

6.2.8 Site Specific Management Measures Action Plan Table

Table 41. Site Specific Management Measures Action Plan.

| CALEDONIA | | | | | | | | | | | |
|--|--|---------------------------|--------------------------------|--|--|--|---------------------|---------------------------------------|--|---|---------------------------------|
| ID# | Location | Units (acres/linear feet) | Owner (public or private) | Existing Condition | Management Measure Recommendation | Pollutant Reduction Efficiency | Priority | Responsible Entity | Sources of Technical Assistance | Cost Estimate | Implementation Schedule (Years) |
| DETENTION BASIN RETROFITS & MAINTENANCE (See Figure 68) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Technical assistance needed to implement detention basin retrofits is relatively low while financial assistance needs are moderate. Private landowners will require the greatest assistance. | | | | | | | | | | | |
| 19A | Between Kingdom Ct. & Mary Drew Dr. | 0.7 acres | Residential HOA (private) | Existing wet bottom detention basins with mown turf grass side slopes. | Design and implement project revegetate basin side slopes with native vegetation. | Wetland Det.: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Low | Residential HOA | Ecological Consultant/ Contractor | \$8,500 to design and install prairie vegetation; \$1,000/ year maintenance | 10-20+ Years |
| 20A, 20B | Prince of Peace Lutheran Church | 0.1 acres | Church (private) | Two existing small depressional detention areas near access road to church. Both areas are dominated by invasive wetland vegetation. | Design and implement project to create aesthetically pleasing stormwater features by removing invasive species and replanting with native vegetation similar to a grain garden. | Wetland Det.: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Low | Prince of Peace Lutheran Church | Root-Pike WIN; Ecological Consultant | \$10,000 to design and plant as rain gardens; \$500/yr maintenance | 1-10 Years |
| 20C | N end of Nature Dr. | 0.1 acres | Resident (private) | Existing small dry bottom detention basin with mown turf grass adjacent to Tributary G within residential area. | Design and implement project to revegetate basin with native vegetation to establish aesthetically pleasing rain garden feature that will improve water quality, wildlife habitat, and green infrastructure connection benefits. | Dry Detention: TSS = 77.5% TN = 20% TP = 44% Bacteria = 88% | Low | Resident | Root-Pike WIN | \$3,000 to design and plant as rain garden; \$100/yr maintenance | 1-10 Years |
| 20D | NW side of Baywood Estates Subdivision | 0.7 acres | Residential HOA (private) | Existing wetland bottom detention basin servicing Baywood Estates Subdivision. Basin is dominated by invasive species and a 400 lf low flow concrete channel with turf grass slopes enters the basin from the south. | Design and implement project to alter low flow concrete channel and plant side slopes with native vegetation. Replant detention area with native wetland vegetation. | Wetland Det.: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | High: Critical Area | Caledonia; Developer; Residential HOA | Caledonia; Civil Engineer; Ecological Consultant/ Contractor | \$25,000 to design and install; \$1,000/yr maintenance | 1-10 Years |
| 21A | SW corner of Stephan Rd & Ambassador Ln. | 0.4 acres | Residential HOA (private) | Existing dry bottom basin with mown turf grass servicing adjacent subdivision. Basin is located adjacent to Tributary G Reach 3. | Design and implement project to naturalize detention basin by replacing turf grass with native vegetation to improve water quality, wildlife habitat, and green infrastructure connection. | Dry Detention: TSS = 5 tons/yr TN = 52 lbs/yr TP = 6 lbs/yr Bacteria = 88% | High: Critical Area | Residential HOA | Caledonia; Civil Engineer; Ecological Consultant/ Contractor | \$20,000 to design and install native vegetation; \$1,500/yr maintenance | 1-10 Years |
| 24A | Candlelight Meadows Subdivision | 0.7 acres | Residential HOA (private) | Existing dry bottom detention in form of mown turf grass swale along north side of development. | Design and implement project to convert dry bottom detention into bioswale planted with native vegetation. | Dry Detention: TSS = 77.5% TN = 20% TP = 44% Bacteria = 88% | Low | Residential HOA | Caledonia; Civil Engineer; Ecological Consultant/ Contractor | \$12,000 to design and install native vegetation; \$1,000/yr maintenance | 10-20+ Years |
| 25A | SW corner of Heartland Ln. & Middle Road | 0.4 acres | Residential HOA (private) | Existing dry bottom basin with mown turf grass servicing adjacent subdivision. Basin is located at headwaters of Tributary G Reach 6. | Design and implement project to naturalize detention basin by replacing turf grass with native vegetation to improve water quality, wildlife habitat, and green infrastructure connection. | Dry Detention: TSS = 5 tons/yr TN = 52 lbs/yr TP = 6 lbs/yr Bacteria = 88% | High: Critical Area | Residential HOA | Caledonia; Civil Engineer; Ecological Consultant/ Contractor | \$20,000 to design and install native vegetation; \$1,500/yr maintenance | 1-10 Years |
| 22A, 26A, 26B, 26C | Audubon Arboretum Subdivision | 3.5 acres | Caledonia; Developer (private) | Four existing naturalized wet bottom detention basins in uncompleted Audubon Arboretum conservation development. | Spot seed and plant with additional native vegetation and maintain to preserve quality. | Wetland Det.: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Medium | Caledonia; Developer; HOA long term | Ecological Consultant/ Contractor | \$20,000 to remediate; \$4,000/yr maintenance | When development resumes |

| ID# | Location | Units (acres/linear feet) | Owner (public or private) | Existing Condition | Management Measure Recommendation | Pollutant Reduction Efficiency | Priority | Responsible Entity | Sources of Technical Assistance | Cost Estimate | Implementation Schedule (Years) |
|----------|--|---------------------------|---------------------------|--|---|--|---------------------|--------------------|--|--|---------------------------------|
| 26D | NE of Five Mile Rd. & Charles St. | 2.3 acres | Residential HOA (private) | Existing wet bottom detention basin with mown turf grass slopes surrounded by residential development. Landowners have installed multiple shoreline features. | Work with landowners to develop a consistent buffer of native plants around pond to enhance water quality and wildlife benefits. | Wetland Det.: TSS = 60% TN = 35% TP = 45% Bacteria = 70% | Low | Residential HOA | Root-Pike WIN; Ecological Consultant/ Contractor | \$40,000 to design and install native vegetation; \$3,000/yr maintenance | 10-20+ Years |
| 26E | Between Shore Dr. & Newberry Ln. | 4.2 acres | Residential HOA (private) | Existing wet bottom detention basin with mown turf grass slopes surrounded by residential development. Landowners have installed multiple shoreline features. | Work with landowners to develop a consistent buffer of native plants around pond to enhance water quality and wildlife benefits. | Wetland Det.: TSS = 60% TN = 35% TP = 45% Bacteria = 70% | Low | Residential HOA | Root-Pike WIN; Ecological Consultant/ Contractor | \$70,000 to design and install native vegetation; \$4,000/yr maintenance | 10-20+ Years |
| 29A, 30A | Parkview Senior Living | 0.8 acres | Association (private) | Two existing naturalized wet bottom detention basins in average ecological condition but with many invasive species along shoreline and buffer. | Implement annual management program to control invasive species. | Wetland Det.: TSS = 60% TN = 35% TP = 45% Bacteria = 70% | Medium | Association | Ecological Contractor | \$2,000/yr maintenance | Ongoing |
| 31A | N side of Johnson Ave. | 18 acres | Caledonia (public) | Large dry bottom regional detention basin servicing surrounding development. Basin consists of low flow concrete channels and mown turf grass. Basin is also located at headwaters of Tributary J. | Design, permit, and install project to retrofit exiting detention basin by altering low flow channels and creating wetland and prairie storage areas that would provide water quality benefits, wildlife habitat and, green infrastructure. | Wetland Det: TSS=67 tons/yr TN=474 lbs/yr TP=107 lbs/yr Bacteria=78% | High: Critical Area | Caledonia | Caledonia; Civil Engineer; Ecological Consultant/ Contractor | \$450,000 to design, permit, and install; \$6,000/yr maintenance | 1-10 Years |
| 34A | NW corner of Pilgrim Dr. & Stonebridge Dr. | 3.7 acres | Residential HOA (private) | Existing dry bottom detention basin servicing adjacent subdivision. Basin consists mostly of mown turf grass and also abuts the Union Pacific RR. | Design and implement project to retrofit basin by removing turf grass and installing native vegetation to improve water quality, wildlife, and green infrastructure benefits while reducing long term maintenance costs. | Dry Detention: TSS = 77.5% TN = 20% TP = 44% Bacteria = 88% | Medium | Residential HOA | Ecological Consultant/ Contractor | \$45,000 to design and install native vegetation; \$3,000/yr maintenance | 10-20+ Years |

WETLAND RESTORATION (See Figure 69)

Technical and Financial Assistance Needs: Wetland restoration projects are typically complex and require high technical and financial assistance needs to protect land, design, construct, monitor, and maintain the restoration.

