics
- Food recovery hierarchy gap remains regarding edible food surplus
 - ◆ The largest organic ‘waste’ streams are inaccessible to the public
 - ◆ Unchecked potential for food rescue – interception prior to depackaging

Emergent Strategy: Soil Cycle BTV

Soil Cycle BTV emerged in response to a lack of social and physical infrastructure within the city of Burlington for residents to responsibly recycle their food scraps in community. Households are thus required to divert organics to Williston, or compost in their backyard.

Even for a master-composter, the volume of organics generated by a single household does not build enough mass to maintain activity year-round. To compost in community, our neighborhoods will require affordable systems that fit the unique challenges of the urban landscape (space limitations, odor & vector attraction). In-vessel systems are appropriate technology that enables year-round activity for collective composting at the smallest scale.

In order to facilitate and uplift the spirit of decentralized composting within the city, Soil Cycle BTV has collaborated with existing community hubs based on the following ethos:

Appropriate Technology & Horizontal Growth

For the past 18 months, Soil Cycle BTV has piloted, demonstrated, and launched an in-vessel system that remains active year-round, at a minimal volume threshold

- 10 vertical drums were established around the city in 2024
 - Bike pick-up service available for city residents
 - Supporting mutual-aid (local food) networks with organics diversion
- Each site supports organic flows generated by 6-10 households
 - Food scrap throughput maxes out around 150 lbs/week
 - 3 month process; generates ~½ ton of compost (1 cubic yard)
- Site material is sourced by upcycled HDPE (diverted from the landfill)
- Carbon and bulking materials sourced from local crafters & farmers

Place-based Climate Solutions

Similar to our NPAs, neighborhood-scale composting networks build upon the pre-existing culture of local self reliance that Vermont is well known for

- Establishing structure for a local nutrient economy empowers community members to hold a sense of responsibility over the quality of the local soil
- Self-reliance fosters innovation – the functional role of critical community resources (such as biologically-robust fertilizer) is enhanced by engagement
- Dynamic systems require variance of scale, smallest scale is often overlooked

Additional Context

The Concurrent Value of *Community* Composting

Safe gathering spaces are difficult to access for free. Composting with neighbors and friends offers a unique space for eco-somatic therapy and community cycle-tracking. To witness the breakdown of the organic material we generate offers reflection on our own transformations within cycles of life and death. This practice invigorates a sense of belonging, not only to the place, but also to the ever-changing self.

- In 2024, Soil Cycle BTV facilitated 8 demonstrations and field days
- Social & Physical Cultural Legacy: Expanding our Time Horizon¹
 - Rot & Soul; DIY event and virtual container for death, decay, & rebirth
 - Building organic matter and microbiological diversity in our backyards will strengthen eco-system resiliency for generations to come

Increasing Accessibility with Automation

Rock Point Commons is currently collaborating with Soil Cycle BTV to compost on-site with organics generated from Rock Point School. The weekly flux of foodscraps provided by RPS has been found to surpass the capacity of our (5') vertical batch system. In response to this challenge, we see an opportunity to demonstrate a viable urban climate solution.

The design we have proposed is publicly available online and generously offered for free by our collaborators in NY, Compost For Good. They've proven this technology to be successful at several schools across northern NY. Based on their expertise, this DIY system was designed to minimize cost (often the barrier of entry for neighborhood composting).

The automation of this design substantially reduces the labor input of operation – the (5') vertical batch system requires manual augering, while the (20') horizontal drum tumbles the material thru automated rotation (roller chain assembly). Establishing a 20' system at Rock Point would increase capacity for Eagle Bay in addition to Rock Point School. Even if we increased the number of vertical batch systems on-site, the capacity and throughput of the 20' continuous system out-perform what four 5' vertical batch systems can produce.

- 20' drum capacity: ~1000 lbs/wk
- 4' drum capacity: ~150 lbs/wk
 - X 4 units: ~600 lbs/wk

In addition to the material generated at RPS (~200 lbs/wk) and Eagle Bay (~500 lbs/wk), we anticipate additional capacity for 25-50 households nearby. Food scrap hauling services offered by Soil Cycle BTV will increase access for residents to compost locally.

¹ Meadows, D. H. (2008). *Thinking in Systems*. Chelsea Green Publishing.

Community-Scale Composter operating manual



NYSERDA



**CAMP TREETOPS
NORTH COUNTRY SCHOOL**





Jennifer Perry and John Culpepper, North Country School

Community-Scale Composter

operating manual and reference document

Drafted by: John Culpepper ~ Co-founder, Compost for Good. Document updated March 2021

“ This operating manual is about using our design to compost food waste on a community scale. This design can be adapted to meet the needs of communities all across the globe. We believe that community composting is an important part of building a more resilient world. By keeping food waste local, we keep money and nutrients local, which allows us to directly support our land and our neighbors. ”



Acknowledgements:

In 2016, North Country School and Camp Treetops, in partnership with the Adirondack North Country Association (ANCA), received a \$35,000 grant through the New York State Energy Research and Development Authority (NYSERDA) to design a low cost, in-vessel drum composter for medium to large communities. This pilot composter was so successful that \$120K was awarded by NYSERDA to build and install 3 additional units.

North Country School and Camp Treetops opted to distribute the 3 systems to remote site hosts. Concurrently, a boarding school in New Jersey has constructed and is operating a system following the North Country School and Camp Treetops model. As the lead project designer, I, John Culpepper, realized the need for a document to support current and future organizations and individuals operating the in-vessel composter design. I have drafted this manual to offer such support.

All of the ideas that led to the development of this system are a result of time spent with people smarter than, or more experienced than me. I was simply the conduit through which this idea of designing and building an in-vessel composter came to be. I acknowledge legions of others who have inspired, taught, or otherwise helped me in this. I also acknowledge and appreciate the extent to which various executive directors at North Country School and Camp Treetops and the all-volunteer board of trustees have allowed me the opportunity to explore this and many other sustainability initiatives for our campus. I would like to express my appreciation to the following individuals and organizations whose support has allowed me to experiment with various versions of this project:

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Any opinions, findings, and/or interpretations of data contained herein are the responsibility of the author(s) and do not necessarily represent the opinions, interpretations or policy of Rochester Institute of Technology and its NYS Pollution Prevention Institute or the State.



About Compost for Good

Compost for Good grew out of John Culpepper's composting work at North Country School and Camp Treetops. It was the school's longstanding commitment to sustainability and John's passion for composting that inspired the design and build of an innovative community-scale composter.

The first of these composters was installed at North Country School and Camp Treetops, is operated by the students and campers, and processes all of the food waste of the organization. This operating manual is designed to accompany that composter.

With the success of this composter, there was a growing demand from communities around the world for more information about this design. To meet that demand, John founded Compost for Good with Jennifer Perry and Katie Culpepper. Though our reach is increasingly global, we are building from a local focus. We are grateful to have organized under AdkAction, as one of their projects. ADKAction is a nonprofit organization that creates projects that address unmet needs, promote vibrant communities, and preserve the character of the Adirondacks. Working with ADKAction strengthens our ability to help communities within the Adirondacks and beyond to implement composting systems that meet their unique needs.



Community-scale Composter Operation Manual

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Introduction

My great hope is that by putting this design out into the world, free of charge, others will find ways to build it more easily, for less money, and to adapt it to reflect their unique organics recycling needs. This composter was originally designed to process unsorted food, but we have subsequently demonstrated that the composter is capable of processing a wide array of organic materials. I believe this design could have implications in communities around the planet, in both industrial and non-industrial areas. By reimagining our organic waste streams, we can build business opportunities, while closing our nutrient loops and decreasing environmental degradation across the globe.

This composter can play a vital role in ending the foolish endeavor of throwing away valuable plant and soil food, only to import nutrients from somewhere else. I hope that this composter is a resource for communities who want to keep their resources close to home, decrease pressures on

landfills, decrease greenhouse gas emissions and build up their local economy.

Please visit our website at adkaction.org/compost for more information. Also, more resources are available at our Facebook page: <https://www.facebook.com/compostforgoodteam>.

-- John Culpepper

LIABILITY/DISCLAIMER: North Country School and Camp Treetops, its agents and employees are not liable for any claims, actions, damages, losses, expenses and costs of every nature and kind, including attorney's fees, up to and through any and all appeals incurred by or asserted or imposed against North Country School and Camp Treetops resulting from the operation of this composter. Manufacturers and site hosts assume all risks associated with construction, installation, and implementation of the drum compost system.



