CHAPTER FIVE
Implementation

5-Year Implementation Plan

This Chapter lists the action items required to implement the recommendations listed in Chapter Four. These items are organized into the following categories within the chapter: Flood Control and Stormwater Infrastructure; Vegetation, Prairies and Wetlands; Stream and Aquatic Resources; and Trails and Recreational Amenities. Each section of the chapter prioritizes and lists action items out over a 5-year period.

PARTNERSHIPS – THE FOUNDATION FOR BUILDING FUTURE SUCCESS

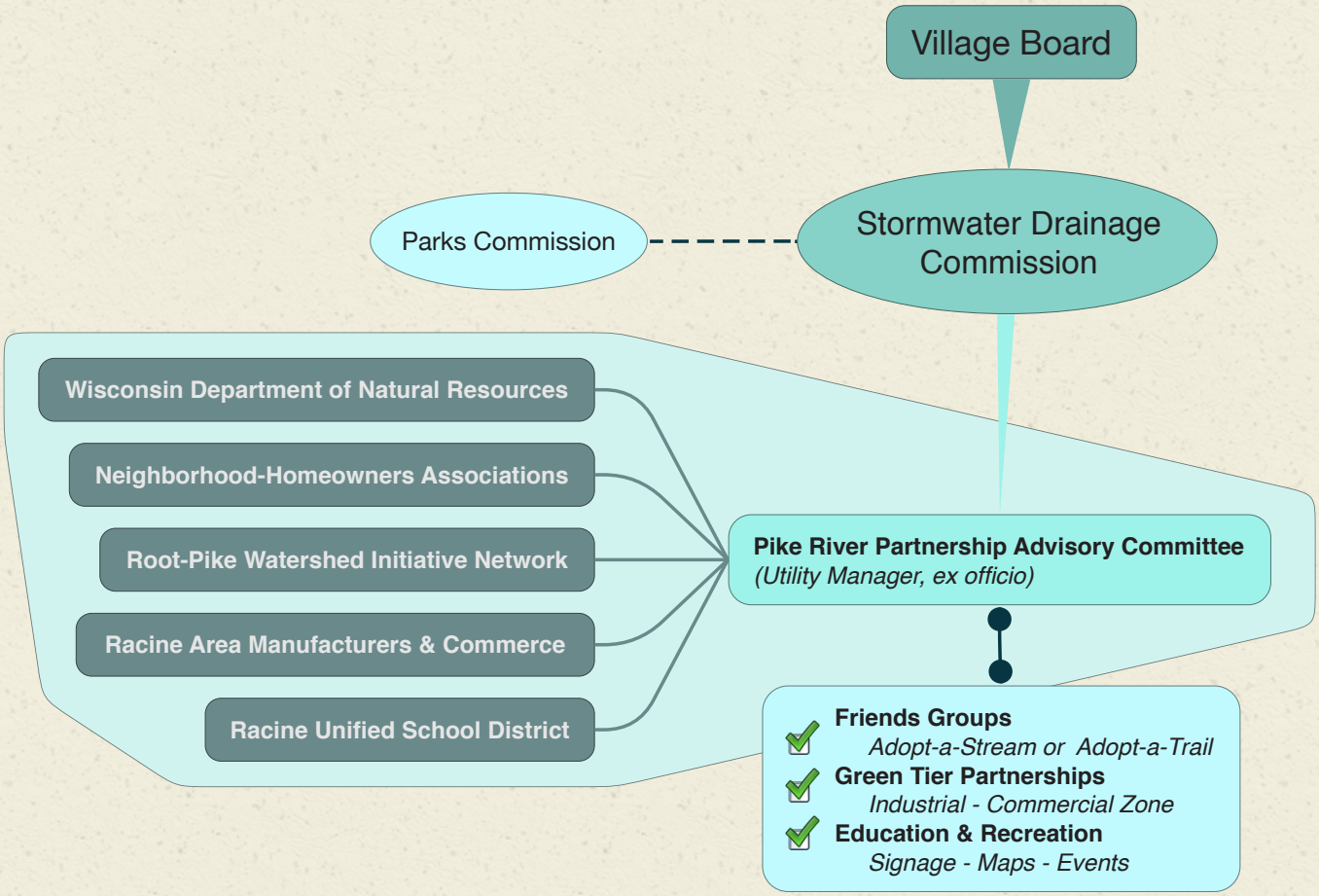
The Pike River Corridor is a complex system of people connecting with water, land, animals, plants, roads, trails, buildings and businesses. At the core of past success and future sustainability are the strong partnerships between the Village government, the Mount Pleasant community and State and Federal Agencies. Since the Plan's inception in 1998, the Wisconsin Department of Natural Resources has worked closely with Village Staff, consultants and elected officials to both leverage resources and provide expertise in design, construction and maintenance. In addition, the Root-Pike Watershed Initiative Network (RPWIN) has become a core partner with the Village in providing outreach and educational assistance throughout the area.

The use of the trails and natural areas in the Corridor will continue to grow. It is important not only that the existing partnerships be maintained and strengthened, but also that new partnerships be developed that expand and deepen the connections between the corridor and the community. These partnerships will provide a forum for continued community input into establishing priorities, as well as leveraging volunteer resources and in-kind support for maintenance activities.

One potential structure would include the formation of a Pike River Partnership Advisory Committee (PRPAC). The PRPAC might exist under the Stormwater Drainage Commission and be coordinated through the Utility Manger. Membership would include representatives from WDNR, neighborhood-homeowners associations, the Root-Pike Watershed Initiatives Network, local business and industry, and the local school district. In addition to providing advice to the Commission, the PRPAC would serve as the conduit for building collaborative networks in the corridor such as friends groups, Green Tier partnerships, as well as educational and recreational initiatives.

On of the first activities to be undertaken by the Pike River Partnership Advisory Committee would be the planning and hosting of the "Ribbon Cutting" for the official opening of the Pike River Corridor Restoration following the completion of Phase 9 in 2017.

Potential Partnership Structure for the Pike River Long-Term Maintenance Plan



Flood Control and Stormwater Infrastructure

The following pages list the proposed activites for stormwater management by year and by phase.

FLOOD CONTROL AND STORMWATER INFRASTRUCTURE

2015 PROPOSED MANAGEMENT ACTIVITIES

Phase 2

- Structure 35 - Channel outfall/ Connecting storm sewer - Clear woody vegetation from in front of the end section.
- Structure 37 - Two-stage outlet structure/ Pond connection to channel - Remove debris from orifice and sump on outlet structure. Clear evergreens from access area to outlet structure. Clear woody vegetation from in front of the end section.
- Structure 45 - Pond connection to channel -Repair end section. May need to cut end of pipe to a point where the ground can support the end section if re-attached, then replace the riprap around the end section and slope. Another option would be to remove end section from the site and stabilize the point discharge area with medium riprap to prevent scour and erosion.

Phase 3

- Structure 52 - Channel outfall/ Connecting storm sewer - Add outfall to illicit discharge inspection list. Remove riprap from end section and place around structure.
- Structure 53 - Channel outfall/ Connecting storm sewer - Remove sediment from within end of pipe and clear away sediment pile in front of pipe.
- Structure 54 - Channel outfall/ Connecting storm sewer - Repair the broken concrete pipe and end section connection.
- Structure 55 - Channel outfall/ Connecting storm sewer - Clean out end of pipe and remove trash.
- Structure 57 - Channel outfall/ Connecting storm sewer - Locate to determine if still functioning.

Phase 4

- Structure 65 - Pond Outfall - Locate outfall to determine if still functioning. Remove inlet protection.
- Structure 66 - Pond Outfall/ Connecting storm sewer -

Place grouted riprap over and along the sides of both end sections for structural support.

