

Stretch Scoring and Narratives

This attachment contains a lengthy, detailed narrative covering each stretch in each subwatershed. Elements of the narrative include:

- Description of the stretch
- Scoring of the stretch and any changes in scoring resulting from rehabilitation efforts
- Impacts of any issues identified in the stretch
- Recommendations resulting from Steering Committee discussions
- Updates of any work that is ongoing or has been completed at location within the stretch

As changes are made in the watershed, details are added to this section. Text from each stretch is used for publishing stretch information on the website as well.

Arcadia Creek Stretch Scoring and Updates

Six of the 16 numbered stretches identified in Arcadia Creek fell into the 0-15 category. Overall, periodic flood damage near the West Main Street/Elm Street intersection (Stuart Neighborhood) provides incentive for upland approaches that reduce storm water volumes reaching this pinch point.

Arcadia Creek Stretch #1 (no score; no flow detected)

Updates

None

Arcadia Creek Stretch #2 (24.5 points)

Description

A high score resulted for this stretch due to the existing pond, southeast of the Michigan Avenue/Drake Road intersection, containing emergent vegetation, a wooded riparian edge on its south shore, herbaceous vegetation on the north shore, a connection to the floodplain and very few storm water outlets. This property is owned by the City of Kalamazoo. An existing stop board control structure (a board placed across a limited size opening to allow water levels to rise behind it) exists at the east end of the pond.

Impacts

The surrounding general area, especially along Michigan Avenue, continues to undergo increased development with more growth expected in the future.

Recommendations

- Investigate, through the City of Kalamazoo, the addition of another stop board (8") for an increased storm water storage capacity of 2.5 acre-feet.
- Maintain/improve the general vegetative character of the corridor as it now exists and prevent future degradation.
- All future developments in this area and upstream should be required to manage all storm water by on-site treatment.
- Consideration might also be given to the elimination of invasives and restoration of native species in the corridor.

Updates 2004-2005

The pond receives an estimated 374 acre-feet of storm water annually from direct drainage.

Arcadia Creek Stretch #3 (9 points)

Description

Stretch #3 borders the north side of the Meadow View Mobile Home Park. The community was built on fill material on at a substantially higher elevation than the creek banks. A steep hill covered with scrub vegetation and impacted by large amounts of litter forms the creek's southern riparian area. The creek's northern bank consists of gravel and rock, with little vegetation, supporting railroad tracks. The creek is very channelized in this stretch and has minimal native vegetative cover.

Impacts

Steering Committee discussions focused on the existing negatively impacted and narrow character of this stretch, which seems unlikely to provide a return on implementation funds. The railroad bed and tracks on the north side drop sharply off along a bare slope to the surface of the stream, approximately 3-4 feet wide at the widest. It is believed that the bare slopes are maintained by railroad spraying of herbicides and cutting of vegetation. This transitions immediately to a very steep embankment on the other side with what appears to be limited scrub vegetation and excessive amounts of litter.

Recommendations

Address education and policy concerns rather than structural improvements by:

- Establishing contact with the Southern Pacific Railroad (WMU and/or City of Kalamazoo) to discuss the relationship between the railroad right-of-way, Arcadia Creek, their maintenance plans and any possible future railroad plans for affected properties,
- Using City of Kalamazoo Public Works staff to work with the Meadow View Mobile Home Park to elicit stewardship of the steep embankment by maintaining vegetative

buffers and reducing litter input (enforce that no trash be thrown into the stream or onto the embankment if necessary),

- Bringing a representative of the USDA Plant Materials Center to this and adjacent sites for recommendations of vegetation that might become established, and
- Establishing an Adopt-A-Creek group and periodically conducting trash clean-ups of this reach.

Updates

Erosion from this bank was estimated to contribute 19 tons of TSS to the stream annually. Storm sewer drainage contributes approximately 109 acre-feet of runoff annually.

Arcadia Creek Stretch #4 (12.5 points)

Description

Included in this segment is a transition area, from the east end of the Meadow View Mobile Home Park to an area of wetlands leading up to the City of Kalamazoo Well Field #12. Moving to the east, less debris was accompanied by an increase in aquatic vegetation and a flattening of the southern bank.

Impacts

Many of the physical/biological conditions (steep banks with little to no vegetation) continue from Stretch #3 to the east, which prompted similar educational approaches as those already suggested. However, there no outfalls contributing storm water directly to the creek in this stretch.

Recommendations

An effort to expand the floodplain area and increase both off-line flood storage capacity and the variety and amount of native species in the area is recommended. This could be accomplished by lowering the entire berm along the riparian areas of this stretch [and continuing eastward into the City of Kalamazoo Well Field (Stretch 5)]. Such action would allow for increased levels of storm water (in the 5 -10+ year storm event range) to overflow the dividing berm and enter the wetland area on the south side of the berm. This would not only relieve some downstream storm water pressure but also expand wetlands. Impact on the well field needs to be avoided by this action. Partners for this effort could include Hinman Development Corporation (the property owner), the City of Kalamazoo and WildOnes Native Landscapers.

Updates

Proposed development plans of the portion of the stretch adjoining the north side of Stadium Drive which called for filling of riparian wetlands were halted in 2003.

This site is undeveloped and the upland areas are being filled to match the grade of Stadium Drive and entice commercial development.

Arcadia Creek Stretch #5 (23 points)

Description

The City of Kalamazoo Well Field #12 comprises this segment and includes a mostly naturalized area of shrub wetlands and a small, open water pond.

Impacts

This stretch represents a fairly naturalized area. However, erosion problems from the adjacent embankment of the Stretch #4 parcel are creating an alluvial deposition area (sediments that have run off from a narrow source, tapered away and spread into a fan-shaped area) where invasive plants are dominant.

Recommendations

- Preservation and improvement of the character of the vegetation within the parcel. Given City of Kalamazoo ownership, most participants believe this concept does not need to be addressed by any short-term pursued implementation funds.
- Facilitation of an expanded storm water detention area, discussed in Stretch #4 (above),
- Alleviation of erosion problems from the adjacent embankment, and
- Revegetation of the embankment behind the filling station. The existing erosive conditions have been characterized by plan participants as “serious and in need of rapid attention”.

Preventative action(s) must be implemented to prevent further erosion and a repetition of similar problems.

Updates

Storm sewer drainage contributes 113 acre-feet of runoff annually to this stretch.

Arcadia Creek Stretch #6 (28 points)

Description

Stretch #6 continues east from the Kalamazoo Well Field #12 into an herbaceous wetland area owned by Adams Outdoor Advertising. This stretch is undeveloped and contains a billboard structure at its eastern end. It represents a unique, relatively undisturbed open space within the commercial development along Stadium Drive.

Impacts

No immediate impacts were noted. However, future development is a potential threat.

Recommendations

Recommended efforts are directed toward the preservation of this site. Vegetative analysis conducted by members of The WildOnes revealed that the site has “unique floristic character of value to the state”. The Southwest Michigan Land Conservancy is willing to accept and preserve the parcel as is, complete with Adams Outdoor Advertising-owned billboards, which will be allowed to remain if the property transfer takes place. The recommendation is that this be assigned both a short and long-term priority, given the uniqueness of the site and its location along a major gateway corridor into the City of Kalamazoo.

Updates

Storm sewer drainage contributes 99 acre-feet annually to this stretch.

Arcadia Creek Stretch #7 (30 points)

Description

This segment is owned by the Second Reformed Church. Mostly dominated by a shrub and cattail wetland, the Church has created an “Inspiration Walk” through the wetland and leading to the Kalamazoo Christian High School to the north. An educational, as well as spiritual, experience is provided by this path. Voluntary efforts have been discussed to assist the church in the creation of a “wetland park/quiet area” along Inspiration Walk.