I. Introduction



This operating manual includes general composting instruction and guidelines interspersed with specific details from experience operating the composter at North Country School and Camp Treetops since May of 2016. Contact the author if on-site training or other consultation is desired. A design document, educational blog posts, and more information about the Compost for Good project can be found on our website and a list of additional resources can be found in section X; the user is encouraged to reference them.

The design for the community-scale composter was born from a desire to find an affordable and efficient way to compost mixed food waste, in a way that produces high-quality soil amendments on a community scale.

A variety of very good in-vessel composters can be purchased on the open market. This composter is designed to be built affordably, using materials found worldwide, constructed by reasonably competent mechanics in a reasonably well-equipped shop, and if desired, placed inside a 40-foot shipping container. The 20-foot long, 4-foot diameter drum is constructed from a polyethylene highway culvert. The system optimizes the environmental conditions for the organisms that do the hard work of breaking down unsorted food wastes and other organics.

Our composter addresses many community-scale composting challenges, making the process more feasible for institutions and organizations. North Country School and Camp Treetops has demonstrated that this composter design can be managed by a single adult, with middle school-age children assisting, and can process up to 50,000 pounds of food waste, and 13,750 pounds of carbon bulking materials and other organic material per year¹.

At the time of this writing, there are five of our composter

designs in operation. Four are in Upstate New York and one is in New Jersey. On the North Country School and Camp Treetops campus, the in-vessel composter has reduced the amount of time needed to process organic material from 12 to 3 months. Additionally, the finished compost is much higher quality with more fertility and stable carbon compounds than from previous composting processes. Food waste takes anywhere from 25-45 days to pass through the drum, at which point the material is stable, but still needs to go through secondary decomposition in a static pile. Many other organics can be processed in even less time.

Poor operation of the system can create conditions that could pose negative public relations and health issues, so it is highly recommended that this document be reviewed several times before the composting system is put into operation. By following the enclosed recommendations, the operator will safely create conditions that are favorable to beneficial microbes, create minor offensive odors, and operate in a way that does not attract flies, dogs, and vermin.

It is the many trillions of bacteria, and bacteria-like organisms that do most of the work of decomposition. Our job as operators is to maximize the environmental conditions within the drum for the organisms. In other words, the better you care for these little guys, the more effective they will be.

1) We believe that the steel frame and drive system of this composter could be modified to accommodate a 5-foot diameter drum, increasing the volume inside of the drum more than 1.5 times. A 6-foot diameter drum should also be possible, allowing more than 100,000 pounds of food scraps per year to be composted. We also believe that more than one composter could be operated in tandem, with opportunities for automation.



II. Composting basics

Composting is simply a way of breaking down carbon-based materials into simpler compounds. The composting process creates conditions where decomposition happens more quickly than in nature.

Currently, most large scale composting happens in windrow systems. While this can be an effective strategy, this process requires a fair amount of land and time, and can pose a host of other issues with run-off and pests. In-vessel systems optimize environmental conditions, thus significantly reducing both the time and space typically needed by windrow systems. Because the composting process is contained within a drum, pest pressure is vastly reduced.

Proper operation of this in-vessel system requires the drum to be $\frac{1}{2}$ full at all times. At $\frac{1}{2}$ full, a 4-foot diameter, 20-foot long drum contains approximately 3,200 pounds of material. Within the composting material, there are roughly the same number of microbes as there are the number of grains of sand on all of the beaches on planet earth. Each microbe generates a very small amount of heat as it metabolizes proteins, sugars, etc. Keeping the microbes 'happy' results in high thermal energy, and rapid decomposition.

Bacteria

Bacteria are the primary microorganisms during the primary phase of composting. There are two major types of bacteria: aerobic and anaerobic. Aerobic bacteria flourish in the presence of oxygen and anaerobic bacteria flourish in the absence of oxygen. Anaerobic bacteria live in human guts, and other places where oxygen is excluded.

Successful composting creates conditions for aerobic, oxygen-loving bacteria. If the conditions in the drum are not maintained properly then anaerobic bacteria begin to multiply, generating foul smelling and potentially flammable methane. These conditions should be avoided.

Aerobic bacteria fall into two basic categories at higher temperatures: mesophilic ('prefer' temperatures between 77°F to 104°F), and thermophilic ('prefer' temperatures over 113°F).

For aerobic bacteria to thrive, the carbon to nitrogen ratio and moisture levels need to be within certain ratios, and the material needs to be aerated frequently.

The ideal range for composting unsorted food waste within



the drum is between 122°F and 140°F. At these temperatures flies will not lay eggs, weed seeds are destroyed, and pathogens are eliminated. Temperatures significantly lower than 122°F suggest that conditions inside the drum are not conducive for primary decomposition, and temperatures too far above 140°F will begin to reduce the overall species diversity of bacteria.

The end result

When proper primary decomposition is achieved (25-45 days), the material exiting the drum will be mostly stable, should not have an overly offensive smell, and should not attract flies, dogs, or rodents.

This material can be used as a topdressing on gardens and in landscaping, even before going through a secondary decomposition phase. At this stage, the compost should not be tilled into the soil, because of the presence of large organic material that will borrow nitrogen from the soil, thus taking it away from plants, as it continues to break down.

If you do not use the material as topdressing, it should be placed in a pile for secondary decomposition. This pile should be large (we recommend a pile that is at least 6 feet by 6 feet



122°F - 140°F

– *The ideal range for composting within the drum*

and 4 feet high), with the least amount of surface area possible, adding enough moisture to keep the pile damp but not soggy. These conditions will encourage the microbes to reheat the organic material. To a point, the larger the pile the better. Temperatures at this phase often reach 140°F. Watering and turning the secondary decomposition pile (or piles) will greatly aid the continuing decomposition process. Piles that are in the high temperature range will dry out fairly quickly. If the pile becomes too dry then the composting process stops, poten-

tially producing odor and fly issues. When proper conditions are maintained, then over the course of several weeks, temperature will begin to drop. This is a sign that the bacteria and bacteria-like organisms are dying off or going dormant and higher-order organisms, including fungi, are beginning to proliferate. It is these higher organisms that break down the carbon containing molecules into much smaller molecules like humic and fulvic acids and when the real magic of composting happens. When added to soil, these small carbon compounds persist for years or decades, aiding water retention, cation exchange between the soil complex and plant roots, and helping to facilitate additional microbial life in the soil.

If compost will be bagged, it is important to allow the material to fully mature. If overly wet or immature compost is bagged, it will produce mold as well as foul-smelling compounds. Compost that is stable will have a deep, earthy smell very similar to forest soil, has a high retail value, and is capable of making soils much more productive.





III. Feedstock

With a few caveats, just about any common organic material can be composted with this in-vessel design.

Below is a list of items that we have had success with and those that we have not had success with. Operators may wish to try other items but it is suggested that this be done with care, testing small amounts at a time until it can be determined if the drum composter is a good fit for the experimental feedstock. In some cases, a compostable product or material does not fully decompose during primary decomposition, but may decompose during secondary decomposition or by running the material through the drum a second time.

Winners

The following items have proven to do well in this composter:

- All unsorted food waste coming from kitchen meal prep and from plates after a meal (greens, meats, eggshells, bones, etc): Bones and shells come out clean but not decomposed. There is valuable calcium and magnesium in these items. After primary decomposition, we suggest that you crush these items and apply to soils. If selling compost, sending the crushed bones and shells back through the composter is recommended.
- Some paper towels. Ripping paper towels (brown or white) before adding them to the composter will prevent the paper from rolling into balls inside of the drum.
- Coffee grounds and filters: Coffee grounds, filters, tea bags, and paper towels can be collected in a bucket next to coffee machines.
- Animal mortalities or animal offal: At North Country School and Camp Treetops, contents after chicken and turkey harvests are placed into the drum. This includes heads, feathers, feet, etc. For larger animal mortalities, Cornell University's method of decomposing in wood chips is recommended. For large animal parts after a harvest, larger parts are cut up before they go into the composter.

- Bags of spoiled or weevil infested grain and maggot infested food waste
- Large shredded craft paper bags
- Miscellaneous: Old cotton t-shirts, old leather shoes, belts, etc.
- Animal manures: We do not place cat manure in the composter, but have put large quantities horse, sheep, chicken, goat, and other manures in.
- Human urine mixed with wood pellets: We are in the process of exploring the viability of large-scale urine collection and composting in a separate facility. The environmental and cost benefits are compelling.
- Hair or fur
- Weeds from gardens: Given the bulky nature of weeds, they are typically composted in separate, open, static bay composting bins, however the composter could process them as well.
- Limited amounts of wood ash: If that ash comes from a high efficiency, wood gasification biomass plant, then much of the ash has properties similar to biochar.

