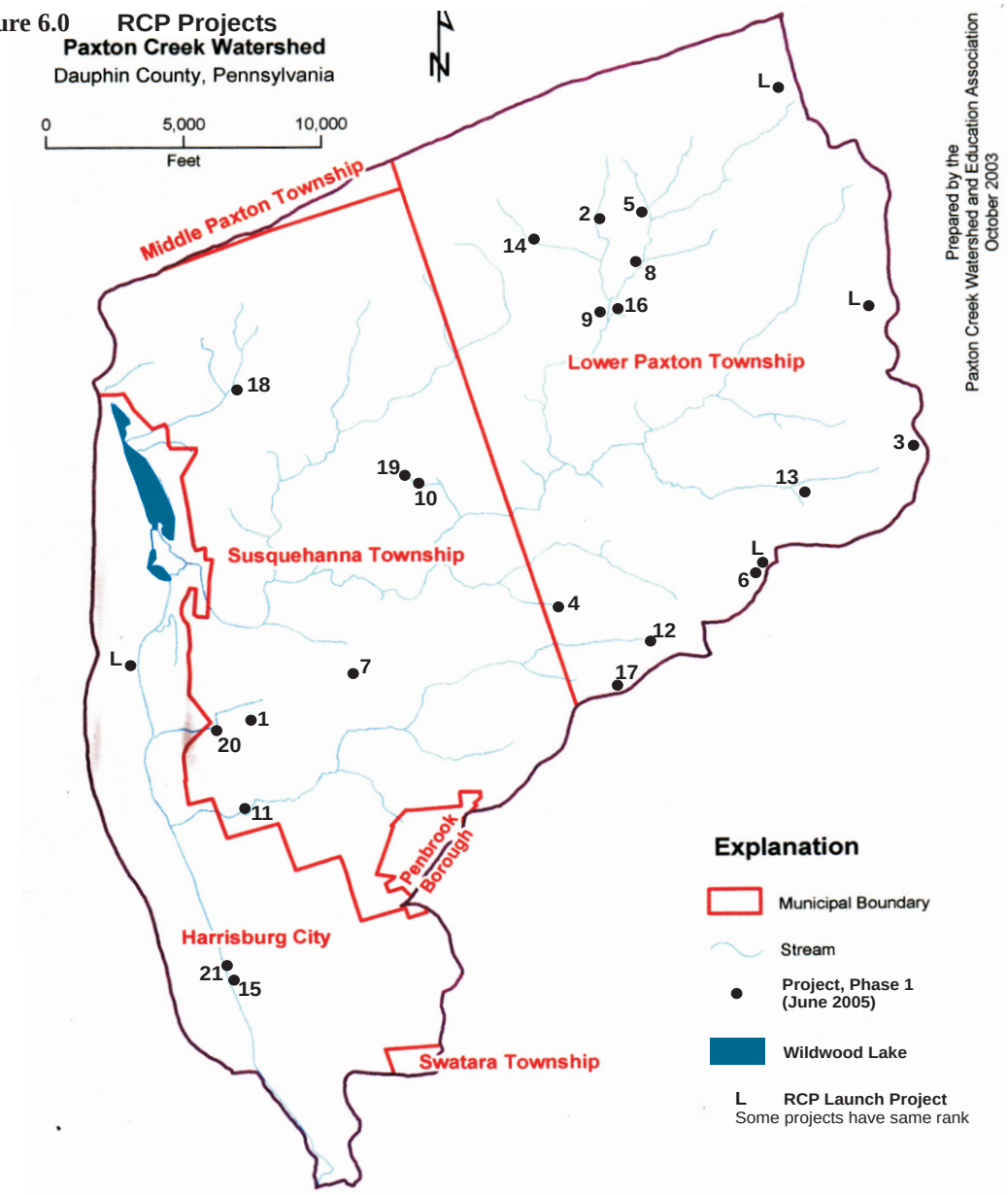
6 Projects to Fix, Enhance and Protect

Hundreds of places in Paxton Creek are in need of protection, rehabilitation, and enhancement. Studies have identified dozens of project areas. More will undoubtedly be added to the list, as additional subwatersheds are assessed. Since only a limited number of projects can be accomplished each year, the challenge is to choose wisely. This chapter covers the selection of potential watershed projects.

