

To: Adelaide Dumm, District Manager **From:** Jessica Louisos, Alex Marcucci

Company: Winooski NRCDC **SLR International Corporation**

cc: Lewis Creek Association **Date:** November 13, 2023
Lake Iroquois Association Revised February 15, 2024

Project No. 14439.00006

RE: Planning / Prioritization for Projects in the Lake Iroquois-Patrick Brook Watershed

Project Identification and Prioritization Method

An initial project identification table and map were compiled based on existing reports, mapping, and project team meetings. Data sources were summarized in a watershed resource library (April 2023). Project team meetings guided the selection of priority assessment areas. SLR water resources engineers visited potential project sites and completed a windshield survey of the Lake Iroquois-Patrick Brook watershed to review possible projects during spring and summer 2023. Possible project areas were visited to review existing information, confirm project type, and determine feasibility. Observations and existing mapping were used to inform the project prioritization.

Unified Scoring Prioritization

The Vermont DEC has developed guidelines for stormwater master planning along with a Unified Scoring Prioritization for Stormwater Master Plans table to provide standardized scoring for projects (VTDEC, 2019, Appendix A). The projects identified for a GSI treatment volume are shown on a map (Appendix B) and described and prioritized in the Unified Scoring Prioritization Table (Appendix C). Project photos are included in Appendix D.

BMP Unit Costs and Adjustment factors were derived from stormwater master plans completed by Watershed Consulting Associates (2018) based on research and Vermont construction costs (Table 1). Costs were adjusted to include an 8% total inflation adjustment based on the Consumer Price Indicator Inflation Calculator. Multipliers for site type and permitting and engineering required are also applied (Tables 2 & 3, Watershed Consulting Associates (2018)).

Table 1: BMP Unit Costs

BMP Type	Cost/ft3 Treatment Volume
Constructed Wetland	9.49
Dry Pond	4.87
Grass Conveyance Swale	4.32
Rain Garden (no underdrain)	16.72
Rain Garden (with underdrain)	16.72
Sand Filter	19.37

Subsurface Infiltration	6.76
Surface Infiltration	6.75
Underground Chamber	7.34
Wet Pond	7.35

Table 2: Site Type Cost Adjustment

Site Type	Cost Multiplier
Existing BMP retrofit	0.25
New BMP in undeveloped area	1.00
New BMP in partially developed area	1.50
New BMP in developed area	2.00

Table 3: Permitting and Engineer (P&E) Cost Adjustment

Level of P&E Required	Cost Multiplier
None	1.00
Low	1.20
Moderate	1.25
High	1.35

Non-Unified Scoring Prioritization

Not all projects identified fit within the structure of the Unified Scoring Matrix when the primary recommendation is not stormwater treatment with a GSI method. A Non-Unified Scoring method was used that was developed by Fitzgerald Environmental Associates and SLR (2021). Projects were assigned several numerical scoring metrics that are weighted to assist in prioritizing each project based on water quality benefits, project feasibility, maintenance requirements, costs, and any additional benefits. The maximum possible score is 30. Each category is described and includes a description of the scoring for each criterion (Appendix A). Potential projects are shown on a map (Appendix B). Final evaluation criteria summarized in the Non-Unified Prioritization Project Table (Appendix C) and photos are included in Appendix D.

References

Fitzgerald Environmental Associates, LLC and SLR, 2021. Cambridge / Jeffersonville Stormwater Project Prioritization, dated March 1, 2021, produced for Lamoille County Planning Commission & Villages of Cambridge and Jeffersonville.

Watershed Consulting Associates, LLC., 2018. Stormwater Master Plan for the Town of Berlin, Vermont. Final Report, January 17, 2018. Prepared for the Central Vermont Regional Planning Commission.

VTDEC, 2019. Vermont Stormwater Master Planning Guidelines, Agency of Natural Resources, Department of Environmental Conservation, Clean Water Initiative Program, revised December 12, 2019.





APPENDIX A – SCORING CRITERIA

Lake Iroquois-Patrick Brook Watershed Action Plan

Project Prioritization

Winooski Natural Resources Conservation District

14439.00006

November 13, 2023

Revised March 7, 2024

Unified Scoring Prioritization for Stormwater Master Plans

The following table is to assist in the standardized prioritization of projects identified in a Stormwater Master Plan (SWMP).

Criteria	Proposed Weight	Max points
Water Quality/Environmental impact		
Sediment reduction (using STP calculator for sediment) (not yet developed)	0-4 (natural groupings within the range of sediment reductions for proposed projects for a specific plan. 0=very low reduction, 4= very high sediment reduction)	4
Phosphorus/nutrient reduction (using STP Calculator)	0-4 (natural groupings within the range of phosphorus reductions for proposed projects for a specific plan. 0=very low p reduction, 4= very high P reduction)	4
Impervious area managed	1-4 (natural groupings within the range of impervious surface managed for proposed projects for a specific plan. More impervious treated gets more points)	4
Percent of Water Quality & Channel Protection Volume treated*	0-3 (0= no WQ treated, 1= ½ WQV treated, 2=meeting WQV, 3=meets WQV and CPV). Do not apply to road projects.	3
Percent of Recharge criteria met *	0-3 (0 = no infiltration, 1 =infiltrates less than recharge volume, 2= meets full recharge, 3= exceeds recharge 1.5 times or more) Do not apply to road projects.	3
Streambank or other gully erosion mitigation	0-2 (calculate volume= Length x avg. width x avg. depth, use natural groupings to divide volume into 3 categories)	2
Green infrastructure opportunity	0-1 (0=no, 1=yes)	1
* WQV, CPV and Recharge criteria as outlined in 2017 Vermont Stormwater Management Manual		
Total Water Quality Score (out of 21, or 15 if road project)		
Feasibility Criteria		
Public land or Private Landowner support	0-3 (3=public land, 2=willing private land owner, 0=unwilling or unknown willingness of private landowner)	3
Project and Permitting complexity (number of permits required)	0-2 (2= simple permitting, 0= complex permitting-potential denial)	2
Infrastructure conflicts	1 (Y= 0, N=1)	1
Total Estimated Project Cost)	Enter engineering estimate+ construction estimate (no points)	
Project efficiency (\$/lbs. of P removed)	1-12 (Use natural grouping of \$/lbs. removed)	12
Ease of O&M and ease of access for O&M	0-2 (based on municipal input on what is easiest to maintain, 0=high maintenance, 2=easy maintenance)	2
Total Feasibility Score (out of 20)		
Other considerations/Co-benefits (0=doesn't address concern, 1=addresses concern)		
Educational benefits and or Recreational benefits	1	1
Natural habitat creation/protection	1	1
Infrastructure improvement (culvert replacement)	1	1
Outfall erosion control	1	1
Connected to receiving water	3=all runoff infiltrates on site, 2= runoff receives some treatment before reaching receiving water. 1=runoff drains via infrastructure directly to receiving water with no erosion or additional pollutant loading, 0 =runoff drains directly to receiving water	3
Flood mitigation (known problem)	1	1
Existing local concerns	1	1
Total Co-benefits Score (out of 9)		
Overall Score (out of 50 or 44)		

NON-UNIFIED SCORING PRIORITIZATION SCORING

A Non-Unified Scoring method was used that was developed by Fitzgerald Environmental Associates and SLR (2021). Projects were assigned several numerical scoring metrics that are weighted to assist in prioritizing each project based on water quality benefits, project feasibility, maintenance requirements, costs, and any additional benefits. The maximum possible score is 30. Each category is described below and includes a description of the scoring for each criterion. Final evaluation criteria summarized in the Non-Unified Prioritization Project Table are described below:

Nutrient Reduction Effectiveness (4 points) – Degree of nutrient removal potential with project implementation, this accounts for both the existing nutrient loads and the removal efficiency and capacity of the proposed treatment. Nutrient loading was quantified based on the watershed size, the land cover types, and percent impervious surfaces, and the effectiveness was based on the treatment efficacy of the potential mitigation options appropriate for the space and location of the treatment area.