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|------|------------------------------|----------|------------------------------------|---|--|---|--------|-----------------------------|---|---|--------------------------------------|
| 3, 4 | Charles St. and 3 Mile Rd. | 90 acres | Vulcan Materials Company (private) | 90 acres of drained wetland located within two parcels owned by Vulcan Materials Company. Land is slated for future residential development | Incorporate up to 50% of the site as wetland restoration into future development plans and use restored wetland areas as wetland detention and mitigation. | Wetland: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Medium | Future Developer; Caledonia | WDNR; NRCS; Engineer; Ecological Consultant | \$675,000 to design/ permit/install/ maintain wetland mitigation bank | When planning for development occurs |
| 5 | W of Erie St. | 8 acres | Resident (private) | 8 acres of drained wetland behind residence. | Resident could restore 8 acres of wetland as personal wildlife sanctuary by restoring hydrology and planting native wetland vegetation. | Wetland: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Low | Resident | Root-Pike WIN; Ecological Consultant | \$60,000 to design, permit, and install wetland | 10-20+ Years |
| 6 | W side of Ruby Ave. | 2 acres | Owner (private) | 2 acres of drained wetland on private vacant land that is slated for future residential development. | Land could be purchased by Caledonia or other entity and restored to wetland for stormwater storage purposes. | Wetland: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Low | Owner; Caledonia | Civil Engineer; Ecological Consultant | \$40,000 to design, permit and install wetland | 10-20+ Years |
| 7 | Ag field S of Prairie School | 4 acres | Owner (private) | 4 acres of drained wetland on existing agricultural field. Land is likely to be developed in future. | Incorporate wetland restoration into future development plans by using areas as wetland detention basis. | Wetland: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Medium | Future Developer; Caledonia | WDNR; NRCS; Engineer; Ecological Consultant | \$80,000 to design/ permit/install/ maintain wetland detentions | When planning for development occurs |

| ID# | Location | Units (acres/linear feet) | Owner (public or private) | Existing Condition | Management Measure Recommendation | Pollutant Reduction Efficiency | Priority | Responsible Entity | Sources of Technical Assistance | Cost Estimate | Implementation Schedule (Years) |
|---------|---|---------------------------|--|---|---|--|---------------------|---------------------------------------|--|---|--|
| 11 | W of Royal Park Rd. & S of Four Mile Rd. | 14 acres | Residence (private) | 14 acres of drained wetlands on private residential property and abutting a large regional detention area to south. Area is headwaters of Tributary J. | Investigate homeowner(s) openness to restoring wetlands in their back yards. | Wetland Restore: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Low | Private Residence | Root-Pike WIN | \$70,000 to install and maintain wetland | 10-20+ Years |
| 12 & 13 | NE of 4 Mile Rd. & Charles Rd. | 12.5 acres | Agricultural Land Owner (private) | 12.5 acres of drained wetlands on private agricultural land near headwaters of Tributary J. Areas are also slated for future residential development. | Investigate future developer's openness to restoring wetlands as a green infrastructure feature of the development. | Wetland Restore: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Low | Future Developer; Caledonia | Root-Pike WIN | \$50,000 to install and maintain wetland | As new development is planned |
| 14 | Between Erie St. & Whirlaway Ln. | 9 acres | Agricultural Land Owner (private) | 9 acres of drained wetlands along the south side of Tributary I on private agricultural land that is slated for future residential development. | Incorporate wetland restoration in future conservation or low impact residential development plans by using most feasible areas as wetland detention and/or mitigation. | Wetland Restore: TSS=2.5 tons/yr TN=24 lbs/yr TP=7 lbs/yr Bacteria=78% | High: Critical Area | Future Developer; Caledonia | Caledonia; Engineer; Ecological Consultant | \$150,000 to design/permit/install/maintain wetland | As new development is planned |
| 15 | NE of 4 Mile Rd. & Chester Ln. | 30 acres | Agricultural Land Owner (private) | 30 acres of drained wetlands adjacent to Crawford Park on private agricultural land that is slated for future residential development. | Incorporate wetland restoration in future conservation or low impact residential development plans by using most feasible areas as wetland detention and/or mitigation. | Wetland Restore: TSS=8 tons/yr TN=49 lbs/yr TP=15 lbs/yr Bacteria=78% | High: Critical Area | Future Developer; Caledonia | Caledonia; Engineer; Ecological Consultant | \$225,000 to design/permit/install/maintain wetland | As new development is planned |
| 16 | SD corner of 4 ½ Mile Rd. & Route 32 | 12 acres | Agricultural Land Owner (private) | 12 acres of drained wetlands on 20+ acre agricultural parcel that is adjacent to Tributary G. Parcel is slated for future residential development. | Incorporate wetland restoration in future conservation or low impact residential development plans by using most feasible areas as wetland detention and/or mitigation. | Wetland Restore: TSS=4 tons/yr TN=27 lbs/yr TP=8 lbs/yr Bacteria=78% | High: Critical Area | Future Developer; Caledonia | Caledonia; Engineer; Ecological Consultant | \$150,000 to design/permit/install/maintain wetland | As new development is planned |
| 19 | SW corner of 5 ½ Mile Rd. & Charles St. | 130 acres | Ag and natural land W of Audubon Arboretum | Primary agricultural land along Tributary G and abutting uncompleted Audubon Arboretum residential subdivision. Land is slated for future residential development. | Incorporate wetland restoration along Tributary G into future conservation development plans where feasible. Restored wetlands can be used as detention and/or wetland mitigation. | Wetland Restore: TSS=25 tons/yr TN=24 lbs/yr TP=37 lbs/yr Bacteria=78% | High: Critical Area | Future/ Existing Developer; Caledonia | Caledonia; Engineer; Ecological Consultant | \$600,000 to design/permit/install/maintain wetland | As new development is planned or resumes |
| 20 | Between Catherine Dr. & Rebecca Rd. | 16.5 acres | Agricultural Land Owner (private) | Primary agricultural land along Tributary G on east end of parcel. Land is slated for future residential development. Area is also adjacent to SEWRPC Environmental Corridor. | Incorporate wetland restoration along Tributary G into future conservation development plans where feasible. Restored wetlands can be used as detention and/or wetland mitigation. | Wetland Restore: TSS=10 tons/yr TN=64 lbs/yr TP=24 lbs/yr Bacteria=78% | High: Critical Area | Future Developer; Caledonia | Caledonia; Engineer; Ecological Consultant | \$240,000 to design/permit/install/maintain wetland | As new development is planned |
| 21 | N of 5 ½ Mile Rd. along Tributary G Reach 3 | 15 acres | Agricultural Land Owner (private) | 16.5 acres of drained wetlands along Tributary G Reach 3. Land is currently agricultural and slated for future residential development. Area is also adjacent to SEWRPC Environmental Corridor. | Incorporate wetland restoration in future conservation or low impact residential development plans by using drained wetlands along Tributary G as wetland/floodplain detention and/or mitigation. | Wetland Restore: TSS=7 tons/yr TN=43 lbs/yr TP=13 lbs/yr Bacteria=78% | High: Critical Area | Future Developer; Caledonia | Caledonia; Engineer; Ecological Consultant | \$225,000 to design/permit/install/maintain wetland | As new development is planned |
| 22 | Cliffside Park | 46.5 acres | Racine County (public) | 46.5 acres of drained wetland within Cliffside Park abutting Tributary F. The majority of the existing vegetation here is comprised of old field species. | Investigate possibility to restore hydrology and native vegetation as part of a potential wetland mitigation bank. | Wetland Restore: TSS=3 tons/yr TN=10 lbs/yr TP=7 lbs/yr Bacteria=78% | High: Critical Area | Racine County | WDNR; Hydrologist; Ecological Consultant | \$460,000 to design/permit/install/maintain wetland mitigation bank | 1-10 Years |
| 26 | Between Douglas Ave. & Union Pacific RR | 5 acres | Agricultural Land Owner (private) | 5 acres of drained wetlands along Tributary G on agricultural land. Land is slated for future residential development. | Incorporate wetland restoration in future development plans by using drained wetlands along Tributary G as wetland/floodplain detention. | Wetland Restore: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Medium | Future Developer; Caledonia | Caledonia; Engineer; Ecological Consultant | \$40,000 to design/permit/install/maintain wetland | As new development is planned |

