

5.0**GOALS AND DECISIONS**

Setting realistic and measurable goals is key to the successful implementation of this Watershed Management Plan. A goal is the desired change or outcome as a result of the watershed planning effort. Depending on the magnitude of the problem, goals may be general, specific, long-term or short-term. The goals in this plan focus on improving water quality through the implementation of a variety of management measures. IDEM suggests watershed groups focus on developing goals, management measures, action plans, resources, and legal matters as part of the watershed planning process.

According to IDEM, management measures describe what needs to be controlled or changed in order to achieve the goal. The anticipated timeline for implementing individual management measures is identified in this section. In order to successfully implement this plan, resources such as people, programs, and money need to be identified. It is important to have the support of individuals identified as resources to successfully execute the goals of the plan. Successful implementation may require some legal matters such as obtaining permits, purchasing easements, or the adoption of an ordinance. The UWRBC has decided to focus on goals that improve both water quality issues and water quantity issues in the Upper Wabash River watershed. The topics of concern and the goals outlined by the Commission are described below. Responsibility for implementing tasks will vary with agency initiatives, directives, staffing, and funding opportunities.

Education Goal: *Improve water quality to meet Indiana water quality targets and reduce damages associated with water quantity in the Wabash River watershed through education and outreach efforts that focus on changing stakeholder's habits and behaviors.*

Flooding Goal: *Reduce in-stream and private property damages, nearly \$1.6 million since 1978, associated with increased water quantity through collaborative efforts basin-wide, including the Ohio drainage area.*

Agricultural Goal: *Promote application and participation to implement BMPs throughout the watershed in an effort to remove 303(d) segment listings and impairments within the Upper Wabash River Basin.*

Land Use/Future Development Goal: *Improve water quality to meet Indiana water quality targets and reduce damages associated with water quantity in the Wabash River watershed through basin-wide land use planning and ordinance development for the protection of agricultural activities and floodplain management.*

E. coli Reduction Goal: *Remove 303(d) segment listings and impairments within the Upper Wabash River Basin due to E. coli and nutrient concentrations through proper agricultural nutrient management and on-site household wastewater treatment systems.*

5.1 POTENTIAL IMPLEMENTATION TIMELINE

Management measures identified as high priorities are likely to provide the greatest long term benefit to water quality in the watershed. However, these activities are not always the easiest measures to implement. Likewise some of the measures that may be considered moderate or low priorities may be relatively easy to implement. Therefore, implementation of certain moderate priority measures may occur prior to certain high priority measures, and implementation of certain low priority measures may occur prior to certain medium priority

measures. Additionally, new information or changes in political and economic circumstances may result in a change in the implementation schedule shown below.

Tables 5-1, 5-2, 5-3, 5-4, and 5-5 located on the following pages identify management measures, action plans, resources/cost, legal matters, and progress indicators associated with addressing education, flooding, agriculture, land use planning, and the reduction of *E. coli* (*respectively*) in the Upper Wabash River Basin. “Local Resources” in the tables are intended to provide a list of local organizations that could potentially provide support, advice, or consultation on a particular management measure. These lists are not intended to be comprehensive and are not intended to exclude non-listed organizations from participating in the development or implementation of a particular management measure. Lead agencies will vary with program directives, funding, and staffing abilities. Other non-listed organizations are encouraged to participate as available.

Proposed management measures were discussed and prioritized by the UWRBC into High, Moderate, and Low priority categories. Estimated costs in the tables are identified as Low, Moderate, or High. Those activities, materials, or programs estimated to cost between \$1,000 and \$10,000 are considered low cost. Activities, materials and programs that are estimated to cost between \$10,000 and \$50,000 are considered moderate cost, while those projects estimated to cost over \$50,000 were considered to be a high cost. Anticipated timeline dates are provided as a reference for estimated start dates for the individual management measures proposed.

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Table 5-1: Education Management Measures