In various studies 184 projects were identified. (Table 6.0) From this pool of potential projects, four were selected to launch the RCP, and 21 were chosen for initial prioritization and implementation.

Aspects of these projects include location in headwater areas, multiple watershed goals, landowner support, exceptional demonstration potential, volunteer labor feasibility, potential problem solutions, and other attributes. These projects (Figure 6.0) address the main categories of the RCP actions: water management, land management, creek-based recreation, development, and education in the context of ten types of projects.

Figure 6.0 RCP Projects
Paxton Creek Watershed
Dauphin County, Pennsylvania



"Projects for everybody: to each his or her own."

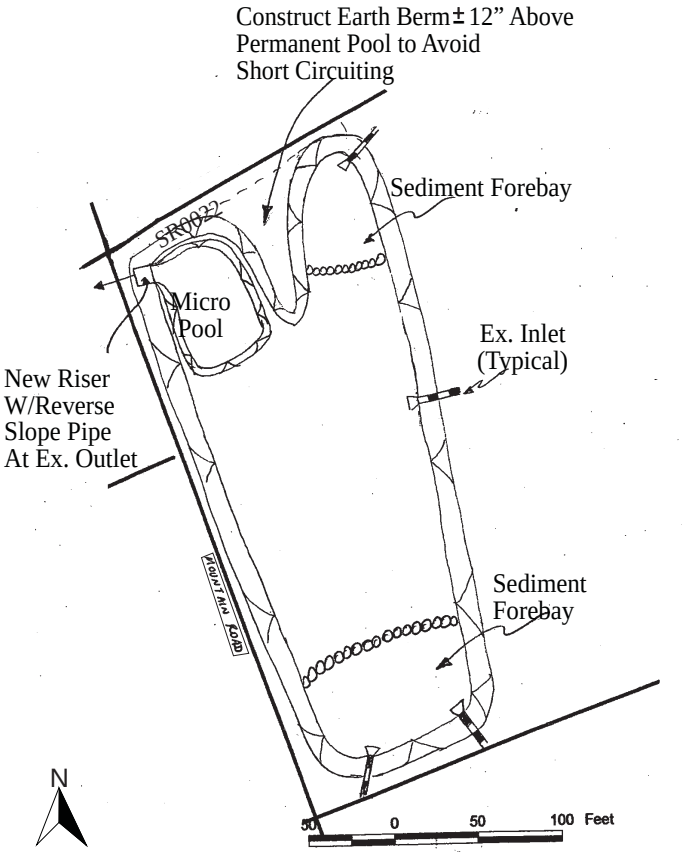
Projects to Fix, Enhance and Protect

Clean Up Trash Tally

Design concepts were prepared for many projects. These designs aim at communicating essential aspects of projects, establishing a sound technical case for the watershed plan, and supporting organized campaigns for helping stakeholders to carry out the projects. A bioretention project design for a stormwater detention pond retrofit at a shopping center (Paxton Square, Rt. 22 and Mountain Road) illustrates the conceptual designs provided in the Appendix. (Figure 6.1) A graphic of the proposed City Beautiful Gang minipark in the channelized creek is another type of design portrayal (Figure 6.2)