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|---|---|---------------------------|-------------------------------------|--|---|--|---------------------|--------------------|---|---|---|
| STREAMBANK, RAVINE, & CHANNEL RESTORATION (See Figure 70) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Stream restorations are complex and require high technical and financial assistance needs to protect land, design, construct, monitor, and maintain the restoration. The project becomes more complex in areas that flow through several governing bodies or multiple private residences. Technical and financial assistance associated with stream maintenance is generally low for minor tasks such as removing debris. | | | | | | | | | | | |
| TRE 3: Tributary E Reach 2 | We Energies property (Rifle Range Ravine) | 3,201 linear feet | We Energies (private) | 3,201 lf of tributary/ravine (to Lake Michigan) on land owned by We Energies (Rifle Range Ravine). A headcut is located at upper portions of reach followed by a deeply incised ravine exhibiting severely eroded slopes. | Design, permit, and implement project to stabilize headcut and highly eroded ravine slopes using a combination of bioengineering and hard armoring approaches. Grade controls will also be needed within the channel to control flow velocities. | Stabilize Banks: TSS=5,510 t/yr TN=11,019 lbs/yr TP =5,510 lbs/yr Bacteria = n/a | High: Critical Area | We Energies | WDNR; Hydrologist; Ecological Consultant; Contractor | \$3,000,000 to design, permit, and implement stabilization measures | 1-10 Years Design; 10+ Years Build |
| TRF 4: Tributary F Reach 4 | Cliffside Park (Cliffside Park Ravine) | 2,450 linear feet | Racine County (public) | 2,450 lf of tributary/ravine (to Lake Michigan) on land owned by Racine County (Cliffside Park Ravine). Two headcuts are located at upper portions of reach where it meets Reaches 2 & 3. This is followed by a moderately incised ravine exhibiting highly eroded slopes. | Design, permit, and implement project to stabilize headcuts and highly eroded ravine slopes using a combination of bioengineering and hard armoring approaches. Grade controls will also be needed within the channel to control flow velocities. | Stabilize Banks: TSS=906 t/yr TN=1,812 lbs/yr TP =906 lbs/yr Bacteria = n/a | High: Critical Area | Racine County | WDNR; Hydrologist; Ecological Consultant; Contractor | \$1,200,000 to design, permit, and implement stabilization measures | 1-10 Years Design' 10+ Years Build |
| TRG 5: Tributary G Reach 5 | Crawford Park to Novak Rd. | 8,073 linear feet | Caledonia (public) | 8,073 lf of tributary between Crawford Park and Novak Rd. within a human created drainage ditch with concrete low flow channel. | Design and implement project to disable low flow channel in up to 20 locations to install artificial riffles. This could be completed in conjunction with riparian area restoration. | n/a | Low | Caledonia | Stormwater Engineer | \$60,000 to install up to 20 artificial riffles | In conjunction with riparian area restoration |
| RIPARIAN AREA RESTORATION & MAINTENANCE (See Figure 71) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Technical assistance needed to implement riparian area & lake buffer restoration and maintenance is moderate at first because an environmental consultant is usually hired to complete a plan and implement the work. However, costs can be greatly reduced over time if municipal or park district staff complete some restoration and most of the long term maintenance in house. Private landowners will need the greatest assistance. | | | | | | | | | | | |
| TRE 1: Tributary E Reach 1 | Route 32 to N of 7 Mile Rd. | 3,781 linear feet | Mostly private agricultural land | 3,468 lf of tributary with a narrow degraded riparian buffer of invasive shrubs and trees in most agricultural areas. | Achieve SEWRPC recommended Goals of 75 whereby 75% minimum of the total stream length should be naturally vegetated and 75 foot wide minimum riparian buffer established. | Filter Strip: TSS =5.5 tons/yr TN = 103 lbs/yr TP = 11 lbs/yr Bacteria = 37% | High: Critical Area | Private Owners | USDA-NRCS | \$55,000 to restore riparian buffer; \$5,000/yr maintenance | 1-10 Years |
| TRE 4/5: Tributary E Reaches 4 & 5 | Route 32 to Union Pacific RR | 4,409 linear feet | We Energies (private) | 4,409 lf at headwaters of Tributary E on property owned by We Energies. Buffer area consists primary of old field vegetation. | Achieve SEWRPC recommended Goals of 75 whereby 75% minimum of the total stream length should be naturally vegetated and 75 foot wide minimum riparian buffer established. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Low | We Energies | Ecological Consultant/ Contractor | \$37,500 to restore riparian buffer; \$5,000/yr maintenance | 10-20+ Years |
| TRE 2/6: Tributary E Reaches 2 & 6 | We Energies property | 3,158 linear feet | We Energies (private) | 3,158 linear feet of riparian area that is generally in good condition but with invasive woody species present. | Enhance riparian buffer by selectively removing invasive woody species. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Low | We Energies | Ecological Consultant/ Contractor | \$45,000 to enhance riparian buffer; \$5,000/yr maintenance | 10-20+ Years |
| TRF 1: Tributary F Reach 1 | W of Union Pacific RR to Cliffside Park | 4,390 linear feet | Private Ag & Residential Properties | 4,390 lf of tributary beginning primarily in agricultural fields then flowing through a residential subdivision through a concrete channel prior to entering Cliffside Park. The riparian buffer is narrow in the ag areas and is mown turf grass in the residential area. | Design and implement project to enhance riparian areas with native prairie vegetation where feasible. Project would create a wildlife corridor and have water quality benefits. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Medium | Private Owners | Root-Pike WIN; Stormwater Engineer; Ecological Consultant | \$40,000 to enhance riparian buffer; \$5,000/yr maintenance | 10-20+ Years |
| TRF 2/3: Tributary F Reaches 2 & 3 | Cliffside Park | 4,790 linear feet | Racine County | 4,790 lf of tributary with average quality riparian buffer but with presence of many invasive woody species. | Enhance riparian buffers by selectively removing invasive woody species. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Low | Racine County | Ecological Consultant/ Contractor | \$66,000 to enhance riparian buffer; \$6,000/yr maintenance | 10-20+ Years |

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|--|---|-------------------------------------|--|---|---|--|---------------------|-----------------------------|---|---|---------------------------------|
| TRG 1: Tributary G Reach 1 | Between Route 31 & Route 32 | 3,197 linear feet | Private Residential Properties | 3,197 lf of tributary flowing through a channelized swale in residential subdivision. Swale side slopes are primarily mown turf grass. | Design and implement project to enhance riparian areas and swale bottom with native prairie & wetland vegetation where feasible to create wildlife corridor and provide water quality benefits. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Medium | Private Owners | Root-Pike WIN; Stormwater Engineer; Ecological Consultant | \$35,000 to enhance riparian buffer; \$4,000/yr maintenance | 10-20+ Years |
| TRG 2: Tributary G Reach 2 | Headwaters to Union Pacific RR | 7,231 linear feet | Multiple Private Properties | 7,231 lf of tributary spanning many private properties between the headwaters west of Route 31 and Union Pacific RR. Much of the riparian area is at least moderate quality but with many invasive woody species. | Enhance select riparian buffer areas by selectively removing invasive woody species. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Low | Private Owners | Root-Pike WIN; Ecological Consultant/ Contractor | \$40,000 to enhance riparian buffer; \$5,000/yr maintenance | 10-20+ Years |
| TRG 3: Tributary G Reach 3 | Union Pacific RR to 5 ½ Mile Rd. | 7,108 linear feet | Multiple Private Properties | 7,108 lf of tributary located across multiple private properties from Union Pacific RR to 5 ½ Mile Rd. Most of reach has a natural but low quality riparian buffer dominated by invasive woody species. | Enhance select riparian buffer areas by selectively removing invasive woody species and extending buffer width where feasible in agricultural areas. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Low | Private Owners | Root-Pike WIN; Ecological Consultant/ Contractor | \$60,000 to enhance riparian buffer; \$6,000/yr maintenance | 10-20+ Years |
| TRG 4: Tributary G Reach 4 | Holy Cross Cemetery to Crawford Park | 4,056 linear feet | Multiple Urban Private Properties | 4,056 lf of tributary that is channelized through multiple urban areas. Riparian condition varies but is mown turf grass in many areas. | Achieve SEWRPC recommended Goals of 75 whereby 75% minimum of the total stream length should be naturally vegetated and 75 foot wide minimum riparian buffer established. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Low | Private Owners | Root-Pike WIN; Ecological Consultant/ Contractor | \$70,000 to enhance riparian buffer; \$7,000/yr maintenance | 10-20+ Years |
| TRG 5: Tributary G Reach 5 | Crawford Park to Novak Rd. | 8,073 linear feet | Caledonia (public) | 8,073 lf of tributary between Crawford Park and Novak Rd. within a human created drainage ditch with concrete low flow channel. Side slopes are mown turf grass. | Design and implement project to restore native prairie and wetland vegetation along buffer areas to create green infrastructure connection benefits. A bike or walking trail could also be constructed. | Filter Strip: TSS =75 tons/yr TN = 984 lbs/yr TP = 154 lbs/yr Bacteria = 37% | High: Critical Area | Caledonia | Stormwater Engineer; Ecological Consultant | \$100,000 to enhance riparian buffer; \$10,000 /yr maintenance | 1-10 Years |
| TRG 6: Tributary G Reach 6 | Middle Rd. to TRG5 | 3,198 linear feet | Private Agricultural Property | 3,198 lf of tributary that is moderately channelized along north side of agricultural field. Riparian buffer is mostly a narrow bank of second growth invasive woody species. | Increase riparian buffer width to at least 75 feet along south side of tributary within agricultural field. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Low | Private Owner | USDA-NRCS | \$10,000 to restore riparian buffer; \$1,000/yr maintenance | 10-20+ Years |
| TRH 1: Tributary H Reach 1 | Charles St. to Lake Michigan | 4,501 linear feet | Primarily Private Residential Properties | 4,501 lf of tributary that is in average ecological condition with intact floodplain dominated by second growth woody species. Some invasive species such as buckthorn and honeysuckle are found in the riparian area. | Enhance select riparian buffer areas by selectively removing invasive woody species. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Low | Private Owners | Root-Pike WIN; Ecological Consultant/ Contractor | \$40,000 to enhance riparian buffer; \$5,000/yr maintenance | 10-20+ Years |
| TRI 1: Tributary I Reach 1 | Charles St. to Lake Michigan | 5,880 linear feet | Primarily Private Residential Properties | 5,880 lf of tributary that is in good ecological condition with intact floodplain dominated by older second growth woody species. Some invasive species such as buckthorn and honeysuckle are found in the riparian area. | Enhance select riparian buffer areas by selectively removing invasive woody species. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Low | Private Owners | Root-Pike WIN; Ecological Consultant/ Contractor | \$54,000 to enhance riparian buffer; \$6,000/yr maintenance | 10-20+ Years |
| TRI J: Tributary J Reach 1 | West of Erie St. to Lake Michigan | 7,468 linear feet (3,700 in Caled.) | Primarily Private Residential Properties | 3,700 lf of upstream portion of tributary that is in good ecological condition with intact floodplain dominated by older second growth woody species. Some invasive species such as buckthorn and honeysuckle are found in the riparian area. | Enhance select riparian buffer areas by selectively removing invasive woody species. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Low | Private Owners | Root-Pike WIN; Ecological Consultant/ Contractor | \$34,000 to enhance riparian buffer; \$4,000/yr maintenance | 10-20+ Years |
| GREEN INFRASTRUCTURE PROTECTION AREAS (See Figure 72) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Technical and financial assistance needed to protect open space or implement conservation/low impact development is high because of land, design/permitting, and construction costs. | | | | | | | | | | | |
| GI6 | Generally between 6 Mile and 7 Mile Rd. | 334 acres | Private agricultural and vacant land | 334 acres on private agricultural and vacant parcels along Tributary E Reach 1 and Cliffside Park to the southeast. Parcels are slated for residential and also contain SEWRPC Environmental Corridors. | Incorporate Conservation or Low Impact design standards into future development plans. | Pollutant reduction cannot be assessed via modeling | High: Critical Area | Future Developer; Caledonia | WDNR; USACE; NRCS/ SWCD; Eco. Consultant | Cost for implementing a Conservation or Low Impact Development cannot be determined | As new development occurs |