- 0 points – No nutrient source and/or no increased treatment
- 1 point – Minor nutrient source and/or minor increase in treatment
- 2 points – Moderate nutrient source with some increase in treatment
- 3 points – Moderate nutrient source with significant increase in treatment
- 4 points – Major nutrient source with significant increase in treatment

Sediment Reduction Effectiveness (4 points) – Degree of sediment removal potential with project implementation, this accounts for both the existing sediment loads and the removal efficiency and capacity of the proposed treatment. Sediment loading was quantified based on the watershed size, the land cover types, and percent impervious surfaces, and the effectiveness was based on the treatment efficacy of the potential mitigation options appropriate for the space and location of the treatment area.

- 0 points - No sediment source and/or no increased treatment
- 1 point – Minor sediment source and/or minor increase in treatment
- 2 points – Moderate sediment source with some increase in treatment
- 3 points – Moderate sediment source with significant increase in treatment
- 4 points – Major sediment source with significant increase in treatment

Drainage Area (1 point) – Approximate drainage area to site is greater than 2 acres

Impervious Drainage (3 points)– Approximate area of impervious surfaces draining to the site.

- 0 points – Area of impervious surfaces is less than 0.25 acres
- 1 point – Area of impervious surfaces is 0.25-0.5 acres
- 2 points – Area of impervious surfaces is 0.5-1.0 acres
- 3 points – Area of impervious surfaces is >1.0 acres

Connectivity to Surface Waters (3 points)

- 0 points – All stormwater infiltrates on site
- 1 point – Stormwater receives some treatment before reaching receiving waters
- 2 points – Stormwater drains into drainage infrastructure that directly outlets to receiving waters (assumes no erosion or additional pollutant loading to discharge point)



- 3 points – Stormwater drains directly into receiving waters (typically stormwater draining directly into a large wetland is assigned 2 points)

Landowner Support (2 points)

- 0 points – Project is located on private property, no contact with landowner
- 1 point – Project is on Town or State property with no contact
- 2 points – Project has been discussed and is supported by landowner

Operation and Maintenance Requirements (2 points)

- 0 points – Project will require significant increased maintenance effort
- 1 point – Project will require some increased maintenance effort
- 2 points – Project will require no additional maintenance effort

Cost and Constructability (6 points) – This score is based on the overall project cost (low score for high cost) and accounts for additional design, permitting requirements, and implementation considerations, such as site constraints and utilities, prior to project implementation.

Additional Benefits (5 points total) – Description of other project benefits, total score is roughly a count of the number of additional benefits. Additional benefits considered in the prioritization are as follows:

1. **Chronic Problem Area** – The site requires frequent maintenance and/or is an ongoing problem affecting water quality
2. **Seasonal Flooding** – The site is affected by or contributes to seasonal flooding
3. **Educational** – The site provides an opportunity to educate the public about stormwater treatment practices
4. **High Visibility** – The site is highly visible and will benefit from aesthetically designed treatment practices
5. **Infrastructure Conflicts** – The stormwater problem area is increasing erosion or inundation vulnerability of adjacent infrastructure (i.e. roads, buildings, etc.)
6. **Drains to Connected Stormwater Infrastructure** – The site drains into a larger stormwater conveyance system that is less likely to receive downstream treatment
7. **Reduces Thermal Pollution** – Project implementation will reduce the risk of thermal loading from runoff to receiving surface waters
8. **Improves BMP Performance** – Project implementation will improve the performance of existing stormwater treatment practices that receive runoff from the site
9. **Peak Flow Reduction** – Project implementation will significantly reduce stormwater peak flows leaving the site
10. **Enhances Natural Communities** – Project implementation will promote a native vegetated lakeshore buffer and/or provide wildlife habitat along the lakeshore or river.





