FINAL REPORT

NEIWPCC Job Code:	0356-002-001
Project Code:	LS-2021-018
Contractor:	Poultney Mettowee NRCD
Prepared By:	Sadie Brown, Nursery Manager
Project Period:	3/1/21 to 3/31/2023
Date Submitted:	March 10, 2023
Date Approved:	March 2023

ST CATHERINE COURT NEIGHBORHOOD STORMWATER INFILTRATION PROJECT

CONTACT INFORMATION

Poultney Mettowee Natural resources Conservation District

P.O. Box 209 Poultney, VT 05764

(802) 287-6606, info@pmnrcd.org

This is a U.S. EPA funded project.

This project was funded by an agreement awarded by US EPA to NEIWPCC in partnership with the Lake Champlain Basin Program (LCBP).

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EXECUTIVE SUMMARY

The goal of this project is for partners including the Poultney Mettowee Natural Resources Conservation District (PMNRCD), the Lake St Catherine Conservation Fund (LSCCF), and the Town of Wells, to address a high priority stormwater issue via a series of planned infiltration areas in a neighborhood adjacent to Lake St Catherine.

This work was completed throughout the 2021 and 2022 field seasons and consisted of multiple iterations of work phases to complete outreach, design, and implementation of projects designed to reduce stormwater runoff to Mill Brook. PMNRCD developed outreach materials including a homeowner letter, handouts, raingarden design examples, and project descriptions. These outreach materials were used in the completion of multiple days of door-to-door outreach speaking directly with 23 residents on-site, mailing letters, and leaving handouts throughout the neighborhood. In addition to direct on-site outreach and education, PMNRCD promoted the project at public events, wrote a blog article, and collaborated with the Lake St Catherine Conservation fund through social media and board engagement. Outreach included local education about the effects of land use changes at a watershed scale on lake water quality, the importance of infiltration projects to decrease stormwater runoff, and the use of native plants and the benefits they provide.

PMNRCD worked with Evan Fitzgerald of Fitzgerald Environmental Associates (FEA) to develop a drainage map of the neighborhood watershed(s), which was then incorporated into targeted outreach the following season (2022). PMNRCD staff completed in-depth follow up site visits with five different landowners and developed rain garden practice designs for four of those properties. The designs led to the implementation of six rain gardens based on the local topography and landowner preferences with the goal of reducing sediment inputs to local surface waters, foremost Little Lake St Catherine and Mill Brook. The gardens all included native or native friendly plants suited to the site locations.

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1. PROJECT SYNOPSIS

Saint Catherine Court is a 14-acre neighborhood located at the southern end of Lake St Catherine's Little Lake, in Wells, VT. The stormwater generated in this neighborhood carries sediment and nutrients and drains to the outfall of Lake St Catherine, which flows to Wells Brook (via Mill Brook) and Lake Champlain. The neighborhood is relatively flat, and areas of incidental ponding and infiltration on lawns are occurring at several locations, illustrating the potential for success of a coordinated and purposely designed set of infiltration projects on multiple properties to decrease the contaminated stormwater flowing offsite. Soil types in this neighborhood (71A and 97A) are well drained and would be appropriate for green stormwater solutions. This project is located in the South Lake Champlain watershed and was a high-ranking project identified in the 2019 Lake St Catherine and Wells Brook Stormwater Master Plan (FEA / PMNRCD). Assuming that this 14-ac neighborhood receives approximately 40 inches of rain annually, it potentially generates over 15 million gallons of stormwater per year.

During a February rainstorm in 2018, PMNRCD staff witnessed a stream of sediment laden water running down North St and into the outlet of Lake St Catherine. The water originated in the St Catherine Court neighborhood, and while the neighborhood was relatively flat with well-draining soils and some ponding occurred on lawns, there was no planned direction or infiltration of stormwater. Through 22 site visits, this project introduced the neighborhood residents to stormwater practices that can infiltrate and minimize stormwater draining from St Catherine Court to Mill Brook, a Wells River tributary and the outfall of Lake St Catherine. Many of these homeowners are not lake association members, as their properties do not directly border the lake, so a new audience was reached through this outreach.

This project consisted of four main components: landowner outreach, project identification and design, project implementation, and community awareness. PMNRCD, working in conjunction with the Champlain Valley Native Plant Restoration Nursery (CVNPRN), developed and utilized technical educational materials for use in outreach efforts to recruit landowner participation. Working with a contractor, PMNRCD identified projects and generated designs based on individual properties. The final outcome of this project includes implementation of six green stormwater projects. Upon completion of the projects, PMNRCD employed various avenues of communication to promote the projects and their intent to improve water quality, promote purposeful management of stormwater, decrease sediment and nutrients to Mill Brook and Lake Champlain, and increase use of native plants in the neighborhood for birds and pollinators.

2. TASKS COMPLETED

Task 1 Outreach:

PMNRCD staff completed outreach to individual property owners within the St. Catherine Court and Jones Rd neighborhoods through letters, door-to-door outreach, and by utilizing events and assistance from outside organizations.

In 2021, staff wrote and sent letters to all separate parcel properties in the neighborhood. The letter outlined the project need and way for residents to become involved. Following the development of the subdrainage map by Evelyn Boardman of Fitzgerald Environmental Associates (FEA), staff sent additional letters in 2022 to the properties where drainage was concentrated near green spaces where larger practices could go.

During in person outreach, staff used rain garden packets and handouts to help explain the problem and potential solutions. The Champlain Valley Native Plant Restoration Nursery (CVNPRN) developed 3 scenario example garden plans that focused on salt tolerant, low maintenance, and high-water use plants. In addition to the handout and garden scenarios, PMNRCD also utilized previously developed printed educational materials to be used throughout project outreach. These included the Vermont Raingarden Manual and the VT Guide to Stormwater Management for Homeowners and Small Businesses.