| ID# | Location | Units (acres/linear feet) | Owner (public or private) | Existing Condition | Management Measure Recommendation | Pollutant Reduction Efficiency | Priority | Responsible Entity | Sources of Technical Assistance | Cost Estimate | Implementation Schedule (Years) |
|------|--------------------------------------|---------------------------|--|--|--|---|---------------------|-----------------------------|--|---|---------------------------------|
| GI7 | NW of 5 Mile Rd. and Rt. 31 | 85 acres | Private agricultural land and woodland | 85 acres on private agricultural land and woodland at headwaters of Tributary G Reach 2. SEWRPC Environmental Corridors are also included on these parcels. Parcels are slated for future residential development. | Incorporate Conservation or Low Impact design standards into future development plans. | Pollutant reduction cannot be assessed via modeling | High: Critical Area | Future Developer; Caledonia | WDNR; USACE; NRCS/ SWCD; Eco. Consultant | Cost for implementing a Conservation or Low Impact Development cannot be determined | As new development occurs |
| GI8 | Generally between 5 ½ and 5 Mile Rd. | 228 acres | Primary private agricultural | 228 acres of land on parcels that are primarily agricultural and slated for future residential development along Tributary G Reaches 5 & 6. The unfinished "Arboretum" subdivision and SEWRPC Environmental Corridors are also located within this area. | Incorporate Conservation or Low Impact design standards into future development plans. | Pollutant reduction cannot be assessed via modeling | High: Critical Area | Future Developer; Caledonia | WDNR; USACE; NRCS/ SWCD; Eco. Consultant | Cost for implementing a Conservation or Low Impact Development cannot be determined | As new development occurs |
| GI9 | N of 4 Mile Rd. | 96 acres | Primary private agricultural | 96 acres of land on parcels that are primarily agricultural and slated for future residential development and cemetery expansion at headwaters of Tributary G Reach 4. | Incorporate Conservation or Low Impact design standards into future residential development plans and incorporate stormwater best management practices into cemetery expansion where feasible. | Pollutant reduction cannot be assessed via modeling | High: Critical Area | Future Developer; Caledonia | WDNR; USACE; NRCS/ SWCD; Eco. Consultant | Cost for implementing a Conservation or Low Impact Development & other stormwater BMPs cannot be determined | As new development occurs |
| GI10 | NE or Charles St. & 3 Mile Rd. | 115 acres | Vulcan (private) | 115 acres of land owned by Vulcan that is mostly agricultural and slated for future residential development. | Incorporate Conservation or Low Impact design standards into future residential development plans. | Pollutant reduction cannot be assessed via modeling | High: Critical Area | Future Developer; Caledonia | WDNR; USACE; NRCS/ SWCD; Eco. Consultant | Cost for implementing a Conservation or Low Impact Development cannot be determined | As new development occurs |

AGRICULTURAL MANAGEMENT PRACTICES (See Figure 73)

Technical and Financial Assistance Needs: Technical and financial assistance needed to implement farm management practices is relatively low because of programs offered by agencies such as USDA/NRCS.

| | | | | | | | | | | | |
|-----|---|-----------|---------------------------|---|---|---|---------------------|-------------------------------|-----------|---|----------|
| AG2 | E & W of Route 32 & N or 7 Mile Rd. | 115 acres | Private agricultural land | 115 acres of agricultural land in row crop production at headwaters of Tributary E. | Enroll in NRCS/SWCD programs and implement conservation tillage (no till) with filter strips. | No Till w/Filters: TN= 548 lbs/yr TP= 294 lbs/yr TSS=192 tons/yr | High: Critical Area | Existing Farmers/ Land Owners | NRCS/SWCD | The cost for implementing conservation tillage depends on available equipment and crop type | Annually |
| AG3 | Along Union Pacific RR between 7 Mile & 6 Mile Rds. | 259 acres | Private agricultural land | 259 acres of agricultural land in row crop production. | Enroll in NRCS/SWCD programs and implement conservation tillage (no till) with filter strips. | No Till w/Filters: TN= 1138 lbs/yr TP= 610 lbs/yr TSS=391 tons/yr | High: Critical Area | Existing Farmers/ Land Owners | NRCS/SWCD | The cost for implementing conservation tillage depends on available equipment and crop type | Annually |
| AG4 | W of Route 31 & S of 6 Mile Rd. | 113 acres | Private agricultural land | 113 acres of agricultural land in row crop production at headwaters of Tributary G. | Enroll in NRCS/SWCD programs and implement conservation tillage (no till) with filter strips. | No Till w/Filters: TN= 539 lbs/yr TP= 289 lbs/yr TSS=189 tons/yr | High: Critical Area | Existing Farmers/ Land Owners | NRCS/SWCD | The cost for implementing conservation tillage depends on available equipment and crop type | Annually |
| AG5 | E of Middle Rd. & S of 6 Mile Rd. | 159 acres | Private agricultural land | 159 acres of agricultural land in row crop production. | Enroll in NRCS/SWCD programs and implement conservation tillage (no till) with filter strips. | No Till w/Filters: TN= 734 lbs/yr TP= 393 lbs/yr TSS=255 tons/yr | High: Critical Area | Existing Farmers/ Land Owners | NRCS/SWCD | The cost for implementing conservation tillage depends on available equipment and crop type | Annually |
| AG6 | E & W of Route 32 & along 4 Mile Rd. | 132 acres | Private agricultural land | 132 acres of agricultural land in row crop production at headwaters of Tributary G. | Enroll in NRCS/SWCD programs and implement conservation tillage (no till) with filter strips. | No Till w/Filters: TN= 620 lbs/yr TP= 333 lbs/yr TSS=217 tons/yr | High: Critical Area | Existing Farmers/ Land Owners | NRCS/SWCD | The cost for implementing conservation tillage depends on available equipment and crop type | Annually |
| AG7 | Along Charles St. & N of 3 Mile Rd. | 88 acres | Private agricultural land | 88 acres of agricultural land in row crop production. | Enroll in NRCS/SWCD programs and implement conservation tillage (no till) with filter strips. | No Till w/Filters: TN= 431 lbs/yr TP= 231 lbs/yr TSS=152 tons/yr | High: Critical Area | Existing Farmers/ Land Owners | NRCS/SWCD | The cost for implementing conservation tillage depends on available equipment and crop type | Annually |