Phase 5

- Structure 86 - Channel outfall/ Connecting storm sewer - Remove and dispose of geotextile fabric. Stabilize slopes around and under end section with grouted heavy riprap for structural support. Rebuild energy dissipation pool with heavy riprap.

2016 PROPOSED MANAGEMENT ACTIVITIES

Phase 1

- Structure 12 - Channel outfall/ Ditch drainage - Remove sediment from downstream end section; Remove sediment and clear woody vegetation from within and around the upstream end section.
- Structure 22 - Channel outfall/ Trail crossing - Remove sediment and clear woody vegetation from within and around the upstream and downstream end sections.
- Structure 26 - Pond connection/ Trail crossing - Clear woody vegetation from in front of the upstream end section.
- Structure 28 - Pond connection/ Trail crossing - Clear woody vegetation from in front of the upstream and downstream end sections.
- Structure 29 - Pond connection - Repair erosion over and alongside the west end of the pipe by minor grading, placing topsoil, seed, and erosion mat. Then, monitor weekly until vegetation is established.

Phase 2

- Structure 31 - Channel outfall/ Trail crossing - Remove riprap from inside of end section and replace around structure. Remove debris and clear vegetation growing over the top of the beehive inlet grate.
- Structure 32 - Pond outfall - Remove riprap from inside of end section and place around structure. Clear woody vegetation from in front of end section.

Phase 3

- Structure 59 - Channel outfall/ Connecting storm sewer - Place grouted riprap in the undermined area to stabilize the end section.
- Structure 61 - Culvert Crossing/ Oakes Road - Remove riprap and sediment from within the culvert pipes and place riprap back at the upstream end. Clear vegetation from in front of the upstream and downstream end sections.
- Structure 62 - Channel outfall/ Connecting storm sewer - Remove debris from trash rack. Clear vegetation from within and in front of end section.
- Structure 63 - Channel outfall/ Connecting storm sewer - Remove riprap from inside of pipe. Clear vegetation from in front of end section.

Phase 4

- Structure 68 - Channel outfall/ Connecting storm sewer - Clear vegetation from in front of end section.

Phase 6

- Structure 90 - Channel outfall/ Connecting storm sewer - Add topsoil, seed, and erosion mat to the gullies and associated bare areas.
- Structure 94 - Channel outfall/ Connecting storm sewer - Place grouted riprap in the undermined area for structural support.
- Structure 97 - Channel outfall/ Connecting storm sewer - Place grouted riprap in the undermined area for structural support.

2017 PROPOSED MANAGEMENT ACTIVITIES

Phase 1

- Structure 9 - Channel outfall/ Roadside ditch drainage - Remove sediment and clear vegetation from upstream end of pipe.
- Structure 10 - Bridge Crossing/ Pedestrian - Remove sediment and clear vegetation from within and around box opening.
- Structure 14 - Channel outfall/ Trail crossing - Remove inlet protection.
- Structure 15 - Channel outfall/ Trail crossing - Remove sediment and clear vegetation away from beehive inlet manhole and channel end section.
- Structure 16 - Bridge crossing/ Bartlett Branch - Clear vegetation from within and around box opening.
- Structure 17 - Channel outfall/Trail crossing - Remove sediment and clear vegetation away from beehive inlet manhole and channel end section. Remove inlet protection.
- Structure 18 - Channel outfall/ Trail crossing - Remove sediment and clear vegetation away from beehive inlet manhole and channel end section.
- Structure 20 - Channel outfall/ Trail crossing - Remove sediment and clear vegetation away from beehive inlet manhole and channel end section.

Phase 2

- Structure 40 - Pond outfall - Remove debris from trash rack.
- Structure 43 - Pond outfall with headwall/ Connecting storm sewer - Remove vegetation and debris from the trash racks and pipes.
- Structure 48 - Channel outfall/ Connecting storm sewer - Remove riprap and gravel from within end section and place around structure.

Phase 3

- Structure 49 - Channel outfall/ Connecting storm sewer - Secure trash rack in place. Remove debris from trash rack. Remove riprap from within end section and placE around structure.
- Structure 56 - Channel outfall/ Connecting storm sewer - Remove rocks and other debris from behind trash rack. Place grouted riprap within the undermined area to stabilize end section.
- Structure 60 - Channel outfall/ Connecting storm sewer - Modify the steel fan type grate to fit the standpipe opening or remove and replace with other type of grate.

2018 PROPOSED MANAGEMENT ACTIVITIES

Phase 4

- Structure 70 - Channel outfall/ - Connecting storm sewer - Remove sediment from the 24-inch pipe.
- Structure 78 - Trail crossing - Clear vegetation from within and around both end sections.

2019 PROPOSED MANAGEMENT ACTIVITIES

Phases 1-9

- All structures even if not listed in Appendix X should be monitored every five years and maintained, if needed.

Vegetation, Prairies and Wetlands

The nuts and bolts for how to maintain healthy habitat is that we need to observe what's working and what's not working, try to enhance the first, and control the second.

VEGETATION, PRAIRIES AND WETLANDS

Phases 1-7

The 6-year vegetation management timeline is presented below This timeline summarizes all of the vegetation monitoring and management activities that should be occurring each year by season. As outlined in the timeline and mentioned earlier in this report, each year it is recommended that the ecological contractors and the Commission review the invasive maps and the Adaptive Management Field Worksheet in preparation for the upcoming year's management activities. It will be important to plan enough time to schedule important activities such as prescribed burning, in order to obtain permission from the local fire department, create burn units, get bids and notify surrounding landowners, etc.

The timeline uses the strategies highlighted in the Management Section and outlines the most appropriate season for the tasks to control specific invasives. It will be important to review the timeline the winter of each year in advance of herbiciding activities in order to plan and budget accordingly. Obviously performing the task in a different time frame may be necessary due to budgets or weather, but the proposed time frame is our best judgment.

Spring will be an important window for prescribed burns, mowing and re-seeding. Early summer is ideal for controlling legumes such as crown vetch and birdsfoot trefoil. Mid- late summer is appropriate for invasive species chemical control of reed manna grass, hairy willow herb, cut-leaved teasel and reed canary grass. We have found chemical control of *Phragmites* and reed canary grass effective in early fall (ie: September) when the plant is actively pulling sugar (and the chemical) into it's roots.

Alternating spring and fall burns and mows (as shown on the management timeline) will increase diversity. Spring burns favor native grasses, while fall burns favor prairie forbs and thus alternating the seasons can influence native vegetation diversity.

In 2020, it will be important to revisit this plan and make any needed revisions or updates to the management and monitoring timeline. It is possible that by that time new invasive species

might be present, management needs may have changed, and surrounding land use may have changed. An adaptive, working management plan will be an on-going effort to integrate monitoring data with management tactics.

The following is a comprehensive list of Vegetation Management Activities for the next 5 years. As data is collected during annual monitoring these activities may shift. Optional activities are bolded in the schedule.