PMNRCD completed 4 days of door-to-door outreach where staff walked the neighborhoods left handouts, packets, and spoke with residents directly about the project. During the field season in 2021 and 2021, 23 residents were spoken with directly at their properties and 13 additional handouts were left at houses.

Staff coordinated with the Little Like Conservation Fund to conduct outreach through their membership. Information was shared at the LLCF board meeting and posted to their social media. A board member who lives nearby the project area was given printed handouts and spoke to neighbors about the project. During public events that PMNRCD participated in, staff brought handouts and spoke with those interested. These events included East Poultney Day event 2021 and 2022 and the Libraries Love Lakes Day on July 3rd 2022. (attendance through LCBP E&O grant project).

Task 2 Project Development:

Staff completed field work and site visits on northern end of the neighborhood with Environmental Consultant, Evan Fitzgerald on 9/2/21. During the visit, staff discussed the mapping of sub drainage areas and project development for the larger parcels within the community. A sub drainage map for the neighborhood was developed by our Consultant during the winter of 2021 and staff visually field verified the drainage points

in the 2022 field season. Through conversations with landowners and field observations during storm events, the stretch along North Street was the main point of conveyance of water to the drop inlet that drains to the outfall of Lake St Catherine.

In 2021, Staff completed information-gathering site visits for two properties and designed 2 raingardens that were best suited to capture runoff based on property location and characteristics. The initial designs were shown to Holly Greenleaf of Greenleaf Designs for her input on 10/8/21. In the fall 2022, staff completed site visits and desktop reviews of two additional properties and developed 2 garden designs for each of the properties. These two properties were located on the main stretch of north street within the identified watershed.

Garden designs were based on the size of the infiltration area, location within the property, the area of nearby impervious surfaces, and landowner's plant preferences, landowners garden aesthetic, and the interest (or not) in future practice maintenance. All the plants utilized were native or native friendly and are commonly used for raingarden purposes. Plants included buttonbush, winterberry, and ninebark shrubs and flowering perennials such as blue flag iris, echinacea, swamp milkweed, and cardinal flower.

Task 3 Project Installation:

During the field season of 2021 and 2022 PMNRCD staff installed six raingardens on four different properties within the St Catherine Court and Jones Rd Neighborhood watershed. The initial two gardens are located on the Southern end of the drainage area, and the four installed in 2022 were located on the southwestern side of the drainage area along North Street. Installation included soil removal within the designated area, the mixing of sand in with native soil to increase infiltration rates, and planting the depression (or areas of it) with native vegetation as outlined in the plans developed in Task 2.

9/30/21 - 10/1/21 staff installed one raingarden (Lebell) on St Catherine Court, spoke to neighbors during and after implementation on what and why work was taking place.

Photo 1: PMNRCD crew installing the Lebell rain garden.

10/5/21 – 10/6/21 staff installed a raingarden (Johnson) on St Catherine Court, spoke to spoke to neighbors during and after implementation on what and why work was taking place. Gave handouts and contact information to neighbors.

Photo 2 and 3: PMNRCD Staff installing the Johnson rain garden.

In the spring of 2022 staff followed up with landowners to see how their gardens and projects were doing. Summer interns and seasonal staff, through the District's Lake Education and Action Program funded by the Lake Champlain Sea Grant, helped one of the landowners maintain their rain garden through weeding and assisting in identifying plants.

10/17-19/2022 Staff installed two raingardens on a North Street property (Saumell). Garden B is located on the southern corner of the property and captures water with a high sediment load running off the dirt road, St Catherine Court, before making its way onto North Street. The second raingarden A is located along North Street. The Landowner was very interested in the benefits of native plants and wanted a variety of flowering plants incorporated into their plans. Staff incorporated additional plant material for a smaller spacing between plants to give a continuous look to the garden as it grows and included flowers such as swamp milkweed that have traditional pollinator value.

Photo 4 and 5: PMNRCD crew installing the gardens at the Saumell property.

11/7,9/2022 Staff installed two raingardens on a North Street property (Tobin). Garden A treats water from North Street directly and that which pools along the paved driveway. Garden B collects water directly from the conveyance along North Street. Both gardens are designed for limited maintenance with over half of each garden and swale being seeded and mowable.

Photo 6 and 7: PMNRCD crew installing the gardens at the Tobin property.

Task 4 Community Awareness:

General awareness for this project and related goals of water quality and native plants occurred through a few different outlets.

Staff spoke directly with 23 residents on site during door-to door outreach. Of these, five residents were potentially interested in having a project completed. These residents received in-depth, follow-up visits with PMNRCD staff to look closely at their properties. These follow up site visits included reviewing the goals of the overall project, looking at the points of water conveyance and surrounding impervious surfaces. Outside of direct on-site education, staff spoke to an additional eight people about the project during public events.

In 2022, staff wrote a blog article that was published on the District website and shared on social media in 2022. The blog article explained the project, showcased the two gardens installed in 2021, and promoted additional participation. This blog article 31 views on social media.

Staff coordinated with the Little Like Conservation Fund to conduct outreach through their membership. Information was shared at the LLCF board meeting and posted to their social media. A board member who lives nearby was giving printed handouts and spoke with neighbors about the project.

Task 5 Reporting:

Staff completed and submitted quarterly and final reporting including project summaries, and associated educational materials, articles, and photos. Outreach and landowner interest required more time to garner and successfully implement projects than anticipated and PMNRCD received a grant extension for the 2022 season. Staff used this time to completed additional outreach and implement four more projects.