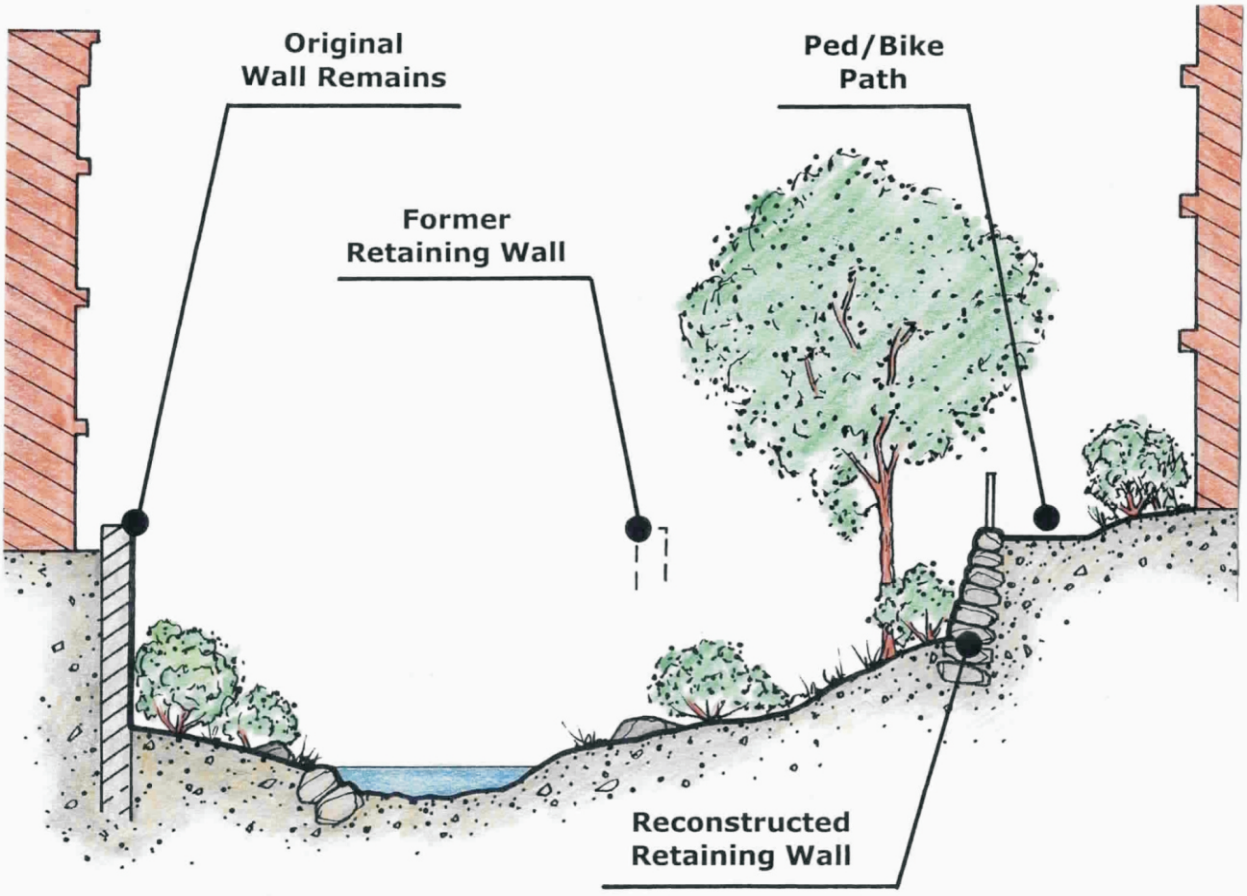
Tables 6.1 and 6.2 contain data on the projects selected for launch, and initial prioritization and implementation. Attributes of these large and small projects include location in headwater areas, multiple watershed goals, landowner support, exceptional demonstration potential, volunteer labor feasibility, potential problem solutions, and other aspects.

