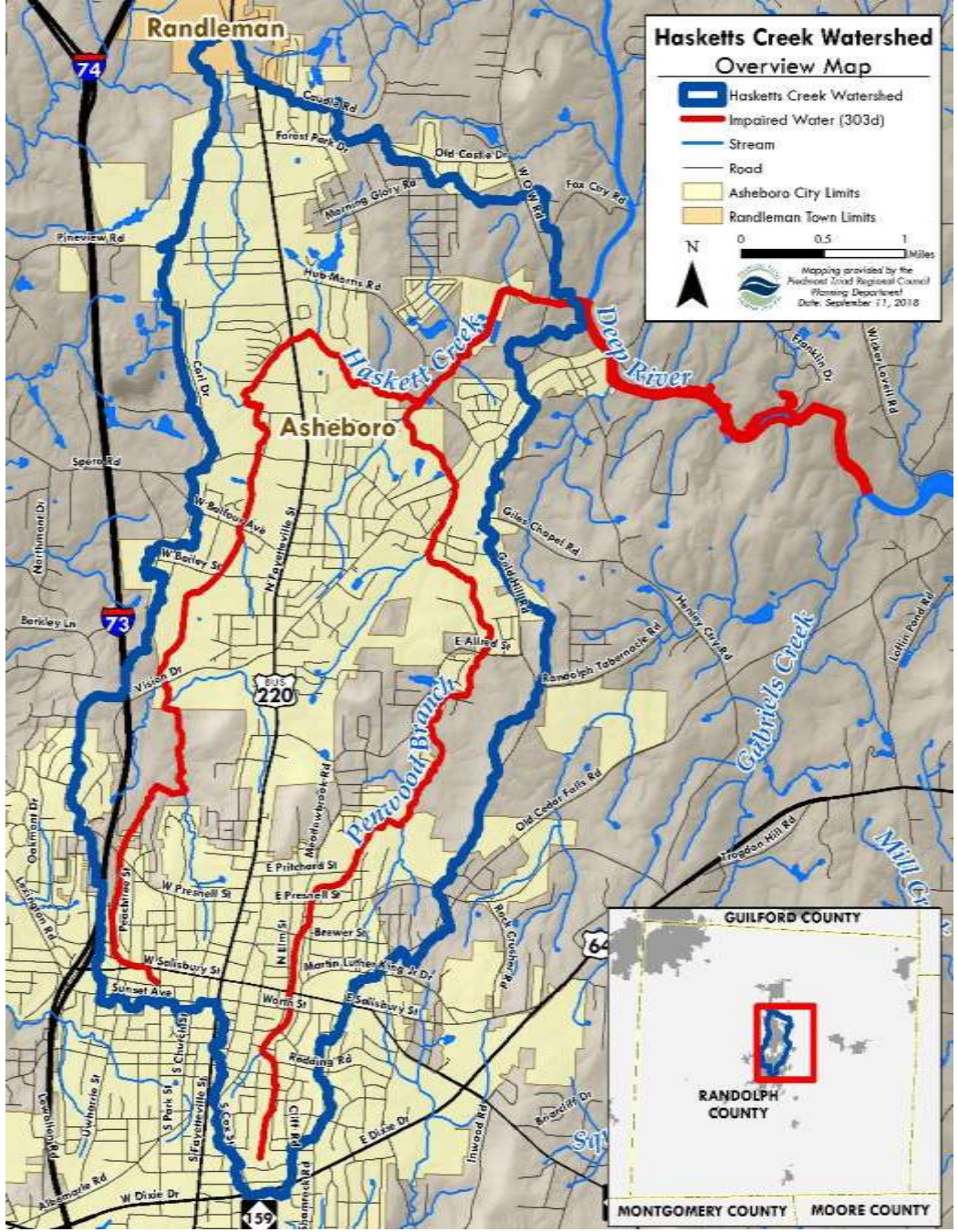
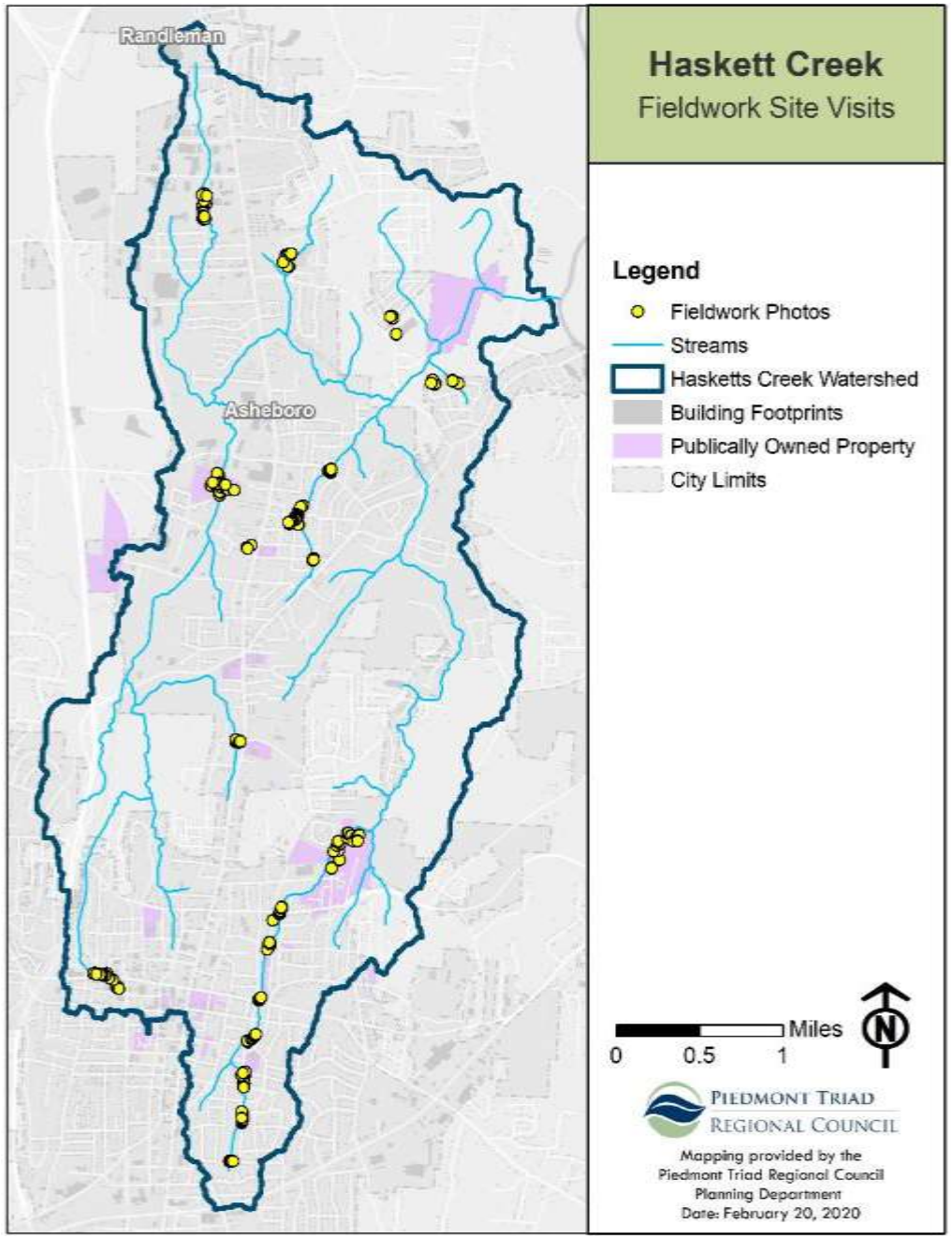
HASKETT'S CREEK WATERSHED PLAN

