

## 12 Watershed Restoration Action Register

Goal and objectives were developed based on stakeholder concerns and information collected through the watershed characterization process. Each action register table, presented below, identifies the strategies, target audiences, timeframes, milestones, estimated costs, possible partners, and technical assistance to reach these goals. The action register is set up as five year work plan. Progress will be evaluated, modifications considered, and new work plans developed in subsequent 5-year cycles. The greatest focus over the next five to ten years will occur in the Tier 1 critical areas and priority preservation areas.

Goal 1: Reduce *E. coli* concentrations by 80% so that all waterways meet the state water quality standard of 235 CFU/100 mL (single sample) and 125 CFU/100mL (geomean) during the recreational season (April 1 – October 31).

Goal 2: Restore warmwater fish and macroinvertebrate communities so that all waterways meet their aquatic life use designations with natural waterways maintaining at least a “good” integrity class rating and modified waterways maintaining at least a “fair” integrity class rating.

### Objectives:

- Improve dissolved oxygen levels so that all waterways maintain a concentration > 4 mg/L.
- Reduce nutrient and sediment loads from urban and agricultural land uses.
- Restore riparian vegetation to improve channel stability, nutrient processing, sediment capture, and landscape habitat connectivity.
- Improve bed form diversity within channelized/incised or dammed stream reaches to increase depth variability and substrate quality.
- Improve channel stability to reduce suspended and bedded sediments.
- Provide floodplain connectivity for channelized/incised stream reaches to improve channel stability and facilitate sediment storage and nutrient processing outside of the channel.
- Reduce storm water runoff volume and rates to improve flow-duration conditions and flow dynamics.



## 12.1 Recreational Use

### 12.1.1 Reduce E. coli Loads

Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
Restrict livestock access to streams and reduce runoff from pastures  Long-term target: 75% of livestock owners & facility operators will have and implement provisions of conservation plan	Livestock Owners & Facility Operators	2016-2017	Coordinate with NRCS and ISDA to do site visits at identified facilities to determine if livestock have unrestricted livestock access to waterway or if pastures are in near proximity to potential conveyances.	*See Note	Watershed Group, SWCD, ISDA, NRCS	TSPs, SWCD, NRCS, ISDA, Purdue Extension
		2016-2020	Market conservation programs to owners and operators.	**See Note		
		2016-2020	Develop individual conservation plans as needed. Plans may include provisions for alternate water systems, livestock fencing, conservation buffers, and rotational grazing.	**See Note		
		2016	Develop a 319 cost-share program.	*See Note		
		2016-2020	Install alternate water systems, livestock fencing and conservation buffers as needed			
Implement manure management and application BMPs  Long-term target: 75% owners and operators that have fields to which manure is applied will have and implement provisions of conservation plan	Livestock Owners & Facility Operators	2016-2017	Coordinate with NRCS and ISDA to do site visits at identified facilities to determine if manure from facilities is being field applied.	*See Note	Watershed Group, SWCD, ISDA, NRCS	TSPs, SWCD, NRCS, ISDA, Purdue Extension
		2016-2020	Market conservation programs to owners and operators.	**See Note		
		2016-2020	Develop individual conservation plans as needed. Plans may include provisions for manure management, nutrient management, cover crops, and conservation buffers.	**See Note		
		2016	Develop a 319 cost-share program.	*See Note		
		2016-2020	Install cover crops, conservation buffers as needed. Implement manure and nutrient management practices as needed.			

Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
Increase public awareness of proper septic system maintenance	Septic system owners	2016-2020	Collaborate with NWI Septic System Working Group in promoting SepticSmart Week.	*See Note	Watershed Group, NWI Septic System Working Group	ISDH, County Health Department
		2016-2017	Collaborate with NWI Septic System Working Group to develop outreach program strategy and materials	*See Note		
		2018-2020	Implement outreach program	*See Note		
Support the adoption of ordinances that improve county health department oversight of septic system operation and maintenance  Long-term target: Lake & Porter Counties will have an O&M program and/or point-of-sale inspection ordinance	County Health Departments	2016-2020	Collaborate with NWI Septic System Working Group to support development of an operation and maintenance program ordinance and/or point-of-sale inspection ordinance	*See Note	Watershed Group, NWI Septic System Working Group	ISDH, County Health Department
Increase use of LID practices	Municipalities & Urban Landowners	2016-2020	See 12.2.2 Reduce Nutrient & Sediment Loads	--	Municipalities Watershed Group	MS4 Communities, IDEM, Consulting Firms

Table 132 Action register to reduce pathogen loading from agricultural and urban land uses