APPENDIX B – PROJECT MAP

Lake Iroquois-Patrick Brook Watershed Action Plan

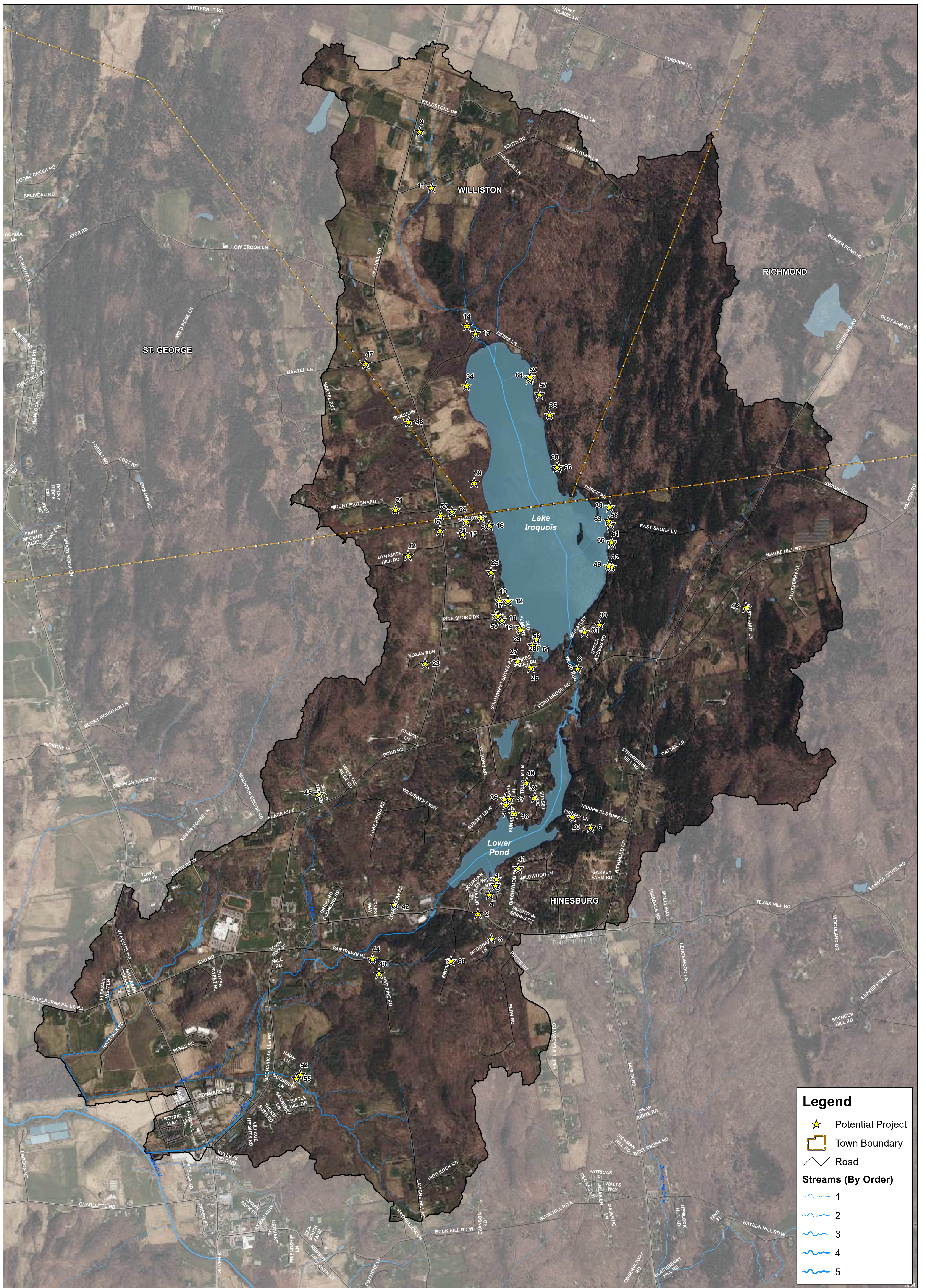
Project Prioritization

Winooski Natural Resources Conservation District

14439.00006

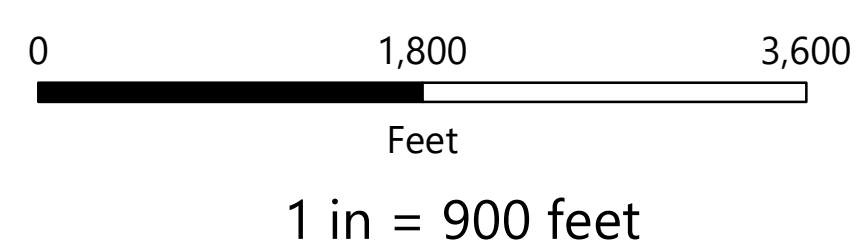
November 13, 2023

Revised March 7, 2024



LAKE IROQUOIS & PATRICK BROOK WATERSHED PROJECT IDENTIFICATION

LAKE IROQUOIS-PATRICK BROOK WATERSHED ACTION PLAN
WINOOSKI NATURAL RESOURCES CONSERVATION DISTRICT



SLR
1 SOUTH MAIN ST
WATERBURY, VT 05676
802.882.8335



APPENDIX C – PROJECT TABLES

Lake Iroquois-Patrick Brook Watershed Action Plan

Project Prioritization

Winooski Natural Resources Conservation District

14439.00006

November 13, 2023

Revised March 7, 2024

Lake Iroquois-Patrick Brook Watershed Action Plan - Projects
 Unified Scoring Prioritization Matrix
 March 7, 2024

Project Number	Town	Name	Project Description	Total Drainage Acreage	Impervious Acreage in Drainage Area	BMP Type	Phosphorus/Nutrient Reduction - Calculated (kg/yr)	WQv (cu ft)	Treatment Volume (cu ft)	Percent of WQv Treated	Percent of WQv & CPv Treated	Total Water Quality Score	Total Feasibility Score	Total Co-benefits Score	Overall Score
34	Hinesburg	Lake Iroquois Boat Launch Rain Garden	Install swale, stone forebay, and rain garden to capture untreated runoff flowing from boat launch into lake	0.11	0.11	Rain Garden	0.05	372	384	103%	2	5	7	4	16
49	Hinesburg	East Shore Lane Rain Garden	Construct rain garden to capture road runoff before it reaches lake	0.52	0.07	Rain Garden	0.13	323	250	77%	1	5	11	4	20
50	Hinesburg	Pine Shore Drive Rain Gardens	Construct rain garden to treat runoff from roadside swale and pond, Construct filter berms in the roadside swale with depressions upgradient planted with rain garden vegetation	8.15	0.69	Rain Garden, Filter Berms	0.95	3733	724	19%	1	6	17	4	27
51	Hinesburg	Southwest Shore Road Rain Garden	Construct rain garden to treat runoff from 452 Southwest Shore Road	0.34	0.08	Rain Garden	0.12	323	250	77%	1	5	13	4	22
52	Hinesburg	Hawk Lane Rain Garden	Construct rain garden to treat runoff from 114 Hawk Lane	0.28	0.1	Rain Garden	0.11	378	250	66%	1	5	13	4	22
53	St. George	Oak Hill Road Rain Garden	Construct rain garden to treat runoff from Oak Hill Road and 5327 Oak Hill Road property	0.29	0.18	Rain Garden	0.19	641	250	39%	1	5	17	5	27
62	Hinesburg	Shadow Lane Rain Garden	Construct rain garden to treat runoff from 163 Shadow Lane	0.16	0.05	Rain Garden	0.04	192	230	120%	2	5	7	5	17
63	Hinesburg	Dimick Road Rain Garden	Construct rain garden to treat runoff from 56 Dimick Road	0.29	0.07	Rain Garden	0.1	281	350	125%	2	7	9	4	20
64	Williston	746 Beebe Lane Rain Garden	Construct rain garden to treat runoff from 746 Beebe Lane	0.15	0.06	Rain Garden	0.04	223	500	225%	2	5	7	4	16
65	Williston	1140 Beebe Lane Rain Garden	Construct rain garden to treat runoff from 1140 Beebe Lane	0.15	0.02	Rain Garden	0.02	93	500	537%	2	5	7	4	16
66	Hinesburg	563 East Shore Lane Rain Garden	Construct rain garden to treat runoff from 563 East Shore Lane	0.88	0.05	Rain Garden	0.18	324	400	124%	2	6	13	4	23

Lake Iroquois-Patrick Brook Watershed Action Plan - Projects
 Unified Scoring Prioritization Matrix
 March 7, 2024