2015 PROPOSED MANAGEMENT ACTIVITIES

- Submit cost proposals to Village for invasive control
- Herbicide invasives in pre-construction footprint of Phases 7, 8, 9
- Determine if teasel needs to be treated at fill site on south end of Phase 4, treat teasel in Phase 3 and riverbank Phase 4 (locations mapped)
- Cut/treat stems of woody invasives, prioritized: Phase 3 (urgent), Phase 1, 2, Phase 4 (see Vegetation maps, Chapter 2)
- Herbicide crown vetch/birdsfoot trefoil Phases 5 and 6 in spring
- Mow Phases 2, 3 or weed whip steep slopes
- Prescribed burn, Phase 4
- Herbicide hairy willow herb (Phase 1)
- Herbicide *Phragmites*, and reed manna grass/ reed canary grass hot spots Phases 1-6
- Monitor throughout per plan
- Collect seed, replant bare areas Phase 1 (beaver area), Phase 5 (crown vetch areas)/6 (bare areas on slope/ stream bank)
- Plant oak trees (Argosy foundation) in Phase 4, 6 – possibly grow trees this summer in pots and plant in fall
- Compile Monitoring notes, make recommendations for 2016, Consultants meet with Village to determine priorities
- Tributaries: Remove woody debris/trash at various blocked points (See Tributary Maps in Appendix)
- Management Trails: Determine if additional Management Trails are feasible to facilitate management activities in Phases 2, 3 and 7 (see Vegetation Maps, Chapter 2).

2016 PROPOSED MANAGEMENT ACTIVITIES

- Winter meeting to determine priorities
- Submit cost proposals to Village for invasive control
- Herbicide invasives in post-construction footprint of Phases 7, 8, 9 especially crown vetch and birdsfoot trefoil
- Determine if teasel needs to be treated at fill site on south end of Phase 4, treat teasel in Phase 3 and riverbank Phase 4 (locations mapped)
- Cut/treat stems of woody invasives, prioritized: Phase 3 (urgent), Phase 1, 2, Phase 4 (see Vegetation maps, Chapter 2), determine what was done in 2015, prioritize 2016
- Herbicide crown vetch/birdsfoot trefoil Phases 5 and 6 in spring
- Prescribed burn, Phase 1 and Phase 5 or Mow Phases 1 and 5 and weed whip steep slopes if prescribed burn not possible
- Mow Phase 6, weed whip steep slopes for woody shoots
- Herbicide hairy willow herb (Phase 1)
- Herbicide *Phragmites*, and reed manna grass/ reed canary grass hot spots Phases 1-7
- Monitor throughout per plan
- Collect seed, replant bare areas
- Notify surrounding landowners to not ride ATV's in newly constructed Phases 7-9, place signage on boundaries
- Compile Monitoring notes, make recommendations for 2017, Consultants meet with Village to determine priorities
- Tributaries: Contact landowners in areas that could be protected by riparian buffer strips or work with local agency or non- profit to approach landowners.
- *Phragmites*: Prioritize additional control efforts at *Phragmites* in ponds that empty into Pike River (see Vegetation maps, Chapter 2).
- Woody Plantings: Obtain native trees and shrubs for Phase 7; plant in the fall months.

2017 PROPOSED MANAGEMENT ACTIVITIES

- Winter meeting to determine priorities
- Submit cost proposals to Village for invasive control
- Herbicide invasives in post-construction footprint of Phases 7, 8, 9 especially crown vetch and birdsfoot trefoil - determine in 2016 if additional species are an urgent risk
- Determine if teasel needs to be treated at fill site on south end of Phase 4
- Cut/treat stems of woody invasives, prioritized: Phase 1, 2, Phase 4, Phase 6, determine what was done in 2016, prioritize 2017
- Herbicide crown vetch/birdsfoot trefoil Phases 5 and 6 in spring- determine if more seed necessary in bare areas, seed immediately or in fall
- Mow Phases 6 or weed whip steep slopes if prescribed burn not possible, revisit hot spots Phases 1-4 and mow or weed whip
- Prescribed burn, Phase 6 or Mow Phases 6 and weed whip steep slopes if prescribed burn not possible (for example in 6A, unless mowed in 2016). Include Biex-Ramche Prairie in burn proposal and burn as well or mow.
- Mow Phases 2 and 3 in fall, weed whip steep slopes for woody shoots
- Herbicide hairy willow herb (Phase 1)
- Herbicide *Phragmites*, and reed manna grass/ reed canary grass hot spots Phases 1-7
- Monitor throughout per plan
- Collect seed, replant bare areas
- Monitor ATV damage on all Phases, any other threats, determine actions.
- Compile Monitoring notes, make recommendations for 2017, Consultants meet with Village to determine priorities.
- Tributaries: Follow up- Contact landowners in areas that could be protected by riparian buffer strips or work with local agency or non- profit to approach landowners. Get

Funding, work with stakeholders to buffer tributaries.
- *Phragmites*: Prioritize additional control efforts at *Phragmites* in ponds that empty into Pike River (locations of 2014 stands mapped).
- Woody Plantings: If native trees are available to the Village, determine areas to plant in Phases 1-7 in the fall months.

2018 PROPOSED MANAGEMENT ACTIVITIES

- Winter meeting to determine priorities
- Submit cost proposals to Village for invasive control
- Herbicide invasives in post-construction footprint of Phases 7, 8, 9 especially crown vetch and birdsfoot trefoil - determine in 2017 if additional species are an urgent risk
- Determine if teasel needs to be treated at fill site on south end of Phase 4, treat teasel at any locations Phases 1-7.
- Cut/treat stems of woody invasives, re- prioritize hot spots based on 2017 monitoring. (With aggressive prescribed burn schedule/mowing this will task will lessen and be confined to un burned locations especially near bridges)
- Based on 2017 monitoring, determine strategy for crown vetch/birdsfoot trefoil Phases 1-7
- Mow Phases 6 or weed whip steep slopes if prescribed burn not possible, revisit hot spots Phases 1-4 and mow or weed whip
- Prescribed burn, Phase 3 (south end), 4 and 7 or Mow areas and weed whip steep slopes if prescribed burn not possible (for example in 6A, unless mowed in 2016).
- Herbicide hairy willow herb (Phase 1 or any other locations)
- Herbicide *Phragmites*, and reed manna grass/ reed canary grass hot spots Phases 1-7
- Monitor throughout per plan
- Collect seed, replant bare areas, target re-seeding of Biex-Ramche ATV areas following prescribed burn of 2017.
- Monitor ATV damage on all Phases, any other threats, determine actions.
- Compile Monitoring notes, make recommendations for 2019, Consultants meet with Village to determine priorities
- *Phragmites*: Prioritize additional control efforts at *Phragmites* in ponds that empty into Pike River (locations of 2014 stands mapped).
- Manage Wood Lots: Begin to cut common buckthorn within woodlots (possible winter activity). Prioritize woodlots, possibly begin with Phase 4.

2019 PROPOSED MANAGEMENT ACTIVITIES

- Winter meeting to determine priorities
- Submit cost proposals to Village for invasive control
- Treat teasel at any locations- Phases 1-7.
- Cut/treat stems of woody invasives, re- prioritize hot spots based on 2018 monitoring. (With aggressive prescribed burn schedule/mowing this will task will lessen and be confined to un burned locations especially near bridges)
- Based on 2018 monitoring, determine strategy for crown vetch/birdsfoot trefoil Phases 1-7
- Mow Phases 2-3 in spring or weed whip steep slopes
- Prescribed burn, Phase 1 and Phase 5 or Mow areas and weed whip steep slopes if prescribed burn not possible
- Herbicide hairy willow herb (Phase 1 or any other locations)
- Herbicide *Phragmites*, and reed manna grass/ reed canary grass hot spots Phases 1-7
- Monitor throughout per plan
- Collect seed, replant bare areas, based on 2018 monitoring
- Monitor ATV damage on all Phases, any other threats, determine actions.
- Compile Monitoring notes, make recommendations for 2019, Consultants meet with Village to determine priorities for 2020 and incorporate Phases 8 and 9 into plans.
- Tributaries: Monitor hot spots for debris (culverts/grates), consider other strategies depending on outcome of prior out -reach efforts.