Impacts

No immediate impacts were noted. However, future development is a potential threat.

Recommendations

Consideration could be given to the expansion and connection of this walk to Kalamazoo Christian High School as improvements are implemented on that parcel. This stretch serves as a good example of voluntary protection efforts on private property. The lack of public accessibility to this site was noted as a potential detriment to the use of public funds for implementation projects.

Updates

Storm sewer drainage contributes 52 acre-feet annually to this stretch

Arcadia Creek Stretch #8 (14 points)

Description

The Kalamazoo Christian High School property at the northwest corner of Stadium Drive and Howard Street comprises this reach. The creek banks are severely eroded, as they lack riparian vegetation and are impacted by storm water inputs from upstream areas. Positive attributes of this stretch include its:

- proximity to the Second Reformed Church “Inspiration Walk”,
- educational mission, and
- accessible/visible location.

Impacts

- extreme sinuosity of the stream resulting in severe bank erosion (stream cutting) estimated to contribute 152 tons of sediment to the creek annually,
- a turf grass monoculture, and
- maintenance practices that eliminate riparian vegetation.

Recommendations

Participants determined that this site provides a physical opportunity to slightly widen and revegetate the stream course to develop a vegetated floodplain. This will provide for:

- a diversity of native vegetation,
- nutrient uptake,
- increased storm water detention,
- filtration of sediments carried in storm water, and
- a decrease in the speed of wet weather flows.

The educational component will feature an innovative demonstration site, extend and continue the path of the “Inspiration Walk”, create an incentive for the school to maintain and nurture the site and provide a living laboratory for the high school education program. BMP’s will include:

- stream restoration,
- buffer strips,
- infiltration techniques,
- vegetative bank stabilization, and
- wetland restoration techniques.

Updates

It was estimated that 43 acre-feet of runoff is discharged to the creek in this stretch. Streambank TSS loading was estimated at 152 tons/year.

CMI implementation funding was received in 2005 to support a project at this site. Conceptual drawings are available in Attachment 13.

Arcadia Creek Stretch #9 (27.5 points)

Description

At the southeast corner of Howard Street and Stadium Drive, flow from Kalamazoo Christian High School passes under Howard Street to property owned by WMU. The next five stretches are on WMU property. This heavily wooded area is considerably lower in elevation than the surrounding property. From this point, flow travels a short distance to the east before passing under Stadium Drive and emerging on the opposite side of the road.

Impacts

Minimal immediate impacts were noted. However, future development is a potential threat.

Recommendations

This stretch will not likely present an opportunity for the detention of upstream flows. Shading provided by vegetation is a positive attribute. There may be an opportunity to alter the creek substrate to increase oxygenation of the water as it falls. The volume of storm water discharges received at this point from contributing areas needs to be further evaluated. Options for on-site treatment of storm water from the WMU-owned apartments immediately south of the stream will likely be dependent upon the future use of these units, as determined by WMU. WMU has addressed several upland opportunities for detention-type BMP's, to be constructed on the former psychiatric hospital grounds on Oakland Drive, to detain storm water generated there.

Updates

Runoff from Howard Street and surrounding areas amounts to 112 acre-feet annually.

Arcadia Creek Stretch #10 (20 points)

Description

After passing under Stadium Drive and the Amtrak rail line, Arcadia Creek flows eastward through a shrub-vegetated valley between the north side of the Amtrak railroad and the south side of a WMU parking lot before turning again and passing through a culvert back to the south side of Stadium Drive. The creek banks immediately adjacent to the watercourse are relatively flat, but then steeply rise on both sides.

Impacts

This is a fairly narrow stretch with parking lots and railroad tracks in close proximity to the creek. However, the water clarity, flattened banks and riparian vegetation allowed it to score high.

Recommendations

The existing area between Stadium Drive and the railroad tracks could be utilized for the creation of off-line storage (physical capacity to retain elevated flows of water not in a direct line of the creek flow) of wet weather flows. The area surrounding this site may then become suitable for vegetative restoration activities.

Updates

Future impacts may include increased storm water loading from the current 207 acre-feet annually.

Arcadia Creek Stretch #11 (27.5 points)

Description

At the west end of the WMU Power Plant, on the south side of Stadium Drive, a relatively mature wooded and shrubby vegetative area borders the stream.

Impacts

The creek cuts through the area leaving eroded streambanks with fairly deep cuts. Storm sewer drainage estimates for this stretch were combined with those for Stretch #12, both of which are part of the WMU Power Plant.

Recommendations

This stretch may be a candidate for some degree of floodplain restoration and revegetation, which may add storage capacity during wet weather. Consideration has been given to the creation of a similar off-line storm water detention area, as proposed above for Stretch #10, for this and the following reach.

Updates

Sediment losses were estimated at 5.3 tons annually.

Arcadia Creek Stretch #12 (20.5 points) (improved to 23 with addition of no mow zone)

Description

Contiguous with Stretch 11, Stretch 12 continues toward the east, primarily with mowed grass (observed during the 2002 surveys) rather than dense woody vegetation. The maintenance practice of mowing grass up to the edge of the creek had been the norm until June, 2002, when this practice was discontinued to allow vegetation to grow as a buffer strip. There also exists a small ponded area within this segment.

Impacts

Minimal immediate impacts were noted. Future development is not expected to impact this area because it is a part of the WMU Power Plant property.

Recommendations

One favorable option is to widen and broaden the stream channel, creating more of a vegetated floodplain than currently exists. Such action would create additional storage capacity for storm water flows. Potential for additional off-line storage as mentioned in Stretch #11 above may also be possible.

Updates

Past mowing practices contributed to an estimated 17 tons of sediments to enter the creek from erosion annually. Storm sewer contributions for the Power Plant property amount to 70 acre-feet annually.

Arcadia Creek Stretch #13 (19 points) (improved to 23.5 with no mow zone and Goldsworth Valley Pond improvements)

Description

Acadia Creek again passes under Stadium Drive and runs between WMU's Kanley Track and the railroad bed.

Impacts

Creek banks along this area have been mostly mown grass until June, 2002 and may serve as a good site for vegetative restoration and removal of exotic species, including purple loosestrife. Storm water inputs from the WMU Campus also impact this stretch, but have been mitigated in part due to improvements to Goldsworth Valley Pond. These activities included increasing flood storage capacity, removing carp and planting riparian vegetation.

Recommendations

Potential exists for off-line storage between the railroad bed and Stadium Drive along this reach. As a highly visible stretch with sight lines from Kanley Track, Stadium Drive and Waldo

Stadium this would make an ideal educational site. At the end of this segment, storm water from Goldsworth Valley Pond and other WMU storm water drains merge, thereby creating a deficiency in the existing storm sewer infrastructure's capacity to adequately handle storm flows. The off-line detention systems proposed above would be intended to address this situation. It is also expected that additional BMP's will be implemented over time by WMU within the campus grounds to reduce the volume of storm water reaching the storm sewer system.

Updates

Early estimates of sediment reductions due to these recent activities indicated 11.4 tons annually. Without taking the retention capabilities of the pond into account, 391 acre-feet of runoff drain to this stretch annually.

Arcadia Creek Stretch #14 (6.5 points) (score improved to 11 with no mow zone at park)

Description

After emerging from an underground conduit beginning near Kanley Track, the creek flows from Lovell Street to Academy Street between a park and railroad tracks.

Impacts

- Flows enter the area within a large capacity storm drain that discharges into a limited capacity channel.
- Commercial, institutional and open space property, as well as several streets, occupy much of this stretch.
- The channel is relatively straight and eroding in several areas at an estimated rate of 80 tons of sediment annually.
- Proximity of the railroad bed further complicates any improvement options.
- Storm sewer drainage contributes 165 acre-feet of runoff annually.