Project Number	Town	Name	Project Description	Total Drainage Acreage	Impervious Acreage in Drainage Area	BMP Type	Phosphorus/Nutrient Reduction - Calculated (kg/yr)	Phosphorus/Nutrient Reduction - Score	Impervious Area Managed (acres, uses % treated)	Impervious Area Managed	WQv (acre-feet)	WQv (cu ft)	Treatment Volume (cu ft)	Percent of WQv Treated	Percent of WQv & CPv Treated	Hydrologic Soil Group	Hydric	Percent of Recharge Criteria Met - Score	Streambank/gully erosion mitigation-Volume	Streambank/gully erosion mitigation	Green Infrastructure Opportunity	Total Water Quality Score
34	Hinesburg	Lake Iroquois Boat Launch Rain Garden	Install swale, stone forebay, and rain garden to capture untreated runoff flowing from boat launch into lake	0.11	0.11	Rain Garden	0.05	1	0.1	1	0.01	372	384	103%	2	D	No	0	0	0	1	5
49	Hinesburg	East Shore Lane Rain Garden	Construct rain garden to capture road runoff before it reaches lake	0.52	0.07	Rain Garden	0.13	1	0.1	1	0.01	323	250	77%	1	A	No	1	0	0	1	5
50	Hinesburg	Pine Shore Drive Rain Gardens	Construct rain garden to treat runoff from roadside swale and pond, Construct filter berms in the roadside swale with depressions upgradient planted with rain garden vegetation	8.15	0.69	Rain Garden, Filter Berms	0.95	2	0.1	1	0.09	3733	724	19%	1	C	No	1	0	0	1	6
51	Hinesburg	Southwest Shore Road Rain Garden	Construct rain garden to treat runoff from 452 Southwest Shore Road	0.34	0.08	Rain Garden	0.12	1	0.1	1	0.01	323	250	77%	1	A	No	1	0	0	1	5
52	Hinesburg	Hawk Lane Rain Garden	Construct rain garden to treat runoff from 114 Hawk Lane	0.28	0.1	Rain Garden	0.11	1	0.1	1	0.01	378	250	66%	1	C/D	Yes	1	0	0	1	5
53	St. George	Oak Hill Road Rain Garden	Construct rain garden to treat runoff from Oak Hill Road and 5327 Oak Hill Road property	0.29	0.18	Rain Garden	0.19	1	0.1	1	0.01	641	250	39%	1	C/D	No	1	0	0	1	5
62	Hinesburg	Shadow Lane Rain Garden	Construct rain garden to treat runoff from 163 Shadow Lane	0.16	0.05	Rain Garden	0.04	1	0.1	1	0.00	192	230	120%	2	D	Yes	0	0	0	1	5
63	Hinesburg	Dimick Road Rain Garden	Construct rain garden to treat runoff from 56 Dimick Road	0.29	0.07	Rain Garden	0.1	1	0.1	1	0.01	281	350	125%	2	A	No	2	0	0	1	7
64	Williston	746 Beebe Lane Rain Garden	Construct rain garden to treat runoff from 746 Beebe Lane	0.15	0.06	Rain Garden	0.04	1	0.1	1	0.01	223	500	225%	2	D	No	0	0	0	1	5
65	Williston	1140 Beebe Lane Rain Garden	Construct rain garden to treat runoff from 1140 Beebe Lane	0.15	0.02	Rain Garden	0.02	1	0.1	1	0.00	93	500	537%	2	D	No	0	0	0	1	5
66	Hinesburg	563 East Shore Lane Rain Garden	Construct rain garden to treat runoff from 563 East Shore Lane	0.88	0.05	Rain Garden	0.18	1	0.1	1	0.01	324	400	124%	2	A	No	1	0	0	1	6

Lake Iroquois-Patrick Brook Watershed Action Plan - Projects
 Unified Scoring Prioritization Matrix
 March 7, 2024

Project Number	Town	Name	Project Description	Public or Private Landowner Support	Project and Permitting Complexity	Infrastructure Conflicts	BMP Unit Cost	Site Type Cost Adjustment	Permitting & Engineer Cost Adjustment	Total Estimated Project Cost	Project efficiency (\$/kgs P removed)	Project efficiency Score	Ease of O&M and ease of access for O&M	Total Feasibility Score	Education and/or recreational benefits	Natural Habitat Creation/Protection	Infrastructure Improvement (Culvert Replacement)	Outfall Erosion Control	Connected to Receiving Water	Flood Mitigation (Known Problem)	Existing Local Concerns	Total Co-benefits Score	Overall Score
34	Hinesburg	Lake Iroquois Boat Launch Rain Garden	Install swale, stone forebay, and rain garden to capture untreated runoff flowing from boat launch into lake	2	2	1	16.72	1.5	1.2	\$ 11,557	\$ 231,137	1	1	7	1	0	0	0	3	0	0	4	16
49	Hinesburg	East Shore Lane Rain Garden	Construct rain garden to capture road runoff before it reaches lake	0	2	1	16.72	1.5	1.2	\$ 7,524	\$ 57,877	7	1	11	1	0	0	0	3	0	0	4	20
50	Hinesburg	Pine Shore Drive Rain Gardens	Construct rain garden to treat runoff from roadside swale and pond. Construct filter berms in the roadside swale with depressions upgradient planted with rain garden vegetation	2	2	1	16.72	1.5	1.2	\$ 21,790	\$ 22,936	11	1	17	1	0	0	0	3	0	0	4	27
51	Hinesburg	Southwest Shore Road Rain Garden	Construct rain garden to treat runoff from 452 Southwest Shore Road	2	2	1	16.72	1.5	1.2	\$ 7,524	\$ 62,700	7	1	13	1	0	0	0	3	0	0	4	22
52	Hinesburg	Hawk Lane Rain Garden	Construct rain garden to treat runoff from 114 Hawk Lane	2	2	1	16.72	1.5	1.2	\$ 7,524	\$ 68,400	7	1	13	1	0	0	0	3	0	0	4	22
53	St. George	Oak Hill Road Rain Garden	Construct rain garden to treat runoff from Oak Hill Road and 5327 Oak Hill Road property	2	2	1	16.72	1.5	1.2	\$ 7,524	\$ 39,600	11	1	17	1	0	0	0	3	0	1	5	27
62	Hinesburg	Shadow Lane Rain Garden	Construct rain garden to treat runoff from 163 Shadow Lane	2	2	1	16.72	1.5	1.2	\$ 6,922	\$ 173,052	1	1	7	1	0	0	0	3	0	1	5	17
63	Hinesburg	Dimick Road Rain Garden	Construct rain garden to treat runoff from 56 Dimick Road	2	2	1	16.72	1.5	1.2	\$ 10,534	\$ 105,336	3	1	9	1	0	0	0	3	0	0	4	20
64	Williston	746 Beebe Lane Rain Garden	Construct rain garden to treat runoff from 746 Beebe Lane	2	2	1	16.72	1.5	1.2	\$ 15,048	\$ 376,200	1	1	7	1	0	0	0	3	0	0	4	16
65	Williston	1140 Beebe Lane Rain Garden	Construct rain garden to treat runoff from 1140 Beebe Lane	2	2	1	16.72	1.5	1.2	\$ 15,048	\$ 752,400	1	1	7	1	0	0	0	3	0	0	4	16
66	Hinesburg	563 East Shore Lane Rain Garden	Construct rain garden to treat runoff from 563 East Shore Lane	2	2	1	16.72	1.5	1.2	\$ 12,038	\$ 66,880	7	1	13	1	0	0	0	3	0	0	4	23

Lake Iroquois-Patrick Brook Watershed Action Plan - Projects
 Non-Unified Scoring Prioritization Matrix
 March 7, 2024