Phases 8-9

The 5-year vegetation Management Timeline for Phases 8 & 9 has already been approved by the US Army Corps' plan and is presented in the Appendix. Like the Phase 1-7 management timeline discussed above, this timeline summarizes all of the vegetation monitoring and management activities that should be occurring each year by season.

Like Phases 1-7 it will be important to revisit the timeline each winter with the Commission and the US Army Corps to identify new threats, review previous year's management activities and plan the upcoming year's strategy. At the end of the US Army Corps involvement Phases 8 and 9 should be incorporated into the overall management plan with Phases 1-7.

However, the Biex-Ramche Prairie adjacent Phase 9 is not within the US Army Corps project area and needs burn management and possible re-seeding in the year after (in areas of ATV damage) as shown on the Management Timeline and discussed above in the comprehensive list of activities.

As discussed in the Tributary section above, Phases 8 and 9 are bounded by agricultural fields and it will be very important to have signage, intended uses and possibly enforcement to protect the native plantings from disturbances including ATV trails, over mowing or plowing and other outside impacts.

Maintaining native vegetation is on-going as weed seeds blow in from outside our influence, yet the beauty of a native prairie flower in bloom, the tall prairie cord grass waving on the streambank rewards our efforts

Pike River Phases 1 through 7 & Biex-Ramcke Prairie

Monitoring & Management Plan - 6 Years

	2015				2016				2017				2018				2019				2020			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
Monitoring																								
Annual reporting, cost proposal & meeting with Commission																								
Management & Monitoring																								
Invasive Species Control & Monitoring*																								
Chemical control – Cut/treat purple loosestrife (*Lythrum salicaria*)			Phases 1,4				Phases 1,4				Phases 1,4				Phases 1,4				Phases 1,4				Phases 1,4	
Chemical control – Cut/treat hairy willow herb (*Epilobium hirsutum*)			Phase 1				Phase 1				Phase 1				Phase 1				Phase 1				Phase 1	
Chemical control – Treat *Glyceria maxima* & reed canary hotspots		Phases 1-6				Phases 1-7				Phases 1-7				Phases 1-7				Phases 1-7				Phases 1-9		
Chemical control – Treat *Phragmites australis* (giant reed grass)				Phases 1-6				Phases 1-7				Phases 1-7				Phases 1-7				Phases 1-7				Phases 1-7
Chemical control – Cut/treat woody invasives	Phase 3				Phases 1,2,4				Prioritize				Prioritize				Prioritize				Prioritize			
Chemical control – Treat bird's foot trefoil & crown vetch		Phases 5, 6				Phases 5, 6, 7				Phases 5, 6, 7				Phases 5, 6, 7				Phases 5, 6, 7				Phases 5, 6, 7-9		
Chemical control – Treat cut-leaved teasel			Phases 3,4				Phases 3,4				Phases 3,4				Phases 1-7				Phases 1-7				Phases 1-9	
Mowing - Where able to access with mower weed-whip steep slopes		Phase 2, 3				Phase 6A						Phase 2, 3				Phase 6A		Phase 2, 3				Phase 6A		
Prescribed Burn* **		Phase 4 - complete				Phases 5&Biex-Ramcke Prairie				Phase 1				Phase 6				Phase 7				Phase 8, 9 & Biex-Ramcke		
Re-seeding, seed collection, Re-planting**		Phase 1**		Phase 5 & 6A**				As needed				As needed		Biex-Ramcke		As needed				As needed				As needed

***** Inspection and monitoring should be on-going to track the success of management activities and the potential establishment
of new invasive species or populations. GPS locations of trouble spots should be taken in able to return with management (Refer to Annual Monitoring Framework).

**** Re-seed/re-plant in beaver damaged area (Phase 1), in herbicided areas (Phase 5) and in bare areas that were suppressed by erosion control matting (Phase 6A)**
***** If weather or funding prevent a spring burn in any of the years, a fall burn can be substituted**

Notes: Phases 2, 3 and portions of 6A may be unable to burn, so a mowing regime is recommended above.

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Estimated Vegetation Management Costs

		Responsibility	Approximate Timetable and Costs					
Invasive Species Control			**2015**	**2016**	**2017**	**2018**	**2019**	**2020+**
A	Spray crown vetch and birdsfoot trefoil	Staff/consultant	$8,500	$10,000	$9,500	$8,500	$8,000	$7,500
B	Spray teasel	Staff/consultant	$1,500	$6,000	$5,000	$5,000	$5,000	$5,000
C	Cut/spray hairy willow herb	Staff/consultant	$2,000	$2,000	$1,500	$1,500	$1,500	$1,500
D	Spray Phragmites australis & Glyeria hotspots	Staff/consultant	$7,100	$9,000	$10,000	$10,000	$10,000	$10,000
E	Cut/spray purple loosestrife	Staff/consultant	$1,500	$1,500	$1,400	$1,400	$1,300	$1,600
F	SPOT Cut/treat buckthorn, honeysuckle and other woody invasives	Staff/consultant	$2,000	$3,000	$2,500	$2,500	$2,500	$2,500
G	***Invasive Species Control Total Costs***		***$22,600***	***$31,500***	***$29,900***	***$28,900***	***$28,300***	***$32,800***
Mowing*		Staff/consultant	$5,000	$2,500	$5,000	$2,500	$5,000	$2,500
Prescribed Burning**		Staff/consultant	$6,000	$7,000	$7,000	$5,000	$7,000	$14,000
Seed collection, re-seeding/re-planting		Staff/consultant	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000
Monitoring, maps, annual reporting and meet with Commission		Staff/consultant	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500
Total Cost			$38,100	$45,500	$46,400	$40,900	$44,800	$53,800

* Mowing costs are estimated using a 2015 quote provided by Kier Peckham, a natural areas management firm.

** Prescribed burning costs are estimated using a 2015 quote for Phase 4 that was provided by a 3rd party natural areas management firm.

Stream and Aquatic Resources

Maintaining the value of the significant investment to improve water quality, stream habitat and ecological resources in the Pike River Corridor will require on-going efforts. This section outlines the priorities and anticipated costs.

STREAM AND AQUATIC RESOURCES

- Implement monitoring program (Chapter 4)
  - Yearly spring inspection;
  - Continuous monitoring stations;
  - High-flow spot-checks after storms;
  - Baseline monitoring (begin following completion of Phases 7-9);
- First priority maintenance action include:
  - Removing sedimentation or blockage that reduces channel flow capacity;
  - Stabilizing channel erosion that threatens adjacent structures or property.
- Second priority maintenance actions include:
  - Fixing barriers to fish passage;
  - Stabilizing bank erosion greater than normal that affects water quality;
  - Repairing non-functioning log and boulder fish habitat structures.
- Third priority maintenance actions include:
  - Installation of brush bundles to improved stable meandering of the low-flow channel in reaches of chronic bank erosion or sedimentation;
  - Addition of supplemental gravel and cobble substrates in Phase 4 to maintain riffles;
  - Enhancing stream-side shading with tall grasses and shrubby canopy throughout the corridor.

FIVE-YEAR STRATEGIC REVIEW

- Every 5 years, a strategic review of the monitoring data and maintenance activities should be conducted. The result of this review should include a revision of the SWOT tables for each of the 9 Phases, including tributaries.