Losers

These items do NOT do well, or are incompatible in the drum composter:

- Wax paper or wax cardboard
- Large amounts of shredded paper: Shredded paper tends to ball up during rotation, creating conditions that don't allow for decomposition.
- Fossil fuel based plastics: We are experimenting with compostable plastics, however early results indicate that they do not breakdown during our typical composter retention time. These products often need six months or more in a high temperature composting environment to fully break down.
- Paper plates: The retention time in the drum does not seem to be enough to process paper plates. A second run through the system might result in full decomposition.

IV. Recipe

Microbes that break down food waste and other organics require a carbon to nitrogen ratio around 30 parts carbon to 1-part nitrogen (30:1). Normal food waste, especially if it is fresh, is typically high in nitrogen and low in carbon. Providing a carbon bulking material provides more surface area for the bacteria, provides the necessary carbon for the microbes to metabolize the other organics, and soaks up the liquids created from the breakdown of cell walls thereby increasing the air spaces within the material. This space is vital to maintaining healthy populations of aerobic bacteria.

We have previously used wood chips (relatively dry and not so dry), wood shavings, and commercial grade wood pellets. Other carbon sources may be appropriate, but these are the only tested carbon types to date.

Each of these materials has pros and cons. Wood chips tend to be the least expensive, often times free for collecting; sometimes tree trimming services will deliver for free. However, wood chips need to be screened after primary decomposition, or left to decompose during an extended period of secondary decomposition. Also wood chips often have a higher water content. Combined with the liquids liberated during decomposition, using a high moisture content carbon bulking material can reduce air spaces in the mix, reducing the availability of oxygen for the oxygen-loving bacteria. These issues can be overcome by adjusting the mix, and by using sawdust to mop up liquids generated either at the end of the composter or through small penetrations along the length of the drum.

Wood shavings work well, but they tend to be expensive. Commercial wood pellets can be expensive, but if your facility is operating pellet stoves or boilers for space heating purposes then you may be buying pellets in bulk, which can lower the cost. At the North Country School and Camp Treetops facility they purchase pellets 20 tons at a time, lowering the cost. (They have also found that pellets can be a good substitute for animal bedding in some situations.)

Because of the densified nature of wood pellets and because of their shape you can reduce the storage space needed for the carbon bulking material, and you can move those pellets mechanically with the use of flexible augers or vacuum systems, making it possible to employ automation in the composter loading process. Additionally, pellets quickly turn into sawdust in the composter, and they are fairly well decomposed when they come out of the drum.

Whether you use wood chips, wood shavings, or wood pellets you will need to experiment with the recipe to make sure that the mix is neither too wet or too dry. If too wet, often indicated by liquid coming out of the end of the composter,

Making Compost



food scraps



carbon source

It is important to experiment with the ratio of carbon bulking material to food scraps to find the right balance for your materials.

then add more carbon bulking material. If too dry then reduce the amount of carbon.

Successful recipe

In the North Country School and Camp Treetops composter, each pound of food scraps from the kitchens and dining rooms is mixed with .275 pounds of wood pellets (this is a mass to mass ratio) before being added to the composter. So for example, if you are processing 50,000 pounds of food scraps per year, then you should plan on using approximately 13,750 pounds of densified wood pellets for the carbon source. At the time of this writing the average cost of pellets in Upstate NY is \$240/ton. So if you were processing 50,000 pounds of food scraps annually, then you should plan on spending approximately \$1,700 in pellets.

When using undried wood chips we've used two volumes of wood chips to one volume of food scraps. (Due to the complications of weighing large amounts of undensified wood chips, a volume to volume ratio was found to be easier.) The food scraps in these examples contain a mix of vegetable, dairy, and meat products.

Due to different types of feedstocks (food scraps and other organics) and the type of carbon bulking material that is used, each facility will need to experiment with their carbon bulking material to food scraps ratio to find what works best for them. The best indicator that everything is going well is internal temperatures of over 125 degrees F.

Composting is as much art as it is science. With experience you will find the right type and amount of carbon bulking material for your feedstock.



V. Daily operation

Each facility will develop their own processes that meet their particular needs. The information below is an overview of how North Country School and Camp Treetops set up their composting system.

Start up

Because the microbes that break down food waste are already in the environment, it is not necessary to add purchased bacteria. However, it is never a bad idea to add a couple shovel loads of active compost when you begin to load your drum composter for the first time. If available, using compost from more than one source ensures that you have a wide variety of microbe species.

Collection and delivery to the composter

Once a day, unsorted food waste is collected in 8-gallon pails with lids and transported to the composter in a garden cart. They use more than two carts during the seven weeks of Camp Treetops when they are feeding approximately 300 people. The food waste is taken to an area next to the composter where it is weighed and recorded. The food waste is then dumped onto a concrete floor enclosed by a wooden bin.

Preparing the food waste/carbon mix

With shovels or lawn edging tools, the food waste is lightly chopped, focusing on larger scraps with intact skin, like apples and oranges. The weight of the food waste determines the amount of carbon bulking agent to add (see recipe section above). With flat shovels, the food waste is lightly mixed with the carbon bulking material (wood pellets), then placed in different 8-gallon containers. That blend is carried to the loading door of the drum and dumped inside.

After placing all of the food waste and carbon bulking material inside the drum, we add dry sawdust to the floor of the mixing area to soak up liquids and grease. Sawdust is also added to any area under the drum where liquids accumulate. Once the sawdust has done its job, it is added to the drum to compost.

Loading the composter

Before loading the blended mix into the drum it is important to measure and record the temperature inside. Each time the door is opened to be loaded, a thermometer is placed just inside the loading door to determine how well the composting process is going. We have also added two Onsite/HOBO temperature data loggers that travel with the composting material, recording temperature every five minutes.³ Once the data loggers exit the drum, the data is downloaded and translated into graph form.



Safety Tip: Pinch points

Care must always be taken when rotating the drum. The interface between the drive wheels and the drum, the chains and sprockets and close walls or ceilings represent pinch points. Those pinch points must be isolated or monitored to avoid injury. It is highly recommended that a momentary switch thereby stopping the drum rotation be housed within a locked cover for additional injury protection. Locating the switch to the side of the drum, provides a line of site of the entire system allowing the operator to release the switch if he or she determines that someone is getting too close to the pinch points.

It is helpful to have a hoe or other tool to push the material away from the door as more blended mix is added. We use a tool called a McLeod that serves this purpose well.

Once the food waste/carbon bulking agent is loaded into the drum, the loading door is closed. After the supervising adult ensures that no one is close to the composter pinch points, he/she will unlock the momentary switch door, and rotate the drum the appropriate number of times to ensure that it remains $\frac{1}{2}$ full (each rotation lasts ~60 seconds). We rotate the drum 1-5 full rotations depending on the amount of material in the drum and how much material was placed inside the drum that day. If it is allowed to get more than $\frac{1}{2}$ full, the number of

3) Each time the drum is rotated, the temperature drops significantly, and it takes some time for it to stabilize and start climbing again. For maximum organic breakdown in the shortest time possible, the goal is to maintain an operating temperature of 120-140 °F as consistently as possible. We are looking for ways to reduce these dramatic temperature swings. Rotating the drum every other day helps, but rotating the drum every 3-4 days does not. This is likely due to decreased oxygenation due to decreased tumbling. Research is ongoing and encouraged by other hosts.

rotations needed will increase substantially in order to move the material to the discharge end.⁴ Determining how many rotations to give the drum each time material is placed inside the drum becomes easier with experience.⁵

At the end of each number of rotations, the mixed material inside of the drum comes to rest at an angle. This angle is known as the angle of repose. The drum should always be stopped when the angle of repose matches the bottom of the door, leaving the door at an angle when at rest. Stopping the drum at this point will allow new material to be loaded into the drum on the next day without the existing material inside of the drum spilling out of the drum. You might consider painting a mark on the drum in such a way that you can always stop the drum in the correct position.

Clean up

Carefully consider where the food scraps collection buckets will be washed. This can be a messy job. With a spatula, clean out the collection buckets well so that food particles don't go down a drain when cleaning the buckets. Cleaning up well after each loading session also reduces smells and flies. Applying dry sawdust on the floor of the mixing area will help soak up liquids and oils making the composting area much neater. Sweeping the floor and loading deck also helps.