Management Measures	Action Plan	Resources/Cost	Legal Matters	Progress Indicators
<p>Improve communication and coordinate activities with OH & IN Upper Wabash River Communities.</p> <p>High Priority</p>	<ul style="list-style-type: none"> • Create a working partnership between UWRBC and GLWWA. • Explore newsletter mailing lists and contact information to ensure that all communities are included. • Create an At-Large position on each Board, devote agenda time for updates. 	<ul style="list-style-type: none"> • UWRBC • Adams, Jay, and Wells County SWCDs • Local media outlets (print, TV, and radio) for information transfer • Mercer County (OH) SWCD • Low Cost 	<ul style="list-style-type: none"> • Amendments to By-Laws or other provisions may need to occur to create an At-Large position on each representative Board. 	<ul style="list-style-type: none"> • Members from each respective Board are coordinating water quality and water quantity efforts utilizing a Basin-wide approach. <p>Anticipated Timeline 2008-2010</p>
<p>Formation of Joint OH & IN Wabash River Basin Commission</p> <p>High Priority</p>	<ul style="list-style-type: none"> • Create an Interstate Wabash River Basin Commission to ensure information, projects, proposals and efforts are conducted for the benefit of the entire Basin. 	<ul style="list-style-type: none"> • UWRBC • GLWWA Joint Board • Low Cost 	<ul style="list-style-type: none"> • Amendments to By-Laws, State Legislation, or other provisions may need to occur to create a Joint Board representative of the entire Basin, including Ohio. 	<ul style="list-style-type: none"> • A Joint Board representative of the entire Basin, including Ohio has been created. <p>Anticipated Timeline 2011</p>
<p>Install Pilot/Demonstration project highlighting 2-stage ditch design methods.</p> <p>Moderate Priority</p>	<ul style="list-style-type: none"> • Explore various methods of drainage ditch design, construction, and maintenance. • Determine feasibility of innovative methods in specific locations within the watershed. • Determine best technique and best location for the Pilot project or demonstration project. • Monitor area for beneficial or detrimental results, compile results and distribute to interested stakeholders. 	<ul style="list-style-type: none"> • Adams, Jay, and Wells County Surveyor's Offices • Adams, Jay, and Wells County SWCD/NRCS offices. • Purdue Extension • IDNR • Moderate Cost 	<ul style="list-style-type: none"> • Permits may need to be obtained prior to onset of work. • Conservation or Construction and Maintenance Easements may need to be purchased to complete work and monitor results. 	<ul style="list-style-type: none"> • Pilot/Demonstration project has been constructed and regularly monitored for results. <p>Anticipated Timeline 2010</p>
<p>Prepare and distribute an educational brochure regarding proper septic system operation and maintenance.</p> <p>Moderate Priority</p>	<ul style="list-style-type: none"> • Distribute educational brochure on proper septic system operation and maintenance to 25% of the watershed population. • Target known areas in the watershed with existing septic systems. 	<ul style="list-style-type: none"> • Local Resources <ul style="list-style-type: none"> • Adams, Jay, and Wells County Health Departments • Area Plan Commissions • Low cost 	NA	<ul style="list-style-type: none"> • Follow up contact indicates that stakeholders receiving brochures have changed their behaviors and/or practices. <p>Anticipated Timeline 2008</p>
<p>Submit bi-annual articles and updates to newspapers and other community organizations in the Upper Wabash River Watershed.</p> <p>Moderate Priority</p>	<ul style="list-style-type: none"> • Biannual submissions beginning in 2006. 	<ul style="list-style-type: none"> • Local Resources <ul style="list-style-type: none"> • Local media outlets. • Adams, Jay, and Wells County SWCD Newsletters and Mailings • Farm Service Agency Newsletters • Purdue Extension • Low cost 	NA	<ul style="list-style-type: none"> • Analysis of future survey distribution will indicate that water quality awareness of local landowners has improved and that stakeholder behaviors have changed. <p>Anticipated Timeline Ongoing</p>

Management Measures	Action Plan	Resources/Cost	Legal Matters	Progress Indicators
<p>Conduct a septic system demonstration project to promote onsite wastewater treatment systems resulting in improved water quality.</p> <p>Low Priority</p>	<ul style="list-style-type: none"> Explore feasibility of implementing an alternative treatment system demonstration project. Locate one or more landowners with currently failing septic systems willing to participate in a demonstration. Conduct an onsite wastewater treatment system demonstration project with regular system monitoring. 	<ul style="list-style-type: none"> Local Resources <ul style="list-style-type: none"> Adams, Jay, and Wells County Health Departments ISDH Section 319 grant High cost 	<ul style="list-style-type: none"> Proper permit will need to be obtained from local, and possibly State Health Departments. 	<ul style="list-style-type: none"> Future water quality sampling indicates a reduction of <i>E.coli</i> concentrations in the Upper Wabash River Watershed. Awareness of proper installation, operation and maintenance of residential septic systems is increased. <p>Anticipated Timeline Ongoing</p>
<p>Prepare educational displays and participate in at least four community events annually.</p> <p>Low Priority</p>	<ul style="list-style-type: none"> Identify 2 events per year providing best results to improve awareness of water quality issues. Identify contact persons for respective events. Develop and maintain a display that can easily be updated (i.e. impacts of residential land use such as car washing, dog waste, and lawn care at the county fair). 	<ul style="list-style-type: none"> Display board, laminated images, brochures, flyers, etc. Local Resources <ul style="list-style-type: none"> Purdue Extension Adams, Jay, and Wells County SWCDs Low cost 	NA	<ul style="list-style-type: none"> Analysis of future survey distribution will indicate that water quality awareness of local landowners has improved and that stakeholder behaviors have changed. <p>Anticipated Timeline Ongoing</p>
<p>Survey watershed stakeholders in order to determine their awareness of water quality issues and to identify localized water quality problems.</p> <p>Low Priority</p>	<ul style="list-style-type: none"> Distribute surveys to landowners along creeks and ditches. Repeat distribution of survey annually 	<ul style="list-style-type: none"> Local Resources <ul style="list-style-type: none"> Upper Wabash River Watershed Commission Low cost 	NA	<ul style="list-style-type: none"> Analysis of future survey distribution will indicate that water quality awareness of local landowners has improved and that stakeholder behaviors have changed. <p>Anticipated Timeline Ongoing</p>
<p>Promote and encourage participation in Waste District Tox-Drop and Recycling Programs.</p> <p>Low Priority</p>	<ul style="list-style-type: none"> Distribute materials at 2 local events and workshops per year. 	<ul style="list-style-type: none"> Local Resources <ul style="list-style-type: none"> Solid Waste Districts Low cost 	NA	<ul style="list-style-type: none"> Future surveys indicate changes in stakeholder attitudes and behaviors as they relate to pollution prevention. <p>Anticipated Timeline Ongoing</p>