Figure 6.1 Detention Pond Retrofit Conceptual Design



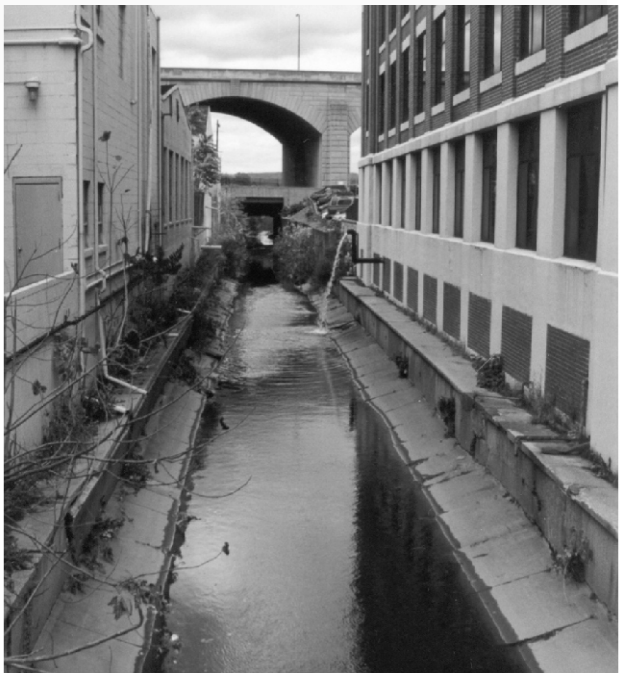
Detention Pond at Paxton Square
View North

Figure 6.2 Channelized Area Revitalization Concept



"Much of Paxton Creek (in the City) is channelized and confined by adjacent buildings (RCP cover photograph) … No physical constraints appear to prevent the conversion of this area from its present condition … to a significant community amenity and focal point for economic redevelopment." -- Todd Moses, Skelly and Loy, March, 2003

Large-scale projects are more complex, requiring more design, engineering, capital, and construction equipment. Small scale projects need less engineering, and involve volunteers for a major part of the required effort. The Appendix (Implementation and Management section) contains descriptions and conceptual designs of many large-scale and small-scale priority projects.



Channelized Paxton Creek

Criteria and Prioritization

Criteria are simply factors that help set priorities for action. In effect, criteria constitute the basis upon which planning decisions are made. Project assessment criteria are used to prioritize rehabilitation and enhancement projects. These criteria help decide what projects to implement, and their execution order. These prioritizations are only temporary. Subsequent subwatershed assessments and new data can affect project rankings, and additional assessment criteria may be added. Rankings are likely to change with major reviews of project lists.

In assigning priority to rehabilitation and enhancement projects for the watershed, PCWEA compiled the following 10 criteria for project assessment:

Goals and Environmental Effects. How many goals (stormwater management, recreation, development, other) does the project address? Is the project consistent with subwatershed goals? What environmental problems or benefits (pollution removed, areas improved, services provided) are associated with the project?

Site Suitability. Is the project located in an area with relatively good water quality, severe channel erosion, forest degradation, development pressure, education opportunity, upstream protection, or other circumstances?

Land Ownership. Is the site public or private? Have landowners given consent? Are owners willing to implement the rehabilitation or enhancement efforts?

Technical Feasibility. What is the size of the area affected? Are structural (bricks and mortar) or nonstructural practices (schedules, behavior) involved? Are permits necessary? Is there concern over access, utility arrangements, conflict with surroundings, or safety concerns? Does it provide technical synergism (integrate with other rehabilitation or enhancement efforts for increased effects)?

Financial Feasibility. What are the monetary and in-kind or other costs? Is it located near other projects to help reduce cost and maximize volunteer labor? Are there financial synergism possibilities?

Funding Availability. Are public-private partnerships planned? What are the likely funding arrangements (particularly from local sources) for implementation? Are funding resources timely and forthcoming?

Public Support. Are organizations, municipalities, the general public, and watershed stakeholders cooperative and supportive of the project?

Educational Value and Visibility. Can the project demonstrate awareness, stewardship behaviors or practices, and/or help convey watershed lore? Is it suitable for contribution to formal or nonformal education systems?

Human Resources. Can the project be implemented by PCWEA members, and/or other volunteers? Donated rotational labor? Professional or other paid labor? Is labor readily available?

Operation, Maintenance (O & M) and Future Needs. Is O and M accounted for in the project design phase? Are future project components anticipated or expected?