3. METHODOLOGY

Task 1. Outreach: PMNRCD developed outreach materials targeted to this project and area. Additional outreach materials included in homeowner packets were the Vermont Raingarden Manual and the VT Guide to Stormwater Management for Homeowners and Small Businesses. Letters were sent to all separate parcel properties based on data from the Town of Wells. 2021 consisted mainly of widespread outreach with a goal to make contact (direst or otherwise) with each resident. In 2022 Targeted letters were sent to 3 larger properties based on the subdrainage maps developed through FEA and additional door-to-door outreach took place along North Street where a main conveyance of water had been pinpointed through observation and mapping.

Task 2. Project Development: In 2021, project development and project locations were led by landowner interest of the St Catherine Court residents. Following a neighborhood visit with our Storm Water Master Plan (SWMP) consultant Evan Fitzgerald (FEA), a subdrainage map was developed which further outlined the locations of effective practices. This map, along with observations and input from residents, informed the project development focus in 2022.

Size and placement of gardens were designed for the topography specific to each property and an estimation of the contributing impervious surface area. Designs were based off outlines found in the Vermont Rain garden manual and the Stormwater Treatment Practice Calculator. Plants were chosen based on those typically suited for rain garden practices and those commonly available through CVNPRN.

Garden designs were sent to landowners for approval and input before implementation dates were scheduled.

Task 3. Project Installation: Projects were implemented by PMNRCD staff and took place over a one or two-day timeframe. Installation included soil removal within the designated area, the mixing of sand in with native soil to increase infiltration rates, and adding mulch, grass seed, or planting the depression with native vegetation as outlined in the plans developed in Task 2.

Task 4. Community Awareness: PMNRCD utilized web-based services to promote the project. A blog post was written and added to the PMNRCD website and social media pages. PMNRCD connected with the Lake St Catherine Conservation Fund for

outreach and promotion and project information was added to their social media and shared during a board meeting.

4. QUALITY ASSURANCE TASKS COMPLETED

For projects with approved QAPPs only

This project does not have a QAPP.

5. DELIVERABLES COMPLETED

Task 1 Outreach:

Letter example sent to landowners:

POULTNEY METTOWEE NATURAL RESOURCES CONSERVATION DISTRICT
PO BOX 209; POULTNEY VT 05764; (802) 558-3515; INFO@PMNRCD.ORG; WWW.PMNRCD.ORG

Dear Landowner,

This is Sadie Brown with the Poultney Mettowee Natural Resources Conservation District (PMNRCD). As you may know, the Conservation District has been working on implementing projects identified through the 2019 Lake St Catherine and Wells Brook Stormwater Master Plan in Wells and Poultney.

Stormwater Master Plans (SWMP) identify stormwater issues and potential opportunities within a watershed and are used as a tool for organizations to implement larger scale, high quality projects that will make the most impact on water quality. Within the 2019 SWMP, the St Catherine Court Neighborhood was identified as an area with high-ranking project potential. During the field work portion of the SWMP process, areas of incidental ponding and infiltration on lawns were observed to be occurring throughout the neighborhood. These observations helped illustrate the potential for success of a coordinated and purposely designed set of infiltration projects on multiple properties to decrease the stormwater flowing offsite to Mill Brook via North St.

Stormwater is defined as water that is generated from rain or snow events that flows over land or impervious surfaces such as roads and driveways, parking lots, and rooftops, and does not soak into the ground. In Vermont, stormwater is increasingly being identified as a source of unintended pollutants entering waterbodies. As water flows across the landscape, it picks up and carries with it pollutants such as pesticides, herbicides, oils, road salt, sediment, and excess nutrients such as phosphorus and nitrogen. Here in the Poultney Mettowee Watershed, stormwater not only impacts local waterways like Wells Brook and Lake St Catherine, but the receiving waters of Lake Champlain as well.

The District has received funding through the Lake Champlain Basin Program (LCBP) to assist landowners in the St. Catherine Court Neighborhood and potentially implement infiltration practices such as small raingardens or swales for those interested.

If you would like to learn more about the project and how you may fit in, please contact us, we would be happy to do an informational site visit. We are looking to schedule visits soon so be sure to reach out if interested.

Looking forward to hearing from you!

Thanks,

Sadie Brown

CVNPRN Nursery Manager

PMNRCD Environmental Planner

sadie@pmnrcd.org

(802) 287-0710

Handout developed for outreach:

POULTNEY METTOWEE NATURAL RESOURCES CONSERVATION DISTRICT
PO BOX 209; POULTNEY VT 05764; (802) 558-3515; INFO@PMNRCD.ORG; WWW.PMNRCD.ORG

The Issue:

Stormwater is water generated from rain or snow events, that flows over land or impervious surfaces such as roads and driveways, parking lots, and rooftops, and does not soak into the ground. In Vermont, stormwater is increasingly being identified as a source of unintended pollutants entering waterbodies. As water flows across the landscape, it picks up and carries with it pollutants such as pesticides, herbicides, oils, road salt, sediment, and excess nutrients such as phosphorus and nitrogen. These contaminants decrease water quality and contribute to problems like algae blooms.

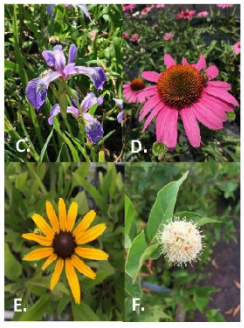
Stormwater Master Plans (SWMP) identify stormwater issues and potential opportunities within a watershed and are used as a tool for organizations to implement larger scale, high quality, projects that will make the most impact on water quality. During the 2019 SWMP for Lake St PMNRCD identified sediment and erosion issues occurring on the ditch running along north street. Nearby neighborhoods generate additional water and contribute to the sediment heavy stormwater that outlets directly to Mill Brook.