| ID# | Location | Units (acres/linear feet) | Owner (public or private) | Existing Condition | Management Measure Recommendation | Pollutant Reduction Efficiency | Priority | Responsible Entity | Sources of Technical Assistance | Cost Estimate | Implementation Schedule (Years) |
|---|--------------------------------------|---------------------------|---------------------------|---|--|---|----------|----------------------|-----------------------------------|--|--|
| OTHER MANAGEMENT MEASURES (See Figure 74) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Technical and financial assistance needed to implement these projects varies depending on complexity. | | | | | | | | | | | |
| 3 | Between 6 Mile Rd. & Trib G | 2,000 lf | Caledonia (Pubic) | Existing concrete bottom channel flowing south between 6 Mile Rd. and Tributary G. Channel is located within residential subdivision. | Design and implement project to remove concrete channel and create bioswale dominated by native vegetation to improve water quality, wildlife habitat, and green infrastructure. | Filter Strip: TN= 40% TP= 45% TSS= 73% | Low | Caledonia | Engineer & Ecological Consultants | \$100,000 to design and install bioswale | 10-20+ Years |
| 4 | Crestview Park on Crestview Park Dr. | 1,000 lf | Caledonia (Public) | Series of existing turf grass swales within Crestview Park. | Design and implement project to retrofit existing turf grass swales with native vegetation to create bioswales. | Filter Strip: TN= 40% TP= 45% TSS= 73% | Low | Caledonia | Ecological Consultants | \$25,000 to design and install bioswale | 10-20+ Years |
| 5 | Between 4 ½ Mile Rd. and Trib G | 3,000 lf | Caledonia (Public) | Existing turf grass swale between 4 ½ Mile Rd. and Tributary G that flows between residential areas. | Design and implement project to retrofit existing turf grass swale with native vegetation to create bioswale. | Filter Strip: TN= 40% TP= 45% TSS= 73% | Low | Caledonia | Engineer & Ecological Consultants | \$60,000 to design and install bioswale | 10-20+ Years |
| 6 | Ravine Bay Estates Subdivision | 0.5 acre | Subdivision (Private) | Residential subdivision under construction that does not appear to have any stormwater detention. Subdivision stormsewers appear to outlet into small intermittent tributary that eventually flows to Tributary I. The intermittent tributary is currently stable with minimal erosion. | Consider designing and implementing a naturalized detention basin in open lot at corner of Horner Dr. & Marwood Dr. with strict stormwater release rates to project the condition of the small intermittent tributary. | Wetland Det: TSS=77.5% TN= 20% TP= 40% Bacteria=78% | Medium | Developer/ Caledonia | Engineer & Ecological Consultants | \$80,000 to design and construct detention basin | Before Residential Development is Complete |
| 8 | St. Rita School | 1/8 acre | St. Rita School (Private) | Depressional area in front of school with several stormwater downspouts draining to it. | Design and construct demonstration rain garden. | Wetland Det: TSS=77.5% TN= 20% TP= 40% Bacteria=78% | Low | St. Rita School | Root-Pike WIN | \$10,000 to design and install rain garden | 10-20+ Years |

NORTH BAY

| ID# | Location | Units (acres/linear feet) | Owner (public or private) | Existing Condition | Management Measure Recommendation | Pollutant Reduction Efficiency | Priority | Responsible Entity | Sources of Technical Assistance | Cost Estimate | Implementation Schedule (Years) |
|---|---------------------------|---------------------------|--------------------------------|---|---|--|----------|--------------------|--------------------------------------|---|---------------------------------|
| RIPARIAN AREA RESTORATION & MAINTENANCE (See Figure 71) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Technical assistance needed to implement riparian area & lake buffer restoration and maintenance is moderate at first because an environmental consultant is usually hired to complete a plan and implement the work. However, costs can be greatly reduced over time if municipal or park district staff complete some restoration and most of the long term maintenance in house. Private landowners will need the greatest assistance. | | | | | | | | | | | |
| TRI L: Tributary L Reach 1 | Erie St. to Lake Michigan | 3,141 linear feet | Private Residential Properties | 3,141 lf of tributary in close proximity to residential lots. The channel is relatively stable but the riparian area is narrow and generally not in good ecological condition as private residents have elected to install different buffer treatments. | Enhance select riparian buffer areas by engaging residents in an educational forum where they learn to enhance buffer areas using ecologically sound approaches. Residents implement buffer enhancements following education. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Low | Private Owners | Root-Pike WIN; Ecological Consultant | \$15,000 to restore riparian buffer; \$3,000/yr maintenance | 10-20+ Years |

OAK CREEK

| ID# | Location | Units (acres/linear feet) | Owner (public or private) | Existing Condition | Management Measure Recommendation | Pollutant Reduction Efficiency | Priority | Responsible Entity | Sources of Technical Assistance | Cost Estimate | Implementation Schedule (Years) |
|---|--|---------------------------|---------------------------------|---|---|--|---------------------|-----------------------------|--|--|---|
| DETENTION BASIN RETROFITS & MAINTENANCE (See Figure 68) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Technical assistance needed to implement detention basin retrofits is relatively low while financial assistance needs are moderate. Private landowners will need the greatest assistance. | | | | | | | | | | | |
| 4B | N end of MMSD South Shore WWTP | 35 acres | MMSD (private) | Series of existing linear dry bottom detention features with mown turf grass slopes and concrete channels on MMSD South Shore WWTP property. | Design and implement project to retrofit existing detention features to create linear bioinfiltration swales planted with native vegetation. Project would enhance and expand on existing green infrastructure along Lake Michigan. | Infiltration Basin: TSS=23 tons/yr TN=336 lbs/yr TP=42 lbs/yr Bacteria=78% | High: Critical Area | MMSD | Civil Engineer & Ecological Consultant/ Contractor | \$250,000 to design and install bioinfiltration features; \$5,000/year maintenance | 1-10 Years |
| 5A, 5B, 5C | Residential subdivision along 6th Street | 2.3 acres | Residential HOA (private) | Three existing wet bottom detention basins with mown turf grass side slopes. Basin A in not yet complete. Scattered invasive willow is also present. | Design and implement project to retrofit existing detention basins by installing native vegetation along side slopes and emergent zones; control invasive willow. | Wetland Det.: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Low | Residential HOA | Ecological Consultant/ Contractor | \$37,000 to design and install native vegetation; \$2,000/year maintenance | 10-20+ Years |
| 8A, 8B, 8C | Bender Park | 2.7 acres | Milwaukee County Parks (Public) | Three existing naturalized wetland bottom detention basins along restored bluff area in Bender Park. All are in good ecological condition. | Continue of begin to implement management program to maintain current condition. | Wetland Det.: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Medium | Milwaukee County Parks | None needed | \$2,000/yr maintenance | Ongoing |
| 9A | NE corner of The Bluffs Subdivision | 0.6 acres | Residential HOA (Private) | Existing wet bottom detention basin dominated by cattail along the edge and with mown turf grass side slopes adjacent to Union Pacific RR. Surrounding development is currently under construction. | Design and implement project to retrofit existing basin by installing native vegetation along side slopes to improve water quality, wildlife habitat, and green infrastructure connection benefits. | Wet Pond Det.: TSS = 60% TN = 35% TP = 45% Bacteria = 70% | Medium | Developer & Residential HOA | City of Oak Creek | \$8,000 to design and install native vegetation; \$1,000/year maintenance | Prior to developer completing subdivision |
| WETLAND RESTORATION (See Figure 69) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Wetland restoration projects are typically complex and require high technical and financial assistance needs to protect land, design, construct, monitor, and maintain the restoration. | | | | | | | | | | | |
| 23 | We Energies Property | 9 acres | We Energies (private) | 9 acres of drained hydric soils on south side of We Energies plant along the Lake Michigan coast/bluff. Area is partially developed. | Investigate potential for wetland restoration area that could be used to mitigate for future wetland impacts by We Energies. | Wetland Restore: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Medium | We Energies | Ecological Consultant | \$135,000 to design/ permit/install/ maintain wetland mitigation | As needed by We Energies |
| 24 | N of Ryan Rd. | 5 acres | DuPont (private) | 5 acres of wetland that has been altered via installation of a drainage channel. | Restore wetland as part of future redevelopment plan for the site. | Wetland Restore: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Medium | Future Developer; Oak Creek | Landscape Architect | \$40,000 to design & install wetland | When redevelopment occurs |
| 25 | Between 5th Ave. & Union Pacific RR | 5 acres | Industrial Site Owner (private) | 5 acres of drained hydric soils adjacent to existing wetland complex. Area is slated for future mixed use development. | Restore wetlands as part of future development. | Wetland Restore: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Low | Future Developer; Oak Creek | Engineer; Ecological Consultant | \$40,000 to design & install wetland | When redevelopment occurs |