Continuous Real-Time Monitoring: *Stations Located at Phase 4 and Phase 9*				
Data Type	**Meaurements**	**Frequency**	**Quality Assurance**	**Metadata**
Water Quality - Sondes: Multiparameter Probes	Water depth, temperature, dissolved oxygen, conductivity, pH, turbidity	Readings logged every 20 minutes. Data downloaded every 6 hours via cell-phone modem to web database.	Monthly comparison to in-field measurements and calibration of all sensors and back-adjustment for drift, following USGS and manufacturer recommended procedures.	GPS location, drainage area of watershed to location, land use of sub-area.
Water Quality - Nutrients: Photometric Measurements	Total Phosphorus, Orthophosphate, Nitrate, Amonium, Chloride	Integrated samples taken monthly at sonde monitoring stations	Field sampling following USGS standard procedures. Lab instruments calibrated monthly per manufacturer specifications. Field controls and blank samples included for each sampling session.	Date, time and location of samples
Weather Data: Metereological Station	Temperature, Relative Humidity, Wind speed and direction. Atmospheric pressure, Solar radiation, Rainfall (tipping-bucket rain gauge)	Readings logged every 20 minutes. Data downloaded every 6 hours via cell-phone modem to web database.	Monthly comparison with in situ manual measurements. Annual calibration of all sensors.	Sensor detection limits, accuracy (confidence intervals), drift rate, calibration dates, calibration coefficients.
Stream Flow: Water Depth Sensor	Calculate stream discharge, using water depth from mutiparameter sondes in conjunction with establishing a depth*discharge rating curve for each station	Readings logged every 20 minutes. Data downloaded every 6 hours via cell-phone modem to web database.	Monthly comparison to field measurements. Post-deployment correction for atmospheric pressure changes.	Rating Curves, flows, cross-sections and elevations for stage
Stream Channel Issue Inventory and Structural Habitat Assessment: *Yearly Visual Inspection of Entire Length of Stream Corridor*				
Streambed, Substrate and Bank Erosion/ Stability	Substrate composition, Siltation & Erosion, Channel width & depth, Streambank conditions, flow status	Conducted yearly for each Phase during summer base-flow conditions	Methods adapted from USEPA RAPID Bioassessment Protocols (http://water.epa.gov/scitech/monitoring/rsl/bioassessment/). See example data sheet for Channel Assessment	Include GPS geotagged photographs for issues requiring follow-up maintenance actions noting changes from prior year.
Fish Habitat Structures	Functional status of constructed fish habitats: Log deflectors, Boulder clusters, Riffles, Pools	See above	Methods adapted from USEPA RAPID Bioassessment Protocols (http://water.epa.gov/scitech/monitoring/rsl/bioassessment/). See example data sheet for Fish Habitat Assessment	See above
Riparian Zone and Vegetation	Conditions of vegetated riparian buffer, noting issues regarding the presence of invasive species, erosion/runoff, pollution sources	See above	Methods adapted from USEPA RAPID Bioassessment Protocols (http://water.epa.gov/scitech/monitoring/rsl/bioassessment/). See example data sheet for Riparian Assessment	See above
Baseline Monitoring of Ecological Integrity: *Conducted Every 5 Years at 4 Stations (Phases 1, 4, 7 and 9) using WDNR Protocols*				
Habitat Evaluation	Habitat: Substrate composition, water width/depth, bank conditions, flow, fish habitat. Calculated Wisconsin low-gradient habitat rating.	Every 5 years during summer base-flow conditions (mid-June - July).	Methods will follow procedures established by the Wisconsin DNR Baseline monitoring project (Lyons et al. 2000).	Geotagged reference photos for each station
Fisheries Survey	Fish species composition and abundance using stream and/or backpack electrofisher. Calculated warmwater Index of Biotic Integrity.	Every 5 years during summer base-flow conditions (mid-June - July).	Methods following WDNR procedures (Lyons et al 2000) Identification by trained personnel. Voucher specimens will be retained for unusual species.	Fish deformities, reproductive condition.
Benthic Macro-invertebrate Survey	Benthic Macro-invertebrate diversity, abundance and Family Biotic Index. Samples collected using either Hess Sampler or Rock Baskets	Every 5 years during summer base-flow conditions (mid-June - July).	Methods following EPA procedures (EPA document 600/4-90/030) with ID as above and voucher specimens retained	Geotagged reference photos for each station

Stream and Aquatic Resources Monitoring and Maintenance

		Responsibility	Approximate Timetable and Costs					
Continuous Monitoring Stations (Phases 4 and 9)			**2015**	**2016**	**2017**	**2018**	**2019**	**2020+**
A	Select and order 2 sondes, weather stations and communications platforms	Staff/consultant	$30,000	$2,400	$1,200	$1,200	$1,200	$1,200
B	Install / Maintain monitoring platforms	Staff/consultant	$6,000	$1,000	$500	$500	$500	$500
C	Create and Maintain web-linked portal for data access	Staff/consultant	$2,000	$1,000	$500	$500	$500	$500
D	Monthly sonde calibration and maintenance (March - November)	Staff/consultant	$2,400	$2,520	$2,646	$2,778	$2,917	$3,063
E	Monthly water samples and lab analysis for nutrients	Staff/consultant	$7,200	$7,560	$7,938	$8,335	$8,752	$9,189
F	Create stage-discharge relationship for converting depth to flow	Staff/consultant	$1,200	$600	$300	$300	$300	$300
G	***Continuous Monitoring Total Costs***		***$48,800***	***$15,080***	***$13,084***	***$13,613***	***$14,169***	***$14,752***
Yearly Site Inspections and Stream/Structure Maintenance								
A	Field inspection of entire channel (Phase 1-9)	Staff/consultant	$2,800	$2,940	$3,087	$3,241	$3,403	$3,574
B	Log Structure Adjustments	Staff/consultant	$3,000	$500	$500	$500	$500	$500
C	Stream Bank Reinforcements (stone or riprap)	Staff/consultant/ volunteers	$4,000	$2,000	$1,000	$4,000	$2,000	$1,000
D	Brush bundle installation	Staff/consultant/ volunteers	$2,400	$2,520	$2,646	$2,778	$2,917	$3,063
E	Riffle gravels and course substrate additions	Staff/consultant/ volunteers	$1,000	$1,000	$500	$500	$500	$500
F	Debris removal	Staff/consultant	$500	$500	$500	$500	$500	$500
G	***Yearly Site Inspections and Maintenance Costs***		***$13,700***	***$9,460***	***$8,233***	***$11,520***	***$9,821***	***$9,137***
5-Year Baseline Monitoring Bioassessments								
A	Baseline Habitat Assessments	Consultant/ volunteers	$4,000	N/A	N/A	N/A	N/A	$5,000
B	Baseline Fish Biotic Integrity Sampling	Consultant/ volunteers	$8,000	N/A	N/A	N/A	N/A	$10,000
C	Baseline Macroinvertebrate Sampling	Consultant/ volunteers	$4,000	N/A	N/A	N/A	N/A	$5,000
D	Data analysis and reporting	Staff/consultant	$2,400	N/A	N/A	N/A	N/A	$3,400
E	***5-Year Baseline Monitoring Costs***		***$18,400***	N/A	N/A	N/A	N/A	***$23,400***

Trail and Recreational Resources

Introduction

The Inventory and Analysis and Needs Assessment sections document the strengths and a few weaknesses facing the Pike River Corridor. The Implementation Action plan describes how the Village leaders should execute a series of correlated policy, operational, capital improvements and maintenance over the next 5 years and beyond, to reach the corridors recreational goal and objectives.

Policy and Operational Improvements

Adopting this plan as public policy is the first step of implementing the recommendations within. Village leaders, adjacent property and business owners and other community stakeholders will need to collaborate to meet the goals and objectives of this plan. Recreational policy action items are listed in the Pike River Maintenance Table later in this section.