The Solution:

During the field work portion of the SWMP process, areas of incidental ponding and infiltration on lawns were observed to be occurring throughout the neighborhood. These observations helped illustrate the potential for success of a coordinated and purposely designed set of infiltration projects on multiple properties to decrease the stormwater flowing offsite to Mill Brook via North St. Within the 2019 SWMP, the St Catherine Court Neighborhood was identified as an area with high-ranking project potential.

The District has **received funding** through the Lake Champlain Basin Program (LCBP) to **assist landowners** in the St. Catherine Court Neighborhood and **implement infiltration practices** such as small raingardens or swales for those interested **free of charge**. Projects like these, allow water to soak back into the ground, reducing runoff into waterbodies, filtering sediment and excess nutrients, recharging ground water, reducing flood risk downstream, and ultimately improving water quality.

These infiltration practices may take a variety of forms and would be **designed to suit your property and personal preferences.**



A. Erosion on North Street ditch
B. Sediment plume at culvert outlet
C. Blue Flag Iris
D. Purple Coneflower
E. Black Eyed Susan
F. Buttonbush

If interested in an informational site visit, please contact PMNRCD. Projects will be implemented July-Oct 2022

Sadie Brown, sadie@pmnrcd.org, (802) 287-0710

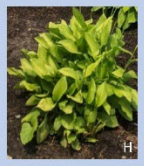
Funding for this project was provided by the Lake Champlain Basin Program through the New England Interstate Water Pollution Control Commission

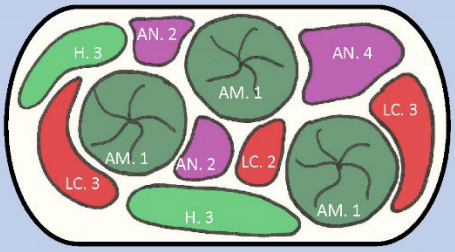
Garden design examples developed for outreach:

Salt Tolerant -Partial Sun

Many rain gardens receive water from roads and parking areas which may be laden with high concentrations of salt. Not all plants are able to survive in this type of environment. Below is a list of salt tolerant plants and an example garden layout for partial shade.

Perennials	Trees	Shrubs
Nodding Onion	Serviceberry	Black Chokeberry
Columbine	Hackberry	Red Chokeberry
Windflower	Witch Hazel	Summersweet
N.E Aster	Red cedar	Inkberry
Flat Topped Aster	Swamp White Oak	Spirea
Daylilies	Red Oak	Highbush Blueberry
Blue Flag Iris	**Herbaceous**	
Cardinal flower	Grey Sedge	
Spiked Lobelia	Fox Sedge	
Black Eyed Susan	Switch Grass	
Goldenrod	Little Bluestem	
Smooth Oxeye		
Canada Tick-trefoil		
Hosta		





15'

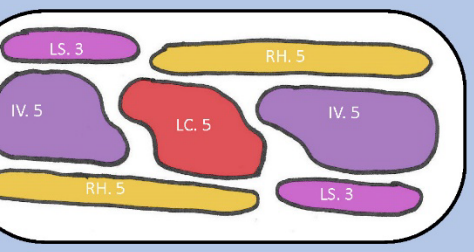
Abr.	#	Botanical Name	Common Name	Mature Height	Seasonal Interest	Spacing
AM	3	Aronia melocarpa	Chokeberry	3-4'	Sp, F	5'
AN	8	Aster novae-angliae	NE Aster	2-3'	F	22"
LC	8	Lobelia cardinalis	Cardinal Flower	2-3'	S,F	22"
H	6	Hosta spp.	Hosta	1-2'	S	18"

Funding for this project was provided by the Lake Champlain Basin Program through the New England Interstate Water Pollution Control Commission

Salt Tolerant – High Use

Many rain gardens receive water from roads and parking areas which may be laden with high concentrations of salt. Not all plants are able to survive in this type of environment. Below is a list of salt tolerant plants and an example garden layout. This garden scenario is meant for areas that receive a large volume of water and a center depression/conveyance feature.

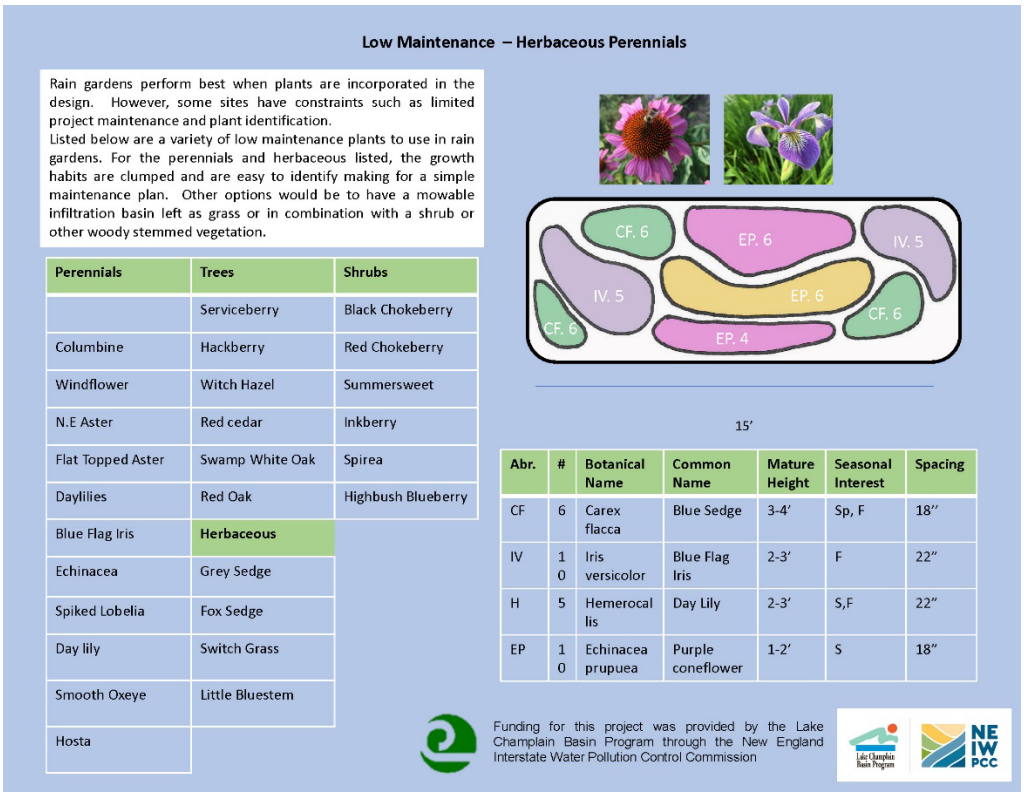
Perennials	Trees	Shrubs
Nodding Onion	Serviceberry	Black Chokeberry
Columbine	Hackberry	Red Chokeberry
Windflower	Witch Hazel	Summersweet
N.E Aster	Red cedar	Inkberry
Flat Topped Aster	Swamp White Oak	Spirea
Daylilies	Red Oak	Highbush Blueberry
Blue Flag Iris	**Herbaceous**	
Cardinal flower	Grey Sedge	
Spiked Lobelia	Fox Sedge	
Black Eyed Susan	Switch Grass	
Goldenrod	Little Bluestem	
Smooth Oxeye		
Canada Tick-trefoil		
Hosta		