| ID# | Location | Units (acres/linear feet) | Owner (public or private) | Existing Condition | Management Measure Recommendation | Pollutant Reduction Efficiency | Priority | Responsible Entity | Sources of Technical Assistance | Cost Estimate | Implementation Schedule (Years) |
|---|-----------------------------------|---------------------------|---------------------------------|---|---|--|---------------------|------------------------------|--|---|------------------------------------|
| STREAMBANK, RAVINE, & CHANNEL RESTORATION (See Figure 70) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Stream restorations are complex and require high technical and financial assistance needs to protect land, design, construct, monitor, and maintain the restoration. The project becomes more complex in areas that flow through several governing bodies or multiple private residences. Technical and financial assistance associated with stream maintenance is generally low for minor tasks such as removing debris. | | | | | | | | | | | |
| TRB 2: Tributary B Reach 2 | Bender Park | 1,497 linear feet | Milwaukee County Parks (public) | 1,497 lf of tributary (to Lake Michigan) within Bender Park that is naturally meandering but with moderately to highly eroded streambanks resulting from a headcut. Reach is bordered immediately by young mesic woodland. | Design, permit, and implement project to stabilize headcut and selectively stabilize highly eroded areas using bioengineering techniques. In addition, install up to five artificial riffles/grade controls within the stream channel. | Stabilize Banks: TSS = 69 tons/yr TN = 137 lbs/yr TP = 69 lbs/yr Bacteria = n/a | High: Critical Area | Milwaukee County Parks | WDNR; Hydrologist; Ecological Consultant; Contractor | \$250,000 to design, permit, and implement stabilization measures | 1-10 Years Design; 10+ Years Build |
| TRD 2: Tributary D Reach 2 | N side of We Energies property | 1,537 linear feet | We Energies (private) | 1,537 lf of tributary (to Lake Michigan) on land owned by We Energies. Upper portion of reach is naturally meandering but exhibits highly eroded streambanks. About 500 lf along the downstream portion of the reach is a deep ravine with severe erosion prior to joining Lake Michigan. | Design, permit, and implement project to stabilize highly eroded stream and ravine slopes using a combination of bioengineering and hard armoring approaches. Grade controls will also be needed within the channel to control flow velocities. | Stabilize Banks: TSS=1,753 t/yr TN =3,506 lbs/yr TP =1,753 lbs/yr Bacteria = n/a | High: Critical Area | We Energies | WDNR; Hydrologist; Ecological Consultant; Contractor | \$1,200,000 to design, permit, and implement stabilization measures | 1-10 Years Design; 10+ Years Build |
| RIPARIAN AREA RESTORATION & MAINTENANCE (See Figure 71) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Technical assistance needed to implement riparian area & lake buffer restoration and maintenance is moderate at first because an environmental consultant is usually hired to complete a plan and implement the work. However, costs can be greatly reduced over time if municipal or park district staff complete some restoration and most of the long term maintenance in house. Private landowners will need the greatest assistance. | | | | | | | | | | | |
| TRA 1: Tributary A Reach 1 | Union Pacific RR to Lake Michigan | 3,468 linear feet | Private residential lots & MMSD | 3,468 lf of tributary reach with a degraded riparian buffer dominated by invasive mown turf grass and invasive shrubs and trees. | Achieve SEWRPC recommended Goals of 75 whereby 75% minimum of the total stream length should be naturally vegetated and 75 foot wide minimum riparian buffer established. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Medium | Private Owners | Ecological Consultant/ Contractor | \$45,000 to restore riparian buffer; \$5,000/yr maintenance | 10-20+ Years |
| TRB 1: Tributary B Reach 1 | Bender Park | 2,291 linear feet | Milwaukee County Parks (public) | 2,291 lf of tributary within Bender Park with riparian area dominated by invasive shrubs, trees, and other herbaceous species. | Remove invasive shrubs and trees and spot herbicide problematic herbaceous species within a minimum 75 foot buffer on each side of tributary. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Medium | Milwaukee County Parks | none | \$42,000 to enhance buffer; \$5,000/yr maintenance | 10-20+ Years |
| TRB 2: Tributary B Reach 2 | Bender Park | 1,497 linear feet | Milwaukee County Parks (public) | 1,497 lf of tributary within Bender Park with good quality mesic woodland buffer but with overabundant sugar maple that is shading the herbaceous layer. | Selectively remove young maple trees and other invasive species in the immediate riparian corridor and supplement herbaceous layer with native species to help stabilize stream bank and floodplain soils. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Low | Milwaukee County Parks | none | \$20,000 to enhance buffer; \$3,000/yr maintenance | 10-20+ Years |
| TRC 1: Tributary C Reach 1 | Bender Park | 2,693 linear feet | Milwaukee County Parks (public) | 2,693 lf of tributary within Bender Park with riparian area consisting of many second growth invasive woody species and degraded sedge meadow. | Enhance riparian area by selectively removing invasive woody species and interseeding existing sedge meadow to enhance diversity. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Medium | Milwaukee County Parks | none | \$40,000 to enhance buffer; \$5,000/yr maintenance | 10-20+ Years |
| GREEN INFRASTRUCTURE PROTECTION AREAS (See Figure 72) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Technical and financial assistance needed to protect open space or implement conservation/low impact development is high because of land, design/permitting, and construction costs. | | | | | | | | | | | |
| G12 | NW corner of Puetz Rd. & 5th Ave. | 90 acres | Private land | 90 acres on private parcels along headwaters of Tributary A and also including SEWRPC Environmental Corridors. Parcels are slated to become residential development in the future. | Incorporate Conservation or Low Impact design standards into future development plans. | Pollutant reduction cannot be assessed via modeling | High: Critical Area | Future Developer; Oak Creek | WDNR; USACE; SEWRPC NRCS/ SWCD; Eco. Consultant | Cost for implementing a Conservation or Low Impact Development cannot be determined | As new development occurs |
| G13 | N of Ryan Road | 250 acres | Mostly private vacant land | 250 acres of mostly vacant brownfields know as the Lakefront Redevelopment Area. In 2011 the City of Oak Creek produced and adopted a redevelopment plan for the site that includes redevelopment incorporating green infrastructure. | Implement development concepts outlined in the City Redevelopment Plan and stabilize shoreline to prevent bluff erosion. | Pollutant reduction cannot be assessed via modeling | High: Critical Area | Future Developers; Oak Creek | UW-Milwaukee; WDNR; USACE; SEWRPC NRCS/ SWCD | Cost for implementing proposed designs cannot be determined | As new development occurs |

| ID# | Location | Units (acres/linear feet) | Owner (public or private) | Existing Condition | Management Measure Recommendation | Pollutant Reduction Efficiency | Priority | Responsible Entity | Sources of Technical Assistance | Cost Estimate | Implementation Schedule (Years) |
|-----|-----------------------------------|---------------------------|------------------------------------|---|---|---|---------------------|--|---|---|--|
| G14 | Between Fitzsimmons & Oakwood Rd. | 95 acres | Private agricultural & vacant land | 95 acres of private agricultural and vacant land adjacent to Bender Park and slated for future residential development. | Milwaukee County Department of Parks consider purchasing and restoring parcels to increase open space/green infrastructure adjacent to Bender Park. | Pollutant reduction cannot be assessed via modeling | High: Critical Area | Milwaukee County Parks | n/a | Cost cannot be determined | As parcels become available for purchase |
| G15 | S of Oakwood Rd. | 36 acres | We Energies Property | 36 acres of land currently owned by We Energies but slated for future residential/mixed use development. Parcels also include SEWRPC Environmental Corridors. | Incorporate Conservation or Low Impact design standards into future development plans. | Pollutant reduction cannot be assessed via modeling | High: Critical Area | Future Developer; Oak Creek; We Energies | WDNR; USACE; SEWRPC NRCS/ SWCD; Eco. Consultant | Cost for implementing a Conservation or Low Impact Development cannot be determined | As new development occurs |

AGRICULTURAL MANAGEMENT PRACTICES (See Figure 73)

Technical and Financial Assistance Needs: Technical and financial assistance needed to implement farm management practices is relatively low because of programs offered by agencies such as USDA/NRCS.

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|-----|---|-----------|---------------------------|--|---|--|---------------------|----------------------------|-----------|---|----------|
| AG1 | E & W of Union Pacific RR & between Ryan & Oakwood Rds. | 109 acres | Private agricultural land | 109 acres of agricultural land in row crop production. | Enroll in NRCS/SWCD programs and implement conservation tillage (no till) with filter strips. | No Till w/Filters: TN= 507 lbs/yr TP= 272 lbs/yr TSS=177 tons/yr | High: Critical Area | Existing Farmer/Land Owner | NRCS/SWCD | The cost for implementing conservation tillage depends on available equipment and crop type | Annually |
|-----|---|-----------|---------------------------|--|---|--|---------------------|----------------------------|-----------|---|----------|

OTHER MANAGEMENT MEASURES (See Figure 74)

Technical and Financial Assistance Needs: Technical and financial assistance needed to implement these projects varies depending on complexity.

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| 2 | Lake Michigan Bluff from Fitzsimmons Rd. S to Elm Rd. | 4,500 lf | Milwaukee Co. Parks & We Energies | Approximately 4,500 linear feet of severe/accelerated bluff erosion along Lake Michigan on land owned by Milwaukee Co. Parks and We Energies. | Develop a feasibility study to determine the need for and costs of stabilizing the eroded bluff using approaches similar to the bluff stabilization work that was completed at Bender Park. | n/a | High: Critical Area | Milwaukee Co. Parks & We Energies | Structural Engineer, Planning & Ecologist firms | \$50,000 to conduct feasibility study; cost to construct cannot be determined until plans are complete | 1-10 Years Design; 10+ Years Build if determined necessary |
|---|---|----------|-----------------------------------|---|---|-----|---------------------|-----------------------------------|---|--|--|

RACINE

| ID# | Location | Units (acres/linear feet) | Owner (public or private) | Existing Condition | Management Measure Recommendation | Pollutant Reduction Efficiency | Priority | Responsible Entity | Sources of Technical Assistance | Cost Estimate | Implementation Schedule (Years) |
|-----|----------|---------------------------|---------------------------|--------------------|-----------------------------------|--------------------------------|----------|--------------------|---------------------------------|---------------|---------------------------------|
|-----|----------|---------------------------|---------------------------|--------------------|-----------------------------------|--------------------------------|----------|--------------------|---------------------------------|---------------|---------------------------------|

DETENTION BASIN RETROFITS & MAINTENANCE (See Figure 68)

Technical and Financial Assistance Needs: Technical assistance needed to implement detention basin retrofits is relatively low while financial assistance needs are moderate. Private landowners will need the greatest assistance.