Stakeholders applied these criteria to RCP projects at a May 2005 prioritization workshop. An assessment process called the Watershed Restoration Template (CVI and DEP, 2004) was used to rank these protection, rehabilitation, and enhancement projects for Paxton Creek. At the center of this assessment scheme is a project prioritization matrix determined by ranking and weighting the criteria applied to the projects. (Tables 6.1 and 6.2) Although these projects are located throughout the watershed, they reflect the RCP procedure on assigning ranks according to subwatershed evaluations (first, Paxton Creek North). The initial assessment shows the projects in the upper third (rankings 1-7) tend to deal more with downstream effects, protect headwaters, exhibit high visibility (education with demonstration value), and have public ownership. Common characteristics of those in the lowest third (rankings 14-21) are sites mainly on private properties, have several goals, and consist of multiple components.

Subsequent project prioritizations will be conducted by watershed stakeholders, led by PCWEA.

Table 6.1 Large Scale Priority Rehabilitation Projects

Project (rank no., name, & sub'shed)	Project Type	Area Treated (acres)	Stream Length Modified (ft)	Priority Reason	Planning Level Cost Estimate
5 Centennial Acres (PCN)	Pocket Wetland Stream Rehabilitation Riparian Reforestation Better Site Design	5	1,000	Headwater Location Multiple Components Downstream of Development Site Drainage Treatment	$105,000
21 Capitol View Commerce Center (PC)	Riparian Reforestation Bioretention/Conservation Landscaping	5.4	700	Multiple Components Multiple Goals Willing Landowner	$35,000
8 Fairfax Village North (PCN)	Stormwater Retrofit & Bioretention Riparian Reforestation Stream Rehabilitation Trash Cleanup	1	800	Headwater Location Multiple Components Multiple Goals Willing Landowners	$100,000
19 Vartan Offices Property (PCN)	Stormwater Retrofit Recreation (Minipark)?	2.4	N/A	Multiple Components Runoff Causing Erosion on Multiple Properties Willing Landowner?	$50,000 to $75,000
7 S. Police Headquarters and Vicinity (PCN,AR)	Stormwater Bioretention, Riparian Reforestation & Creek Rehabilitation	14.0	300	Public Land Good Access Severe Erosion Visible Location	$105,000
9 Bumble Bee Golf Center (PCN)	Stormwater Bioretention & Riparian Reforestation	2	600	Highly Visible Site Multiple Components Mid-water Location	$30,000
20 PA DEP Offices (PC)	Stormwater Retrofit	1.2	N/A	Visible Location Multiple Components	$50,000
18 Fargreen Road (MT)	Stream rehabilitation Riparian Reforestation	N/A	2,500	Active Degradation of Major Wetlands (Wildwood Lake) High Visibility	$200,000
11 Hbg State Hospital Grounds (AR)	Flood Control Stormwater Retrofit Stream Rehabilitation	2	600	Public Land Floodplain Rehabilitation Good Access	$250,000to $400,000
15 M.L. Dock Minipark (PC)	Recreation (Minipark) & Development & Stream Rehabilitation	0.02	N/A	Development Help Recreation Launch? Willing Partner	$350,000
12 The Brook Apartments and Colonial Park Mall (AR)	Stormwater Retrofit Stream Rehabilitation Riparian Reforestation, Treatment Train, Recreation & Trail?	2	1,700	Headwater Location Multiple Components High Visibility Good Access	$250,000 to $400,000

Planning-level costs estimates are based on average costs for local, similar types of projects. More specific estimates require additional information on precise drainage area and impervious cover, location of utilities, resources (particularly labor) availability, and necessary permits; subwatershed acronyms (AR, Asylum Run; MT, Mountaindale; PC, Paxton Creek; PCN, Paxton Creek North.