STAKEHOLDER MEETING #4



MEETING RECAP

- Went over fieldwork data collected in February
- Goals & Strategies workshop
  - Identified specific actions, partners, timeframes, necessary resources, and measures of success for each restoration strategy.



FIELDWORK OVERVIEW

- Visited 19 locations throughout the watershed
- Collected:
  - 282 Photos +
  - 47 SCITS Points
- Identified 7 potential SCM projects

Goals, Strategies, & Actions

Strategy:

Specific Action	Partners (circle lead)	Timeframe	Resources Needed	Measures of Success
How can we best achieve the goal/strategy? What steps need to be taken?	Who should lead this effort? What other partners are needed?	How high of a priority is this action? What is a realistic timeframe to complete this action?	What technical or financial resources are needed to support this action? Do other steps need to be taken first?	How can we track the completion and effectiveness of this action? What metrics could be used?

Randolph Creek Week

- Postponed until fall
- Danica is working with Lauren Daniels to potentially host a virtual Creek Week
- The watershed plan requires some sort of educational component
- Any suggestions?
  - Project website
  - Social media
  - Survey

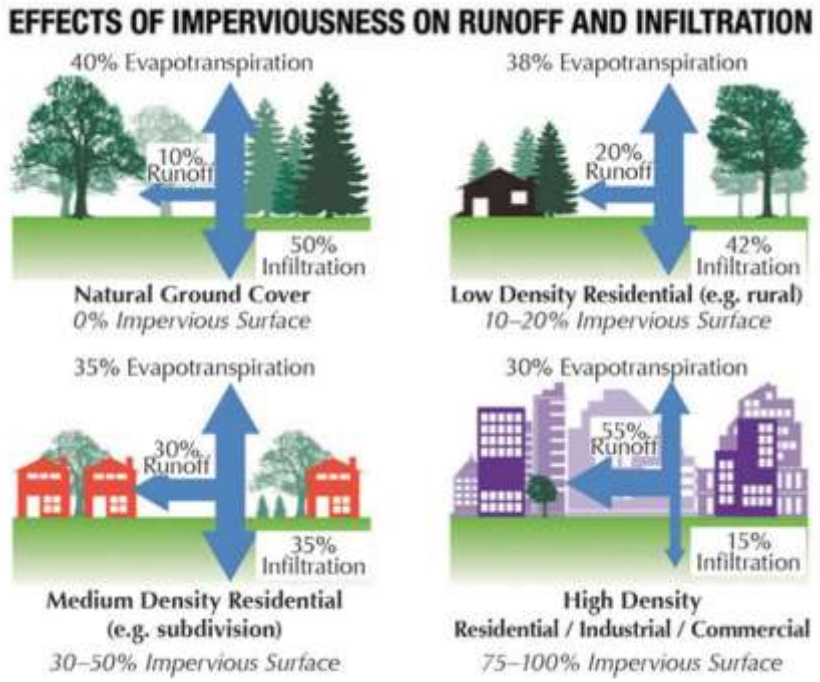
STORMWATER REDUCTION

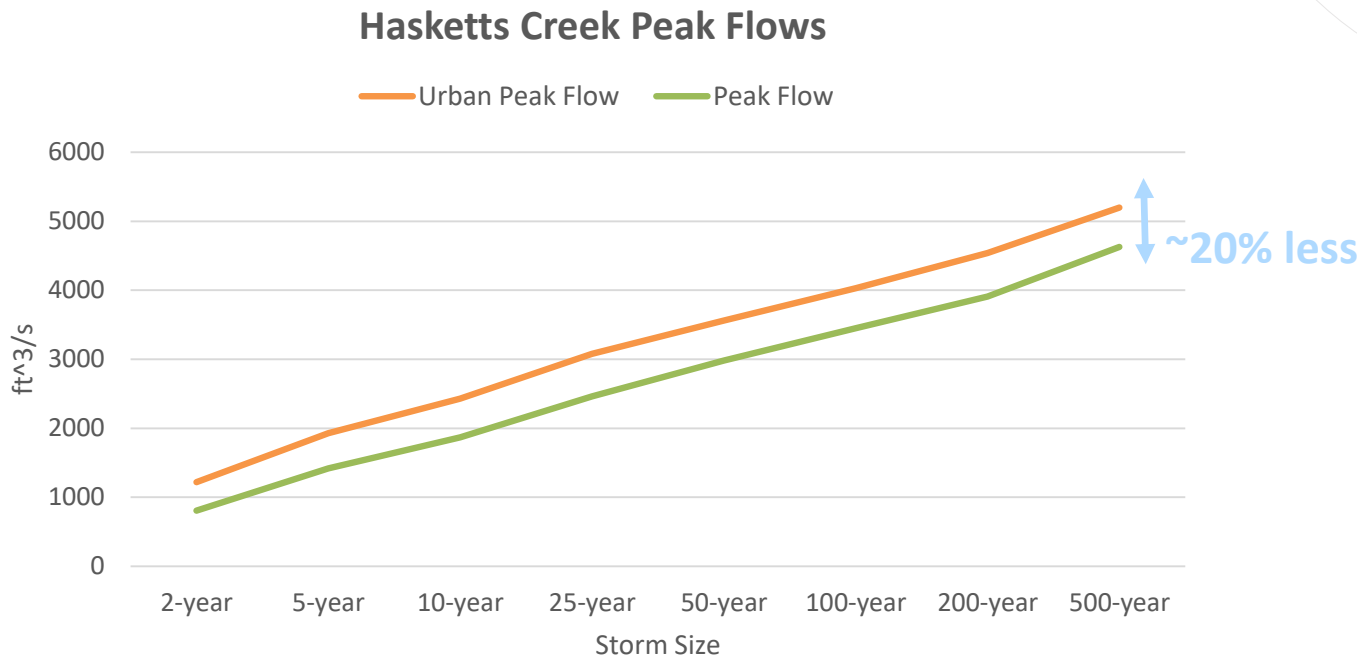
USGS StreamStats

StreamStats is a Web-based tool that provides streamflow statistics, drainage-basin characteristics, and other information for USGS streamgaging stations and for user-selected ungaged sites on streams.

Watershed Goal

Reduce stormwater runoff by at least **20%**