15'

Abr.	#	Botanical Name	Common Name	Mature Height	Seasonal Interest	Spacing
LS	6	Liatris spicata	Blazing star	3-4'	S	18''
IV	10	Iris versicolor	Blue Flag Iris	2-3'	Sp	22"
LC	5	Lobelia cardinalis	Cardinal Flower	2-3'	S	22"
RH	10	Rudbeckia hirta	Black Eyed Susan	1-2'	S, F	18"

Funding for this project was provided by the Lake Champlain Basin Program through the New England Interstate Water Pollution Control Commission



Low Maintenance – Herbaceous Perennials

Rain gardens perform best when plants are incorporated in the design. However, some sites have constraints such as limited project maintenance and plant identification.
Listed below are a variety of low maintenance plants to use in rain gardens. For the perennials and herbaceous listed, the growth habits are clumped and are easy to identify making for a simple maintenance plan. Other options would be to have a mowable infiltration basin left as grass or in combination with a shrub or other woody stemmed vegetation.

Perennials	Trees	Shrubs
	Serviceberry	Black Chokeberry
Columbine	Hackberry	Red Chokeberry
Windflower	Witch Hazel	Summersweet
N.E Aster	Red cedar	Inkberry
Flat Topped Aster	Swamp White Oak	Spirea
Daylilies	Red Oak	Highbush Blueberry
Blue Flag Iris	**Herbaceous**	
Echinacea	Grey Sedge	
Spiked Lobelia	Fox Sedge	
Day lily	Switch Grass	
Smooth Oxeye	Little Bluestem	
Hosta		

Abr.	#	Botanical Name	Common Name	Mature Height	Seasonal Interest	Spacing
CF	6	Carex flacca	Blue Sedge	3-4'	Sp, F	18''
IV	10	Iris versicolor	Blue Flag Iris	2-3'	F	22''
H	5	Hemerocallis	Day Lily	2-3'	S,F	22''
EP	10	Echinacea prupuea	Purple coneflower	1-2'	S	18''

Funding for this project was provided by the Lake Champlain Basin Program through the New England Interstate Water Pollution Control Commission

Outreach notes:

2021 Outreach:

Summer of 2021, all individual property parcels (19) within the St Catherine Court and Jones Rd neighborhood were sent letters that briefly explained the project.

CVNPRN staff compiled rain garden packets that were used during door-to-door outreach and during site visits. Included in this information are alternative rain garden examples.

Staff completed three days of door-to-door outreach (6/28/21, 8/5/21, 8/31/21) within the St Catherine Court neighborhood handing out information and speaking to residents (18 residents/sites) on their participation in the program and the importance of stormwater projects. An additional 10 handouts were left for residents who were not home during outreach. Connected with 4 landowners interested in potentially implementing stormwater practices.

Spoke with neighborhood residents during East Poultney Day event 2021 (attendance through LCBP E&O grant project).

2022 Outreach

Staff sent additional letters were sent to the prominent properties outlined in the drainage map developed in by FEA

Staff coordinated with the Little Like Conservation Fund to conduct outreach through their membership. Information was shared at the LSCCCF board meeting and posted to their social media. A board member who lives nearby handed out printed handouts and spoke with neighbors about the project.

Staff brought handouts to a lake event and educational day (7/3/22) to give to residents.

Spoke with neighborhood residents during East Poultney Day event 2022 (attendance through LCBP E&O grant project).

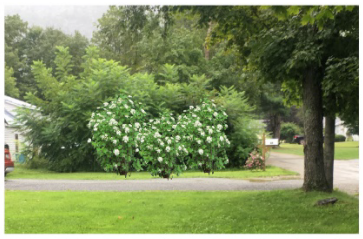
Staff conducted the final round of door-to-door outreach on 9/29/22, targeting those at key points in the mapped sub watersheds. During this outreach staff spoke with five new landowners and left three additional handouts at properties.

Task 2. Project Development

Plans and designs for 6 raingardens on 4 different properties.

Garden Description

Rain Garden located to the east of the driveway at 27 St. Catherine Court. The Garden will consist of native species of shrubs and flowering perennials. Species chosen are low maintenance and do well in full sun. From the west will be a shallow grassed mowable swale leading from the corner of the driveway and road to the garden treatment area. From the south eastern corner will be a small gravel swale directing water runoff from the eastern edge of property into the treatment area of the garden. The gravel will aide in sediment removal. Both swale entrances will be planted with blue flag iris which has a high salt tolerance.