Project Number	Town	Stream Segment	Name	Project Description	Project Type	Nutrient Reduction Effectiveness	Sediment Reduction Effectiveness	Drainage Area	Impervious Drainage	Connectivity to Surface Waters	Landowner Support	O&M Requirements	Cost and Constructability	Additional Benefits, Score	Additional Benefits, See List	Total Score
1	Hinesburg	Sunset Lake south trib	Culvert replacement at Sunset Lake Cooperative	Replace significantly undersized culvert under Wile Street. Major aggradation upstream of structure. Stream overtopped road at culvert and flooded Wile Street, Jourdan Street, and a nearby mobile home	Culvert Replacement	1	2	1	3	3	0	1	1	2	1,5	14
2	Hinesburg	Sunset Lake south trib	Culvert replacement at Richmond Road	Replace undersized culvert under Richmond Road. Perched outlet and streambed scour at outlet of structure	Culvert Replacement	1	2	1	3	3	1	1	1	2	1,5	15
3	Hinesburg	Sunset Lake south trib	Remove berm and restore gully	Stream between McDonald Lane and Richmond has been extensively manipulated. Channel appears to have been excavated and large berm built on right bank. Stream is more of a gully presently and bank erosion abundant	Stream restoration	3	3	1	2	3	0	1	3	1	10	17
4	Hinesburg	Sunset Lake south trib	Improve flood resiliency at Sunset Lake Cooperative	Consider buyouts, floodplain restoration, buffer restoration	Flood Resiliency	2	2	1	3	3	0	1	3	4	1,4,5,10	19
5	Hinesburg	Sunset Lake	Move snow pile location at Sunset Lake Cooperative	Move snow pile location away from wetland, stream, and lake		3	3	1	3	3	0	2	6	2	4,10	23
6	Hinesburg	Sunset Lake eastern trib	Culvert replacement at Hidden Pasture Lane	Replace rusted out culvert	Culvert Replacement	1	1	1	1	3	0	1	1	1	5	10
7	Hinesburg	Sunset Lake western trib	Restoration of Sunset Lake western trib	Remove destroyed bridge and renaturalize channel	Stream Restoration	1	1	1	2	3	0	1	3	1	10	13
8	Hinesburg	Patrick Brook	Remove masonry dam between two lakes	Remove small stone dam between Lake Iroquois and Pond Brook Road	Dam Removal	1	1	1	3	3	0	1	2	1	10	13
9	Williston	Patrick Brook	Stream and buffer restoration at Isham Family Farm	Widen and naturalize riparian buffer; straightened channel with hay field on both sides lacking woody vegetation, sinuosity, LWD, etc.; plant woody vegetation around pond to increase shading	Buffer Planting, Stream Restoration	3	3	1	3	3	0	2	5	3	4,7,10	23
10	Hinesburg		Filter berms at 260 and 310 Pine Shore Drive	Construct filter berms to treat runoff from 260 and 310 Pine Shore Drive	Filter Berm	1	1	0	0	3	2	1	5	1	3	14
11	Williston	Patrick Brook	Buffer restoration downstream of South road	Widen riparian buffer into adjacent mowed field; plant	Buffer Planting	3	3	1	3	3	0	2	6	2	7,10	23
12	Hinesburg		Sea wall removal and bank restoration along Pine Shore Drive	Remove existing sea walls on three properties and restore bank	Lakeshore Restoration	1	1	1	2	3	2	1	4	2	2,10	17
13	Williston	Patrick Brook	Culvert replacement on Beebe Lane	Replace undersized culvert on Beebe Lane	Culvert Replacement	1	2	1	3	3	0	1	1	1	5	13
14	Williston	Patrick Brook	River corridor easement/land conservation upstream of Beebe Lane	Protect land through easement or conservation; large wetland complex with connected floodplain	Easement/Conservation	1	1	1	1	3	0	2	6	1	10	16
15	Hinesburg	Lake Iroquois Shadow Ln Trib - Lower	Stabilize gully in lower Shadow Lane tributary	Numerous headcuts and actively eroding gully between Pond Road and lake. Stabilize gully to reduce sediment input to lake	Stream Restoration	3	4	1	3	3	2	1	3	1	10	21

	Additional Benefits List
1	Chronic Problem Area
2	Seasonal Flooding
3	Educational
4	High Visibility
5	Infrastructure Conflicts
6	Drains to Connected Stormwater Infrastructure
7	Reduces Thermal Pollution
8	Improves BMP Performance
10	Enhances Natural Communities

Lake Iroquois-Patrick Brook Watershed Action Plan - Projects
 Non-Unified Scoring Prioritization Matrix
 March 7, 2024

Project Number	Town	Stream Segment	Name	Project Description	Project Type	Nutrient Reduction Effectiveness	Sediment Reduction Effectiveness	Drainage Area	Impervious Drainage	Connectivity to Surface Waters	Landowner Support	O&M Requirements	Cost and Constructability	Additional Benefits, Score	Additional Benefits, See List	Total Score
16	Hinesburg	Lake Iroquois Shadow Ln Trib	Riparian buffer planting along Shadow Lane tributary	Buffer lacking vegetation along southern bank near lake shore. Conduct plantings	Buffer Planting	3	3	1	3	3	2	2	6	2	7,10	25
17	Hinesburg	Lake Iroquois Pine Shore Drive tributary	Buffer planting around onstream pond on Pine Shore Drive tributary	Plant woody vegetation around pond to increase shading	Buffer Planting	3	3	1	3	3	0	2	6	2	7,10	23
18	Hinesburg	Lake Iroquois Pine Shore Drive tributary	Expand no-mow zone/buffer planting around driveway on Pine Shore Drive Tributary	Expand riparian buffer zone in vicinity of driveway	Buffer Planting	3	3	1	3	3	0	2	6	2	7,10	23
19	Hinesburg	Lake Iroquois Old Pump Road tributary	Culvert replacement on Old Pump Road	Replace undersized, clogged culvert with poor placement with larger structure set at appropriate elevation	Culvert Replacement	1	2	1	3	3	0	1	1	1	5	13
20	Hinesburg		New swale along Firefly Lane	Create new swale and turnout along Firefly Lane	Road Improvement	1	1	0	0	1	0	1	3	0		7
21	St. George		Mount Pritchard Lane Improvements	Improve existing swales - stone line with larger rock due to slope and erosion; regrade to remove berm; create new sediment trap at the bottom of swale; cleanout existing turnouts	Road Improvement	3	3	1	3	2	0	1	3	3	1,4,8	19
22	Hinesburg		Dynamite Hill Road Improvements	Regrade road to establish crown and remove berms; improve existing swales - stone line due to slope and erosion; create new turnouts; stabilize/replace existing culverts; install new sediment traps; install new settling basin at bottom of road	Road Improvement	4	4	1	3	3	0	1	2	3	1,4,8	21
23	Hinesburg		Kozas Run Improvements	Improve existing swales - stone line due to slope and erosion; create new sediment traps	Road Improvement	3	4	1	2	2	0	1	3	2	1,8	18
24	Hinesburg		Shadow Lane Improvements	Major gully erosion of roadside swales and roadway	Road Improvement	4	4	1	3	3	2	1	2	3	1,4,8	23
25	Hinesburg		Pine Shore Drive Improvements	Reshape existing swale; install new settling basin	Road Improvement	1	1	0	0	1	0	1	3	1	8	8
26	Hinesburg		Pikes Point Road Improvements	Install new swale and settling basin; regrade to remove berm; improve vegetated buffer at lake	Road Improvement	1	1	0	0	1	0	1	3	1	10	8
27	Hinesburg		Cove Road Improvements	Install new swale, settling basin, and culvert	Road Improvement	1	1	0	0	1	0	1	3	0		7
28	Hinesburg		Southwest Shore Road Improvements	Install new swale with check dams and culvert	Road Improvement	1	1	0	0	3	0	1	3	1	8	10
29	Hinesburg		Old Pump Road Improvements	Crown to raise road grade; grade to remove berm	Road Improvement	1	1	0	0	3	0	1	5	0		11
30	Hinesburg		Upper Access Road Improvements	Install new swales, culvert, and turnouts; regrade to establish crown and remove berm; improve existing turnouts	Road Improvement	1	1	1	2	3	0	1	2	1	8	12
31	Hinesburg		Wheatley Road Improvements	Grade to establish crown	Road Improvement	1	1	0	0	3	0	1	5	0		11