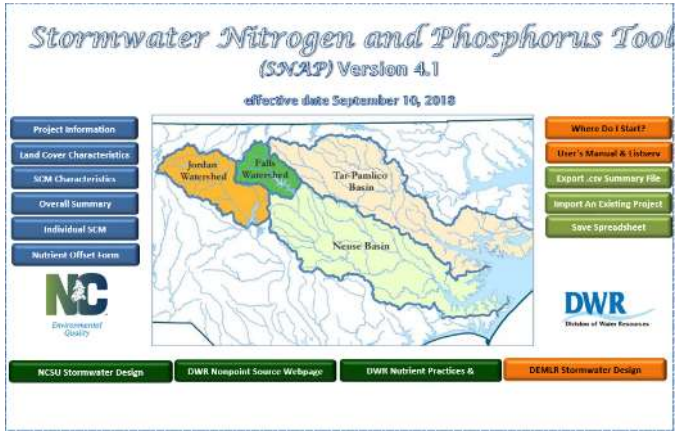




STORMWATER NITROGEN AND PHOSPHORUS TOOL (SNAP)

What is it?

Project-scale tool for modeling nitrogen and phosphorus in stormwater runoff from development sites and nutrient reductions provided by stormwater treatment.



Inputs: 1) Precipitation, 2) Soils, 3) Drainage Area, 4) Land Use, 5) SCM type/size

PROJECT AREA LAND COVERS	TN EMC (mg/L)	TP EMC (mg/L)	Pre-Project Area (ft^2)	Post-Project Area (ft^2)
Roof	1.18	0.11	14,368	14,368
Roadway	1.64	0.34	0	0
Parking/Driveway/Sidewalk	1.42	0.18	16,671	16,671
Protected Forest	0.97	0.03	0	0
Other Pervious/Landscaping	2.48	1.07	80,504	79,645
CUSTOM LAND COVER 1				
CUSTOM LAND COVER 2				
CUSTOM LAND COVER 3				
LAND TAKEN UP BY SCM	1.18	0.11	0	859

Nutrient Export Summary

	Pre-Project Whole Site Conditions	Post-Project Whole Site without SCMs	Post-Project Whole Site with SCMs	Post-Project SCM-Treated Area
Percent Impervious (for runoff calculation) (%)	27.8%	28.6%	28.6%	28.6%
Percent Built-Upon Area (BUA) (%)	27.8%	27.8%	27.8%	27.8%
Annual Runoff Volume (ft^3/yr)	113,355	116,115	94,286	94,286
Annual Runoff % Change (relative to pre-D)	0%	2%	-17%	
Total Nitrogen EMC (mg/L)	1.45	1.44	1.22	1.22
Total Nitrogen Load Leaving Site (lb/yr)	**10.26**	**10.45**	**7.15**	7.15
Total Nitrogen Loading Rate (lb/ac/yr)	*4.01*	*4.08*	*2.79*	*2.79*
Total Nitrogen % Change (relative to pre-D)	0%	2%	-30%	
Total Phosphorus EMC (mg/L)	0.26	0.25	0.13	0.13
Total Phosphorus Load Leaving Site (lb/yr)	**1.83**	**1.84**	**0.76**	0.76
Total Phosphorus Loading Rate (lb/ac/yr)	*0.71*	*0.72*	*0.30*	*0.30*
Total Phosphorus % Change (relative to pre-D)	0%	1%	-58%	