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|-----|-----------------------------------|------------|------------------|---|---|---|---------------------|-----------|--|--|--------------|
| 39B | Vidian Chelsak Park | 3 acres | Racine (public) | Existing dry bottom detention basin within Vidian Chelsak Park along the south side of 3 Mile Rd. Vegetation in the basin consists of mown turf grass. | Design and implement project to replace turf grass and revegetate with native vegetation to improve water quality, wildlife, and green infrastructure benefits while reducing long term maintenance costs. Project would also be good demonstration for public. | Dry Detention: TSS = 22 tons/yr TN = 148 lbs/yr TP = 32 lbs/yr Bacteria = 88% | High: Critical Area | Racine | Root-Pike WIN; Civil Engineer; Ecological Consultant/ Contractor | \$40,000 to design and install prairie vegetation; \$2,000/ year maintenance | 1-10 Years |
| 39D | Matson Park Detention | 0.9 acres | Racine (public) | Existing dry bottom detention basin within Matson Park consisting of mown turf grass. | Design and implement project to naturalize basin with native vegetation as a demonstration project for the public to see the benefits of improved water quality, wildlife habitat, and green infrastructure. | Dry Detention: TSS = 77.5% TN = 20% TP = 44% Bacteria = 88% | Medium | Racine | Root-Pike WIN; Civil Engineer; Ecological Consultant/ Contractor | \$15,000 to design and install prairie vegetation; \$1,000/yr maintenance | 10-20+ Years |
| 43A | Between William St. & Layard Ave. | 13.3 acres | Racine (private) | Existing regional storage area that has been naturalized in part with native prairie and wetland vegetation. Several invasive species are common on the site. | Implement a monitoring and management program to keep invasive species under control and to ensure the storage area performs as designed. | Wetland Det: TSS=280 tons/yr TN=1,800 lbs/yr TP=456 lbs/yr Bacteria=78% | High: Critical Area | Caledonia | Caledonia; Civil Engineer; Ecological Consultant/ Contractor | \$450,000 to design, permit, and install; \$6,000/yr maintenance | 1-10 Years |

WETLAND RESTORATION (See Figure 69)

Technical and Financial Assistance Needs: Wetland restoration projects are typically complex and require high technical and financial assistance needs to protect land, design, construct, monitor, and maintain the restoration.

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|---|--------------------------------------|----------|------------------------------------|---|--|---|--------|-----------------------------|---|---|--------------------------------------|
| 2 | SE corner of Route 32 and 3 Mile Rd. | 25 acres | Vulcan Materials Company (private) | 25 acres of drained wetland located within parcel owned by Vulcan Materials Company. Land is slated for future residential development. | Incorporate up to 50% of the site as wetland restoration into future development plans and use restored wetland areas as wetland detention and mitigation. | Wetland: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Medium | Future Developer; Caledonia | WDNR; NRCS; Engineer; Ecological Consultant | \$375,000 to design/ permit/install/ maintain wetland mitigation bank | When planning for development occurs |
|---|--------------------------------------|----------|------------------------------------|---|--|---|--------|-----------------------------|---|---|--------------------------------------|

RIPARIAN AREA RESTORATION & MAINTENANCE (See Figure 71)

Technical and Financial Assistance Needs: Technical assistance needed to implement riparian area & lake buffer restoration and maintenance is moderate at first because an environmental consultant is usually hired to complete a plan and implement the work. However, costs can be greatly reduced over time if municipal or park district staff complete some restoration and most of the long term maintenance in house. Private landowners will need the greatest assistance.

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|----------------------------|--------------------------------------|------------------------------------|--|---|--|--|-----|----------------|-----------------------|-----|--------------|
| TRI K: Tributary K Reach 1 | North of 3 Mile Rd. to Lake Michigan | 2,428 linear feet mostly in Racine | Primarily Private Residential Properties | 2,428 lf of tributary, most of which is located in close proximity to residential lots. The channel is relatively stable but the riparian area is narrow and generally not in good ecological condition as private residents have elected to install different buffer treatments. | Enhance select riparian buffer areas by engaging residents in an educational forum where they learn to enhance buffer areas using ecologically sound approaches. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Low | Private Owners | Root-Pike WIN; Racine | n/a | 10-20+ Years |
|----------------------------|--------------------------------------|------------------------------------|--|---|--|--|-----|----------------|-----------------------|-----|--------------|

GREEN INFRASTRUCTURE PROTECTION AREAS (See Figure 72)

Technical and Financial Assistance Needs: Technical and financial assistance needed to protect open space or implement conservation/low impact development is high because of land, design/permitting, and construction costs.

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|------|-----------------|----------|------------------|---|--|---|---------------------|--------------------------|--|---|---------------------------|
| GI11 | S of 3 Mile Rd. | 56 acres | Vulcan (private) | 56 acres of land owned by Vulcan that is mostly vacant and slated for future residential development. | Incorporate Conservation or Low Impact design standards into future residential development plans. | Pollutant reduction cannot be assessed via modeling | High: Critical Area | Future Developer; Racine | WDNR; USACE; NRCS/ SWCD; Eco. Consultant | Cost for implementing a Conservation or Low Impact Development cannot be determined | As new development occurs |
|------|-----------------|----------|------------------|---|--|---|---------------------|--------------------------|--|---|---------------------------|

| ID# | Location | Units (acres/linear feet) | Owner (public or private) | Existing Condition | Management Measure Recommendation | Pollutant Reduction Efficiency | Priority | Responsible Entity | Sources of Technical Assistance | Cost Estimate | Implementation Schedule (Years) |
|---|---|---------------------------|--|---|--|---|----------|--------------------------------|--------------------------------------|---|---------------------------------|
| OTHER MANAGEMENT MEASURES (See Figure 74) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Technical and financial assistance needed to implement these projects varies depending on complexity. | | | | | | | | | | | |
| 9 | W of Wyoming Way Rd. (Sundance Sub.) & N side of Batten Airport | 2,000 lf | Sundance Sub. & Batten Airport (Private) | Existing concrete bottom swale beginning in Sundance Sub. & flowing south then east through the northern portion of Batten Airport. | Design and implement project to remove concrete channel and create bioswale dominated by native vegetation to improve water quality, wildlife habitat, and green infrastructure. | Filter Strip: TN= 40% TP= 45% TSS= 73% | Low | Sundance Sub. & Batten Airport | Engineering & Ecological Consultants | \$100,000 to create bioswale | 10-20 + Years |
| 10 | Batten Airport | 300 acres | Batten Airport (Private) | Existing mowed turf grass areas surrounding all runways. | Investigate possibility to naturalize about 150 acres of turf at airport with short grass native prairie vegetation. | Filter Strip: TN= 40% TP= 45% TSS= 73% | Low | Batten Airport | Ecological Consultant | \$400,000 to install 150 acres of native vegetation | 10-20 + Years |
| 11 | Douglas Park/Cesar Chavez Center | 1/8 acre | Racine (Public) | Parking lot at Douglas Park draining to manholes; adjacent unused mowed turf grass area. | Design and implement project to create curb cuts and drain stormwater runoff from parking lot to constructed rain gardens. | Wetland Det: TSS=77.5% TN= 20% TP= 40% Bacteria=78% | Low | Racine | Engineering & Ecological Consultants | \$15,000 to design and construct rain garden | 10-20 + Years |
| 12 | Second Presbyterian Church | 1/8 acre | Second Presbyterian Church (Private) | Parking lot at church drains stormwater NE to turf grass area. | Design and implement project to create bioswale at NE corner of parking lot. | Filter Strip: TN= 40% TP= 45% TSS= 73% | Low | Second Presbyterian Church | Ecological Consultant | \$15,000 to design and install bioswale | 10-20 + Years |
| 13 | Trinity Lutheran Church | 1/16 acre | Trinity Lutheran Church (Private) | Small depressional area near secondary entry to church taking on stormwater from small pipe. | Design and implement project to create rain garden in small depressional area. | Wetland Det: TSS=77.5% TN= 20% TP= 40% Bacteria=78% | Low | Trinity Lutheran Church | Ecological Consultant | \$6,000 to design and construct rain garden | 10-20 + Years |
| 14 | Roosevelt Elementary School | 1/16 acre | Roosevelt Elementary School (Private) | Several stormwater downspouts into linear turf grass area on east side of school/along Superior St. | Design and implement project to create rain gardens along turn area. This would also be a good demonstration project for the school. | Wetland Det: TSS=77.5% TN= 20% TP= 40% Bacteria=78% | Low | Roosevelt Elementary School | Root-Pike WIN | \$10,000 to design and construct rain garden | 10-20 + Years |
| 15 | Racine Municipal Parking Area on Wisconsin St. | 1.0 acres | Racine (Public) | Older municipal parking area on west side of Wisconsin St. | Consider designing and implementing community park that incorporates stormwater BMPs such as rain gardens, bioswales, etc. | Wetland Det: TSS=77.5% TN= 20% TP= 40% Bacteria=78% | Medium | Racine | Planner, Engineer, Ecologist Firms | \$200,000 to design and construct project | 10-20 + Years |
| 16 | St. Johns Church | 1/16 acre | St. Johns Church (Private) | Linear turf grass area along south side of church/English St. with several stormwater downspouts draining to it. | Design and implement project to create rain garden in turf area. | Wetland Det: TSS=77.5% TN= 20% TP= 40% Bacteria=78% | Low | St. Johns Church | Ecological Consultant | \$10,000 to design and construct rain garden | 10-20 + Years |

SOUTH MILWAUKEE

| ID# | Location | Units (acres/linear feet) | Owner (public or private) | Existing Condition | Management Measure Recommendation | Pollutant Reduction Efficiency | Priority | Responsible Entity | Sources of Technical Assistance | Cost Estimate | Implementation Schedule (Years) |
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DETENTION BASIN RETROFITS & MAINTENANCE (See Figure 68)

Technical and Financial Assistance Needs: Technical assistance needed to implement detention basin retrofits is relatively low while financial assistance needs are moderate. Private landowners will need the greatest assistance.