Lake Iroquois-Patrick Brook Watershed Action Plan - Projects
 Non-Unified Scoring Prioritization Matrix
 March 7, 2024

Project Number	Town	Stream Segment	Name	Project Description	Project Type	Nutrient Reduction Effectiveness	Sediment Reduction Effectiveness	Drainage Area	Impervious Drainage	Connectivity to Surface Waters	Landowner Support	O&M Requirements	Cost and Constructability	Additional Benefits, Score	Additional Benefits, See List	Total Score
32	Hinesburg		East Shore Lane Improvements	Improve existing swales; improve existing turnouts; create new settling area; create new swales, turnout and settling basin; grade to establish crown	Road Improvement	2	3	1	2	3	0	1	2	2	4,8	16
33	Hinesburg		Dimick Road Improvements	Regrade to remove berm; create new turnout; install new culvert	Road Improvement	1	1	1	0	3	0	1	3	0		10
35	Williston		Beebe Lane Improvements	Grade to establish crown and remove berms; clean out existing turnouts; install new turnouts and sediment traps	Road Improvement	2	2	1	3	3	0	1	3	2	4,8	17
36	Hinesburg		Sunset Lane West Improvements	Improve existing swales - stone line due to slope; create new swale and sediment traps	Road Improvement	1	1	1	2	3	0	1	2	1	8	12
37	Hinesburg		Lake Street/Sunset Lane East Improvements	Improve existing swale - stone line due to slope	Road Improvement	1	1	0	1	1	0	1	3	1	8	9
38	Hinesburg		Sunset Court Improvements	Replace culvert; install new culvert and sediment traps	Road Improvement	1	1	0	0	1	0	1	2	1	8	7
39	Hinesburg		Sunset Lane East Improvements	Improve existing swale; replace culvert; install new sediment trap	Road Improvement	1	1	0	0	1	0	1	2	1	8	7
40	Hinesburg		Trillium Lane Improvements	Improve existing swales - stone line due to slope; install new sediment trap; create settling basin; replace culvert	Road Improvement	2	2	1	1	1	0	1	2	1	8	11
41	Hinesburg		Birchwood Drive Improvements	Improve existing swale - stone line due to slope and erosion; replace culverts; install new sediment trap; grade to remove berm	Road Improvement	3	4	1	2	3	0	1	2	2	8,10	18
42	Hinesburg		Longmeadow Road Improvements	Grade to establish crown	Road Improvement	1	1	0	1	1	0	1	5	0		10
43	Hinesburg		Red Pine Road Improvements	Improve existing swales; replace culvert; install new culvert; clean out culvert; stabilize culvert; divert flow out of swale	Road Improvement	1	2	1	2	3	2	1	2	1	8	15
44	Hinesburg		Partridge Hill Improvements	Improve existing swales - stone line and add check dams due to slope; clean out existing culverts; install new sediment traps; create new turnouts; install new culverts; grade to raise road and remove berm	Road Improvement	4	4	1	3	3	2	1	2	3	1,8,10	23
45	Hinesburg		Maple Tree Lane Improvements	Create new swale and sediment traps	Road Improvement	1	1	0	1	1	0	1	3	0		8
46	Hinesburg		Butternut Lane Improvements	Improve existing swale - stone line due to slope; install new culvert	Road Improvement	1	1	0	0	1	0	1	2	1	8	7
47	Williston & St. George		Martel Lane Improvements	Improve existing swales - stone line due to slope and erosion; create new settling basin	Road Improvement	1	2	1	2	1	0	1	3	1	8	12
48	Williston & St. George		Iroquois Lane Improvements	Improve existing swale; install new sediment trap; grade to establish crown	Road Improvement	1	1	0	1	1	0	1	3	1	8	9
54	St. George		Filter berms at 5327 Oak Hill Road	Construct filter berms to treat runoff from 5327 Oak Hill Road	Filter Berm	1	1	0	1	3	2	1	5	1	3	15
55	Hinesburg		Filter berms at 114 Hawk Lane	Construct filter berms to treat runoff from 114 Hawk Lane	Filter Berm	1	1	0	0	3	2	1	5	1	3	14

Lake Iroquois-Patrick Brook Watershed Action Plan - Projects
 Non-Unified Scoring Prioritization Matrix
 March 7, 2024

Project Number	Town	Stream Segment	Name	Project Description	Project Type	Nutrient Reduction Effectiveness	Sediment Reduction Effectiveness	Drainage Area	Impervious Drainage	Connectivity to Surface Waters	Landowner Support	O&M Requirements	Cost and Constructability	Additional Benefits, Score	Additional Benefits, See List	Total Score
56	Hinesburg		Filter berms at 452 Southwest Shore Road	Construct filter berms to treat runoff from 452 Southwest Shore Road	Filter Berm	1	1	0	0	3	2	1	5	1	3	14
57	Williston		Driveway improvement at 840 Beebe Lane	Install water bars on driveway	Driveway Improvement	1	1	0	0	3	2	1	5	1	3	14
58	Hinesburg		Driveway improvement at 56 Dimick Road	Install water bars on driveway	Driveway Improvement	1	1	0	0	3	2	1	5	1	3	14
59	Williston		Sea wall removal and bank restoration at 746 Beebe Lane	Remove existing sea walls and restore bank	Lakeshore Restoration	1	1	1	2	3	2	1	4	2	2,10	17
60	Williston		Driveway improvement at 1140 Beebe Lane	Install water bars on driveway	Driveway Improvement	1	1	0	0	3	2	1	5	1	3	14
61	Hinesburg		Filter berms at 563 East Shore Lane	Construct filter berms to treat runoff from 563 East Shore Lane	Filter Berm	1	1	0	0	3	2	1	5	1	3	14
67	Hinesburg	Lake Iroquois Shadow Ln Trib - Upper	Arrest incision and create settling area in upper Shadow Lane Trib	Stabilize headcut and eroding channel; install settling area upstream of Pond Road to capture sediment and stormwater	Stream Restoration	3	4	1	2	3	0	1	3	1	10	18
68	Hinesburg		Enos Road Improvements	Create new swale, stone line swale, and add cross culverts	Road Improvement	1	1	1	1	1	2	1	3	0		11
69	Williston		Land conservation along Lake Iroquois western shore	Protect large undeveloped lakeshore parcel through easement or conservation	Easement/Conservation	1	1	1	3	3	0	2	6	1	10	18
70	Hinesburg		Explore dam removal and naturalization of system	Investigate removal of dams within watershed that are not in active use to promote more natural hydrology and improved aquatic organism passage	Dam Removal	1	1	1	3	3	0	1	2	1	10	13