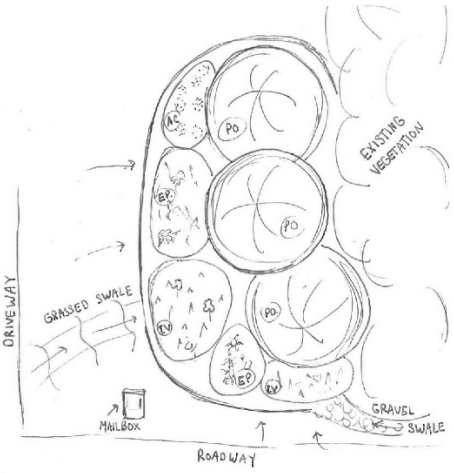
Garden sizing

Dimensions: ~18ft X 10ft

Area: ~180 sq. ft

Approx. impervious drainage area: 2,300 sq ft.

Size factor: sand, 8" depth



Abr	Qty	Botanical Name	Common Name	Height	Spread	Seasonal interest	Photo
PO	3	Physocarpus opulifolius	Ninebark	5-10'	6-8'	Spring to Early Summer, white-light pink flowers	
EP	6	Echinacea purpurea	Purple Coneflower	2-3'	1-2'	Mid-late summer, light purple/pink flowers	
IV	12	Iris versicolor	Blue Flag Iris	2-3'	1-2'	Early spring, dark purple/blue flowers	
AC	3	Allium cernuum	Nodding onion	1-3'	2-3'	Early summer, light pink flowers, mosquito repellant characteristics	

8/24/21 PMNRCD

Garden Description

Rain Garden located to the east of the driveway at 44 St. Catherine Court in Wells, VT. The garden will capture driveway and roof runoff from the South East end of the property and will consist of native species of shrubs and flowering perennials. Species chosen are low maintenance and do well in full sun. The garden will help filter sediment as it accumulates from the new driveway and reduce the water volume currently flowing into neighboring driveway and roadway. The garden will follow the natural depression between properties and will be planted with plants to aid in infiltration. The depression along the paved driveway will be accentuated slightly to make an intentional grassed swale directed to the garden.

Garden sizing

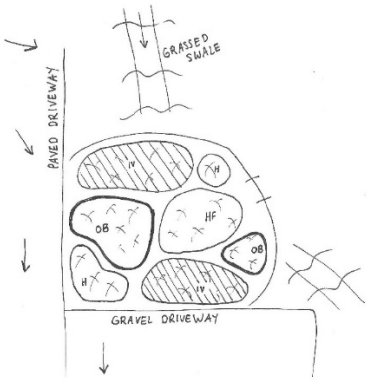
Dimensions: ~10ft X 10ft

Approx. impervious drainage area: ~200sq ft.

Area: ~100 sq. ft

Size factor: sand, 6" depth

Abr	Qty	Botanical Name	Common Name	Height	Spread	Seasonal interest	Photo
H	4	Hosta ssp.	Hosta	1-2'	18-24"	Summer purple-white flowers	
OB	6	Oenothera biennis	Common Evening Primrose	1-2'	1-2'	Summer yellow flow-ers	
HF	5	Hermerocallis fulva	Day Lilly	2-3'	18-24"	Summer yellow-orange flowers	
IV	10	Iris versicolor	Blue Flag Iris	2-3'	1-2'	Early spring, dark purple/blue flowers	



9/20/21 PMNRCD

Saumell Rain Garden

Garden Description

Rain Gardens located on the lawn of 244 North St. in Wells, VT spaced out between the St Catherine Court roadway and the gravel driveway. The gardens will capture and help filter roadway runoff (North St and St Catherine Crt), and runoff generated from the nearby building structures, as well as help reduce the volume of water flowing farther down the road during storm events. The gardens will consist of native species of shrubs and flowering perennial that are suited for wet and partial shade conditions. The garden will follow the natural depressions within the lawn which will be deepened and have course sand and plants to aid in infiltration. Small grassed swales will be added from the roadway and impervious surfaces to capture additional water.

Garden sizing A,B

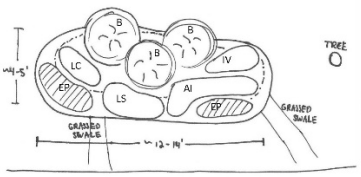
Dimensions: ~6ft X 12ft, ~4ft X 12ft

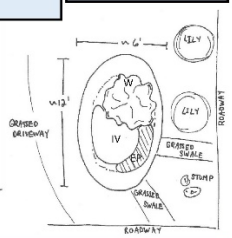
Impervious drainage area: ~3,828sq ft., 899sq ft

Area: ~72 sq. ft, ~48sq ft

Size factor: sand + depth ~12", sand + depth ~10"

Treatment: ~50-75%



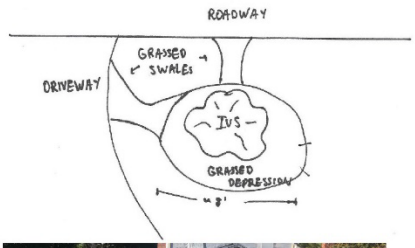


Abr	Qty	Botanical Name	Common Name	Height	Spread	Seasonal interest	Photo
B	3	*Cephalanthus occidentalis*	Buttonbush	6-12'	4-8'	Summer white globe flowers	
W	1	*Ilex verticillata*	Winterberry	6-10'	6-10'	Spring-White spring flowers, Fall-Winter-red or yellow fall-winter berries	
HF	10	*Echinacea purpurea*	Purple Coneflower	2-3'	1-2'	Summer pink/purple flowers	
IV	12	*Iris versicolor*	Blue Flag Iris	2-3'	1-2'	Early spring, dark purple/blue flowers	
LC	3	*Lobelia cardinalis*	Cardinal Flower	2-3'	1-2'	Summer Red flowers	
AC	9	*Asclepias incarnata*	Swamp Milkweed	3'	1-2'	Summer bright pink flowers	
LS	9	*Lobelia siphilitica*	Blue Lobelia	2'	1-2'	Summer blue flowers	