Table 6.2 Small Scale Launch and Priority Rehabilitation Projects

Project (rank no., name, & sub'shed)	Project Type	Area Treated (acres)	Stream Length Modified (ft)	Priority Reason	Planning Level Cost Estimate
* Linglestown Schools (LT)	Rain Garden Stormwater Bioretention	0.3	N/A	Urban Headwater Location Public Land High Visibility Volunteers Facilitation RCP Launch Site	$5,000
*Harrisburg Area Community College (PC)	Parking Lot Stormwater Bioretention	1.3	N/A	Semi-Public Land High Visibility Volunteers Facilitation RCP Launch Site?	$13,000
* Friendship Community Center (DT)	Retrofit Dry Pond Bioretention	7.4	N/A	Headwater Location Public Land Volunteers Facilitation RCP Launch Site	$20,000
* Parkway West Road Farms (PCN)	Riparian Restoration	N/A	2,000	Natural Headwater Location Erosion Prevention Need Volunteers Facilitation RCP Launch Site?	$5,000
2 Centennial Acres Park (PCN)	Stormwater Bioretention & Upland Reforestation	0.4 -3	N/A	Headwater Location Public Land Multiple components Uncomplicated design	$10,000
1 Farm Show Overflow Parking (PC)	Stormwater Retrofit	17.9	N/A	Urban Headwater Location Public Land	$5,000
14 Forest Hills (PCN)	Riparian Reforestation	1.4 –2	600-1,000	Headwater Location Uncomplicated Design Land Owned by a single Entity (HOA)	$3,000 to $5,000
10 Davis Landscaping (PCN)	Stormwater Bioretention	TBD	N/A	Willing Landowner Downstream Erosion From Runoff Design/Place Economy	$8,000
17 PennDOT I-83 Cloverleaf Bioretention (PCN)	Stormwater Retrofit	0.5	N/A	Highway runoff pollution Public land Uncomplicated design	$5.000
16 3Bs Ice Cream (PCN)	Stormwater Retrofit	2.3	N/A	Headwater location Uncomplicated design High visibility	$5,000
13 Village Knoll Apartments (PT)	Stormwater Bioretention	7.5	N/A	Volunteer facilitation Single landowner	$8,000
4 Valley Road near I-83 (DT)	Micropool Pond Storage	144.0	N/A	Good Access (ROW) Severe erosion/NPS pollution High visibility	$100,000
6 Wetlands near Friendship Community Center (DT)	Stream Rehab	13.0	N/A	Headwater storage High visibility	$15,000
3 Paxton Square at Rt. 22 (PT)	Stormwater Retrofit	16.0	N/A	Runoff pollution abatement Headwater location High visibility	$10,000

Planning level cost estimates are based on best professional judgment and average costs for similar local projects. Assumptions for riparian reforestation costs include: trees planted on ten foot spacing using small container stock at $5 per tree (from native plant nurseries) and planted by volunteers; subwatershed acronyms -DT, Devonshire; LT, Linglestown; MT, Mountaindale; PC, Paxton Creek; PT, Paxtonia; PCN, Paxton Creek North.
* RCP launch project.

Watershed Projects: Now, Tomorrow and Beyond

ln 2005 more watershed rehabilitation projects are underway than were conducted in the previous decade. Initial projects for launching the RCP include huge buffer plantings (hundreds of trees and shrubs) planted by over a hundred people, coupled with a rain garden at Linglestown Middle & Elementary Schools, parking lot bioretention areas at Harrisburg Area Community College (HACC), and retrofitted stormwater detention ponds at Friendship Community Center. (Figure 6.3)

In addition to the four PCWEA projects scheduled for summer-fall 2006, Lower Paxton Township will support a headwater stream rehabilitation and trail bridge construction project in Brightbill Park (Devonshire subwatershed). This past summer, the Capital Area Greenbelt and Susquehanna Township finished a trail link connecting the Veterans Park vicinity to the CA Greenbelt crossing the Harrisburg State Hospital grounds. Other additional projects have partial funding from the EPA and DEP: a day lighting scheme on Mish Run (Belleview Park area of Paxton Creek subwatershed), stabilization of creek banks along a short stretch of Asylum Run in Harrisburg, rehabilitation of a significant sediment source draining to Wildwood Lake, designs for increasing the stormwater storage capacity and clearing a major clogged channel of the lake, and a stream rehabilitation project at the mouth of Black Run subwatershed in Susquehanna Township. Near Dauphin Borough, the Dauphin County Conservation District used Growing Greener funds to construct a demonstration site at the District office off Peters Mountain Road. This site features many types of pavement, and another 15 stormwater best management practices.