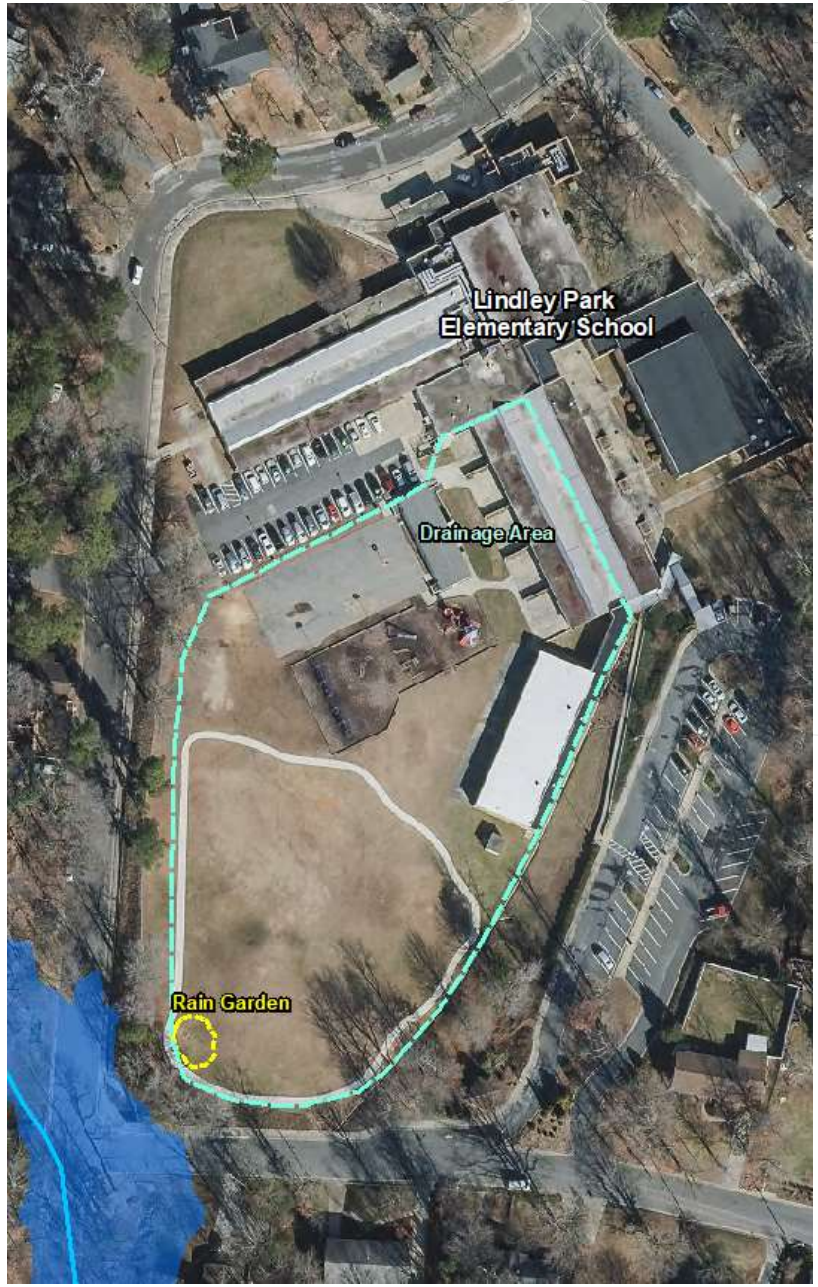
SCM Reduction Estimates

Project Number	SCM Type	Location	Footprint (ft^2)	Drainage Area (ft2)	Percent Impervious	Annual Runoff Volume (ft3/yr)	Volume Reduction (%)	TN Reduction (lb/ac/yr)	TN Reduction (%)	TP Reduction (lb/ac/yr)	TP Reduction (%)
1	Rain Garden	Lindley Park Elementary School	859	111543	27.8%	113355	17%	3.3	30%	1.08	58%
2	Bioswale	City Fields	387	69570	62.5%	144182	13%	2.3	29%	0.55	33%
3	Rain Garden	North Asheboro Park	471	16181	100.0%	51996	19%	1.41	31%	0.25	44%
4	Constructed Wetland	North Asheboro Park	1732	3392476	14.4%	237939	11%	6.4	30%	1.65	45%
5	Constructed Wetland	North Asheboro Park	1732	315850	19.1%	237349	11%	7.39	33%	2.18	52%
6	Bioretention	N. Asheboro Park & Ride	556	133172	59.1%	261983	19%	7.99	33%	2.07	55%
7	Bioswale	W. Allred Street	248	40306	56.5%	76180	4%	1.31	20%	0.22	25%

SCM PROJECT OPPORTUNITIES

Bioretention
Bioswale
Constructed Wetland
Rain Garden
Stormwater Pond

Estimated Costs	$4,295-$12,885
Stormwater Reduction	17%
TN Reduction	30%
TP Reduction	58%