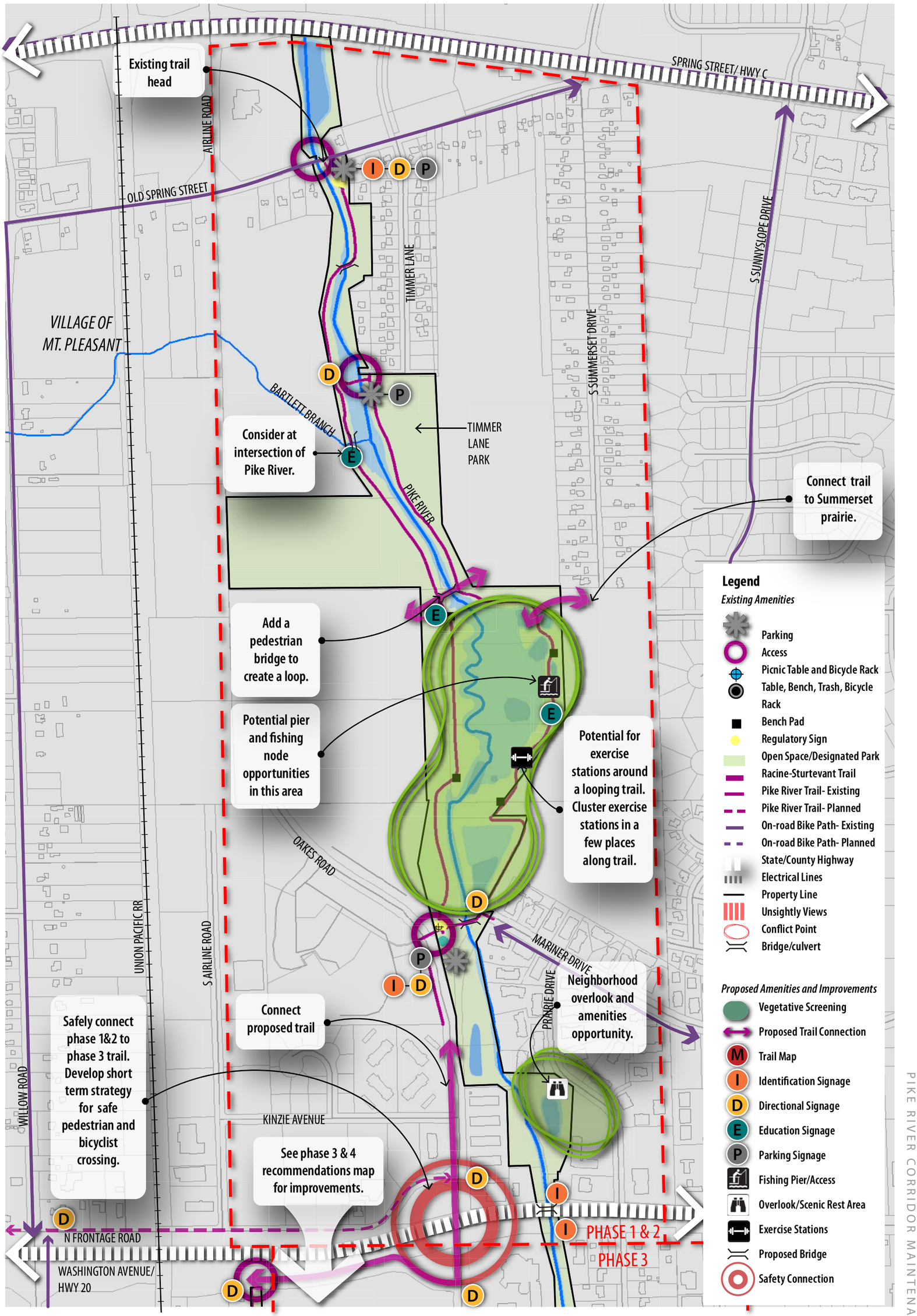
Capital Improvements

The Village of Mount Pleasant has invested millions into important Pike River Improvements for flood mitigation measures, habitat creation and have established recreational amenities simultaneously. This Plan identifies many additional capital improvements that may be deferred past the plan's 5 year timeline due to budget and prioritization of projects. Village leaders should budget and initiate several priority projects including; completing planned phases 7,8 and 9 of the trail and trailhead access points, developing and installing identification, wayfinding and educational signage and implementing short term solutions to safely crossing all roadways with particular attention paid to Highway 20 and 11.

Capital improvement projects typically follow a three phase process: preliminary design/engineering, final design/engineering and construction. The cost of professional preliminary and final design/engineering services is typically 10-12% of the total project value, and the cost of construction phase services is typically 2-3% of the total project value. Some projects, like wayfinding signage, take a relatively short time to execute. Other improvements can take a relatively long time to execute because of design/engineering, multi-jurisdictional permitting and challenging construction logistics.

Aside from completing the final planned trail segments, the Village should start with simple, high impact, modest projects, like wayfinding and marketing. Once these improvements are in place they should budget for and initiate more complicated, high-investment/impact projects, as funding allows, like the Biex-Ramcke Park. Village leaders should actively link capital improvements to significant private sector investment, whenever possible.

Specific capital improvements are represented in the following Recreational Recommendations Maps and outlined in the Table.



Rec. Recommendations Phase 1 & 2

Pike River Maintenance Plan

Mount Pleasant, Wisconsin

1 inch = 550 feet

ISSUE DATE: 3/19/2015

PROJECT NUMBER: 04-1083-001

Rec. Recommendations Phase 1 & 2

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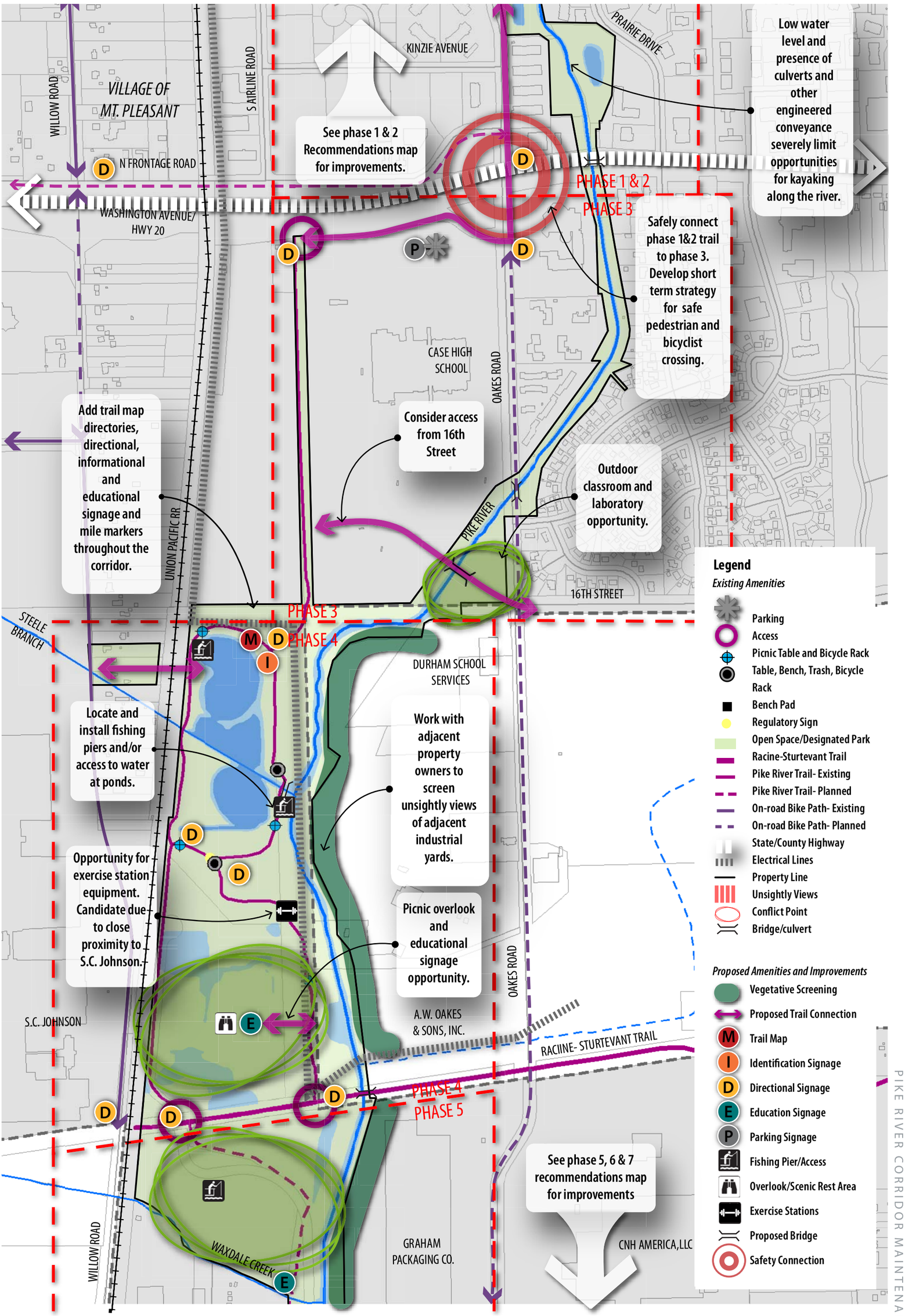