Retention time

The amount of time that compost stays in the drum is determined by how much organic material is added each day. During times when a small amount of food waste is added fewer rotations are needed and the retention time is longer. When larger quantities of food waste are added, more drum rotations are needed and the retention time is shorter.

For us, the shortest retention time has been 20 days. The shorter the retention time, the less decomposed the material is going to be as it exits the drum. The opposite is true for longer retention times. The average duration that it takes for material to travel the length of the drum is 35 days. We monitor this by recording the date that a golf ball enters and exits the system.

In all cases, the goal is to have enough retention time, and a robust composting process, to stabilize the organic matter before being discharged.

Finished product

Since the drum is on an incline, during rotation the material that has undergone primary decomposition falls out the discharge end. Secondary decomposition will be necessary to break down round balls of undecomposed organics and to finish breaking down large carbon-containing molecules into stable organic acids. Secondary decomposition can be accomplished by placing the material in piles or windrows at a remote site, or at the exit point of the drum.

We allow exiting material to build up in a space that is ap-

proximately 12 feet x 8 feet, and to a height of about 3 ½ feet. The accumulated material is run through an electric trommel, however sifting the material on a wood frame, covered by ¼ inch metal hardware cloth will also work. The fine material from the sifting process is piled again to undergo additional primary decomposition and then secondary decomposition. Coarse material from the screening process is put back into the composter. See "Composting Basics" for more information.

In a smaller space, like a 40-foot shipping container, the material should be taken to a storage area each day, or when needed, by wheelbarrow (double wheel wheelbarrows are more stable). The material can also fall into a large bin that can be moved by hand or with equipment once it is full. The ability to hold a week's worth of discharged material before it needs to be removed is ideal.

Quality control

Monitoring the smell of the material inside the drum and of the discharged pile helps determine how effectively the composting process is working. Strong, foul smells including the smell of ammonia is a sign that species of aerobic bacteria are dying out and anaerobic bacteria are becoming prominent. This is an indicator that the recipe needs to be adjusted.

The most common reason that your compost begins to develop foul smells is because the microbes that do so much of the work inside of the drum are not getting enough oxygen. The reason is often because the recipe is too wet, creating little opportunity for oxygen to diffuse throughout the mixed material. If this is the case then the material coming out of the discharge end of the drum will be wet, and often you will see liquid dripping from the end of the drum and sometimes along the bottom of the drum. The solution is simply to adjust your recipe to incorporate more dry carbon. Do this a little at a time and monitor the results, which often take days or weeks to make a difference. I suggest increasing the carbon bulking material by only 5% at a time. Solving the problem of low oxygen will often result in a concurrent increase in the temperature of the mixed material inside of the drum. Remember that there are lots of variables to consider: the type of feedstock; the type of carbon bulking material and its moisture content; the environment in which you are working; the frequency of rotation; how full the drum is (always try and keep the drum ½ full); etc.

Under certain conditions, flies can be attracted to the compost operation. It is therefore important to have fly control measures in place during the warmer months. (More on this in the miscellaneous section.)

4) During decomposition, large quantities of water vapor and carbon dioxide are released, causing both the mass and the volume of the material inside the drum to decrease. Therefore, there is not a one-to-one ratio of material going in and material going out.

5) It may be possible to determine a ratio between the amount of material loaded into the drum and the number of times one would have to rotate the drum each day to keep the drum ½ full.





VI. Housing the composter

Our drum composter is designed to be housed inside a 40-foot shipping container (see details below), however the following guidelines apply regardless of what the composter is housed in.⁶

Electric

A 100amp electric panel will provide more than enough power for all of the needs of the composter. Install as many receptacles and circuits as you deem necessary, but must include:

- One 220V/20A circuit and receptacle for the motor to be plugged into, unless you are using a different type of drive motor.
- One spring-loaded momentary switch (double pole) that will only operate when the switch is being held down. This switch should be installed in such a way that the operator can look at the entire length of the drum when holding down the switch. This allows the operator to make sure that no one is near the rotating pinch points when the drum is rotating.

If you have 3-phase electric service, then we suggest that you run your drum motor with a 3-phase motor to reduce upfront and operating costs. Check with your local electrician for details.

Additional considerations

- Non-motor circuits should be at least 15amp
- Miscellaneous plug loads (future use)
- Space heater sized to provide supplemental heat during the coldest months of the year
- Ventilation fan
- Lights

Safety Tip: Methane Gas

Under certain conditions (low oxygen due to too much water, etc.), anaerobic bacteria can produce methane gas which is combustible. An exhaust fan running on slow speed all of the time, and on higher speeds during the summer to exhaust moisture and odors will ensure that harmful gases do not build up. We recommend installing a methane monitor to be attached to a light or sound alarm especially when installed in small vessels such as a shipping container.

Ventilation

If your composter is in a confined space, like a shipping container, then a hardwired ventilation fan with rheostat, off switch, and intake vent/louver are required. The fan and intake grate should be sized to cool the container in the hottest parts of the summer and to ventilate smells and gases generated during the composting process. If not properly maintained, the composting process can build up ammonia or methane, which needs to be

6) The original composter at North Country School and Camp Treetops is located in a space that is approximately 36 feet wide, by 20 feet long, with two concrete pony walls that create three separate bays, each 12 feet x 20 feet. The ceilings are insulated and the walls are lightly insulated. Even though the winter will usually produce one or two -30°F days, the building is able to maintain comfortable operating temperatures within the drum with only a portable electric heater for backup heat.



vented. The intake vent/louver should be close to the discharge end of the composter.

For shipping containers, so that the roof is not compromised, both exhaust fan and intake louver should be sited on the sidewall of the container. The exhaust fan should be sited at the loading door end of the composter drum. The intake louver should be located at the other end of the container.

Site preparation for shipping container

Site should be level, hard packed (gravel or pavement) and capable of handling a large truck maneuvering around to off-load the container.

Platform

The opening of the drum could be as high as 36" (actual height is based upon the desired outflow height). Therefore, it is recommended that a platform be built to access the composter loading door. The surface area of the platform should safely and easily accommodate 1-2 people with 8-gallon buckets. The platform at North Country School and Camp Treetops is 6'x9', located 31 inches off the ground with 3 steps leading up to it.

Heat and light

Consider a 5kW heater to keep the temperature inside of the shipping container or other structure high enough to make the microbes inside of the drum happy. If the recipe and other conditions are correct the microbes generate a tremendous amount of thermal energy and don't need much supplemental heat. I have seen this composter work very well in temperatures of 10 degrees F or lower within a moderately insulated building.

Flat profile lights with plastic diffusers work well. In the space of a shipping container, unprotected standard bulbs will likely break.

Other considerations

- 40-foot shipping containers can be purchased with two side-swinging doors on one end or both ends. The containers with only one set of side-swinging doors are less expensive. There are many places that can install a 6' roll up door on the solid end. Both ends of the container should be locked when not in use.
- Having access to running water for washing compost buckets and other cleanup is very helpful. Since primary decomposition generates heat, that heat will dry out your pile. Having water at your site for primary and secondary decomposition is very helpful to keep the composting process going.
- Include a space on the loading end of the composter for a mixing area. This is where compost can be chopped and mixed with carbon. For the North Country School and Camp Treetops composter, the mixing area is 3 1/2 feet by 4 feet and is built out of rough sawn lumber.
- Insulation is not required, but would contribute to a more pleasant environment with fewer climate control needs.



Additional safety tips:

- Consider posting warning signs at the pinch points of the system
- Consider how you plan to restrict access to the container doors when it is unattended
- Develop a plan to restrict the ability of anyone to be near the wheels and gears when the system is in operation. A loaded composter is heavy and unforgiving. Fingers could easily be severed if caught between the roller and steel band when the composter is rotating. While restricting access to the pinch points is critical, it will also be important to be able to gain access to the wheels, chain, motor, and reduction drive for future repair and service.

Before installing the composter

For shipping container installations, there will be a total of 16 linear feet of available space once the composter has been sited within the container. The operator needs to consider how the drum will be situated. In the middle of the shipping container? With more space on one end than the other? Consider the throughputs of the system and how it will be fed and how the compost will be moved out of the container.