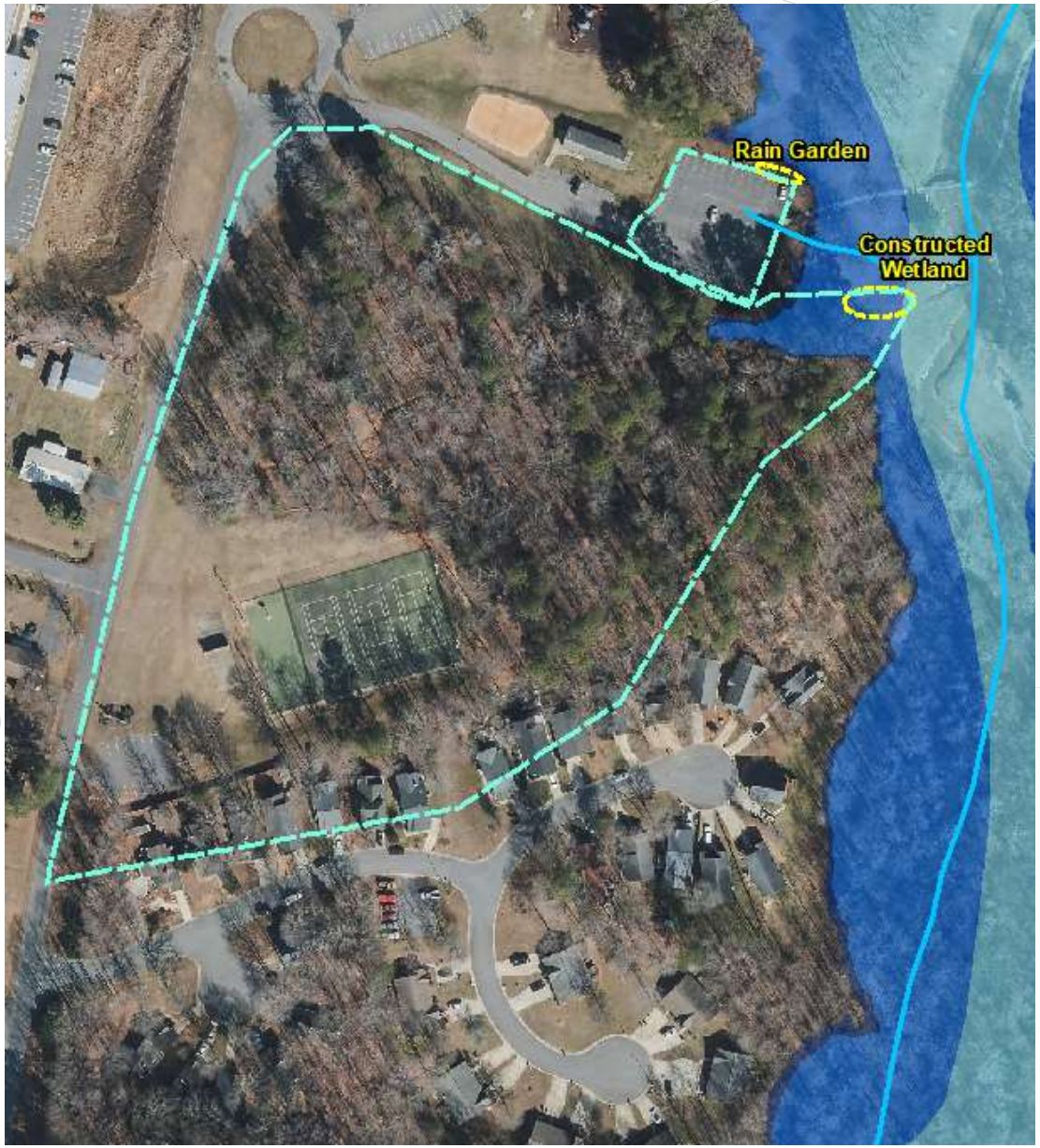
SCM PROJECT OPPORTUNITIES

Bioretention
Bioswale
Constructed Wetland
Rain Garden
Stormwater Pond

Estimated Costs	$1,935-$3,870
Stormwater Reduction	13%
TN Reduction	29%
TP Reduction	33%

SCM PROJECT OPPORTUNITIES

Bioretention
Bioswale
Constructed Wetland
Rain Garden
Stormwater Pond



Rain Garden

Estimated Costs	$2,355-$7,065
Stormwater Reduction	19%
TN Reduction	31%
TP Reduction	44%

Constructed Wetland (Option A)

Estimated Costs	$17,320-$34,640
Stormwater Reduction	11%
TN Reduction	30%
TP Reduction	45%

SCM PROJECT OPPORTUNITIES

Bioretention
Bioswale
Constructed Wetland
Rain Garden
Stormwater Pond

Estimated Costs	$17,320-$34,640
Stormwater Reduction	11%
TN Reduction	33%
TP Reduction	52%