APPENDIX D – PROJECT PHOTOS

Lake Iroquois-Patrick Brook Watershed Action Plan

Project Prioritization

Winooski Natural Resources Conservation District

14439.00006

November 13, 2023

Revised March 7, 2024

Project Photos



Figure 1: Project 1 – culvert replacement at Sunset Lake Cooperative



Figure 2: Project 2 – culvert replacement at Richmond Road



Figure 3: Project 3 – remove berm and restore gully



Figure 4: Project 4 – improve flood resiliency at Sunset Lake Cooperative



Figure 5: Project 5 – move snow pile location at Sunset Lake Cooperative



Figure 6: Project 6 – culvert replacement at Hidden Pasture Lane



Figure 7: Project 7 – restoration of Sunset Lake western tributary



Figure 8: Project 8 – remove dam between Lake Iroquois and Sunset Lake



Figure 9: Project 9 – buffer planting at Isham Family Farm



Figure 10: Project 9 – stream and buffer restoration at Isham Family Farm



Figure 11: Project 9 – buffer restoration at Isham Family Farm pond



Figure 12: Project 10 – Filter berms at 260 and 310 Pine Shore Drive (photo from WNRCD)



Figure 13: Project 11 – buffer restoration downstream of South Road



Figure 14: Project 12 – Sea wall removal and bank restoration along Pine Shore Drive (photo from WNRCD)



Figure 15: Project 13 – culvert replacement at Beebe Lane



Figure 16: Project 14 – river corridor easement upstream of Beebe Lane



Figure 17: Project 15 – stabilize gully in Shadow Lane tributary



Figure 18: Project 16 – buffer planting along Shadow Lane tributary



Figure 19: Project 17 – buffer planting around onstream pond on Pine Shore Drive tributary