The composter can be raised off the ground to varying heights. Consider how the compost will be moved out of the container (forklift, wheelbarrow, tractor, etc.) to determine how high you would like the end chute to be off the floor of the container. Within an 9'6" high cube shipping container, the highest the discharge end can be raised is approximately 4'6". The higher the drum is raised, the higher the platform should be on the loading door end.





VII. Maintenance

We have found that maintenance is infrequent and fairly simple and includes the following:

Daily

- Listen to changes in the sound of the composter as it is rotating. A squeaky sound may be an indication that one of the wheel bearings is failing.

Weekly

- Clean around the loading end door, including the hinges, to ensure that it closes properly.

Monthly

- Lubricate the chains, as needed.
- Check chain tension. If too loose, adjust by loosening the bolt to add tension.
- Check the drive wheels to make sure that they have not slid one way or the other on the axle. Each of the rubber drive wheels are originally set such that they roll on the steel bands that go around the drum, and in between the bolts that go through the steel bands to the 3 x 3 inch angle iron on the inside of the drum. If any of the wheels slip then they will ride over the bolts, damaging the rubber wheel.

Yearly

- Apply grease to the zircon fittings on the bearings, as needed.
- Check the level of the oil in the gear reduction drive.
- Change the oil in the gear reduction box every 2-3 years.





VIII. Miscellaneous

Fly control

Food waste that is composting effectively will generate enough heat to prevent flies from trying to lay eggs in the material inside of the drum. However, because the inside of the loading door tends to be somewhat cooler than the decomposing material, maggots can sometimes be found on the inside of the drum loading door. Those maggots can be scraped off with a plastic dust pan, placed inside the drum and covered with hot, decomposing food waste.

Occasionally maggots have been seen in the material that is discharged from the drum. Typically, this means that the material is not piled high enough to encourage reheating or that it is spread out too much, or the material has not been kept moist enough.

It is important to keep all spaces where food waste is temporarily stored or processed clean and dry. Spreading dry sawdust on the floor where food waste is chopped and mixed with the carbon bulking agent will soak up excess liquids, and if brushed around with a broom, the dry sawdust will pick up grease that comes from the waste.

Parasitoids purchased from a supplier can be placed around the compost facility. The tiny parasitic wasps hatch and look for fly larva to parasitize. You can purchase parasitoids through [Spalding Labs](#). A schedule can be set up to receive parasitoid larvae every few weeks.

While there are many commercial flytraps to choose from, Victor Fly Magnet reusable traps have proven highly effective.

During problematic summers these traps capture thousands of flies. Dead flies are added to the composter or fed to chickens.

Rodent control

While rodents don't necessarily eat the compost, a warm facility is likely to encourage mice or other vermin during cool/cold weather. Commercial traps work well however homemade mouse traps using 5-gallon buckets or other containers full of water are also effective. Dead mice can also be composted.

Nutrient testing

Whether producing compost for sale or use on site, it is a good idea to test for nutrients and other variables like maturity. Penn State compost lab is one option, but there are many labs out there that can test every aspect of your compost.

Composting permits

Each state and municipality has different requirements for permits associated with composting. We strongly recommend that you contact your local regulatory and code enforcement offices for details.

Local code officials will likely require a conversation about an in-vessel compost facility, and may have restrictions on the use of 40-foot shipping containers, and/or require an electrical inspection.



Long periods of inactivity

During times when the drum is not being loaded regularly, it is important to rotate the drum one time every other day to keep the material mixed and oxygenated. If a facility is likely to be inactive for weeks at a time, then once every 3-4 days may suffice. If you anticipate months of inactivity (such as summer vacation), partnering with parents, local restaurants or other facilities to receive food waste once a week would help maintain the biological processes. The presence of a responsible adult when the drum is rotated is a must.

Data collection

Without good mass and volume data it is difficult to know how much food waste is being processed or how much compost is created. An outdoor appropriate floor scale that can be tared, allows the weight of the bucket or container holding the food waste and other organic material to be automatically subtracted. The ACCUTEK440lb is a heavy-duty digital postal scale costs approximately \$45 and works well for this.

Temperature data is one of the most important indicators of the composting process. Compost thermometers will allow for temperature measurements at various depths in the drum and finishing pile. You can purchase thermometers from Reotemp for approximately \$25. For North Country School and Camp Treetops' composter, we purchased two temperature data loggers, which are each zip tied to a whiffle ball and travel with the mixed material from loading end to discharge end. When the data logger/whiffle ball combination comes out of the drum, the data logger can be connected to a USB cable and the data downloaded for analysis. We use the HOBO, U12-015 model. Each data logger costs approximately \$285 including shipping. When the battery runs low, the unit has to be sent back to the company for a new battery. We have seen the battery in our data loggers last well over two years before needing to be sent back to the manufacturer. The data can be viewed and printed either in raw form, or in graph format and can be enormously helpful in understanding the composting process within the drum.

Determining retention time

Determining retention time can be done with a golf ball. Assuming the golf ball travels at the same rate through the drum as the other material, the retention time is the time it takes for the golf ball to exit the drum. We have tested a single golf ball compared to two golf balls (screwed together to prevent rolling) and loaded on the same day. They seem to come out at about the same time.

Consistency of operations

It is important that the responsibility for the operation of the composter not be spread over several people. Ideally, there is one person who is able to train new people, deal with problems that emerge, monitor safety, perform maintenance, be responsible for all operations, etc.

Emptying the drum

In the event that all contents need to be removed, the end screen assembly is removed, and the drum is rotated until all

contents are out. Increasing the drum angle will assist with this process. The system is designed in a way that most all parts, with the exception of the drum itself, are able to be replaced without emptying the drum.

Education

Composting food waste is deeply connected to biology, microbiology, agriculture, environmental science, horticulture/plant science, social studies, physics, chemistry, business, and many more fields. Operating a composter has the potential to be a significant laboratory for student learning. Contact Compost for Good for supplemental materials including lesson plans, presentations, videos, and other resources.

Research opportunities

TEMPERATURE: Data from the Onsite HOBO temperature data loggers has identified many potential research questions including: what happens to the temperature of the material within the drum when the drum is rotated? Why does the temperature change when the drum is rotated? What happens to microbial species diversity if the temperature gets above a certain point, and why? What is the relationship between temperature and the number of rotations per day, and why? Other than bacterial species, what additional types of microbes exit in the drum, and does the type of organism change with changing temperatures? A great many additional questions could be asked that are not necessarily related to temperature, such as: How much Carbon Dioxide is produced during primary decomposition? How much water vapor is produced during primary decomposition? (Both of these questions relate to the difference between the mass of the material going into the drum and the mass of the material exiting the drum.)

COMPOSTABLE PRODUCTS: Conversations and concerns surrounding compostable products such as cutlery and food containers are occurring on multiple levels. Some of this work is already being done by BPI (see resources section). However, much work needs to be done on how compostable products behave in our composter design.

FEEDSTOCK: University researchers and others have expressed interest in partnering to study the effectiveness of this design, its ability to compost other organics, and the use of a drum composter to compost human urine.

REDUCING GREENHOUSE GAS EMISSIONS: When food waste (and many other organics) are landfilled, anaerobic decomposition within the landfill produces methane. According to the US EPA, methane is 28-36 times more potent as a greenhouse gas than carbon dioxide. Composting food waste not only yields a valuable soil amendment but also reduces your carbon footprint. By composting approximately 50,000 pounds of food waste per year, we estimate that we reduce our carbon footprint by approximately eight metric tons of carbon dioxide equivalent per year. Finding a way to measure what, if any, methane is produced in our composter design would be helpful.

The above are only a smattering of the many interesting research questions that could be asked. There are many more.





IX. General guidance

Guidance document when considering implementation

System management

Depending on the amount of food waste, loading the composter, for one adult, takes 10-15 minutes/day. Managing the compost produced, and acquiring the carbon bulking material depends on various factors, but will likely take an average of four hours/month of additional time.

Recommendations

- Read this operation manual completely.
- NEXT: Identify a point person to manage all aspects of the composter, including the safety concerns.
- NEXT: Learn the basics of the composting process. There are a great many resources out there that go into the composting process in much greater detail. For community-scale composting, I highly recommend James McSweeney's book (see the resource section).
- NEXT: Customize the recipe and monitor whether that recipe needs to change over time.