SCM PROJECT OPPORTUNITIES

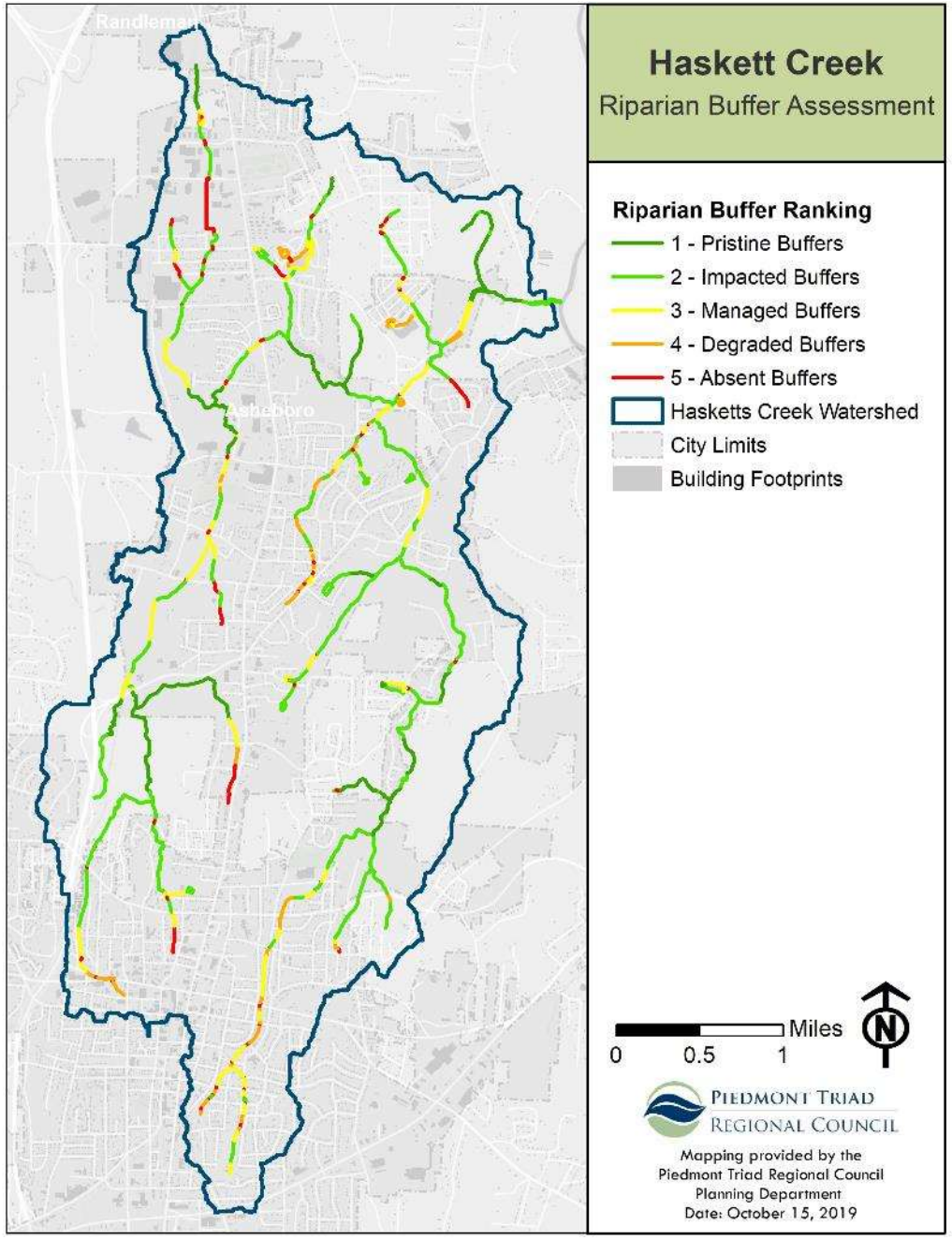
Bioretention
Bioswale
Constructed Wetland
Rain Garden
Stormwater Pond

Estimated Costs	$2,780-$8,340
Stormwater Reduction	19%
TN Reduction	33%
TP Reduction	55%

SCM PROJECT OPPORTUNITIES

Bioretention
Bioswale
Constructed Wetland
Rain Garden
Stormwater Pond

Estimated Costs	$1,240-$2,480
Stormwater Reduction	4%
TN Reduction	20%
TP Reduction	25%



RIPARIAN BUFFER & BANK STABILIZATION PROJECTS

QUESTIONS & DISCUSSION

Goals, Strategies, & Actions

Improve Benthic Community Rating to Good-Fair

Reduce Stormwater Loads

- Actions
- Actions
- Actions

Protect and Restore Riparian Buffers

- Actions
- Actions
- Actions

Preserve Open Space

- Actions
- Actions
- Actions

Increase Outreach & Education

- Actions
- Actions
- Actions

Goals, Strategies, & Actions

Strategy 1: Reduce peak stormwater flows by at least 20%

Action #	Specific Action	Timeframe	Partners	Resources Needed	Evaluation Criteria
1-1	Implement identified stormwater control measure projects	Short-Mid	Asheboro, PART, Lindley Park Elementary, PTRC, RCSW, RCCE, NCDWR, CWMTF, engineering firms	Funding, technical assistance, & staff time	# of SCMs installed, stormwater reduced, water quality data, value added ($/ft/yr)
	Note: Utilize Project Atlas and WIPS tool. Apply for 319 or other grant funding to support.				
1-2	Identify additional stormwater retrofit opportunities on public properties	Short	Asheboro, Randolph County, Randleman, school system, RCSW, RCCE, KRCB, PTRC, engineering firms	Technical assistance & staff time	# of identified projects
	Note: Utilize SCM Suitability Model. Prioritize highly visible sites to promote education.				
1-3	Promote stormwater retrofits in future maintenance or redevelopment of publicly owned buildings, parks, parking lots and drainage systems	Ongoing	Asheboro, Randolph County, Randleman, RCSW, RCCE, WRC, PTRC, NCDWR, NCDWI, CWMTF, engineering firms	Staff time & training	# of SCMs installed, stormwater reduced, water quality data, value added ($/ft/yr)
	Note: Work with partners to provide trainings/information sessions.				
1-4	Develop street tree program and encourage stormwater reduction measures on City streets in future capital improvement projects	Mid	Asheboro, Randolph County, Randleman, RCSW, RCCE, PTRC, UFC, landscaping companies, nurseries	Funding, technical assistance, staff time, & training	# of street trees planted/SCMs, stormwater reduced, water quality data, value added ($/ft/yr)
	Note: Identify streets that are wide enough to accommodate SCMs. Adjust ordinances using Code & Ordinance worksheet to accommodate.				
1-5	Work with Department of Transportation to incorporate retrofits into highway upgrades	Mid-Long	Asheboro, Randolph County, Randleman, NCDOT, PTRPO	Staff time & technical assistance	# of SCMs installed, stormwater reduced, water quality data, value added ($/ft/yr)
	Note: Coordinate with Piedmont Triad RPO.				