Figure 20: Project 19 – culvert replacement on Old Pump Road



Figure 21: Project 20 – new swale along Firefly Lane



Figure 22: Project 21 – Mount Pritchard Lane improvements



Figure 23: Project 21 – Mount Pritchard Lane improvements



Figure 24: Project 22 – Dynamite Hill Road improvements



Figure 25: Project 22 – Dynamite Hill Road improvements



Figure 26: Project 23 – Kozas Run improvements



Figure 27: Project 24 – Shadow Lane improvements



Figure 28: Project 24 – Shadow Lane improvements



Figure 29: Project 24 – Shadow Lane improvements



Figure 30: Project 25 – Pine Shore Drive improvements



Figure 31: Project 26 – Pikes Point Road improvements



Figure 32: Project 26 – Pikes Point Road improvements



Figure 33: Project 27 – Cove Road improvements



Figure 34: Project 28 – Southwest Shore Road improvements



Figure 35: Project 29 – Old Pump Road improvements



Figure 36: Project 30 – Upper Access Road improvements



Figure 37: Project 31 – Wheatley Road improvements

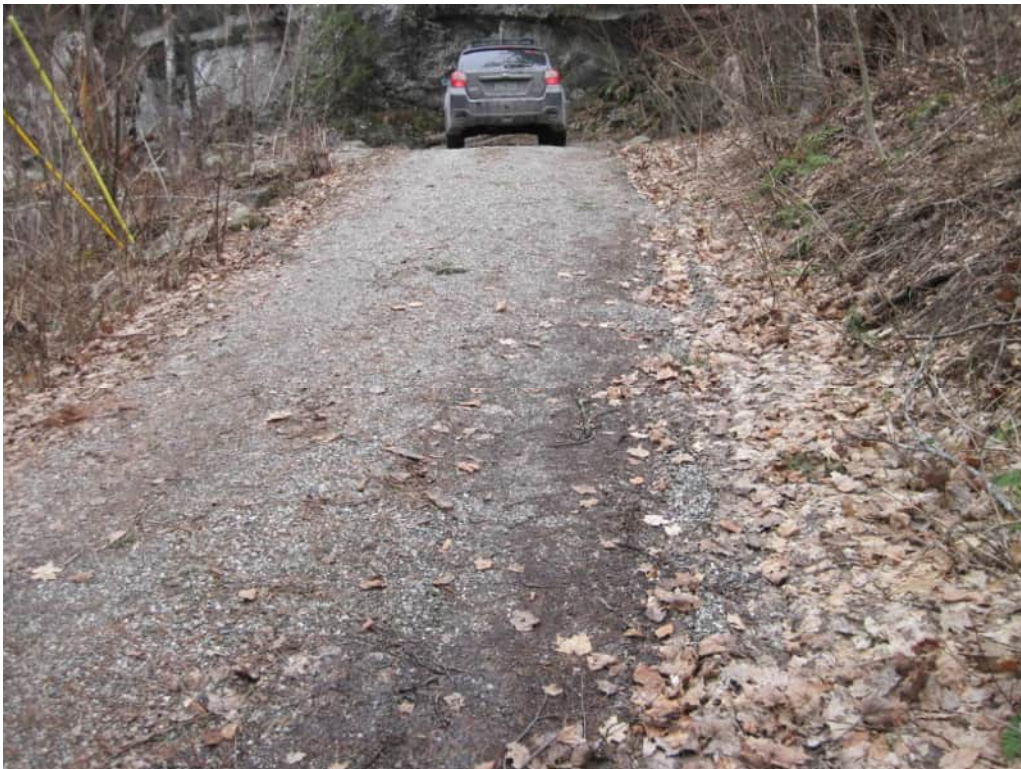


Figure 38: Project 32 – East Shore Lane improvements



Figure 39: Project 33 – Dimick Road improvements



Figure 40: Project 34 – Lake Iroquois boat launch rain garden



Figure 41: Project 35 – Beebe Lane improvements



Figure 42: Project 35 – Beebe Lane improvements



Figure 43: Project 36 – Sunset Lane West improvements



Figure 44: Project 38 – Sunset Court improvements



Figure 45: Project 40 – Trillium Lane improvements



Figure 46: Project 41 – Birchwood Drive improvements



Figure 47: Project 42 – Longmeadow Road improvements



Figure 48: Project 43 – Red Pine Lane improvements



Figure 49: Project 44 – Partridge Hill improvements



Figure 50: Project 44 – Partridge Hill improvements



Figure 51: Project 44 – Partridge Hill improvements



Figure 52: Project 45 – Maple Tree Lane improvements



Figure 53: Project 46 – Butternut Lane improvements

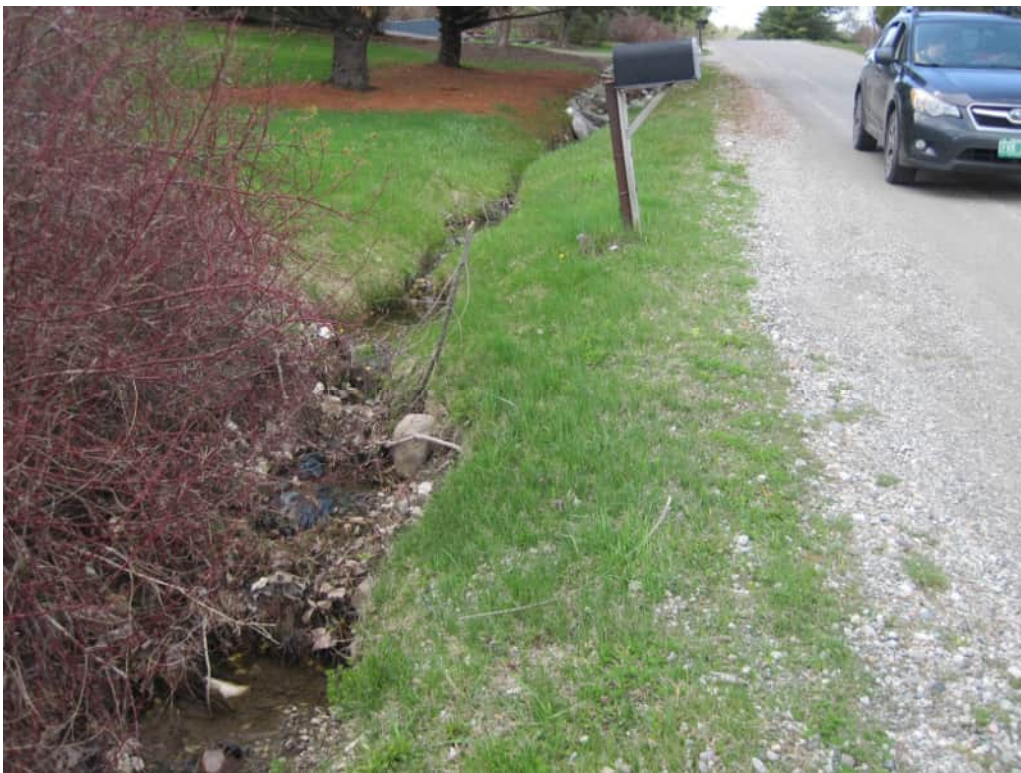


Figure 54: Project 47 – Martel Lane improvements



Figure 55: Project 48 – Iroquois Lane improvements



Figure 56: Project 49 – East Shore Lane rain garden

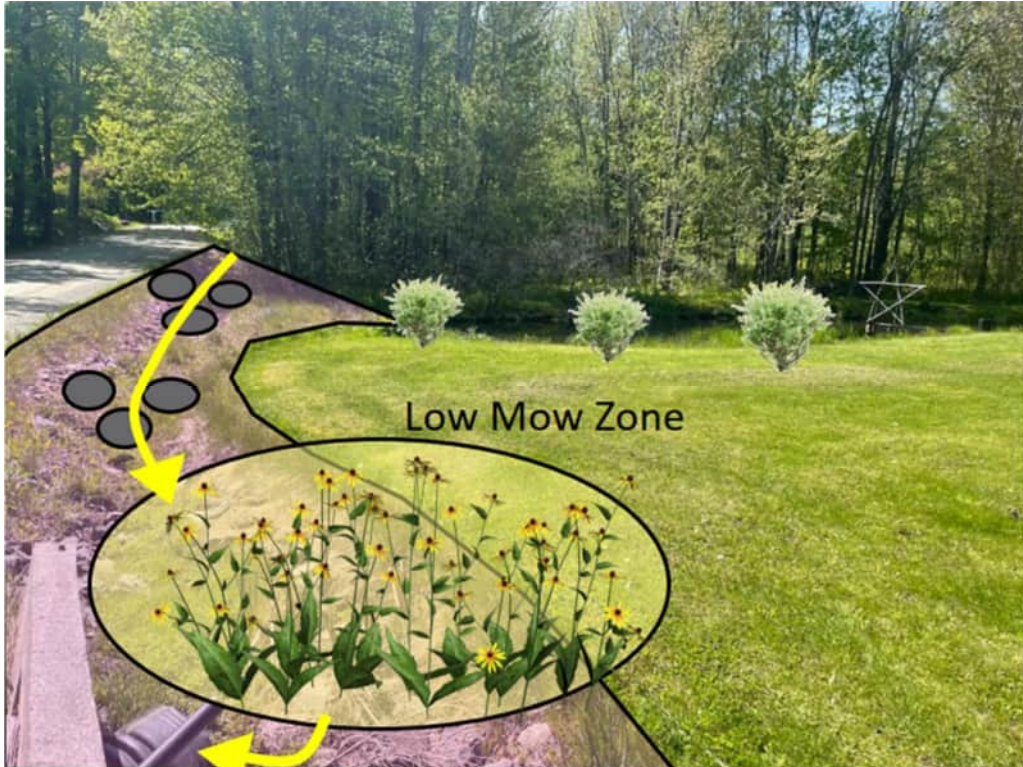


Figure 57: Project 50 – Pine Shore Drive rain gardens (photo from WNRCD)



Figure 58: Project 51 –Southwest Shore Road rain garden (photo from WNRCD)

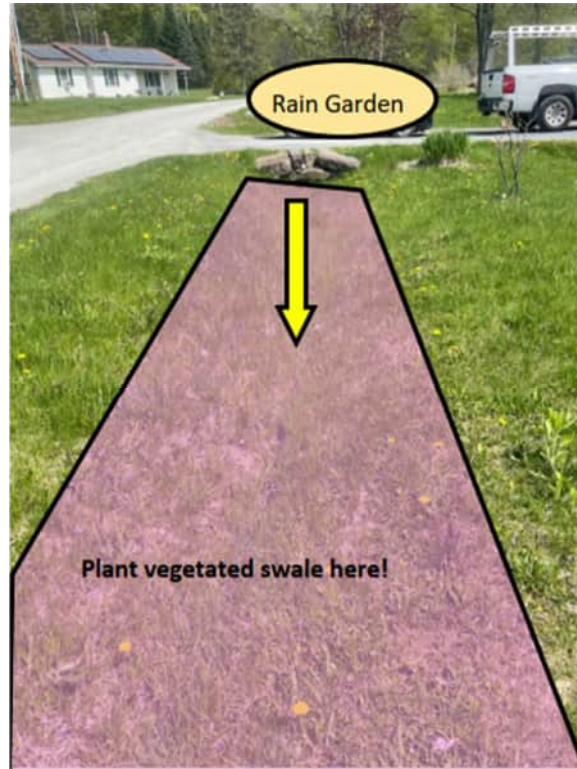


Figure 59: Project 52 – Hawk Lane rain garden (photo from WNRCD)



Figure 60: Project 53 –Oak Hill Road rain garden (photo from WNRCD)



Figure 61: Project 54 – Filter berms at 5327 Oak Hill Road (photo from WNRCD)



Figure 62: Project 55 – Filter berms at 114 Hawk Lane (photo from WNRCD)



Figure 63: Project 56 – Filter berms at 452 Southwest Shore Road (photos from WNRCD)



Figure 64: Project 57 – Driveway improvement at 840 Beebe Lane (photos from WNRCD)



Figure 65: Project 58 – Driveway improvements at 56 Dimick Road (photos from WNRCD)



Figure 66: Project 59 – Sea wall removal and bank restoration at 746 Beebe Lane (photo from WNRCD)



Figure 67: Project 60 – Driveway improvements at 1140 Beebe Lane (photo from WNRCD)



Figure 68: Project 61 – Filter berms at 563 East Shore Lane (photo from WNRCD)



Figure 69: Project 62 – Shadow Lane rain garden



Figure 70: Project 63 – Dimick Road rain garden (photos from WNRCD)



Figure 71: Project 66 – 653 East Shore Lane rain garden (photos from WNRCD)



Figure 72: Project 67 – Upper Shadow Lane Tributary restoration



Figure 73: Project 68 – Enos Road improvements