Feedstock management

- Can range from zero to 200 pounds/day (occasionally more)
- Consistent feedstock is best, but not necessary
- It is best to secure a supply of carbon bulking material that

is consistent in terms of moisture content, size, etc. However, if the carbon bulking material changes then you will likely need to tweak the ratio of the new carbon bulking material to food scraps (or other organic matter that you are composting)

Need to control

- Moisture content
- Temperature
- Flies
- Rodents or other pests

Site considerations

- Proximity to power – 3 phase ideal but not required
- Proximity to water for adding water to compost, if needed, and washing buckets, tools, etc.
- Access to a road or parking lot for food waste delivery
- Remote locations could operate a composter with a generator, a solar PV array, or by hand
- Level site under cover
- Avoid locations that could offend neighbors
- Avoid proximity to environmentally sensitive areas such as wetlands or rivers that might trigger need for permits.



X. Resources

- [The US Composting Council: https://www.compostingcouncil.org/](https://www.compostingcouncil.org/)
- Local master composters
- Local commercial composting businesses
- *Community Scale Composting Systems; A Comprehensive Practical Guide for Closing the Food System Loop and Solving Our Waste Crisis*, by James McSweeney
- [EPA – metrics and GHG estimates](#)
- [Penn State Composting Lab](#)
- The Biodegradable Products Institute (BPI). <https://www.bpiworld.org/>
This organization does research on the vast amount of compostable products coming on into the market. (Some of which are more compostable than others.)

Additional info

Various resources, including consulting services are available from Compost for Good. adkaction.org/compost/

NYS resources

- NYS Association for Reduction, Reusing and Recycling: [NYSAR3](#)
- NYS Department of Environmental Conservation: [NYSDEC](#)
- [Pollution Prevention Institute](#)
- [Cornell Cooperative Extension](#)



Rotating drum composter process flow diagram





The Intervale Center is seeking funding from the Burlington Conservation Legacy Grant to support greater capacity to care for our land and our community with nature-based climate solutions in 2025. Nature-based climate solutions tend our ecosystem to combat climate change while engaging partners and community members in this work, which the Intervale Center practices across all our programs. On our 360 acres along the Winooski River and in our work with partners across Burlington and Vermont, our mission is to strengthen community food systems that sustain farms, land, and people. The Intervale Center stewards 360 acres of land that includes farmland, floodplain forest, and public trails and supports food access initiatives, grows and plants native riparian trees in all VT watersheds, and supports land access and farm viability across Vermont. Our work is guided by three high-level goals: 1) Support farming and food production that balance the needs of people and the environment, 2) Protect and steward the natural environment at the foundation of our food system, and 3) Advance the movement to strengthen community food systems. With this funding we will:

- Expand and steward community gardening space in the Intervale, including additional plots for the Tommy Thompson Community Garden and public access improvements (2A.1, 2A.3, 2B.1, 2B.2)
- Develop city-wide non-native invasive plant management and monitoring (3A.1, 3A.2, 4A.3)
- Diversify community food production and build flood resiliency in the Intervale, including new acreage for agroforestry and increased public education and engagement in wild and cultivated food and medicine (1B.3, 2B.1, 3A.2, 3B.4)
- Steward land with nature-based climate solutions to promote a healthy and resilient environment for food production and land conservation (1B.4, 2A.3, 3A.2)

Expand and steward community gardening space in the Intervale: The fertile soil of the Intervale has been feeding inhabitants for thousands of years, and with 2 in 5 Burlington residents now experiencing food insecurity, community food production is more important than ever. For years the Intervale Center has been working to support growing demand for commercial food production and community gardening on our lands from expanding Tommy Thompson to helping farmers expand acreage and add new greenhouse production and storage. Today, in collaboration with farmers who lease land from us and community garden leadership at Tommy Thompson and AALV, we have identified two areas suitable for further expansion. With support from this fund, we will finalize site designs for expansion to Tommy Thompson Community Garden in consultation with garden leadership and with consideration to current and future site conditions and flood risks. We will begin field clearing, soil preparations, and irrigation coordination for approximately 35 new garden plots (0.8-1.0 acres). As we work to expand community garden space, we will also improve access to existing gardens, including trail connectivity, road enhancement, parking, and gate removal/installations.

Develop city-wide non-native invasive plant management and monitoring: Management of non-native invasive species (NNIPs) directly promotes the success of many other NBCS initiatives, like restoration, biodiversity, and water quality planting projects. Our project will provide three critical factors to effective NNIP management and ecosystem restoration projects: 1) accurate site assessment, 2) ongoing monitoring, and 3) skilled labor.

Together with UVM's Community of Practice interns and researchers at the Rubenstein School, we will facilitate input from partnering open space managers in Burlington including, Rock Point, Winooski Valley Park District, and Burlington Parks, Recreation and Waterfront to establish an assessment and monitoring framework that will lead to increased city-wide prioritization of NNIP management needs and ultimately

increased biodiversity in our landscapes. Through this partnership, Burlington land managers will be able to efficiently utilize student research to assess progress while simultaneously training the next generation of land stewards to understand and implement effective NNIP management.

Identifying, monitoring, and removing invasive species takes time, and as priorities and strategies may shift, it is immensely helpful when this work is executed by staff who are experienced, skilled, and nimble. The Intervale Center's Conservation Nursery Crew implements water quality restoration projects and offers stewardship services across the state and brings years of experience to ecological stewardship. Through this funding, we will work with open space managers partnered through Burlington Wildways to determine priority work sites and our four-person professional stewardship crew will provide NNIP management to each organization (Rock Point, WVPD, BPRW, and Intervale Center).

Diversify community food production and build flood resiliency in the Intervale: To address the challenges of farming in a changing climate, we are increasingly incorporating the principles of agroforestry in the Intervale. Broadly, agroforestry is a regenerative farming approach that integrates trees or shrubs on the landscape or within crop fields, which binds soil, builds flood resilience, increases pollinator habitat, and ultimately benefits crop production and ecosystem health.

The Intervale Center has stewarded and enhanced riparian buffers and hedgerows for over three decades. In 2023 and 2024, we established two agroforestry zones on 88 acres of land we recently acquired—our People's Orchard now grows 430 fruiting trees and shrubs on a fallow, more flood-prone field no longer considered suitable for vegetable production, and 600' of our riparian buffer now utilizes elderberry and other native riparian tree species to protect nearly twelve acres of prime agricultural soils from erosion. In both of these zones, 100% of the fruits are distributed for free to the community.

Funding will support our work to expand our People's Orchard by an additional $\frac{3}{4}$ acre, steward 600' of planted harvestable riparian buffer, plant the second phase of this buffer (~500'), coordinate harvest of berries in partnership with Spoonful Herbals and community members, and bottle and distribute syrup to 300+ members of our free Fair Share CSA. By expanding and diversifying our capacity for community food production, we will provide critical food access while also practicing climate resilient agriculture that can be used as a model for riparian zone stewardship.

Steward the Intervale with nature-based climate solutions: We steward the Intervale using regenerative management strategies that preserve and enhance wetland buffers in order to cultivate a healthy, climate-resilient ecosystem that produces food, feeds people, and cares for natural spaces in a changing climate. As part of this stewardship plan, we are turning marginal lands into bird and pollinator-friendly habitats to facilitate biodiversity. In partnership with Audubon Vermont, we carried out an assessment in 2022 that identified the Intervale Center as a "hotspot for pollinator diversity and abundance," and highlighted three geographical target areas on which to focus habitat improvement. In 2025, we will continue this work by managing those areas through timed mowing, weeding, and managing the success of new plantings from woody shrubs to flowering species.

Support will also enable us to advance our property-wide non-native invasive plant management plan that focuses on non-chemical treatments and engages both staff time and the support of community partners, educators, and volunteers. This work contributes to city biodiversity and ecological regeneration, and also provides a foundation to educate and train the community on the importance of NNIP management as a nature-based climate solution.