Rec. Recommendations Phase 3 & 4

Pike River Maintenance Plan

Mount Pleasant, Wisconsin

1 inch = 550 feet

ISSUE DATE: 3/19/2015

PROJECT NUMBER: 04-1083-001

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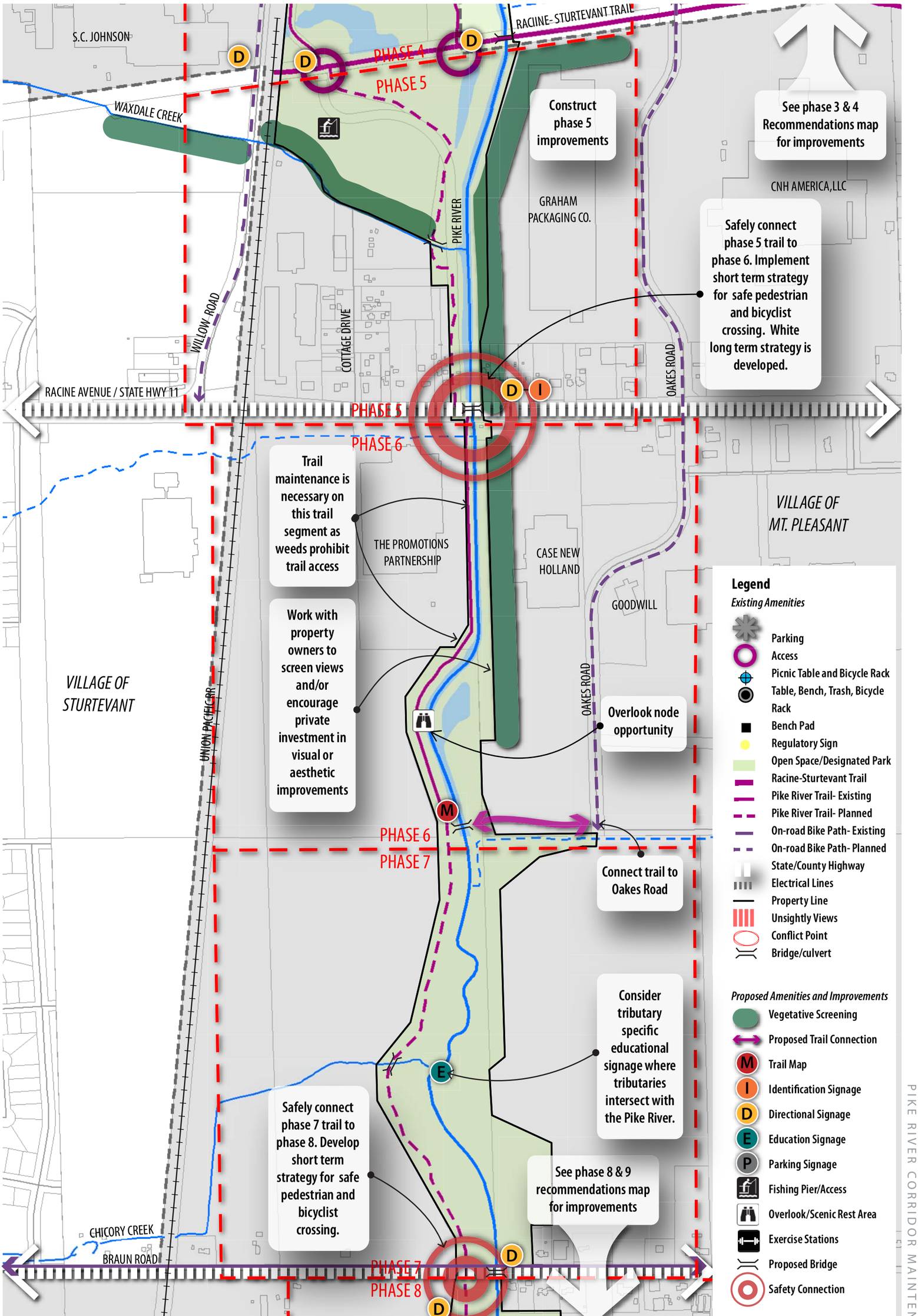