## 12.2 Aquatic Life Use

### 12.2.1 Improve Dissolved Oxygen Levels

Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
Reduce nutrient and sediment loads	--	2016-2020	See 12.2.2 Reduce Nutrient & Sediment Loads	--	--	--
Restore riparian vegetation	--	2016-2020	See 12.2.3 Restore Riparian Vegetation	--	--	--

Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
Improve bed form diversity	--	2016-2020	See 12.2.4 Improve Bed Form Diversity	--	--	--
Improve channel stability	--	2016-2020	See 12.2.5 Improve Channel Stability	--	--	--
Provide floodplain connectivity	--	2016-2020	See 12.2.5 Provide Floodplain Connectivity	--	--	--
Reduce storm water runoff volume & rates	--	2016-2020	See 12.2.6 Reduce Storm Water Runoff Volume & Rates	--	--	--

Table 133 Action register to improve dissolved oxygen levels

12.2.2 Reduce Nutrient & Sediment Loads

Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
Increase awareness of lawn and yard care pollution prevention practices	Urban/ Rural Landowners	2016-2018	Distribute Lawn to Lake & NWI Rain Garden Manuals at public events	\$1,000/ event	Watershed Group, IL-IN Sea Grant	IL-IN Sea Grant, Purdue Extension
		2016-2017	Include information on DRPBWI webpage	\$500		
		2016-2020	Occasionally post information on DRPBWI Facebook page	\$1,000 annually		
Increase use of conservation cropping system (no-till, cover crops, adaptive nutrient and pest management, and precision farming)  Long-term target: 75% of row crop fields	Agricultural Landowners & Operators	2016-2020	Host/promote regional conservation cropping system workshops and field day events.	\$3,000 annually	Watershed Group	SWCD, NRCS, ISDA, Purdue Extension
		2016	Develop 319 cost-share program.	*See Note		
		2016-2020	Annually identify additional funding options.	*See Note		
		2016-2020	Market conservation cropping systems to owners and operators.	**See Note		
		2016-2020	Continue to develop conservation plans as needed.	**See Note		
		2016-2020	Annually implement 500 acres of conservation cropping system.	No-till: \$20/ac Cover crop: \$35/ac Nutr./Pest mgt.: \$20/ac		
2016	Develop 319 cost-share program.	*See Note				

Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
Increase use of conservation cover and critical area planting on areas retired from agricultural production  Long-term target: 1% of agricultural fields	Agricultural Landowners & Operators	2016-2020	Annually identify additional funding options.	*See Note	Watershed Group	SWCD, NRCS, ISDA, Purdue Extension
		2016-2020	Market conservation cover and critical area planting to owners and operators.	**See Note		
		2016-2020	Continue to develop conservation plans as needed.	**See Note		
		2016-2020	Annually implement 50 acres of conservation cover and critical area planting.	\$2,250		
Increase the use of conservation buffers (ex. filter strips, riparian buffer, field borders)	Agricultural Landowners & Operators, Urban/ Rural Landowners	2016	Develop 319 cost-share program.	*See Note	Watershed Group	SWCD, NRCS, ISDA, Purdue Extension
		2016-2020	Annually identify additional funding options.	*See Note		
		2016-2020	Market conservation buffers to landowners and operators.	*See Note **See Note		
		2016-2020	Continue to develop conservation plans as needed.	**See Note		
		2017-2018	Host conservation buffer workshop and field day event for urban areas.	\$5,000/ event		
		2016-2020	Host/promote regional conservation buffer workshops and field day events for agricultural areas.	\$5,000		
		2016-2020	Annually implement 50 acres of conservation buffers	\$10,000-\$25,000		
Increase use of grassed waterways	Agricultural Landowners & Operators	2016	Develop 319 cost-share program.	*See Note	Watershed Group	SWCD, NRCS, ISDA, Purdue Extension
		2016-2020	Annually identify additional funding options.	*See Note		
		2016-2020	Market grassed waterways to landowners and operators.	**See Note		
		2016-2020	Continue to develop conservation plans as needed.	**See Note		
		2016-2020	Annually implement 1,000 feet of grassed waterway	\$10,000		
		2016-2017	Develop an education plan including promotional materials and	\$5,000-\$10,000	Watershed Group	

Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
Increase awareness of drainage water management practices	Agricultural Landowners & Operators		demonstration day for drainage water management			SWCD, NRCS, ISDA, Purdue Extension
		2016	Develop 319 cost-share program.	*See Note		
		2016-2017	Identify a drainage water management highlight project location. Installation target by 2020.	*See Note		
		2017-2020	Annually identify additional funding options.	*See Note		
		2017-2020	Market drainage water management to landowners and operators.	**See Note		
Restrict livestock access to streams and reduce runoff from pastures	Livestock Owners & Facility Operators	2016-2020	See 12.1.1 Reduce E. coli Loads	--	Watershed Group, SWCD, ISDA, NRCS	TSPs, SWCD, NRCS, ISDA, Purdue Extension
Implement manure management and application BMPs	Livestock Owners & Facility Operators	2016-2020	See 12.1.1 Reduce E. coli Loads	--	Watershed Group, SWCD, ISDA, NRCS	TSPs, SWCD, NRCS, ISDA, Purdue Extension
Increase use of LID practices and development  Long-term target: 5% of existing developed lands treated	Municipalities & Urban Landowners	2016	Develop 319 cost-share program.	*See Note	Municipalities Watershed Group	MS4 Communities, IDEM, Consulting Firms
		2016-2020	Annually identify additional funding options.	*See Note		
		2016-2020	Market LID to municipalities and landowners.	*See Note		
		2016-2020	Host an LID development workshop.	\$5,000-\$10,000		
		2017-2020	Develop a web-based LID tour and update at least annually. (See Nashville LID Tour on ArcGIS.com for example)	\$5,000-\$10,000 initial, \$2,500 annually thereafter		
		2016-2020	Annually retrofit and treat an additional 100 acres of urban land uses with LID practices.	\$300,000-\$500,000		

Table 134 Action register to reduce nutrient and sediment loading

**12.2.3 Restore Riparian Vegetation**

Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
Increase conservation buffers area along waterways  Long-term target: 75% of waterway length	Riparian Landowners	2016	Develop 319 cost-share program	*See Note	MS4 Communities, County Surveyors Office, Watershed Group	SWCD, NRCS, ISDA, Purdue Extension
		2016-2020	Annually identify additional funding options.	*See Note		
		2016-2020	Market riparian restoration to municipalities and landowners.	*See Note **See Note		
		2016-2020	Continue to develop conservation plans as needed.	**See Note		
		2016-2020	Restore 20 acres of conservation buffer annually.	\$19,000 - \$50,000		

Table 135 Action register to restore riparian vegetation

**12.2.4 Improve Bed Form Diversity**

Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
Remove/modify the Deep River dam located in Lake Station	Property Owners	2016-2018	Complete engineering feasibility study for dam’s removal or modification.	\$30,000	City of Lake Station, School Corporation of Gary, Little Calumet River Basin Development Commission, Watershed Group	DNR LARE, Consulting Firms
		2017-2018	Identify funding options for construction.	*See Note		
		2018-2020	Begin construction once funding and permits have been secured.	TBD		
Re-meander formerly channelized/incised streams through excavated floodplain	Landowners, County Surveyors Office, Municipalities	2016-2017	Identify potential reaches where re-meandering stream channel and excavating a new floodplain is possible.	*See Note	County Surveyors Office, Municipalities, Little Calumet River Basin Development Commission, Watershed Group	NRCS, DNR, IDEM, USACE, Consulting Firms
		2017-2018	Meet with landowners to discuss willingness	*See Note **See Note		
		2018-2020	Conducted engineering feasibility study as sites are identified.	\$30,000-\$50,000		
		2020	Identify funding options for construction	*See Note		

Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
		--	Construct as possible	TBD		
Incorporate large woody debris and/or other in-stream structures into restoration designs where feasible	Project designers, permitting agencies	2016-2020	Coordinate with project designers and permitting agencies.	*See Note	County Surveyors Office, Municipalities	NRCS, DNR, IDEM, USACE, Consulting Firms

Table 136 Action register to improve bed form diversity

12.2.5 Improve Channel Stability

Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
Remove or modify the Deep River dam located in Lake Station	Property Owners	2016-2020	See 12.2.4 Improve Bed Form Diversity	--	City of Lake Station, School Corporation of Gary, Little Calumet River Basin Development Commission, Watershed Group	DNR LARE, Consulting Firm
Stabilize eroding streambanks downstream impacted by in-channel infrastructure or where infrastructure is threatened	Lake County Parks Department	2017-2018	Complete an engineering design study for the severely eroding streambank on Deep River in Deep River County Park adjacent to County Line Road	\$20,000-30,000	Lake County Parks, Lake County Highway Dept., Watershed Group	DNR LARE Program, Consulting Firms
		2019-2020	Stabilize project reach based on recommendations from engineering design study.	TBD		
	Landowners	2016-2018	Coordinate with partners to identify additional opportunities and create list of sites where stabilization is most needed	*See Note	County Surveyors Office, Municipalities	NRCS, DNR LARE, Consulting Firms



Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
		2018	Identify funding options for construction	*See Note		
		2016-2020	Stabilize streambanks and shorelines as possible	\$22 - \$100 / foot		
Reconstruct conventional drainage ditches/incised channels to include floodplain benches or terraces.	Landowners	2016-2020	See 12.2.6 Provide Floodplain Connectivity	--	County Surveyors Office, Municipalities, Little Calumet River Basin Development Commission	NRCS, ISDA, SWCD, DNR LARE Program, TNC, Consulting Firms
Incorporate channel protection standards into storm water ordinances	Municipalities	2016-2020	Update municipal storm water ordinances to incorporate channel protection standards	\$5,000-\$10,000	MS4 Communities	MS4 Communities, Consulting Firms
Increase conservation buffers area along waterways	Riparian Landowners	2016-2020	See 12.2.3 Restore Riparian Vegetation	--	MS4 Communities, County Surveyors Office, Watershed Group	SWCD, NRCS, ISDA, Purdue Extension

Table 137 Action register to improve channel stability

12.2.6 Provide Floodplain Connectivity

Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
Reconstruct conventional drainage ditches/incised channels to include floodplain benches or terraces.	Landowners	2016-2017	Create a priority list and GIS layer of conventional drainage ditch reaches that could be reconstructed with floodplain benches or terraces.	*See Note	County Surveyors Office, Municipalities, Little Calumet River Basin	NRCS, ISDA, SWCD, DNR LARE Program, TNC, Consulting Firms
		2017-2018	Conduct geomorphic surveys and hydrologic surveys of priority project reaches.	\$5,000 - \$10,000 per reach		

Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
		2016-2017	Identify funding options for construction	*See Note	Development Commission	
		2017-2018	Install ½- mile of two-stage ditch along Turkey Creek (previously identified project) or other appropriate location as a showcase project in the watershed.	\$55,000		
		2019-2020	Host workshop highlighting the benefits of two-stage ditches.	\$5,000		
		2017-2018	Conduct an engineering feasibility study for floodplain connectivity along Willow Creek south of Stone Avenue.	\$30,000-\$50,000		
		2018	Identify funding options for construction.	*See Note		
		2018-2020	Begin construction once funding and permits have been secured.	TBD		

Table 138 Action register to increase floodplain connectivity

12.2.7 Reduce Storm Water Runoff Volume & Rates

Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
Reestablish natural upland habitats  Long-term target additional 2,300 acres for 30% watershed coverage	Landowners	2016	Develop 319 cost-share program.	*See Note	MS4 Communities, DNR, Land Trusts, Watershed Group	NRCS, ISDA, SWCD, DNR, Land Trusts
		2016-2020	Annually identify additional funding options.	*See Note		
		2016-2020	Market upland habitat reestablishment to landowners.	*See Note **See Note		
		2016-2020	Continue to develop conservation plans as needed for agricultural owners and operators.	**See Note		
			Develop conservation & coordinated management plan for the Hobart Marsh Area & Develop long-term vision and strategy for the Deep River Conservation Corridor	\$60,000		

Strategy	Target Audience	Time Frame	Milestone	Cost	Potential Partners	Technical Assistance
		2016-2020	Annually convert 25 acres of turf grass or row crop to natural upland habitat.	\$125,000-\$625,000		
Reestablish depressional wetlands and rehabilitate hydraulic function of wetland drained by ditches  Long-term target additional 2,300 acres for 10% watershed coverage	Landowners	2016	Develop 319 cost-share program.	*See Note	Watershed Group	NRCS, ISDA, SWCD, DNR, USACE, IDEM, Consulting Firms
		2016-2020	Annually identify additional funding options.	*See Note		
		2016-2020	Market wetland restoration to landowners	*See Note **See Note		
		2016-2020	Continue to develop conservation plans as needed.	**See Note		
		2016-2020	Annually implement 5 acres of wetland restoration.	\$10,000-\$50,000		
Increase use of LID practices and development	Municipalities & Urban Landowners	2016-2020	See 12.2.2 Reduce Nutrient & Sediment Loads	--	Watershed Group, Municipalities	MS4 Communities, IDEM, Consulting Firms
Increase urban tree canopy density  Long-term target 30% average UTC	Municipalities & Landowners	2016	Develop 319 cost-share program.	*See Note	Watershed Group, Municipalities	Urban Waters Partnership, USFS, DNR, NIPSCO
		2016-2020	Annually identify additional funding options.	*See Note		
		2016-2020	Market urban forestry and promote Tree City USA program to municipalities.	*See Note		
		2017-2018	Host urban forestry workshop and field day event.	\$5,000		
		2016-2020	Public tree inventory completed by two municipalities.	\$90,000		
		2016-2020	Urban forestry master plan completed by one municipality.	\$5,000-\$10,000		
		2017-2018	Develop one community engagement program.	\$30,000 annually		
		2016-2020	Plant 1,000 native trees annually.	\$200,000-\$300,000 annually		

Table 139 Action register to reduce storm water runoff volume and rates

Notes:

\* Annual salary of watershed coordinator

\*\* Personnel from NRCS/SWCD/ISDA