Intervale Center - Conservation Legacy Fund Application – Budget and Justification

Expense Category	Garden Expansion	Invasive Mgmt	Community Food	Regenerative Land Stewardship	Total
Wages & Benefits	\$20,837.08	\$2,780.08	\$12,237.92	\$8,047.60	\$43,902.68
Supplies	\$10,600.00		\$5,900.00		\$16,500.00
Contractual		\$8,000.00			\$8,000.00
Permits and Fees	\$1,000.00				\$1,000.00
Equipment rental	\$0.00				\$0.00
Subtotal	\$32,437.08	\$10,780.08	\$18,137.92	\$8,047.60	\$69,402.68
Indirect Costs	\$4,865.56	\$1,617.01	\$2,720.69	\$1,207.14	\$10,410.40
TOTAL	\$37,302.64	\$12,397.09	\$20,858.61	\$9,254.74	\$79,813.08

Justification:

Personnel and Benefits:

- Garden Expansion: 580 hrs total to complete Community Garden Expansion includes: 148 hrs @\$40.47/hr loaded rate, 64 hrs @\$36.58/hr loaded rate, 16 hrs @\$36.44/hr rate, 40 hrs @ \$26.02/hr loaded rate and 312 @ \$34.88/hr loaded rate for a total of \$20,837.08.
- Invasive Mgmt: 76 hrs @ \$36.58/hr loaded rate to develop and establish standard monitoring protocol and identify priority stewardship sites, for total of \$2,780.08.
- Community Food: 24 hrs @ \$40.47/hr loaded rate and 308 hrs @ \$36.58/hr loaded rate for planting and foraging capacity, for a total of \$12,237.92.
- Regenerative Land Stewardship: 220 hrs @ loaded rate of \$36.58/hr for increased capacity for habitat enhancement and invasives management for a total of \$8,047.60.

Supplies:

- Garden Expansion: \$200 for soil testing, \$300 for cover crop seed, \$500 for soil amendments, \$6,000 for gate hardware and \$3,600 for road stone for a total of \$10,600.
- Community Food: \$100 for soil testing, \$200 for cover crop seed, \$1,000 for soil amendments at Orchard Expansion, \$2,000 for fencing for People's Orchard, \$600 for irrigation system improvements, and \$2,000 for harvest supplies for a total of \$5,900.

Contractual:

- Invasive Mgmt: \$8,000 for Intervale Nursery Crew stewardship services

Permits and Fees:

- Garden Expansion: \$1,000 for permitting fees

Indirect Costs: Calculated at organizational rate of 15%

- Garden Expansion: \$4,865.56
- Invasive Mgmt: \$1,617.01
- Community Food: \$2,720.69
- Regenerative Land Stewardship: \$1,207.14

Please provide or upload an explanation of how your project's results or effectiveness can be measured.*

At the Intervale Center, we set annual goals through a results-based accountability model for our programs and create workplans to meet them. With funding from the Conservation Legacy Fund, we expect the following outcomes for 2025 for each of these projects:

- **Community gardening space in the Intervale are expanded and stewarded (2A.1, 2A.3, 2B.1, 2B.2)**
 - Site designs for expansion to Tommy Thompson Community Garden are finalized.
 - Fields are cleared and prepared for approximately 35 new garden plots (0.8-1.0 acres). An additional half-acre is ready for community gardening in the 2026 growing season, and the remainder by 2027 in areas where soil conditions require more stewardship (i.e. stump removal, tillage, cover cropping).
 - Additional land and amenities surrounding the community gardens are activated and will expand ongoing collaborative and educational farming, community gardening, and agroforestry programming.
 - Site access is improved, including trail access, road enhancement, parking, and gate removal/installation.
 - Irrigation is planned and installed at each site with City partners.
- **City-wide non-native invasive plant (NNIP) management and monitoring is developed(3A.1, 3A.2, 4A.3)**
 - Input is facilitated from partnering open space managers in Burlington including Rock Point, WVPD, and BRPW. Assessment and monitoring framework is established and enables increased city-wide comparison and prioritization of NNIP management needs.
 - Land managers are supported to scientifically assess the impact of NNIP treatment strategies that are in practice, contributing to a more rapid evolution of NNIP management.
 - Community-based engagement is supported with university students interested in this work, training the next generation of land stewards to understand and implement effective NNIP management.
 - Open space managers work together through Burlington Wildways to determine priority invasive management work sites for the 2025 season. One day of Intervale Conservation Nursery Crew NNIP management services to each organization (Rock Point, WVPD, BPRW, and Intervale Center) for a total of four days.
 - Presence of NNIPs is reduced across the city and biodiversity increases.
- **Community food production is diversified and flood resiliency is built in the Intervale(1B.3, 2B.1, 3A.2, 3B.4)**

- An additional $\frac{3}{4}$ acres of growing space is prepared at the People's Orchard for future plantings, through repeat tillage, cover cropping and weed management, and soil analysis and amendments.
- The expanded People's Orchard is designed as a free community resource for education, floodplain resilience, and access to diverse fruit crops.
- 600' of planted harvestable riparian buffer are stewarded; second phase of buffer (~500') is planted.
- Intervale-grown elderberry at the buffer and People's Orchard is harvested.
- Collaborated with Spoonful Herbs to coordinate and lead 2-3 elderberry syrup-making workshops for the public.
- Elderberry syrup to at least 300 families at Fair Share (free CSA program) is distributed.
- Built management capacity and effective partnerships that can ensure stewardship of this space with and for community through facilitated volunteer engagement and a minimum of three educational workshops. Prioritize linkages with community partners interested in implementing their own community-scale food forest projects.
- Installed critical fencing infrastructure at the People's Orchard to ensure forthcoming plantings and subsequent harvests can be protected from deer browse.
- Continued to invest in partnerships and programming to facilitate dignified and equitable distribution to those in need.
- **Stewarded the Intervale with nature-based climate solutions (1B.4, 2A.3, 3A.2)**
 - Stewarded three pollinator zones planted in 2022 to promote a diverse abundance of pollinators in the Intervale and promote crop production for farms.
 - Created new pollinator habitat between Intervale Conservation Nursery and New Farms for New Americans by planting a mix of perennials and flowering shrubs.
 - Increased structural diversity within hedgerows throughout the Intervale and plant a variety of flowering shrubs in field edges.
 - Reduced the presence of non-native invasive plant species (Goutweed, Japanese Knotweed, Garlic Mustard, and Common Buckthorn).
 - Engaged and educated community members of best regenerative land stewardship practices through volunteer support, partnerships, educational workshops, tours, and signage.

Intervale Center - Conservation Legacy Fund Grant Application																				
Objectives/Outcomes	Tasks	January	February	March	April	May	June	July	August	September	October	November	December							
Community Gardening: Site Design/Permitting	Access planning and design																			
	Stakeholder coordination																			
	Permitting																			
	Planting design																			
	Irrigation design/coordination																			
Community Gardening: Site and Soil Prep	Sumac and brush clearing at northern sight																			
	Brush clearing at eastern site																			
	Field layout																			
	Soil prep																			
Community Gardening: Access and Site Improvements	Access road clearing																			
	Gate installation																			
	Road and trail improvements																			
	Repair swale collapse																			
Invasive Plant Management: Capacity Monitoring	Coordinate with UVM researcher to develop standard monitoring protocol																			
	Coordinate/Lead UVM Community of Practice interns to establish monitoring plots																			
	Facilitate land manager partners input pre-development/tool training post-development																			
Invasive Plant Management: Crew Stewardship	Coordinating with land manager to identify priority sites																			
	Stewardship Crew days (four people)																			
Diversify Community Food Production: Prep Orchard Expansion	Soil testing																			
	Soil prep (tillage, spreading amendments, cover cropping)																			
	Design orchard expansion																			
Diversify Community Food Production: Investments in existing plantings	Irrigation system improvements																			
	Pruning, stewardship, harvest																			
	Staffing for ongoing orchard cultivation, volunteer opportunities, workshops																			
	Staffing for second phase of riparian buffer planting																			
Diversify Community Food Production: Education and equitable distribution	Edible planting capacity for agroforestry buffer																			
	Sustainable foraging capacity																			
Regenerative Land Stewardship	Bird and pollinator-friendly habitat																			
	Invasive plant management capacity																			

Tommy Thompson Community Gardens Expansion

INTERVALE
CENTER

Northern Expansion 1.2 Acres

City Soil Depot

People's Farm

Tommy Thompson Community Gardens

Plastic Grove

Calkins Trail

Eastern Expansion 0.5 Acres

INTERVALE RD

Roadside Path

Legend

- Tommy Thompson Community Gardens
- Expansion Areas
- Trails
- Parking Lots
- Utility Poles
- Water Lines
 - Main Line 1.25"
 - Main Line 1.5"
 - Main Line 2"
 - Sub-Main Line 1"
 - Hose Taps
- Wetlands
 - Wetland B (II)
 - Wetland C (III)
 - Wetland D (III)
 - Wetland Buffer



0 0.03 0.05 0.1 0.15 0.2 Miles

Open Source Microsoft

From: Sharon Bushor
Sent: Friday, January 31, 2025 2:14 PM
To: Dan Cahill; Scott Gustin
Subject: Grant,Awards

[WARNING]: This email was sent from someone outside of the City of Burlington.