Goals, Strategies, & Actions

1-6	Develop cost share/incentive program to encourage SCMs on private property	Mid	Asheboro, Randolph County, Randleman, RCSW, RCCE, WRC, SSMART, Commerce, businesses, & homeowners	Funding, technical assistance, educational materials, & staff time	# of SCMs installed, funding provided ($)
	Note: This could include financial assistance, development incentives, or recognition programs for both structural or non-structural SCMs.				
1-7	Map and inventory existing stormwater network	Short	Asheboro, Randolph County, Randleman, PTRC, engineering firms, NCDWR	Funding & technical assistance	# of outfalls/pipes mapped, # of maintenance needs detected
	Note: Use SCITs tool to mark outfalls. PTRC also has experience mapping stormwater infrastructure.				
1-8	Work with businesses and homeowners to disconnect roof drains	Mid	Asheboro, Randolph County, Randleman, SSMART, businesses, homeowners	Funding, educational materials, & staff time	# of roofs disconnected, volume of stormwater reduced
	Note: Identify neighborhoods with direct roof drain connections. City could provide this service at no-cost to homeowners to incentivize.				
1-9	Reduce sources of I/I	Mid-Long	Asheboro, Randolph County, Randleman, PTRC, NCDWI, NCDWR, engineering firms	Funding, technical assistance, & staff time	# of repairs made, volume of I/I reduced
	Note: Inventory stormwater and wastewater systems. Conduct testing to identify potential leaks, connections, or other maintenance needs.				
1-10	Consider establishing LID requirements for new development	Short	Asheboro, Randolph County, Randleman, RCSW, RCCE, PTRC, WRC, UNCSOG	Technical assistance, staff time, & elected official buy-in	N/A
	Note: Utilize Code & Ordinance Worksheet. UNC School of Governments also has a model Phase II ordinance.				
1-11	Incorporate watershed plan recommendations into other City/County plans	Short	Asheboro, Randolph County, Randleman, PTRC	Staff time	N/A
	Note: Asheboro in process of updating Future Land Development Plan. Coordinate with other departments as needed.				

Goals, Strategies, & Actions

Strategy 2: Protect and restore riparian buffers along creeks and tributaries

Action #	Specific Action	Timeframe	Partners	Resources Needed	Evaluation Criteria
2-1	Implement identified riparian buffer improvement projects using native plants	Short-Mid	Asheboro, Randolph County, Randleman, PTRC, WRC, property owners, landscaping companies, nurseries, NCDWR, CWMTF	Funding, technical assistance, stakeholder buy-in, & staff time	Linear feet of buffers, stormwater reduced, water quality data, value added ($/ft/yr)
	Note: Utilize Project Atlas and WIPS tool. Apply for 319 or other grant funding to support.				
2-2	Stabilize eroding stream banks with native plants and materials	Mid	Asheboro, Randolph County, Randleman, PTRC, WRC, property owners, landscaping companies, nurseries, NCDWR, CWMTF	Funding, technical assistance, stakeholder buy-in, & staff time	Linear feet of stabilized streambank, water quality data, value added ($/ft/yr)
	Note: Replace hardened structures where feasible.				
2-3	Groundtruth riparian buffer assessment to identify additional riparian buffer improvement and stream restoration projects	Short	Asheboro, Randolph County, Randleman, PTRC, RCSW, RCCE, KRCB	Technical assistance & staff time	# of identified projects
	Note: Utilize Riparian Buffer Assessment and WIPS tool.				
2-4	Extend water supply watershed buffer protections to impaired waters	Short	Asheboro, Randolph County, Randleman, PTRC	Staff time & elected offical buy-in	Linear feet of riparian buffers protected, stormwater reduced, water quality data, value added ($/ft/yr)
	Note:				
2-5	Identify buffers as a priority in other ordinances and plans	Short	Asheboro, Randolph County, Randleman, PTRC	Staff time	N/A
	Note: Subdivision, landscaping, future land use plan, recreation, etc.				
2-6	Develop cost share/incentive program to encourage businesses and homeowners to restore buffers on private property	Mid	Asheboro, Randolph County, Randleman, RCSW, RCCE, WRC, SSMART, Commerce, businesses, & homeowners	Funding, technical assistance, & staff time	# of participants, linear feet of buffers, funding provided ($)
	Note: This could include financial assistance or recognition programs.				
2-7	Coordinate buffer improvements with floodplain protection, utility easements, and trail programs	Mid-Long	Asheboro, Randolph County, Randleman, PTRC, PLC, PCC, PLT, MST, NCDOT, Duke, PNG, NCORR	Staff time	N/A
	Note:				