Recommendations

Kalamazoo College, one of the largest property holders in this reach, has expressed a desire to improve storm water management and the area's aesthetics, as it is the main gateway to the College. In June 2002, a local media announcement indicated that grant funds from the Michigan Department of Transportation have been awarded for "Gateway Improvements" to be made in this area. Coordination of efforts is necessary to ensure that watershed stewardship is included in those plans. Elements considered include:

- creating a small plantings demonstration site in the area,
- restoration of streambanks and vegetation,
- installation of appropriate watershed signage (lots of foot and motor traffic),
- alteration of mowing practices, and

- potentially creating a small floodplain area to create limited, but additional, storm water storage capacity.

Updates

Observations of the stretch during 2004 revealed that riparian vegetation in the park was being allowed to grow. Sediment loading from streambank erosion decreased by an estimated 40 tons annually.

Arcadia Creek Stretch #15 (4.0 points)

Description

In Stretch #15, the creek flows from Academy Street to Elm Street between closely developed properties and the railroad tracks.

Impacts

Urban development, little to no vegetation for infiltration or shade and a major pinch point (storm sewer pipe size is inadequate to handle flows from upstream areas) have resulted in significant rain event related flooding of streets, residences and commercial properties in the vicinity of the Stuart Neighborhood. Floodplain insurance is not available for many properties within this area. Streambanks are rock and/or concrete lined within this relatively straight channel. Urban development has been reversed slightly in the stretch where several residences were razed from land owned by Kalamazoo College. A park setting is planned but the status is unknown as of January 2006.

Recommendations

Short term approaches discussed include:

- Explore residential opportunities in the upland areas to reduce contributing flows to the creek. These could include rain gardens, rain barrels, swales and other methods to retain storm water or to increase infiltration.
- A closer working relationship with the Stuart Area Restoration Association and the City of Kalamazoo must be pursued.
- Educational efforts aimed at individuals living and working in this area regarding their individual and collective storm water impacts and how they might take steps to minimize these are key.

Long term approaches include:

- Some infrastructure remedy, such as replacement of the pinch point with a larger capacity culvert, is likely to be required to address the flooding problem.
- Reduction of flows from upstream areas is believed to be the best approach to reduce flooding impacts.

- Policies requiring on-site handling of storm water for all future developments should also be pursued in an effort to reduce wet weather discharges to the creek.

Updates

Load reductions from a change in imperviousness on this two-acre parcel were estimated at one-half ton of sediment annually. Storm sewers contribute 98 acre-feet of runoff annually.

Arcadia Creek Stretch #16 (5.0 points)

Description

A concrete channel, sedimentation pond at the Arcadia Creek Festival Site and underground conveyance to the Kalamazoo River comprise the last stretch of the creek.

Impacts

Virtually no natural shading exists along this segment. The creek substrate is composed of concrete in the channel and large rocks and accumulated sediments in the pond.

Recommendations

Running through the heart of the Central Business District, there appears to be little opportunity for restoration to more natural conditions with perhaps two exceptions. If WMU develops the properties donated to them (former Gilmore dealership area) there is the potential to manage storm water on site rather than allowing it to discharge directly to the creek.

Favored approaches, which were not incorporated into the development plan, all concerns of interest to the Steering Committee, include:

- the use of pervious paving materials,
- landscaping with native vegetation,
- elimination of a foot bridge over the pond (too easy to throw trash into the water below),
- continued periodic pond maintenance practices,
- buffer strip landscaping around the lowest areas of the sediment pond to discourage waterfowl and reduce maintenance costs,
- creation of no-mow areas, and
- strategically located educational signage and guidelines for festival site users.

Longer term alternatives to storm water management should be sought for the urban core of Downtown Kalamazoo. Roof tops, streets, parking lots and other impervious man-made structures all have significant impacts on the quantity and quality of storm water reaching Arcadia Creek. Viable options must be identified and implemented.

Updates

Eight storm water outfalls contribute 530 acre-feet of runoff to this reach. The Arcadia Creek Festival Place renovation project did not change imperviousness substantially but resulted in a change from parking lot runoff (high in metals from automobiles) to innocuous runoff (from a water quality, but not quantity, perspective). The City of Kalamazoo installed a treatment device at this site.

Axtell Creek Stretch Scoring and Updates

Periodic flood damage at the Crosstown Ponds provides incentive for upland approaches that reduce storm water volumes reaching this area. Five of the six numbered sites scored below twenty.

In general, the Axtell Creek component of the plan calls for:

- protection of the headwaters and wetlands,
- bank reshaping and vegetation restoration along some stretches,
- a slight expansion of the floodplain with created wetlands,
- alteration of current mowing operations (which has been initiated),
- an educational walking tour with signage (which have been installed and improved),
- south pond inlet and outlet localized dredging (small quantity),
- alteration around the south pond perimeter with regrading and revegetation (which as been completed),
- restorative work around the mouth of the creek in conjunction with the redevelopment plans for Upjohn Park, and
- exploration of the need to install a flood gate at or near the mouth.

Axtell Creek has distinct section characteristics: the upper, headwaters reaches are in what technically is termed a lotic (flowing water) condition (stretches 1-4), while the lower reaches are in more of a lentic (standing water) condition (stretches 5-6).

Axtell Creek Stretch #1 (28 points)

Description

A very high score resulted for this stretch, as it is comprised of the City of Kalamazoo Well Field #4, which is protected from development. Wooded wetlands and open water dominate the stretch. Artesian flows and pressure relief flows from city well heads contribute to the base flow of the creek. The area is surrounded by higher elevations with medium-density commercial and residential development. Mapped natural areas, including the Kleinstuck Preserve, are in close proximity to this stretch.

Impacts

The area has considerable invasive plant species present, and should be managed as a unique natural feature in an urban setting. Surface and some bank erosion within the site may be contributing to the need for periodic sediment removal from the culvert under Maple Street which appears to have restricted flow.

Recommendations

It has been recognized as a protection goal of this plan to provide both wetland and wellhead protection for the headwaters from any sources of potential or actual contamination.

Updates

This stretch is currently impacted by two storm water outfalls which contribute 20 acre-feet of runoff annually and drainage from what are thought to be basement drains of nearby buildings.

Axtell Creek Stretch #2 (16 points) (score improved to 19 with plantings, rain garden, signage)

Description

The creek flows along Crosstown Parkway and the Maple Street School ball fields from Maple Street to Howard Street in Stretch #2. A rain garden was constructed at the Maple Street School and captures runoff from 23,000 square feet of roof area. This has resulted in a 0.1-ton reduction of sediment loading to the creek annually.

Impacts

The original channel has been altered as evident by old aerial photographs and the current 90-degree bend at the corner of Crosstown Parkway and Maple Street. Virtually no natural meanders remain in this reach. Close proximity of the channel to Crosstown Parkway, in this and the remaining stretches, allows litter, debris, oils and soils to enter the watercourse. The area has limited riparian vegetation, which has been slightly impacted by fence reconstruction operations at Maple Street School. Slight bank erosion (estimated at 0.02 tons of sediment annually), slow flow rates and natural vegetative decay have contributed sediment and nutrients that, over time, created an organic-rich, thick substrate with little cobble or gravel. However, fish have been observed in this stretch. Storm sewer drainage contributes 210 acre-feet annually.

Recommendations

It was recommended that the stream course be restored to a moderate, natural meander and include a created wetlands component from the middle area of the reach to Howard Street. A portion of the ball field near the creek has always caused a maintenance problem because it is usually wet. The proposed created wetland, restorative plantings and educational features are welcome additions from the perspectives expressed by the school principal, facilities manager and the superintendent. Predominantly native vegetation, suitable to these conditions, should be used as planting materials. The City of Kalamazoo could restore some of this vegetation in the street right-of-way areas, especially the northwest corner of Howard Street and Crosstown Parkway.

