

Implementation of Planned Measures

Implementation of the measures listed in the watershed management plan will be a complex process requiring coordination between multiple agencies for technical support, regulation, and funding. This section will identify the implementation process for each improvement measure.

Measure: Stream Maintenance

This measure is a continuation of current practices performed by the Steuben County Surveyor’s Office; therefore, direct implementation is not required. The Soil and Water Conservation District shall coordinate with the Surveyor’s Office as opportunities arise for volunteers to assist with stream maintenance activities.

Measure: Development Code Enforcement

This measure is a continuation of current ordinance enforcement performed by Steuben County and the City of Angola; therefore, direct implementation is not required. The Steering Committee shall coordinate with Steuben County and the City of Angola when ordinance modifications are suggested.

Measure: Removal of Illicit Connections

This measure is a continuation of activities currently performed by the Steuben County Health Department; therefore, direct implementation is not required. The Steering Committee shall coordinate with the Health Department to determine if additional programs such as voluntary dye testing for homes adjacent to waterways are feasible under current staffing and funding allowances.

Measure: Public Education

This measure involves the development and distribution of educational material to inform watershed stakeholders how their actions affect the quality of the watershed. The Steuben County Soil and Water Conservation District can assist in developing and distributing material, through additional coordination from IDEM, NRCS, USDA, and local agencies. Funding for this program can be provided through LARE and ILMS grants and/or local funds. Public education should begin immediately.

Implementation process for Public Education:

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|---|------------------------|
| 1. Obtain funding | 3. Develop material |
| 2. Identify target offense and audience | 4. Distribute material |

Measure: Obtain IDNR Hydrologic and Hydraulic Models

This measure involves obtaining the IDNR hydrologic and hydraulic models for Pigeon Creek for use in assessing the benefits of future flood control plans in the watershed. The County Surveyor shall be responsible for contacting the IDNR and requesting copies of the models. Funding for this action is not required.

Measure: Voluntary Buyout and Structure Elevation

This measure involves the voluntary buyout or elevation of flood-prone structures. The program can be administered by Steuben County and the City of Angola through coordination with FEMA and the National Flood Insurance Program. Funding for this program can be provided through FEMA and IDHS and/or local funds. This program can begin in 2-5 years depending on public demand.

Implementation process for Voluntary Buyout and Structure Elevation Program:

1. Identify potential program participants
2. Coordinate program requirements with FEMA
3. Develop program guidelines
4. Obtain funding
5. Solicit participation

Measure: Wetland / Habitat Restoration

This measure involves the restoration of various wetland / habitat facilities in the watershed. The program can be administered by Steuben Soil and Water Conservation District and NRCS through coordination with the ACOE and IDEM. Funding for this program can be provided through LARE, IDEM, ILMS, and NRCS grants, and/or local funds. Restoration activities should begin in the first five years of the plan.

Implementation process for Wetland / Habitat Restoration Program:

1. Identify potential project sites
2. Obtain funding
3. Construct project

Measure: Site BMP Restoration / Retrofitting

This measure involves BMP restoration and retrofitting on streams and properties throughout the watershed. The program can be administered by the Steuben Soil and Water Conservation District, NRCS, Steuben County, or the City of Angola either collectively or individually. Funding for this program can be provided through IDEM and/or local funds. Retrofit activities should begin in the first five years of the plan.

Implementation process for Stream and Site BMP Restoration / Retrofitting Program:

1. Identify potential project sites
2. Obtain funding
3. Construct project

Measure: Flood Access Plan

This measure involves development of a Flood Access Plan to determine stream crossings that should be improved to ensure emergency vehicle passage during a 100-yr rainfall. This program can be administered by the Steuben County Surveyor's Office, and can be funded through IDHS and/or local funds. This plan can be developed 2-5 years after the plan is approved.

Implementation process for the Flood Access Plan:

1. Obtain funding
2. Contract with engineering consultant
3. Evaluate stream crossings
4. Generate list of crossings to be improved

Measure: Kankamp Property

This measure involves development of the Kankamp Property into a wetland / stormwater detention facility and has been under consideration for the past ten years. This project can be administered by the Steuben County Surveyor's Office and funded through LARE and IDEM grants or local funds. Funding sources for this measure should be researched upon plan approval.

Measure: Bill Deller Road Project

This measure involves construction of a large-scale stormwater management facility on Pigeon Creek near Bill Deller Road. The project can be managed by the Steuben County Surveyor's Office with coordination from IDNR, IDEM, ACOE, and local stakeholders. Funding can be provided through LARE and NRCS grants and/or local funds. This measure is a long-term solution and will require phasing over a twenty year period.