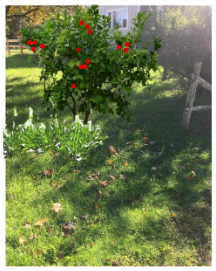
10/13/22 PMNRCD

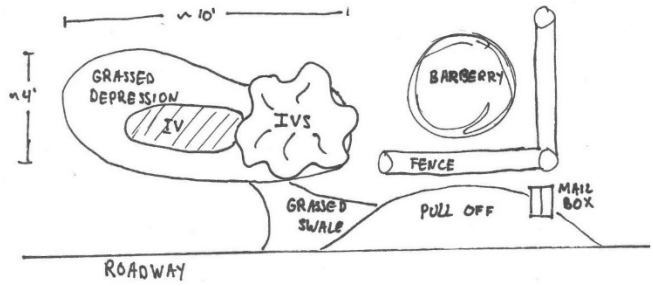
Garden Description

Rain Gardens located at 270 North St. Wells VT. installed alongside the driveway and the southern corner of the property on North St.. The Gardens will consist of native species of shrubs and flowering perennials, winterberry and blue flag iris. Species chosen are low maintenance and do well in full to partial sun and have a salt tolerance. From North Street (via the pull off and driveway) will be shallow grassed mowable swales leading to the garden treatment area. The depression will have an infiltrative sand mix and be seeded to remain mowable for easy maintenance. Winterberry will be added to help with the infiltration process, filter water, and add structure to the gardens.



Abr	Qty	Botanical Name	Common Name	Height	Spread	Seasonal interest	Photo
IVS	2	Ilex verticillata	Winterberry	5-10'	6-8'	Spring small white flowers, Fall-Winter red berries	
IV	8	Iris versicolor	Blue Flag Iris	2-3'	1-2'	Early spring, dark purple/blue flowers	





Garden sizing

Dimensions: ~4ft X 10ft, ~5ft x 8ft

Area: ~40 sq. ft, ~40sq ft

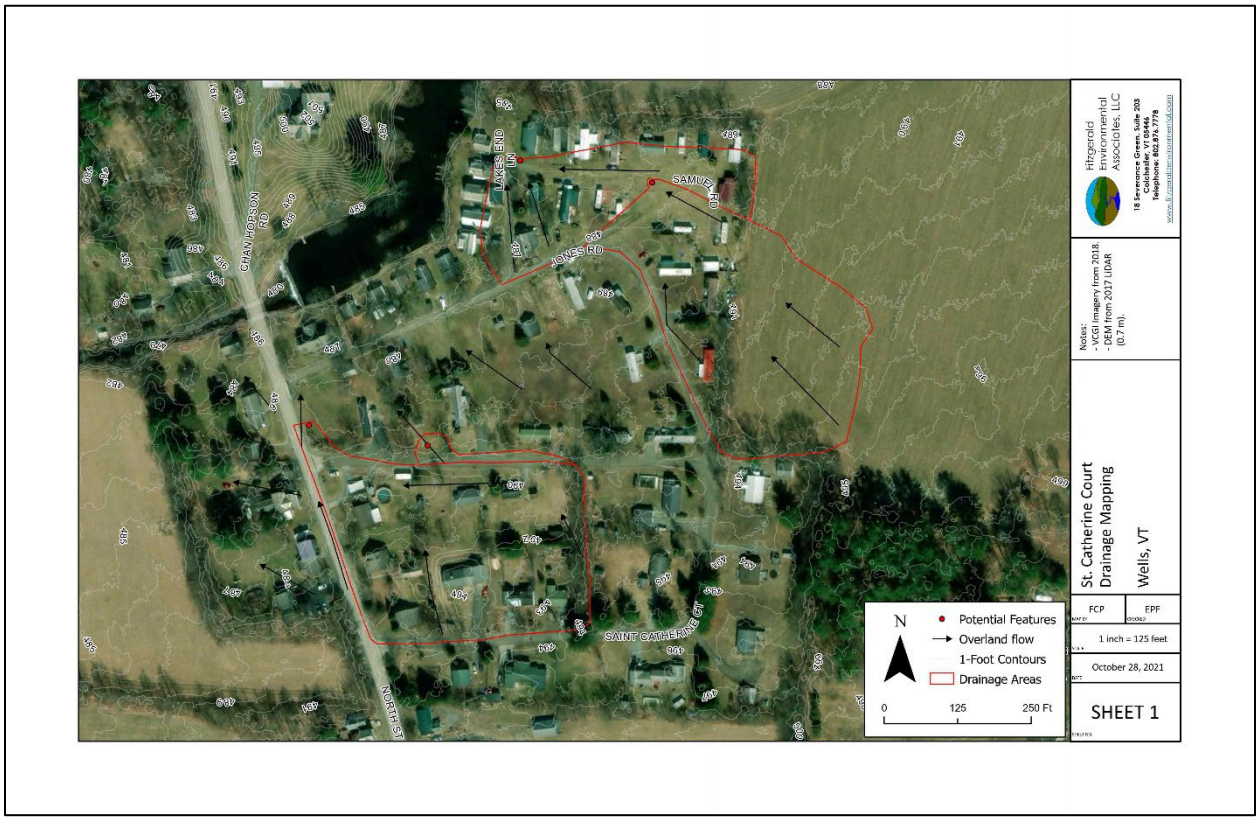
Approx. impervious drainage area: 2,000sq ft.