Updates

The Maple Street School football fence was rebuilt allowing exclusion of a wetland area from the playing fields and mowed areas. The wetland area is being allowed to return to a natural state by the seed stock remaining in the soils. The fence line was also moved back from the stream corridor. Native vegetation was planted and exotic plants were removed in a

collaborative project between the Wild Ones and the Maple School. Education signage was installed in this Stretch and continues to the mouth of the creek. The Axtell Creek Improvement Committee addresses sign upkeep and maintenance.

Conceptual Plans for discussion were drafted and reviewed by the Steering Committee but not selected for implementation (Attachment 13).

The Girls Scouts of Southwest Michigan have recently begun development on an adjacent property (on the east side of Crosstown Parkway and south of Maple Street), which is proposed to be utilized for their new building and interpretive areas. Collaboration with their activities in order to maintain and/or enhance all possible local green space is underway with grant support from the Kalamazoo Community Foundation. Kieser & Associates have reviewed their site plans and familiarized them with ongoing activities in the watershed and opportunities to improve existing resources for educational programs of interest to the scouts.

Axtell Creek Stretch #3 (11 points) (score improved to 17 with riparian vegetation)

Description

Passing under Howard Street, the creek flows northeast along the west side of Crosstown Parkway. This area is visible daily to pedestrian and vehicular traffic.

Impacts

Baseline 2002 landscaping practices along this stretch (mowing/trimming vegetation to the creek edge) did not allow any riparian vegetation to become established and for bank erosion to contribute an estimated sediment load of 5.4 tons annually. Storm sewer drainage contributes 102 acre-feet of runoff annually.

Recommendations

Most riparian landowners in this stretch are willing to institute changes. Creation of an expanded floodplain from the law offices (Howard Street) to Paris Cleaners, even though relatively small in size, could become part of these restoration efforts.

Updates

Signage for a walking tour was added to this stretch, as mentioned in the previous stretch. The WildOnes established a native, riparian garden on the Beneficial *et al* law office property. The City of Kalamazoo established a no-mow zone along the creek, which alleviated erosion problems. Surveys in 2004 quantified streambank sediment loading reductions at 4.8 tons annually. Additional native plantings have been added to this area.

City of Kalamazoo representatives meet periodically with subwatershed stakeholders to discuss an overall strategy for this segment and options for landowner and stakeholder participation.

Axtell Creek Stretch #4 (17 points)

Description

Stretch #4 consists of a small section along a paved parking area behind Paris Cleaners and an office building. Axtell Creek Park is located on the opposite bank. The creek flows under Westledge Avenue and along the National City Bank drive-thru. A narrow strip of wooded vegetation shades the water and provides some habitat.

Impacts

The bank drive-thru/parking lot is on the verge of collapse due to the south creek bank eroding and undercutting this section.

Recommendations

Planting of understory vegetation and a diversion of parking lot storm water to detention areas (if space allows) may alleviate this situation. Infiltration swales and the elimination of “sluices” are recommended. Owners of the Paris Cleaners will need to be willing to address the recommended alterations. Upland educational efforts within the residential neighborhoods that contribute flow to these points will be undertaken to reduce the volume of storm water flowing to the creek. Areas suitable for grassed swales and other physical BMP’s will continue through cooperative efforts between the committee, the city and the neighborhood.

Updates

Storm sewers contribute 33 acre-feet of runoff annually. Parking areas in riparian areas allow overland flow to contribute storm water directly to the creek, accelerating erosion, which is estimated to contribute 13.8 tons of sediment to the creek annually.

Streambank revegetation and plantings were undertaken by WildOnes volunteers in this area during 2005 but details are unknown at this time.

Axtell Creek Stretch #5 (1 point) (score improved to 4.5 with South Pond improvements)

Description

Stretch #5 encompasses the channel along the National City parking lot downstream of a small bridge and the Crosstown Ponds. The riparian areas are mowed.

Impacts

Severe erosion and development issues plague this stretch. The lot is oversized for its current use based upon multiple observations of vehicles in the lot throughout different seasons and different times of the day. The north bank of the watercourse is similarly impacted.

The banks of the south pond (most upstream of the three Crosstown Ponds) were severely eroded, as no vegetative buffer existed. Bank erosion from small but frequent fluctuating water levels, large storm water inputs (384 acre-feet per year) and excessive waterfowl populations contributed high nutrient loads to this pond. Baseline 2002 sediment loading from the pond banks and upstream stream banks were estimated at 20.5 tons annually. Sediment retention capacity and limited storm water detention do still exist. (The south pond is shallow compared to the other two.) The city, as part of its current storm water infrastructure evaluation program expects to verify that sediments need to be dredged from the inlet and outlet of the pond.

Recommendations

The recommendation is to work with National City Bank (property owner) and evaluate if there may be a desire and room for cutting back the lot and installing vegetated detention swales and vegetative buffers.

An extremely visible area, the park is surrounded by major thoroughfares and consistently high traffic volumes. The land use surrounding the ponds is a mixture of commercial, residential and park land. Recreational use of the park land is limited by excessive amounts of waterfowl droppings and, probably, degraded aesthetics. Restoration of the habitat quality of the area is expected to reduce waterfowl use, enhance aesthetics and increase the recreational value. Use of the area by the public and its visibility to traffic makes it an excellent candidate for urban watershed stewardship education. Additionally, as a gateway to the southern neighborhoods of Downtown Kalamazoo, it should serve as a showcase of the city's commitment to economic and environmental harmony.

The plan targets the south pond initially and leaves the other two ponds for future considerations. Other recommended steps include:

- dredging the inlet and outlet of the south pond,
- installing a sediment trap at the inlet, and
- keeping one or two areas at the pond's water edge accessible to the public.

Additionally targeted are:

- a long-term recommendation to construct two simple elevated or floating structures for low impact public access to the water,
- restrictions of nuisance waterfowl,
- installation of signs as part of a community education effort,
- turning the park into a key demonstration site, and
- the development of a maintenance plan to routinely remove litter from all outlets, especially the outlet of the third pond, where it accumulates.

Periodic flooding in this area is associated with backflowing of water from Portage Creek, storm water contributions from 266 acres of drainage and the limited infiltration capacity of the three ponds and surrounding areas.

Updates

Bank reshaping and planting of vegetation occurred on the South Pond in 2004. Pollutant load reductions from streambank erosion are estimated at 7.6 tons of sediment annually.

Following the release of a study of the ponds by Conestoga-Rovers & Associates (June 2002), and participation in this watershed management planning process, the city is moving forward with budget recommendations for the implementation of improvements, including additional BMP's in the area. These improvements began with a change in mowing operations to create a 5-10 foot wide "no-mow" zone around the banks of the south pond in June 2002. In 2004, the banks were reshaped and native vegetation was planted. These efforts (native plantings and removal of exotic vegetation) should continue until a healthy buffer is established.

Draft conceptual plans were created to consider a restoration effort in this stretch but not adopted for implementation (Attachment 13). The Steering Committee plans to consider this site for potential restoration during 2006-2008.

Axtell Creek Stretch #6 (12 points)

Description

Axtell Creek is piped underground for a considerable distance from the outlet of the third pond to the intersection of John Street and Crosstown Parkway. The watercourse then flows behind a City of Kalamazoo property to its convergence with Portage Creek at Upjohn Park. A narrow strip of mature trees lines the banks with some scrub vegetation as understory.