Rec. Recommendations Phase 5, 6 & 7

Pike River Maintenance Plan

Mount Pleasant, Wisconsin

1 inch = 550 feet

ISSUE DATE: 3/19/2015

PROJECT NUMBER: 04-1083-001

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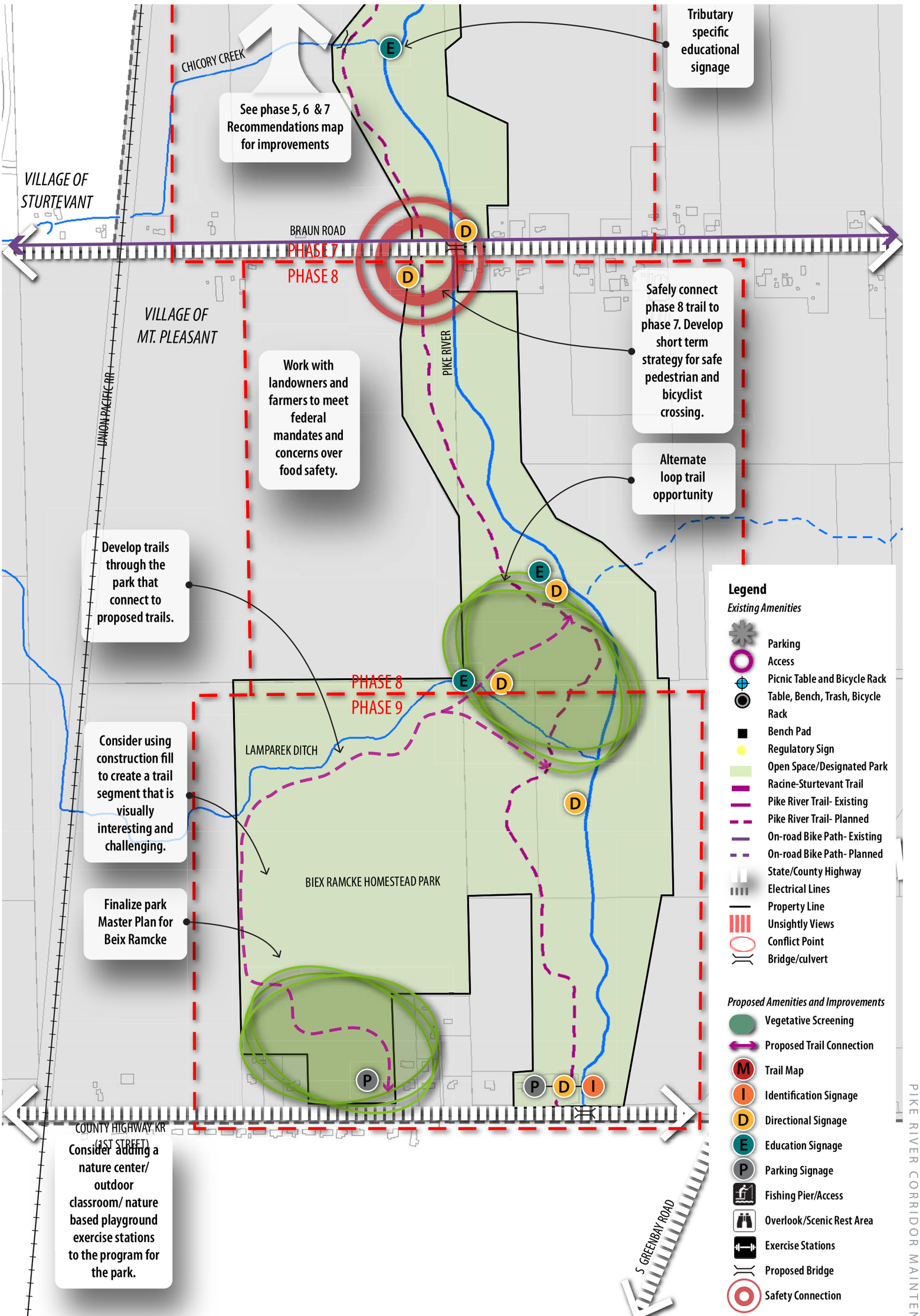

Rec. Recommendations Phase 8 & 9

Pike River Maintenance Plan

Mount Pleasant, Wisconsin

1 inch = 550 feet

ISSUE DATE: 3/19/2015

PROJECT NUMBER: 04-1083-001

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Pike River Maintenance Plan

Recreation Implementation

Master Plan
Plan
Design
Construct
Fund
Maintain

		Responsibility	Approximate Timetable and Costs
PUBLIC POLICY IMPROVEMENTS			2015 2016 2017 2018 2019 2020+
A	Adopt the Pike River Corridor Maintenance Plan as public policy	Staff	
B	Create a recreational master plan.	Staff/consultant	
C	Finalize park master plan for Beix-Ramcke and consider adding a nature center to the program.	Staff/consultant	
D	Finalize acquisition of remaining properties within the project limits	Staff	
E	Develop a signage design standards package and plans for Identification, Directional, Map and Educational Signage throughout the corridor.	Staff/consultant	
F	Study solutions for crossings at Highway 20 and 11.	Village, County, State	
G	Acquire property adjacent currently in urban holding to expand park area.	Staff	**On-going**
H	Hire or identify staff responsible for regularly inspecting and reporting deficiencies of physical improvements in the corridor. (paving, structures, signs and site furnishings)	Staff	**On-going**
I	Work with property and business owners to address unsightly views and improper uses along the corridor.	Staff/property/business owners	**On-going**
J	Advocate and implement best management practices in construction and maintenance of the corridor.	Village, County, State	**On-going**
OPERATIONAL IMPROVEMENTS			2015 2016 2017 2018 2019 2020+
Maintain trail corridor, park and recreational improvements			
A	Develop pavement inspection checklist to monitor and report deficiencies, prioritize preventative measures and establish a replacement schedule.	Staff	
B	Trail Maintenance-Surface	Staff	**On-going, as needed**
	Patching (as needed, typically every 1-3 years)		
	Crack sealing (as needed, typically every 1-3 years)		
	Seal coating (as needed, typically every 3-6 years)		
	Replacement, (varies) determined by condition		
C	Trail Maintenance-Vegetation	Staff	
	Brushing/clearing		**On-going**, spring and fall inspection
	Mown edge		**On-going**, every 1- 2 weeks during growing season
	Vista maintenance		**On-going**, spring and fall inspection
	Develop replacement schedule for recreational structures, furnishings, and signage.	Staff	
D			
E	Trash receptacle and litter clean-up	Staff	
	Scheduled waste pick-up for trash receptacles		**On-going**, weekly
	Scheduled trail inspection for litter and animal waste removal		**On-going**, monthly
F	Generate public-private partnerships in the corridor	Village, County, State, Business and Property Owners, Residents	
	Sponsorship of all related corridor needs: (policy, operational and capital improvements.)		
	Investigate partnerships for educational and exploratory programming.		
	Consider establishing a Friend's of the Pike group to oversee stewardship and events in the corridor.		
G	Investigate funding opportunities for capital improvements.	Staff	
	Partner with local businesses for support, sponsorship and volunteer efforts.		
H	Marketing	Staff/consultant	
	Develop a marketing strategy including messaging, language, graphic standards and applications(digital and print communication, signage)		
CAPITAL IMPROVEMENTS			2015 2016 2017 2018 2019 2020+
	Design (prelim), engineer (final), permit and construct:		
A	Construct trail connection from Mariner Drive Trail head to Route 20	Staff	
B	Construct remaining phases 7,8 & 9	Staff	
C	Way finding Signage	Village, County, State	
	Trail head (Old Spring Road)		
	Highway 20		
	Racine-Sturtevant Trail		
	Highway 11		
	Braun		
	County Highway KR		
D	Safe Crossings	Village, County, State	
	Short term: Highway 20		
	Long term: Highway 20		
	Short term: Highway 11		
	Long term: Highway 11		
E	Phase 1 & 2	Staff/consultant	
	Trail Connection: Connect Phase 1 loop trail to Summerset Drive		
	Fitness Trail Equipment		
	Pike River Outdoor Classroom Option 1		
	Neighborhood overlook		
	Expand existing trail head parking at Oakes Road and Lannon		
F	Phase 3 & 4	Staff/consultant	
	Trail Connection: Connect Phase 3 to Jerome Case High School Prairie area (potential outdoor classroom)		
	Pike River Outdoor Classroom Option 2		
	Picnic Overlook		
G	Phase 5,6 & 7	Staff/consultant	
	Trail Connection: Connect future trail to Oakes Road		
	Phase 8 &9	Staff/consultant	
	Braun Road Trailhead and parking lot		
	Braun Road Crossing		
	County Highway KR Crossing		
	Beix Ramcke Trailhead and parking lot		
H	Corridor wide	Staff/consultant	
	Habitat amenities to attract wildlife (bird and bat houses)		
	Evaluate implementing Emergency poles in key locations throughout the corridor.		
	Evaluate suitable locations for and implement fishing piers and river overlooks.		
	Additional trail amenities such as shade structures, drinking fountains, bicycle racks, bicycle repair stations, benches, picnic rental facilities, outdoor fitness stations, trash and recycling receptacles.		
	Boardwalk system along the river's edge for passive recreation and educational opportunities in key portions of the corridor.		
I	Biex Ramcke Park Improvements		

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