Hi, The memo recapped the applicant's request and,what was awarded. If the award was less than the total amount requested, it would be good to know if in the discussion with the applicant,,it was revealed that the difference was obtained elsewhere.

How soon do we know if the applicant is awarded a smaller amount than requested that the project is still viable? If not viable, can that money be further allocated during this cycle or does it get set aside to augment next year's funds?

Also, it would be good to have included in this award summary... the total amount available and if it includes available unspent funds from previous years.

What % of the total Legacy Funds this represents and how that is calculated.

Without that all being compiled in one summary document with reference to detailed documents supporting this, this process is vulnerable to " drift". Process overtime drifts/ deviates from the adopted formula.

Thanks for considering these comments.

Sharon Bushor
Burlington resident



Lake Champlain Basin Program Acquisition Grant

The City of Burlington has been awarded a grant from the Lake Champlain Basin Program to acquire and steward O North Avenue.

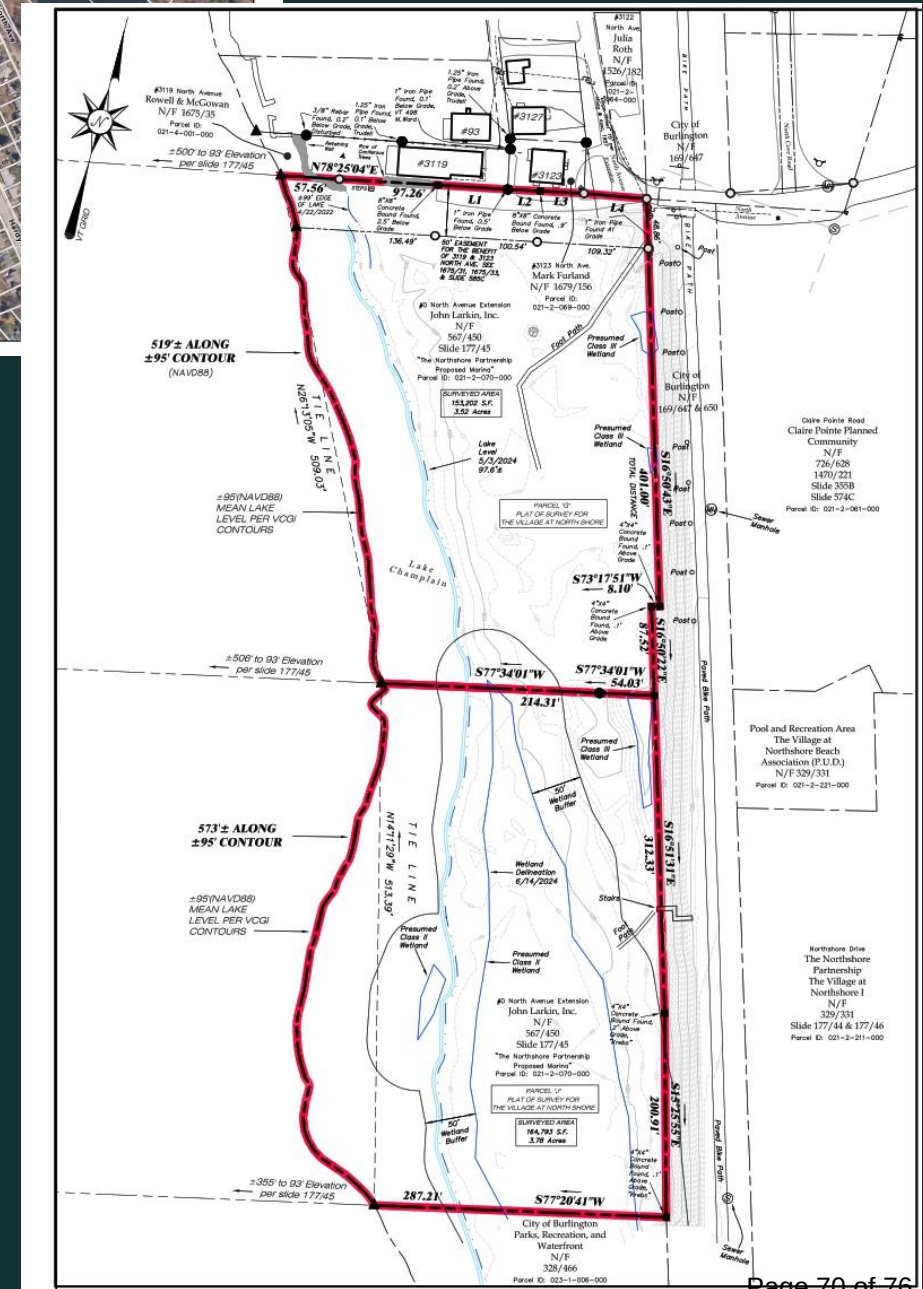
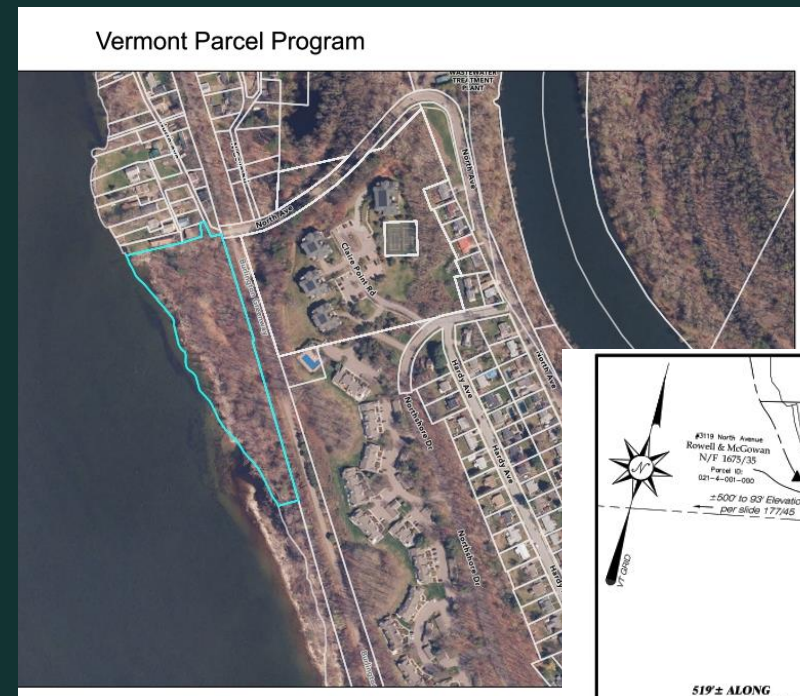
Acquisition Location

Property Location

The acquisition property is located in the far north end of Burlington, contiguous to North Shore Natural Area along the Burlington Greenway. It sits on a steep slope bordering the lake, offering views of the lake in the winter.

Ecological Significance

The property holds one of Vermont's first Class 1 wetlands, provides a vital corridor for animals and offers a view to the unique ecology from the Burlington Greenway.



Project Priorities



Wildlife Habitat

The acquisition will protect critical shoreline habitat.

Aquatic management

Understand and protect the unique shoreline and wetlands

Public Access

The project's goals include an accessible, controlled-access boardwalk that would allow a unique view of the wetlands and wild beach. A feasibility study will determine whether that is possible.

Education

Integrate with NBCS education work through Wildways & BPRW and education panels on-site.

Community Engagement

Neighbor Meetings

Stay connected with the immediate neighbors (one meeting held to date)

Open House

There will be one to two public meetings throughout the project.

On-site communication

We will provide a temporary project kiosk similar to what we have done with other large projects to communicate with the public during the grant period.



Partner Collaboration



Burlington Wildways

- Support with grant management
- Connecting to schools through the NBCS project



Project Timeline

1

Phase 1: Due Diligence

Complete an environmental assessment, develop the school curriculum and acquire the property.

2

Phase 2: Feasibility & Stewardship

Determine feasibility for improvements, steward the land, develop management plan and incorporate into the NBCS school plan.

3

Phase 3: Construction

Construct improvements for access, install permanent signage and finalize the management plan.



Next Steps

1

Finalize grant materials with LCBP

2

Acquire property

3

Develop and advertise RFP and create a curriculum

Questions?

I welcome any questions you may have about this project. Please feel free to contact me at cwright@burlingtonvt.gov or 802-495-1919.