Impacts

Severe erosion was noted at the culvert where the creek emerges. Water clarity is poor, as this stretch appears to receive considerable nutrient and sediment loading from impervious land uses that dominate the drainage area. Flow is relatively stagnant during dry weather periods. During large storm events, flows from Portage Creek back up into Axtell Creek, causing flooding, which extends to the Crosstown Ponds.

Recommendations

Addressing storm water inputs and imperviousness in the lower reaches of Portage Creek and in the highly urbanized areas of the Axtell Creek Subwatershed is a priority. The area along the southeast corner of the convergence of the two creeks is proposed for a "Nature Study Area" by the City of Kalamazoo, as a part of the UpJohn Park Master Plan. Recommendations are to:

- repair erosion around the culvert at the beginning of the stretch,
- alter mowing practices,
- divert parking lot runoff to the created wetland and/or use permeable paving materials at the adjacent city property along Crosstown Parkway,

- explore potential for opening channel sections that are now piped (One alternative is to consider leaving channel bottom exposed and closing sides and top only.),
- study the feasibility of installing one or a series of flood control structures (one or two on Portage Creek upstream from Axtell and one on Axtell near the mouth), and
- shape and stabilize the banks with native vegetation as part of the Upjohn Park renovation.

Updates

Storm sewer drainage contributes 66 acre-feet of runoff annually. Sediment loading from eroding streambanks along the stretch was estimated at 5.5 tons annually.

The City of Kalamazoo reportedly received matching funds for restoration at Upjohn Park but details are unknown at this time.

Portage Creek Stretch Scoring and Updates

Overall, efforts are directed to protect areas scoring high and to implement actions that will raise future scores of those areas that scored lower. Lower scored stretches tend to contribute greater loads of nutrients and sediments to the creek. Participants agreed that allowing degradation of the beneficial aspects of a high scoring stretch and then attempting restoration of those stretches would be extremely costly. Rather, maintaining all high quality stretches will provide the community with the best return on any investments made.

Discussions focused not only upon these stream corridor conditions, but also on non-contributing areas and any upland opportunities that would reduce direct storm water contributions to the creek. With Portage Creek flowing through three municipalities (Texas Township and the Cities of Portage and Kalamazoo) communication and coordination of efforts for implementation of selected actions will be a significant requirement for success.

Scoring revealed a general trend of higher scores within the upper reaches and lower scores toward the middle sections and mouth, e.g., in the South Westnedge Avenue Commercial Corridor, at Milham Park and in Downtown Kalamazoo. Ten of the eighteen stretches scored sixteen or lower. Low scores were primarily due to litter, erosion and a close proximity of development (resulting in little or no riparian zone). Stretches with higher scores include parks and areas isolated from current development. Other noted impairments include flooding due to large storm water inputs near Upjohn Park in Downtown Kalamazoo and sediment contamination from PCBs at the Bryant Mill Pond and the former Portage Paper plant.

Portage Creek Stretch #1 (30 points)

Description

This protected stretch runs through portions of the Gourdneck State Game Area. The maximum score possible was achieved for this stretch due to low development impacts, an isolated nature, undisturbed riparian vegetation and protected lands within the Game Area.

Impacts

TP measurements were elevated at Angling Road during some wet weather sampling events. This is expected as higher flows can flush sediments and nutrients out of the wetland area upstream.

Recommendations

Future land use planning should continue to protect these properties, restrict development in the floodplain and require on-site storm water retention for new developments.

Updates

None

Portage Creek Stretch #2 (16 points)*Description*

Portage Creek flows along the southern border of the Oakland Hills Golf Course, under Oakland Drive and past residential properties.

Impacts

All riparian vegetation has been removed along the north bank, while the southern bank remains relatively undisturbed. Stream sediment quality is poor, having a high organic content. Nutrient loading is expected to be from golf course runoff. Trash debris and litter enters the creek from Oakland Drive traffic.

Recommendations

Reestablish riparian buffers, remove sediment from the Oakland Drive culvert and potentially change the greenscaping practices at the golf course.

Updates

Sediment loading from streambank erosion is estimated to reach 8.9 tons annually.

Conceptual plans have been drafted for a project in the area but was not pursued (Appendix 13).

Portage Creek Stretches #3, 4 (average score: 25.5 points)*Description*

Portage Creek flows along the south side of Dogwood Trail, a residential road off Centre Avenue. A large wetland, which does not appear to have a surface connection to the creek, is located on both sides of Oakland Drive, south of Centre Avenue. In the evaluation the watercourse was split into two stretches due to slight changes in residential landscaping practices from the west end to the east end of Dogwood Trail; yards were closer to the creek at the east end. However, both stretches will be summarized together in the following discussion.

Impacts

As in Stretch #2, the southern bank of the creek contains mature deciduous vegetation and is relatively undisturbed. The northern bank near the west end of Dogwood Trail contains wooded vegetation, as homes were not constructed close to the water (at least not by current water level conditions). The east end tends to have more open lawn character, and hence less shading.

Recommendations

- riparian homeowner education on creek stewardship,
- preservation of the wetland along Oakland Drive, and
- continued use of land use planning to restrict storm water discharges from new developments to the creek.

Updates

None

Portage Creek Stretch #5 (15 points)

Description

Stretch #5 begins at the end of Dogwood Trail and ends upstream of the City of Portage Police Station. Herbaceous wetland areas were noted to the south of Centre Avenue, and wooded riparian areas adjoined the creek to the north of Centre Avenue. The creek flows through a residential yard on the south side of Centre Avenue, where it is channelized and the banks are mown.

Impacts

- a large site of erosion (gully) on the downstream side of the Centre Avenue culvert,
- steep banks downstream of Centre Avenue,
- channelized conditions, small ponds with high algal contents and lack of riparian vegetation in a residential property on Centre Avenue. Sediment loading from streambank erosion is estimated to contribute 8.5 tons annually.
- developments in close proximity to the watercourse and
- litter inputs from Centre Avenue.

Recommendations

- structural erosion control at the Centre Avenue culvert,
- enhanced management of storm water (reduce runoff) from commercial properties along the creek,
- riparian owner education and
- ordinances protecting existing and planted riparian vegetation (buffer strips).

Updates

None

Portage Creek Stretch #6 (25 points)

Description

Portage Creek flows along the west border of the City of Portage Police Station and band shell before entering a culvert under South Westnedge Avenue. The lower half of the stretch underwent a trout restoration project approximately five years ago (1997-1999). Flow was increased by deepening and narrowing the channel. Riffles were created through the addition of rocks and a cobble substrate. Undercuts were created and stabilized to enhance trout habitat. A sand trap was also installed, but it is not known whether the trap is periodically cleaned. Large mature trees and shrubs overhang the stream, providing shade and keeping the water cool.

Impacts

The upper half of this stretch runs adjacent to a mowed lawn, exhibiting erosive conditions. Erosion was also occurring from the back of the band shell, but has been repaired since the 2002 surveys. However, a long gully near the lower end of the stretch is estimated to contribute 7.5 tons of sediment annually.

Recommendations

This positive attribute of the creek should be protected, extended and utilized for education. The erosion from the gully should be repaired and planted with native vegetation.

Updates

None

Portage Creek Stretch #7 (11 points) (score improved to 26 due to STEP project)

Description

Portage Creek flows under South Westnedge Avenue and continues in a northeasterly direction behind several commercial developments.