Figure 6.3 RCP Launch Projects

Rain Garden Site

Bioretention Site

Detention Pond Retrofit Site

Projects to Fix, Enhance and Protect

Subwatershed Distribution

Paxton Creek subwatersheds vary greatly in their land area, impervious surface, stream channel length, forest cover, stream degradation, and other features. Consequently, the types of potential projects desired for subwatersheds vary. For example, needed are more flood control projects in downstream areas, and more protective creek buffers at the natural headwaters. Watershed wide, extensive opportunities exist for riparian reforestation, stormwater retrofits, miniparks, trails, conservation landscaping, and other types of stream protection, rehabilitation, and enhancement. Table 6.3 provides a general list of projects for the coming decades.

Table 6.3 Subwatershed Projects: Summary List 1

Subwatershed	Projects
Asylum Run	Seven reaches (1.5 miles) riparian reforestation; 3 stormwater retrofits and 2 stream rehabs; 1 major flood storage, and 5 early action projects (debris jams, eroding gullies, meandering head cuts); 1 trail;
Black Run	Two reaches (1.2 miles) riparian reforestation; 1 retrofit and 2 stream rehabs; 1 trail;
Devonshire	Four reaches (1.3 miles) riparian reforestation; 1 trail; 2 stormwater retrofits and 1 stream rehab; 2 flood storage ponds;
Linglestown	Five reaches (3.2) miles riparian reforestation, 1 rain garden, and 1 stormwater retrofit; 1 long trail;
Mountaindale (Fox Run)	One reach (0.2 mile) riparian reforestation;
Paxton Creek	Four channelized reaches (3.1 miles) riparian reforestation; 7 stormwater retrofits; 1 creek day lighting; 2 conservation landscaping;1 hydrodynamic retrofit; 3 redevelopment; 2 miniparks; 4 trail segments;
Paxton Creek N (Upper and Lower)	Fourteen reaches (5.7 miles) riparian reforestation; 20 stormwater retrofits; 9 stream rehabs; 1 flood storage; 8 other projects (upland reforestation, discharge prevention and pollution source controls); 1 minipark; 1 long trail; 1 fishing platform for physically-challenged persons;
Paxtonia	Three reaches (0.4 mile) riparian reforestation; 4 stormwater retrofits; 2 stream rehabs;
Wildwood Lake	Two stream rehabs; 1 flood storage; 1 major debris jam removal; transportation museum; PA Canal demo site.

Do the RCP Projects Have Any Serious Conflicts?

Probably not, but maybe.

A big benefit of a Geographical Information System (GIS) is maps that are produced to the same scale. This makes comparison of different facts relativity easy, and accurate, if information are collected and entered carefully into the GIS databases. It is almost like laying data sets one atop another, and viewing the results for conflicts, reinforcement, and patterns.

A map of the RCP projects was compared with maps on other watershed information (environmental inventory, cultural features, sinkholes, erodible soils). During the field surveys, the sites had already been assessed for access, steep slopes, and other considerations that are apparent by visual inspection. These map comparisons indicated the following: the Capital View Commerce Center and the Myra Lloyd Dock minipark projects are on the 100-year floodplain; the HACC parking lot bioretention area on the 500-year floodplain and a former dump site; Capital View Commerce Center on brownfields; regional DEP parking lot atop an abandoned municipal waste site. Because of mapping scale, and potential database inaccuracies with associated ramifications these project sites may warrant closer looks (soils, groundwater, and/or other tests). Another potential watershed project may be in jeopardy due to the presence of a water bug. A significant sediment pollution source of Wildwood Lake Sanctuary may be home for this bug.

Bioretention Area in Old Dump

Some RCP projects can be detrimental over the short run where wetlands or wildlife habitat are disturbed. Vegetation can be removed in rehabilitating creek banks, waterway bottoms can be cleared or smothered in dredging activities, and so on. These effects are temporary. Much worse are impacts associated with land developments, particularly in forested areas as on Blue Mountain. Significant environmental declines occur with as little as 10% impervious cover (allowable under conservation zoning!) Many suburban residential developments in Paxton Creek have up to 35% impervious surface as allowed by ordinances. Problems with the roads, roofs, driveways, and parking lots really add up.