Goals, Strategies, & Actions

Strategy 3: Preserve existing open space to provide water quality benefits

Action #	Specific Action	Timeframe	Partners	Resources Needed	Evaluation Criteria
3-1	Work with Piedmont Land Conservancy, Wildlife Resources Commission, recreation departments, and other partners to prioritize and acquire land for conservation	Short-Mid	Asheboro, Randolph County, Randleman, PLC, WRC, PCC, RCSW, RCCE, PTRC, NCDWR, CWMTF, private landowners	Technical assistance, staff time, & willing property owners	Acres of land conserved, stormwater reduced, water quality data, value added ($/ft/year)
	Note: Prioritize land in critical areas that provides multiple benefits. Aim for ≤10% impervious cover in each catchment.				
3-2	Establish a maximum built upon area limit for new development within the watershed	Short	Asheboro, Randolph County, Randleman, PTRC	Technical assistance, staff time, & elected official buy-in	Acres of land conserved, stormwater reduced, water quality data, value added ($/ft/year)
	Note: The Center for Watershed Protection recommends maintaining a balance of ≤10% impervious cover throughout the watershed.				
3-3	Use Code & Ordinance Worksheet to identify other opportunities to improve open space protections in City/County ordinances	Short	Asheboro, Randolph County, Randleman, PTRC, WRC	Staff time	# of strengthened policies
	Note: Utilize the Green Growth Toolbox and trainings offered by WRC.				
3-4	Identify potential incentivies to encourage open space preservation	Short	Asheboro, Randolph County, Randleman, PTRC, WRC	Technical assistance & staff time	Acres of land conserved, stormwater reduced, water quality data, value added ($/ft/year)
	Note: Utilize Green Growth Toolbox and Code & Ordinance Worksheet.				
3-5	Align conservation goals with Future Land Development Plan	Short	Asheboro, Randolph County, Randleman, PTRC	Staff time	N/A
	Note:				
3-6	Explore floodplain protection and trail opportunities to meet conservation goals	Mid-Long	Asheboro, Randolph County, Randleman, PTRC, PLC, PCC, PLT, MST, NCDOT, NCORR	Funding, technical assistance, & staff time	Acres of land conserved, miles of trail constructed
	Note: Identify floodplain buyout opportunities. Work with Piedmont Legacy Trails, MST, and other trail groups to expand trail access.				

Goals, Strategies, & Actions

Strategy 4: Continue and expand public outreach and education

Action #	Specific Action	Timeframe	Partners	Resources Needed	Evaluation Criteria
4-1	Establish active Watershed Group to implement and monitor plan	Short	Asheboro, Randolph County, Randleman, PTRC, KRCB, PLC, PCC, WRC, NCDWR, SSMART, etc.	Staff time & stakeholder buy-in	# of milestones met
	Note: Determine organizational responsibilities and meeting frequency.				
4-2	Organize StreamWatch & Adopt a Stream volunteer groups	Short-Mid	Asheboro, Randolph County, Randleman, SSMART, KRCB, NC Zoo, NCDWR, afterschool programs, scouts, etc.	Technical assistance, staff time, & willing volunteers	# of volunteers, level of interest in program, # of streams monitored, citizen science data
	Note: Connect StormwaterSMART with local scout, afterschool, or other similar programs.				
4-3	Install educational signage at SCM project sites and stream crossings	Short-Mid	Asheboro, Randolph County, Randleman, PTRC, PTRPO, SSMART, NCDOT, NCDWR	Funding, technical assistance, & staff time	# of signs installed
	Note: 319 funding can be used for educational signage.				
4-4	Continue and expand direct education programs in coordination with StormwaterSMART and other partners	Ongoing	Asheboro, Randolph County, Randleman, SSMART, RCSW, RCCE, KRCB, schools	Technical assistance & staff time	# of programs/events, # of people reached, public buy-in
	Note:				
4-5	Tailor messaging and explore other forms of media to reach diverse audiences	Short	Asheboro, Randolph County, Randleman, SSMART, RCSW, RCCE, KRCB, schools	Technical assistance & staff time	# of new people reached
	Note:				
4-6	Work with Keep Randolph County Beautiful and other partners to reduce litter, pet waste, and pesticide/fertilizer use in watershed	Ongoing	Asheboro, Randolph County, Randleman, SSMART, KRCB	Technical assistance & staff time	Lbs of litter reduced, fecal coliform data, public buy-in
	Note:				
4-7	Increase stewardship of creeks through passive recreation opportunities	Mid-Long	Asheboro, Randolph County, Randleman, PTRC, PLC, PCC, PLT, MST	Funding, technical assistance, & staff time	# of new parks/trails
	Note:				
4-8	Schedule good housekeeping training/workshops	Short	Asheboro, Randolph County, Randleman, PTRC, NCDWR	Staff time & training	# of trainings/workshops, # of staff trained
	Note:				
4-9	Promote online StoryMap and watershed applications	Short	Asheboro, Randolph County, Randleman, PTRC, NCDWR	Technical assistance & staff time	# of website visits, use of watershed applications
	Note:				

WATERSHED PLAN & STORYMAP OUTLINE

StoryMap Examples

Current Hasketts Creek StoryMap

Watauga River Basin Water Resources Plan

Who is the target audience?

What needs to be included?

How do we make it as user friendly as possible?

1) **Watershed Description**
   - Physical & Natural Features
   - Land Use
   - Regulatory
2) **Watershed Conditions**
   - Water Quality
   - Source Assessment (GIS & Fieldwork)
3) **Stormwater Reduction**
   - StreamStats info
4) **Goals, Strategies, & Actions**
   - Table
5) **Management Strategies**
   - SCM Projects
   - Riparian Buffer/Bank Stabilization Projects
   - Other Strategies (Outreach/Education)
6) **Implementation/Adaptive Management**
   - Implementation Schedule
   - Milestones
   - Monitoring
   - Resources

THANK YOU

ccolvin@ptrc.org

www.ptrc.org