Impacts

As of 2002, this was the lowest scoring stretch thus far, and deviated from the expected trend of the lowest scores being at the downstream end. The creek was severely impacted by extremely close development on both banks. The heavily impervious immediate watershed of this stretch is composed of portions of the South Westnedge Avenue Commercial Corridor. Significant litter inputs and erosion (37 tons of sediment from streambanks) impacted the stream in this stretch. There was virtually no riparian buffer zone and no empty land for elevated flows to enter a floodplain. Heaviest impacts were observed at the South Westnedge Avenue culvert, where the parking lot and building from the properties on the west and east sides of the creek, respectively, were very close to falling into the water. Moving downstream, the banks flattened

slightly, and development was located further from the water's edge. However, vegetation was sparse, litter could be found spilling out of trash receptacles and moving toward the water and eroding bank conditions are present.

Updates

This stretch was recently developed for a storm water treatment system, referred to as Stormwater Treatment Enhancement Project or STEP, for South Westnedge Avenue runoff. The commercial buildings were razed, environmental issues were addressed, and the streambanks were reshaped. It is expected that the erosive conditions noted in 2002 were corrected. The project is expected to reduce sediment loading from runoff by 11 tons annually.

Portage Creek Stretch #8 (23 points) (change to 24 by Consolidated Drain project)

Description

Development moves back, away from the creek banks, in this stretch with the exception of an office suite at Garden Lane, where the banks are mown. Railroad tracks lie in close proximity to the east bank of the creek. The Consolidated Drain was recently reconstructed into a multi-stage, biological, storm water treatment system. With its paved trails, educational stations and rest stops, it is part of the City of Portage Trailways complex. It is expected to reduce sediment loading from storm water to the creek by 40 tons annually. Both treated water from this system and untreated storm water (and groundwater baseflow) from the Schuring Drain, converge with Portage Creek at Garden Lane. The now-protected land use in the area makes it unlikely that future development will be located close to the creek. Additionally, the stretch is located just upstream of the City of Portage Bicentennial Park trail.

Impacts

Pollutant loading from the Schuring Drain during wet weather events creates pollutant, as well as physical, impairments to Portage Creek. Vermiculite and marl have been observed flowing from the Schuring Drain to Portage Creek during wet weather events. Additionally, a lack of trees along this stretch contributes to water temperature increases during the summer months. One of the creek's designated uses is a cold-water fishery, and trout are stocked upstream of this stretch.

Recommendations

- promote the accessible educational aspects as a demonstration project to the community,
- extend preservation and restoration techniques (stream bottom and buffer vegetation) upstream to this stretch,
- maintain and enhance as a cold water habitat,
- better manage runoff from greenhouse operations on Garden Lane and along the Schuring Drain, and
- reduce sediment and nutrient loading from the Schuring Drain to Portage Creek.

Updates

None

Portage Creek Stretch #9 (28 points)*Description*

The City of Portage Bicentennial Park trail parallels the west bank of Portage Creek from the Celery Flats (Garden Lane area) to Kilgore Road. It allows low-impact recreational access to the creek. The trail is separated from the water by herbaceous and wooded wetland areas in many areas. Boardwalks and observation decks provide access to the water. Near Romence Road and the Celery Flats, the trail runs close to the water, but a riparian buffer remains. A canoe livery is located just downstream from the Celery Flats. Large woody debris provides fish and invertebrate habitat and bank protection. The east bank of the creek is bordered by commercial properties along Lovers Lane. However, most of these properties are separated from the creek by wetland areas.

Impacts

Some exotic species, such as purple loosestrife, have been observed. A cooling water discharge from the Pharmacia property on Romence Road is the only permitted NPDES discharge in the watershed. The primary historic contribution to the creek from this discharge is elevated water temperature, but the current impact is unknown.

Recommendations

The Bicentennial Park trail presents a good model of riparian protection within a largely commercial zone. The area is and should be promoted as a positive example of watershed stewardship. The relatively isolated, natural recreational experience that is created for users of the trail, along with a refuge for wildlife, should be preserved and enhanced. Invasive vegetation management and planting of appropriate native species is recommended. Land use planning efforts should ensure that any development along the east bank (along Lovers Lane) allows the riparian buffer to remain. (An office development at Milham Road has already been located more closely to the creek banks than might be recommended for future developments.) Since this stretch is used for navigation and recreation, both upstream activities and those within this reach should not conflict with such uses. It is noted that an extension of these activities further downstream has been proposed. Therefore, no actions taken within this stretch should conflict with such future downstream uses.

Updates

None

Portage Creek Stretch #10 (10 points)

Description

Portage Creek flows from the City of Portage into the City of Kalamazoo at Kilgore Road and under Lovers Lane twice. A horseshoe shape is formed as the stream flows through the City of Kalamazoo's Milham Park. This historical park is a well-known, well-used feature of the city and is considered a significant amenity by multiple generations in the community. The park represents a publicly owned site with a lower score, sandwiched by two high scoring, preserved stretches: Bicentennial Park trail and Blanche Hull Preserve.

Impacts

Milham Park has not been managed with water quality in mind. The southern and eastern areas of the park unnaturally support excessive waterfowl populations, increased by individuals who dump birds in the park and encouraged by visitors who feed them. The relatively steep slopes of the Milham Golf Course, a municipal course, abut eastern and northern portions of the creek. Storm water overland flow, potentially delivering fertilizer runoff, is a concern. The northern and western areas of the park are not as severely trafficked or impacted by visitors, since they have fewer amenities. However, stream banks throughout these areas were found to have very little or no riparian vegetation.

Recommendations

- spot soil testing at both the park and the golf course to encourage the use of low or no-phosphorus fertilizers for lawn maintenance (if not already in effect),
- educational signage located within the park,
- grading of stream banks to eliminate bare soils and erosive conditions,
- restoration with native plantings along park streambanks,
- discourage excessive populations of waterfowl from inhabiting the school and park through visitor education and riparian barriers (vegetative, or structural while vegetation is becoming established), and
- a storm water retention demonstration project to increase infiltration using techniques such as rain gardens and pervious paving approaches at Loy Norrix High School.

Updates

Storm water loading (414 acre-feet/year) contributes to considerable bank erosion (sediment loads of 57 tons annually), at times delivered by overland flow from Loy Norrix High School on the south side of Kilgore Road.

CMI implementation funding was received in 2005 to support a project at this site. Conceptual drawings are available in Attachment 13.

Portage Creek Stretch #11 (24 points)

Description

The West Fork converges with Portage Creek, on the west side of Lovers Lane, in the Blanche Hull Preserve, where habitat quality is high.

Impacts

Impacts in this stretch are from three storm sewer discharges and railroad trestles. The watercourse widens into a ponded area, the Monarch Mill Pond. This is an older impoundment created by a dam to the south of Cork Street. Here, shallow water conditions can be linked to a rise in water temperatures. A wide riparian zone exists on the west side between the water's edge and the railroad tracks. Some residential properties are located in close proximity to the east bank.

Recommendations

As much of the area is preserved, the recommendation is to restrict any additional storm water discharges into this stretch. City of Kalamazoo plans call for a pedestrian trail to be extended from the City of Portage Bicentennial Park through this stretch and further into the downtown area. All construction activities must aim to minimize impacts on the creek and maintain existing native vegetation.

Current development through this reach is considered low density. The pond itself appears to provide good habitat attributes. Management within the stretch should include:

- preservation of buffers and vegetated edges,
- signage along trail when it is developed,
- removal of exotic plant species,
- zoning restrictions on future development in riparian areas,
- restrictions on additional storm water discharges to the creek in this stretch and
- future use of on-site storm water detention/retention, grassed swales or other BMP techniques to improve storm water quality.

Updates

Stormwater discharge contributes 761 acre-feet annually.

Portage Creek Stretch #12 (21 points)

Description

Stretch #12 is comprised of the Allied Paper Operable Unit Superfund Site. The entire block, from Cork Street north to Alcott Street, is fenced due to ongoing remediation.