Implementation process for the Bill Deller Road Project:

1. Obtain funding for preliminary hydrologic study
2. Contract with engineering consultant
3. Coordinate with regulators
4. Evaluate project alternatives
5. Select alternative for development
6. Obtain funding for construction document development
7. Contract with engineering consultant
8. Develop construction documents
9. Obtain required permits
10. Obtain land rights
11. Construct facility

Measure: Sediment Basins

This measure involves construction of sediment basins along Pigeon Creek. The project can be managed by the County Surveyor's Office with coordination from the Soil and Water Conservation District, IDNR, IDEM, ACOE, and local stakeholders. Funding can be provided through LARE and IDEM grants and/or local funds. A pilot basin should be funded and constructed upon plan approval, with construction of additional basins over ten years.

Measure: Rock Vortex Weirs

This measure involves construction of rock vortex weirs in the Pigeon Creek channel to limit streambank erosion. The project can be managed by the County Surveyor's Office with coordination from the Soil and Water Conservation District, IDNR, and the ACOE. Funding can be provided through LARE and IDEM grants and/or local funds. Weirs should be constructed over the first five years of the plan.

Measure: Rock Cross Vanes

This measure involves construction of rock cross vanes in the Pigeon Creek channel to limit streambank erosion. The project can be managed by the County Surveyor's Office with coordination from the Soil and Water Conservation District, IDNR, and the ACOE. Funding can be provided through LARE and IDEM grants and/or local funds. Cross vanes should be constructed over the first five years of the plan.

Measure: Filter Strips

This measure involves the construction of filter strips along channels in the watershed. This program can be managed by the Soil and Water Conservation District and funded through LARE, ILMS, and IDEM grants and/or local funds. Filter strips should be constructed over the first five years of the plan.

Measure: Monitoring Replacement of CR 150W Culvert

This measure involves monitoring the replacement of CR 150W culvert over Pigeon Creek to ensure existing flood storage upstream of the culvert crossing is maintained. This activity shall be supervised by the Steering Committee, and no funding is required.

Measure: Shoreline Stabilization

This measure involves the construction of vegetative or engineered shoreline stabilization methods to reduce erosion on lakes and streams. This program can be managed by the Soil and Water Conservation District and funded through IDEM grants and/or local funds. Stabilization measured should be completed in the first five years of the plan.

Measure: West Otter Lake Pump Station

This measure involves the construction of a pump station to improve discharge from West Otter Lake during heavy rainfall events. The project is currently proposed by the Steuben County Surveyor's Office; therefore, direct implementation under the watershed management plan is not required.

Measure: Gravel Pits

This measure involves utilization of gravel pits adjacent to Pigeon Creek for flood storage or low flow runoff treatment. The projects can be managed by the County Surveyor's Office with coordination from IDNR, IDEM, ACOE, and the Soil and Water Conservation District. Funding can be provided through LARE grants and/or local funds. Gravel pits are a long term solution that should be considered over a ten year period.

Measure: Hammond Ditch Culvert Modifications

This measure involves the installation of a control structure on select culverts to provide additional floodplain storage volume in the watershed. The projects can be managed by the County Surveyor's Office with coordination from IDNR, IDEM, ACOE, the Soil and Water Conservation District, and local stakeholders. Funding can be provided through LARE grants and/or local funds. Culvert modifications should be implemented 2-5 years from plan acceptance.

Measure: Arrowhead Lake Outlet

This measure involves the modification of the outlet control at Arrowhead Lake to reduce flood flow downstream on Hammond Ditch. The project can be managed by the County Surveyor's Office with coordination from IDNR, IDEM, ACOE, the Soil and Water Conservation District, and local stakeholders. Funding can be provided through LARE grants and/or local funds. The outlet modification should be implemented 2-5 years from plan acceptance.

Implementation process for the Arrowhead Lake Outlet Project:

1. Obtain funding for preliminary hydrologic study
2. Contract with engineering consultant
3. Evaluate feasibility of modifying outlet without negative impacts on adjacent properties
4. Develop construction documents
5. Obtain required permits
6. Construct new outlet

Table 30 summarizes the implementation process for the improvement measures.