Projects to Fix, Enhance and Protect

Preferences for Flood Mitigation

Major Paxton Creek flooding occurs mainly in two places: the vicinity of the Farm Show Building, and along Cameron Street south of I-83 around Shanois Street. It has two different causes. The Farm Show situation is from upstream waters released from Wildwood Lake, and made worse by confluence with runoff from Asylum Run drainage. The lower floodwaters are from the Susquehanna River, backing into Paxton Creek to inundate south Harrisburg, the old steel mill lands, and Shipoke. Various schemes for remedying the situations call for millions spent on lower creek vitialization and levees. PCWEA favors different approaches for the two locations:

- ☑ Abandon development of the southern floodplain, acquire FEMA relief funds (up to 8% allowed) to clear the remaining buildings west of S. Cameron Street, and use the lands for open space, recreation, trails, and related functions.
- ☑ Solve the upper problem through offsite actions. Clear a clogged channel that is directing most Paxton Creek drainage southward from Wildwood Lake, so some flows can go northward. Install sediment forebays in the creek near Route 322 before waters cross into Wildwood Lake. Run the waters through a split water control structure that allows waters to go north and south; the latter are needed to supply the recreational programs involving Olewine Nature Center and the marsh boardwalks. During storm events raise the walls of the Morning Glory drain (original drain design that has fallen into disrepair), and lower the walls afterwards.
- ☑ Construct extensive impervious cover retrofit and bioretention facilities on upstream reaches in Asylum Run, to reduce stormwater runoff. Consider stormwater storage ponds, where appropriate, as in subwatersheds severely impaired with 20-30% IC; initial inspections show several potential sites exist in Paxton Creek North and Asylum Run subwatersheds.

Additional issues remain (maintenance responsibilities of the sediment forebays and flow control structures, potential contaminants in the clogged soils and their disposal, disruption of American Lotus–a threatened species, and disturbance of recreation programs).

Paxton Creek North Projects

Upper and Lower Paxton Creek North (PCN) subwatersheds have many of the launch and ranked projects. Of over four dozen projects identified for PCN (Figure 6.4), 10 are among those chosen for initial RCP implementation. These priority projects concern a township park, residential developments, offices, golf center, State Police facility, headwater farms, businesses, and an interstate highway. Although these PCN projects for protection, rehabilitation, and enhancement deal mainly with bioretention, stormwater retrofit, and creek rehabilitation, they address most of the PCN subwatershed objectives: additional outdoor recreation opportunities, creek corridor and upland reforestation, creek reaches rehabilitation, stormwater runoff reduction, and education on pollution avoidance and abatement.

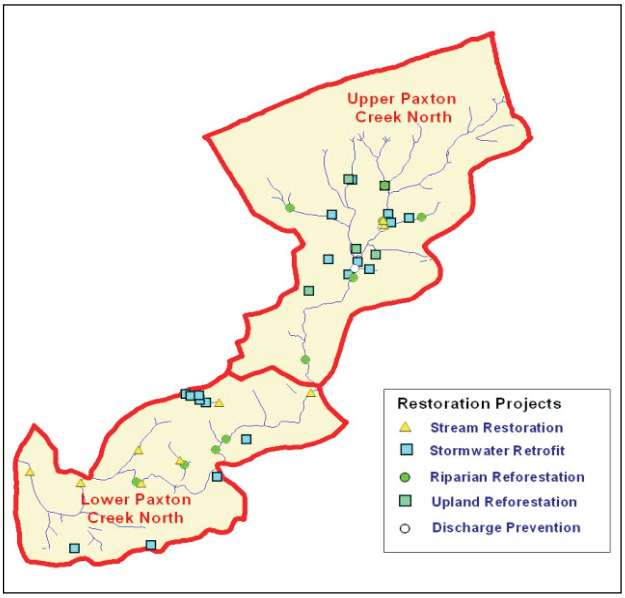


Figure 6.4 Projects in Paxton Creek North Subwatersheds