Impacts

The Portage Creek segment from the Bryant Mill Pond to the Kalamazoo River and the Kalamazoo River itself are listed on the Superfund National Priorities List for PCB contamination in the sediments. These PCBs remain primarily from activities of the paper industry. Although the stretch received a considerably high score for the physical parameters analyzed it is not considered a high quality habitat.

Recommendations

There are no recommendations for this stretch due to its nature as a Superfund site and the approximate \$7 million already spent on clean up and restoration efforts.

Updates

Storm water loading from direct drainage is estimated at 590 acre-feet annually.

Portage Creek Stretch #13 (8 points)

Description

In Stretch #13, Portage Creek flows from Alcott Street, through the former Portage Paper factory, along Reed Court, to Stockbridge Street, primarily through underground culverts and concrete channels.

Impacts

Very little natural character remains in this stretch. The former Portage Paper property is being demolished as part of the City of Kalamazoo's Brownfield Redevelopment program. Contaminants present in the soils could make remediation of a floodplain problematic. The downstream portion of the stretch has urban residential development very close, with Reed Court forming the east bank.

Recommendations

Though this stretch scores very low, there appear to be some opportunities for remediation. Any development on the former Portage Paper property will likely be unable to manage storm water through infiltration, as the soils are contaminated. Recommendations for this stretch include education for those living in the area to foster their stewardship of the creek and investigation of potential storm water detention to be constructed as part of the mill demolition and clean up.

Updates

Storm water loading from direct drainage is estimated at 175 acre-feet annually.

The Performance Paper site on Alcott Street was mostly demolished during 2005. The following paragraph provided by the MDEQ details the general plan for realigning the section of Portage Creek that currently runs through a concrete channel at that site.

The channel is currently quite straight, so length will be added in the form of meanders. The redesigned channel will be 1.2 to 1.5 x the current length. Pre-development, the stream had only small meanders through this area, so large meanders will not be part of the design. A 3:1 slope is proposed for the bank redesign to recreate a floodplain. The goals of the realignment are: to give the creek space, to give the creek form, and to allow for redevelopment of the site. There will likely be some compromises in order to contain the stream both vertically and horizontally to some extent to allow for redevelopment. Also, the path of the stream is also dependent on excavation costs, which remain somewhat unknown. It depends what the consultants find as they complete their site assessments. The design of the stream will recreate a natural stream bed as much as possible. A rubber liner may be necessary if Groundwater/Surface Water Interface pollutant concentrations do not meet DEQ standards. The work is scheduled to take place in 2006.

Portage Creek Stretches #14 and #15 (13.5 average points)

Description

Extending from Stockbridge Street to Crosstown Parkway, this stretch borders the City of Kalamazoo Public Works property and Upjohn Park. Axtell Creek converges with Portage Creek just upstream of Crosstown Parkway. A thin riparian zone of deciduous trees and shrub vegetation shades the watercourse.

Impacts

Banks are largely composed of concrete and fill material. Flooding occurs in this area, as the surrounding land use becomes increasingly urban and impervious with increased storm water volumes discharged to the creek.

Recommendations

Restore floodplain areas on the southwest corner of the convergence of Axtell and Portage Creek. Care should be taken to maintain riparian buffers. Parking areas may be able to be moved back from the creek banks at the City of Kalamazoo property. The City of Kalamazoo is now in the process of exploring:

- storm water handling options for the Stockbridge Street City Works Department property,
- the creation of a wetland between Stockbridge Street and Crosstown Parkway, and
- the redevelopment of Upjohn Park.

A significant obstacle encountered in this area is the high water table. Infiltration and treatment options are severely limited under such conditions. Any future additional storm water flows should be restricted to on-site handling techniques or directed toward retention areas,

possibly south of Upjohn Park. Educational signage could be placed in Upjohn Park along the creek banks as part of the renovation project.

Updates

Streambank sediment loading was estimated to be 84 tons annually. Stormwater volume discharged to the creek was estimated at 192 acre-feet annually.

Portage Creek Stretches #16, #17 and #18 (8.8 average points)

Description

These last three stretches flow from Crosstown Parkway to the creek's convergence with the Kalamazoo River, just north of M43.

Impacts

Banks are largely composed of concrete walls, rock gabions and fill material. Habitat quality is generally poor, with invasive and exotic plant species dominant. Existing development is in very close proximity to the watercourse in some areas. Storm water loading is significant, with several parking areas directing runoff to "sluices" leading directly into the creek.

Recommendations

At the convergence of Portage Creek with the Kalamazoo River, riparian vegetation could be enhanced. The Veterans Memorial Park was recently constructed at this confluence and could serve as a stimulus for further restorative work. The primary recommendation for these stretches is to manage storm water within the watershed by increasing on-site handling capacity and decreasing wet weather loading to the creek. Creation and enhancement of small-scale habitats located on public and private properties is also recommended. This includes native plantings in residential, public and commercial landscaping, as encouraged by the local chapter of the WildOnes Native Landscapers.

Updates

Stormwater loading was estimated to be 865 acre-feet annually.

West Fork Portage Creek Stretch Scoring and Updates

With the West Fork flowing through three municipalities (Texas Township and the Cities of Portage and Kalamazoo) communication and coordination of efforts for implementation of selected actions will be significant for success.

Scoring revealed a general trend of higher scores within the upper reaches of the stream and lower scores toward the mouth, in the commercial South Westnedge Avenue/Kilgore Road area. Only 2 of the stretches scored lower than 15 while 7 of the 10 stretches scored 22 or higher. This was not surprising since the creek runs through primarily protected and undeveloped areas for most of its course. Near its mouth, it flows through the City of Portage South Westnedge Avenue Commercial Corridor and a small portion of urbanized property in the City of Kalamazoo before converging with Portage Creek in the Blanch Hull Preserve.

Within the non-contributing areas, outlying lands in agricultural use were identified as having potential concerns for groundwater impact. Extensive residential development around Eagle and Crooked Lakes potentially impacts the lakes by storm water runoff, bank erosion and potential infiltration from any septic systems that may still be in use.

West Fork Portage Creek Stretch #1 (30 points)

Description

Stretch #1 begins on the east side of 8th Street at Fish Camp Pond and Scouters and Bass Lakes. Most of the land in Stretch #1 falls within the areas of the Rota-Kiwan Boy Scout Reservation and the City of Kalamazoo Al Sabo Well Field Preserve, both relatively protected tracts of woodlands, wetlands and upland fields. The Reservation has a high summer traffic volume from scouters in the weekly Cub and Boy Scout camp sessions. Al Sabo Preserve, open to the public, has many hiking/cycling trails running through the property.

Impacts

Newer residential developments, located west off of 8th Street in Texas Township, were noted to have individual septic systems, rather than a connection to the sanitary sewer system. This is identified as an area for the County Health Department to monitor for future failed septic systems, since this location is at the headwaters, in an otherwise minimally impacted area. Storm water runoff from the Kalamazoo Valley Community College (KVCC) Texas Township Campus was identified as having adverse impacts on the Al Sabo Preserve in the form of bank erosion, sedimentation and storm water loading.

Recommendations

KVCC should consider BMP's for retaining storm water on-site. Infiltration techniques, such as vegetative swales, detention areas, rain gardens and even pervious parking lot materials, can be implemented. It was also recommended that any future developments in the watershed utilize on-site techniques to handle all generated storm water. These upland options will reduce

the storm water volumes reaching the creek and improve the quality of water discharged to the creek.

The Rota-Kiwan Boy Scout Reservation and the Al Sabo Preserve offer demonstration opportunities to implement passive education through self-guided tours and signage. Some erosion is occurring in both parcels. Rota-Kiwan is seeking funds to begin restoration efforts. Overall, the recommendations are for continued protection of the resources including Atwater Mill Pond. Long-term restoration and renovation efforts are directed toward select vegetation and erosion control efforts, where deemed necessary, and the retention of storm water from new developments in the watershed.