Measure	Responsible Agency	Coordinates With:	Funded By:	Required Permits:	Timeline:	Estimated Cost
Stream Maintenance	Surveyor	N/A	Ditch Tax	N/A	In Progress	-
Development Code Enforcement	Steuben Cty C. of Angola	N/A	Local Taxes	N/A	In Progress	-
Removal of Illicit Connections	Health Dept	N/A	Local Taxes IDEM319	N/A	In Progress	-
Public Education	SWCD	IDEM, IDNR, NRCS, USDA, local agencies	LARE ILMS	N/A	Immediate	\$5,000 - \$10,000 / yr
Obtain IDNR Hydrologic and Hydraulic Models	Surveyor	IDNR	N/A	N/A	ASAP	N/A
Voluntary Buyout and Structure Elevation	Steuben Cty C. of Angola	FEMA	FEMA FMA IDHS-SHM	N/A	2 – 5 Years	Site Specific
Wetland / Habitat Restoration	SWCD NRCS	ACOE IDEM	LARE IDEM319 ILMS NRCS	ACOE	5 Years	\$3,500 to \$80,000 / Acre
Site BMP Restoration / Retrofitting	SWCD NRCS Steuben Cty C. of Angola	N/A	IDEM319	N/A	5 Years	\$5,000 - \$20,000 Per Site
Flood Access Plan	Surveyor	N/A	IDHS-SHM	N/A	2 – 5 Years	\$10,000 – \$20,000
Kankamp Property	Surveyor	IDNR IDEM ACOE Stakeholders	LARE IDEM	IDNR IDEM ACOE	As Funded	\$4,000 / acre
Bill Deller Road Preliminary Engineering	Surveyor	IDNR IDEM ACOE Stakeholders	LARE NRCS	N/A	As Funded	\$25,000 to \$60,000
Bill Deller Road Final Engineering	Surveyor	IDNR IDEM ACOE Stakeholders	LARE NRCS	N/A	As Funded	\$100,000 to \$200,000
Bill Deller Road Construction Phase	Surveyor	IDNR IDEM ACOE Stakeholders	Partial: LARE NRCS	IDNR IDEM ACOE	As Funded 2010+	\$1,000,000 to \$8,000,000 Depending on Level of Protection
Sediment Basins	Surveyor	IDNR IDEM ACOE Stakeholders	LARE IDEM319	IDNR IDEM ACOE	10 Years	\$25,000 to \$80,000 Depending on Site

Table 30: Summary of Implementation Process (Continues).

Measure	Responsible Agency	Coordinates With:	Funded By:	Required Permits:	Timeline:	Estimated Cost
Rock Vortex Weirs	Surveyor	SWCD, IDNR, IDEM, ACOE	LARE IDEM319	IDNR, IDEM, ACOE	5 Years	~ \$10,000
Rock Cross Vanes	Surveyor	SWCD, IDNR, IDEM, ACOE	LARE IDEM319	IDNR, IDEM, ACOE	5 Years	~ \$10,000
Filter Strips	SWCD	N/A	LARE IDEM319 ILMS	N/A	5 Years	\$15,000 / acre
Monitoring Replacement of CR 150W Culvert	Steering Committee	N/A	N/A	N/A	ASAP	-
Shoreline Stabilization	SWCD	Stakeholders N/A	IDEM319	IDEM, IDNR, ACOE	5 Years	\$6 / ft Vegetative Practice
West Otter Lake Pump Station	Surveyor	IDNR, IDEM, Stakeholders	N/A	IDNR, IDEM	In Progress	-
Gravel Pits	Surveyor	SWCD, IDNR, IDEM, ACOE	LARE	SWCD, IDNR, IDEM, ACOE	10 Years	\$25,000 - \$50,000
Culvert Modifications	Surveyor	IDNR, IDEM, ACOE, Stakeholders	LARE	IDNR, IDEM, ACOE	2-5 Years	\$20,000 each
Arrowhead Lake Outlet	Surveyor	IDNR, IDEM, ACOE, Stakeholders	LARE	IDNR, IDEM, ACOE	2-5 Years	\$20,000

Table 30: Summary of Implementation Process (Continued).

Grant Abbreviations:

FEMA: Federal Emergency Management Agency

IDEM319: Indiana Department of Environmental Management – Section 319

IDHS-SHM: Indiana Department of Homeland Security – State Hazard Mitigation

ILMS: Indiana Lake Management Society – Small Grant Program

LARE: Indiana Department of natural Resources – Lake and River Enhancement

NRCS: Natural Resources Conservation Service

Coordinating and Permit Agency Abbreviations:

ACOE – U.S. Army Corps of Engineers

IDEM – Indiana Department of Environmental Management

IDNR – Indiana Department of Natural Resources

NRCS – Natural Resources Conservation Service

SWCD – Steuben County Soil and Water Conservation District

USDA – U.S. Department of Agriculture

Note: The required permits identified in Table 30 are a preliminary list that shall be used only as a guideline. The list is subject to change based on the actual project scope of work, as well as changes in regulatory permit procedures. The Project Manager will be responsible for identifying all required permits for each project at the time of implementation.