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|----|-------------------------|------------|-------------------------|---|--|--|--------|----------------------|-----------------------------------|---|--------------|
| 1A | N end of 11th Ave. | 0.36 acres | Business Park (private) | Existing wet bottom detention basins with mown turf grass side slopes within business park along 11th Ave. Basin edges are overgrown in areas with invasive willow. | Design and implement project to remove turf grass from side slopes and revegetate with native vegetation then maintain indefinitely. Also remove invasive willow. Project would expand on green infrastructure located to north. | Wetland Det.: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Medium | Business Association | Ecological Consultant/ Contractor | \$12,000 to design and install prairie vegetation; \$1,000/year maintenance | 10-20+ Years |
| 1B | Behind Grant Park Plaza | 0.50 acres | Business Park (private) | Existing naturalized wetland bottom detention basin servicing adjacent business park. Much of the prairie buffer planting has failed and there is a severely eroded swale near the inlet. | Design and implement project to replant prairie buffer and fix eroded swale near inlet. Project would expand and enhance on surrounding green infrastructure. | Wetland Det.: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Medium | Business Association | Ecological Consultant/ Contractor | \$12,000 to replant prairie vegetation and stabilize eroded swale; \$1,000/year maintenance | 1-10 Years |
| 3C | Behind Franciscan Villa | 0.53 acres | Common Living (private) | Existing wetland bottom detention basin with mown turf grass side slopes along the Union Pacific Railroad. | Design and implement project to remove turf grass from side slopes and revegetate with native vegetation then maintain indefinitely. Project would expand on green infrastructure along RR. | Wetland Det.: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Low | Association | Ecological Consultant/ Contractor | \$14,500 to design and install prairie vegetation; \$1,500/year maintenance | 10-20+ Years |

GREEN INFRASTRUCTURE PROTECTION AREAS (See Figure 72)

Technical and Financial Assistance Needs: Technical and financial assistance needed to protect open space or implement conservation/low impact development is high because of land, design/permitting, and construction costs.

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| G11 | NE corner of Marina Rd. and 5th Avenue | 18 acres | South Milwaukee/ USEP | 18 acres on public land that is currently a USEPA Superfund Site along the Lake Michigan coast. This parcel is slated for future residential development. | Incorporate Conservation Design or Low Impact design standards into future development plans to preserve green infrastructure benefits along Lake Michigan. | Pollutant reduction cannot be assessed via modeling | High: Critical Area | Future Developer; South Milwaukee | WDNR; USACE; NRCS/ SWCD; Eco. Consultant | Cost for implementing a Conservation or Low Impact Development cannot be determined | As new development occurs |
|-----|--|----------|-----------------------|---|---|---|---------------------|-----------------------------------|--|---|---------------------------|

OTHER MANAGEMENT MEASURES (See Figure 74)

Technical and Financial Assistance Needs: Technical and financial assistance needed to implement these projects varies depending on complexity.

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|---|---------------------------------|-----|--------------------------|--|---|-----|--------|-----------------|---------------|---|----------|
| 1 | Lake Shore Dr. & Menomonee Ave. | 0.5 | South Milwaukee (Public) | Existing dump site on side of cliff along Lake Michigan. | Clean up dumped debris and install educational signage. | n/a | Medium | South Milwaukee | Root-Pike WIN | \$5,000 to clean up and install signage | Annually |
|---|---------------------------------|-----|--------------------------|--|---|-----|--------|-----------------|---------------|---|----------|

WIND POINT

| ID# | Location | Units (acres/linear feet) | Owner (public or private) | Existing Condition | Management Measure Recommendation | Pollutant Reduction Efficiency | Priority | Responsible Entity | Sources of Technical Assistance | Cost Estimate | Implementation Schedule (Years) |
|---|--|---|--|---|--|---|---------------------|--|--|--|---------------------------------|
| DETENTION BASIN RETROFITS & MAINTENANCE (See Figure 68) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Technical assistance needed to implement detention basin retrofits is relatively low while financial assistance needs are moderate. Private landowners will need the greatest assistance. | | | | | | | | | | | |
| 31B | S side of Wind Point School | 3 acres | Wind Point School (public) | Existing shallow wetland bottom detention bottom servicing school grounds. Slopes adjacent to basin are mown turf grass. Existing basin is comprised almost entirely of invasive species. | Design and implement project to retrofit existing detention area with native vegetation. Project would be excellent demonstration project for school and surrounding community. | Wetland Det.: TSS = 77.5% TN = 20% TP = 44% Bacteria = 78% | Medium | Wind Point School | Root-Pike WIN; Ecological Consultant/ Contractor | \$30,000 to design and install prairie vegetation; \$2,000/ year maintenance | 10-20+ Years |
| 37C | Adjacent to Prairie School | 20.2 acres | Prairie School & adjacent landowners | Large excavated pond used as detention for Prairie School and other surrounding development. Pond buffer is prairie north of Prairie School and generally weedy old field vegetation in other areas. Some moderate erosion is occurring around portions of the shoreline. | Design and implement project to alter outlet structure and concrete channel and naturalize entire pond shoreline and emergent zone to create wetland detention for water quality, wildlife, and green infrastructure benefits. | Wetland Det: TSS=55 tons/yr TN=328 lbs/yr TP=87 lbs/yr Bacteria=78% | High: Critical Area | Prairie School (lead); and other adjacent landowners | Root-Pike WIN; Ecological Consultant/ Contractor | \$230,000 to design and install prairie and wetland vegetation; \$5,000/yr maintenance | Phased over 1-10 Years |
| WETLAND RESTORATION (See Figure 69) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Wetland restoration projects are typically complex and require high technical and financial assistance needs to protect land, design, construct, monitor, and maintain the restoration. | | | | | | | | | | | |
| 9 | Shoop Park Golf Course W of Lighthouse Dr. | 3 acres | Golf Course (private) | 3 acre turf grass swale in Shoop Park Golf Course that drains adjacent course areas and residential area north south to wetland swale complex that flows east to Lake Michigan. | Restore wetland swale within golf course. A restored wetland would help filter pollutants, provide wildlife habitat, green infrastructure, and be a good demonstration project for the public to see. | Wetland Restore: TSS=7 tons/yr TN=36 lbs/yr TP=12 lbs/yr Bacteria=78% | High: Critical Area | Golf Course | Wind Point; Course Superintendent; Ecological Consultant | \$40,000 to design/ permit/install/ maintain wetland | 1-10 Years |
| 10 | Johnson Foundation at Wingspread | 7 acres | Johnson Foundation (private) | Approximately 7 acres of shallow ponds created via earthen dams along a historic wetland swale on land owned by the Johnson Foundation. | Remove earthen dams and restore wetland hydrology and native wetland plants to benefit water quality, wildlife habitat, and other green infrastructure benefits. | Wetland Restore: TSS=20 tons/yr TN=127 lbs/yr TP=39 lbs/yr Bacteria = 78% | High: Critical Area | Johnson Foundation | WDNR; Ecological Consultant | \$175,000 to design/ permit/install/ maintain wetland | 1-10 Years |
| RIPARIAN AREA RESTORATION & MAINTENANCE (See Figure 71) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Technical assistance needed to implement riparian area & lake buffer restoration and maintenance is moderate at first because an environmental consultant is usually hired to complete a plan and implement the work. However, costs can be greatly reduced over time if municipal or park district staff complete some restoration and most of the long term maintenance in house. Private landowners will need the greatest assistance. | | | | | | | | | | | |
| TRI J: Tributary J Reach 1 | West of Erie St. to Lake Michigan | 7,468 linear feet (3,700 in Wind Point) | Primarily Private Residential Properties | 3,700 lf of downstream portion of tributary that is in good ecological condition with intact floodplain dominated by older second growth woody species. Some invasive species such as buckthorn and honeysuckle are found in the riparian area. | Enhance select riparian buffer areas by selectively removing invasive woody species. | Filter Strip: TN = 40% TP = 45% TSS = 73% Bacteria = 37% | Low | Private Owners | Root-Pike WIN; Ecological Consultant/ Contractor | \$34,000 to enhance riparian buffer; \$4,000/yr maintenance | 10-20+ Years |
| OTHER MANAGEMENT MEASURES (See Figure 74) | | | | | | | | | | | |
| Technical and Financial Assistance Needs: Technical and financial assistance needed to implement these projects varies depending on complexity. | | | | | | | | | | | |
| 7 | Shoop Park Golf Course | 60 acres | Shoop Park Golf Course (Public) | Golf course with rough areas consisting of mowed turf grass. | Retrofit rough areas of golf course by removing turf grass and replacing with native vegetation. | Filter Strip: TN= 40% TP= 45% TSS= 73% | Low | Golf Course/ Wind Point | Ecological and Golf Course Design Consultants | \$100,000 to install approximately 30 acres of prairie vegetation | 10-20 + Years |