Updates

None

West Fork Portage Creek Stretch #2 (25 points)

Description

This segment runs northeasterly under 12th Street, behind residential developments, under Interstate 94 and US-131 and through a series of small lakes to the Parkview Hills Planned Unit Development. The reach is very isolated, flowing within a wooded valley with limited access, between both highways and separated from new development.

Impacts

Several small areas of gully erosion from road and stream crossings and private properties were identified.

Recommendations

Given these conditions, recommendations are more policy oriented, suggesting that both municipalities be cognizant of potential impacts from future land use and mandate on-site storm water handling for all future developments in this area. No sites were selected for specific actions.

Updates

None

West Fork Portage Creek Stretch #3 (22 points)

Description

Parkview Hills, a private planned unit development with protected greenspaces, is the dominant element of this reach. Upstream flows from the West Fork converge with flows

emptying Asylum Lake from the north. This latter branch and surrounding property is owned by WMU. The area around Asylum Lake is designated as a protected area for WMU.

Impacts

Concerns over road runoff during and after the current expansion and reconstruction of Parkview Avenue were expressed to the City of Kalamazoo with the expectation that significant riparian management efforts will be implemented. Potential septic issues from the trailer park on Drake Road were also raised.

Recommendations

In Parkview Hills, protect:

- all wetlands,
- an existing fen,
- a prairie restoration now underway and
- the native integrity of the property by controlling exotic species.

There are protective covenants in place within this development. Management plans have recently been prepared by the Kalamazoo Nature Center and KIESER & ASSOCIATES for Parkview Hills that call for:

- cleaning of catch-basins for road runoff,
- management of invasive species (in progress),
- reduction of sediment accumulation in waters,
- creation of transition zones from water's edge to mowed/paved areas (implement buffer strips),
- structural erosion control methods for the storm water outlet at Cricket Lane and
- erosion control for personal gardens on slopes and hillsides.

Given the private nature of this parcel and the public nature of the Asylum Lake component flowing to it, it is strongly recommended that any and all proposed activities in these areas be openly discussed and mutually agreed upon by both WMU and Parkview Hills. The potential is great for joint educational components that would be beneficial to each and to the community at large.

Education of city staff on erosion control measures should be mandatory for those who will be involved in activities in this vicinity. Continued protection and renovation of the upland areas surrounding the water bodies in this stretch will reduce the magnitude of storm water impacts on the creek and improve the quality of the water reaching the creek.

Updates

None

West Fork Portage Creek Stretch #4 (16.5 points)

Description

This stretch extends from south of Parkview Hills to Oakland Drive. The creek splits into two branches, forms ponds around the Angling Road vicinity and exhibits good emergent vegetation west of Oakland Drive. There are many nice greenspaces within this reach, including the Nature's Way Preschool.

Impacts

Some residential property owners along Angling Road have eliminated the riparian vegetation. The score drops in this stretch due to lack of shading, erosion, number of storm sewer outfalls and lack of riparian vegetation on residential properties.

Recommendations

- educate residential property owners on riparian landscaping practices to protect water quality and habitats,
- utilize appropriate operation and management practices by city road crews to reduce runoff impacts from roadways,
- repair and eliminate soil erosion from around the Angling Road storm water outfalls,
- reduce waterfowl access to stream through vegetative restoration practices,
- continue the effort to eliminate invasives and replace with native species, and
- ensure that educational policies are consistent between the Cities of Kalamazoo and Portage.

Updates

None

West Fork Portage Creek Stretches #5, #6 and #7 (average score of 25.33 points)

Description

These three segments are treated together here due to their similarities in scoring, features and consistencies. Beginning at Oakland Drive the creek flows to the end of Timberlane Road (Stretches #5 and #6), and continues (Stretch #7) along the south of City of Kalamazoo Well Field #9 to De Haan Road. High scores are the result of infiltration available in upland areas, quality in-stream conditions, woodland riparian vegetation in many sections, wetlands and floodplain areas, protected space within the well field and the wellhead protection program.

Impacts

Noted impacts include riparian properties with mowed lawns to the edge of the creek, runoff from I-94 reaching the creek and a pending, large development within the narrow parcel

between the highway and the creek that could create a substantial reduction in floodplain area and existing vegetation that buffers and shades the creek.

Recommendations

- educate riparians on vegetative techniques to protect the water quality in the creek,
- maintain wellhead protection in and around the well field,
- ensure that any development will protect the creek and adjacent property by not eliminating all existing vegetation,
- insist that any new development either treat storm water before it enters the creek, appropriately handle the storm water on-site, or both, and
- only allow future development that maintains the high scores of these stretches.

Updates

None

West Fork Portage Creek Stretch #8 (7 points)

Description

This creek stretch passes through and is affected by one of the increasingly urbanized areas of the City of Portage, as indicated by the low score.

Impacts

Though some natural vegetation remains along portions of the creek, cumulative threats to water quality have begun to mount. Recent commercial developments and their substantial impervious components, including West Fork Crossing Road, Bennigan's Restaurant, Gander Mountain Sports, Hooters Restaurant and Lowes Home Improvement Store, have added to the load contributed by the Meijer's superstore.

Recommendations

- work with Gander Mountain to protect the creek as a usable resource in their back yard (demonstrate fishing gear, etc.) and
- explore the potential for the installation of swales and rain garden-type structures to replace or reduce the reliance upon storm water outlets.

Updates

None

West Fork Portage Creek Stretch #9 (9 points)

Description

The creek flows between a large parking lot and apartment buildings before traveling through residential properties on the north side of Pratt Road. It then crosses under Pratt Road and flows through the Candlewyk Apartments property. One of the positives of this stretch is that a single property owner is responsible for most of the riparian land. The Candlewyk Apartments management maintains an open channel for the creek and does not mow within these confines.

Impacts

There are many invasives among the riparian vegetation at the Candlewyk Apartments property. Along Pratt Road there are riparian management issues that need to be addressed through education. Erosion was noted near the Big Lots parking lot.

Recommendations

The grassed areas of Candlewyk Apartments provide an opportunity for infiltration. Existing erosion problems along parking lots, road crossings and outlets should be addressed in operations and maintenance practices. Assistance may be provided through small grants to help stimulate these actions. Creation of grassed swales, changes in mowing practices and road and parking lot sweeping practices would improve water quality in the creek.

The parking lot in front of Big Lots, on Kilgore Road, presents an additional opportunity, even though the creek here is piped underground. Given the size of the lot and its limited usage, it is recommended that pervious areas for storm water infiltration, rather than direct discharge to the creek, be created.

Updates

None

West Fork Portage Creek Stretch #10 (27 points)

Description

The last stretch of the West Fork of Portage Creek flows through the City of Kalamazoo Blanche Hull Preserve. This former estate has both extensive upland areas for infiltration as well as tracts of wooded uplands, forested wetlands and floodplains. The substrate shows both rock and gravel. All these conditions contribute to the high scoring of this site.

Impacts

Realities of the site also include storm water contributions from both Burdick Street and Kilgore Road, erosion and litter inputs at the Burdick Street culvert and rail road crossings.

Recommendations

Maintain the high quality and character of the parcel and incorporate educational signage. The Portage Bicentennial Trail terminates at this location, where the West Fork merges with Portage Creek. The City of Kalamazoo has plans to continue a similar trail for biking and hiking from this point into the city. As this trail is developed, the physical and biological character of the creek must be considered. Opportunities will exist for education, vegetative restoration and alternative storm water handling techniques. All efforts should enhance the experiences of the users, improve characteristics of the vegetation and protect the creek's water quality.