Size factor: sand mix 10" depth.

Approx. Treatment: ~50%

11/1/22 PMNRCD

Map of sub watersheds



Task 3. Project Installation

Rain gardens were installed by PMNRCD staff in 2021 and 2022. The following are photos of reach of the rain gardens. The total area of new infiltration practices receiving runoff from paved roads is 467 ft^2. Using the stormwater treatment practice calculator, approximately 0.42 kg/year of phosphorus is attenuated (https://anrweb.vt.gov/DEC/cleanWaterDashboard/STP Calculator.aspx). Photos: The six rain gardens post installation.

Photo : Completed raingarden at Lebell property. Photo : Completed rain garden at Johnson property.

Photo : Completed rain garen A at the Saumell property. Photo : Completed rain garden B at the Saumell property.

Photo: Completed rain garden A at the Tobin property, actively receiving water during a rain storm on 11/30/22. Photo: Completed rain garden B at the Tobin property, actively receiving water during a storm on 11/30/22.

Project Table

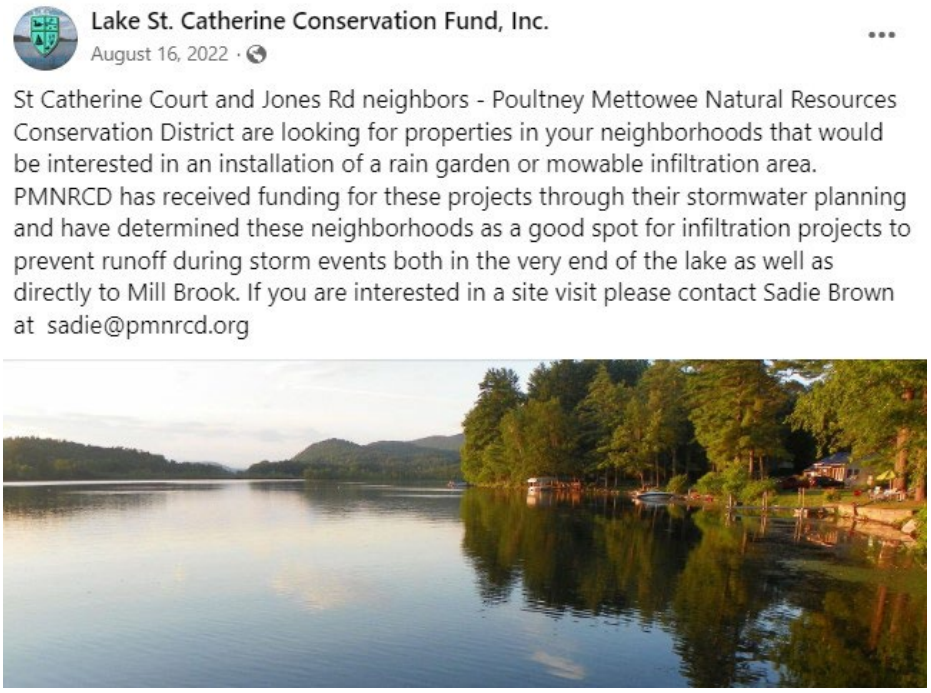
Project Site	Installation Start Date	Approx. Size	# Of Plants
Lebell	9/30/2021	~ 180 sq ft	24
Johnson	10/5/2021	~ 100 sq ft	28
Saumell Garden A	10/17/2022	~ 72 sq ft	37
Saumell Garden B	10/19/2022	~ 45 sq ft	11
Tobin Garden A	11/7/2022	~ 30 sq ft	1
Tobin Garden B	11/9/2022	~ 40 sq ft	9

Task 4. Community Awareness:

Staff spoke directly with 23 residents on site during door-to door outreach. Of these, 5 residents were interested in potentially having a project done and received a more in-depth follow-up visits looking at their properties. These follow-up site visits included reviewing the goals of the overall project, looking at the points of water conveyance, and evaluating the surrounding impervious surfaces

Outside of direct on-site education, staff spoke to an additional 8 people about the project during public events and had 31 views of the blog article on social media.

Media promotion by the Lake St. Catherine Conservation Fund:



Blog article on PMNRCD website and media:

https://www.pmnrcd.org/neighborhood-stormwater management/?fbclid=IwAR3MjnHwCWzM2fjVhyTPTxaacTBvsGO3F8suVV6y-wPqWcatlA8pjV8gQjY

6. CONCLUSIONS

The outreach completed through this grant helps to lay the groundwork for community support of additional implementation practices within this neighborhood or the surrounding area. There are many stormwater projects identified in Wells and the Lake St Catherine Watershed and the continuation of community education helps increase support of the implementation process. Throughout this project, it was challenging to introduce the concept that developed properties and homeowner actions play a role in overall water quality. The landowners, who had not made that connection were less likely to commit to practices being implemented on their properties. However, the level of interest during conversations and the willingness to learn about impacts to water quality through our door-to-door outreach was encouraging.

The main outcomes from this project include improved water quality, purposeful management of stormwater, decreased sediment and nutrients to Mill Brook and Lake Champlain, and increased native plants in the neighborhood for birds and pollinators to utilize. These outcomes were met through the implementation of the series of six small infiltration practices.

Additional outcomes from this project included increased education about individual property contributions to local water quality, as well as general information about stormwater practices, native plants, and local and regional water quality issues. During site visits, staff spoke to property owners about multiple uses for native plants and invasive species. There were multiple invasive barberry plants growing on the Tobin property which the landowner was unaware of and following our visit was compelled to dig out and remove. Interactions like this one show that there are additional benefits in getting out in the community and the impact organizations can have on residents' choices.

7. REFERENCES

8. APPENDICES

Deliverables are embedded in the report. They are also shared electronically.