Table 5-2: Flooding Priority Management Measures

Management Measures	Action Plan	Resources/Cost	Legal Matters	Progress Indicators
<p>Conduct detailed flood protection studies for focused flooding problem areas, leading to basin wide Flood Control Master Plan</p> <p>High Priority</p>	<ul style="list-style-type: none"> Secure funding for flood protection studies to develop Flood Control Master Plan Select appropriate author for Flood Control Master Plan. Implement proposed projects in Flood 	<ul style="list-style-type: none"> Adams, Jay, and Wells County Surveyor's Offices Adams, Jay, and Wells County Commissioners Area Planning Commissions Municipal Governments 	<ul style="list-style-type: none"> Adoption of Flood Control Master Plan and inclusion into basin-wide Comprehensive Plans, Ordinances and Zoning will need to be completed. 	<ul style="list-style-type: none"> Funding secured, Flood Control Master Plan completed and adopted by County and Local Governments and included in existing plans and ordinances.

Management Measures	Action Plan	Resources/Cost	Legal Matters	Progress Indicators
	Control Master Plan.	<ul style="list-style-type: none"> High Cost 		<p>Anticipated Timeline As funding allows</p>
<p>Conduct research on Grand Lake spillway including evaluating design, educational outreach, and open a dialog with affected parties.</p> <p>High Priority</p>	<ul style="list-style-type: none"> Obtain designs, elevations and O&M procedures for current Spillway. Participate in forum with Designers, Operators and downstream residents as to the information obtained. 	<ul style="list-style-type: none"> OH DNR & IN DNR Grand Lake/Wabash Watershed Alliance UWRBC Adams, Jay, and Wells County Surveyor's Offices Mercer County Engineer's Office Low Cost 	<ul style="list-style-type: none"> Ongoing litigation involving Mercer County Landowners and Ohio Department of Natural Resources Plans and project proposals to be adopted by County and Local Governments and Planning Commissions. 	<ul style="list-style-type: none"> Transfer of valid information regarding the Grand Lake Spillway to all parties in Ohio and Indiana. Working partnership developed between Ohio and Indiana Wabash drainage areas. <p>Anticipated Timeline 2009</p>
<p>Inventory log jams and streambank erosion areas of concern.</p> <p>High Priority</p>	<ul style="list-style-type: none"> Inventory locations prone to log jams and streambank erosion Determine need for DNR permit for mitigation activities at each site Prioritize areas and obtain funding for removal or stabilization activities 	<ul style="list-style-type: none"> Adams, Jay, and Wells County Surveyor's Offices Adams, Jay and Wells County SWCDs Property owners along River and tributaries. Moderate Cost 	<ul style="list-style-type: none"> Easements or agreements need to be obtained for private property entrance. Funding mechanisms may include ditch assessments, maintenance fees or other means involving public input. 	<ul style="list-style-type: none"> Inventory and GIS mapping of logjams and destabilized streambanks utilized to determine areas in greatest need. Various sources of funding identified, landowners in aware of the issues. <p>Anticipated Timeline 2008</p>
<p>Increase frequency of drainage ditch maintenance and/or number of miles maintained using appropriate BMPs.</p> <p>High Priority</p>	<ul style="list-style-type: none"> Update inventory and prioritization annually. Inspect new areas and add to inventory. Determine personnel needs to adequately address the maintenance needs of the area. Explore partnership options with other County or Municipal offices. 	<ul style="list-style-type: none"> Adams, Jay, and Wells County Surveyor's Offices Adams, Jay, and Wells County Commissioners NRCS Low Cost unless additional personnel are required. 	<ul style="list-style-type: none"> Work will need to be completed as outlined by the County Drainage Board and the County Surveyor. 	<ul style="list-style-type: none"> Inventory of areas in need is updated annually and utilized as a fluid document. Personnel needs have been addressed. Increased maintenance, either visual or mechanical, is occurring. <p>Anticipated Timeline 2008</p>
<p>Conduct detailed studies of unnumbered Zone A streams (approximately 42 miles)</p> <p>Moderate Priority</p>	<ul style="list-style-type: none"> Prioritize areas in need of study Secure funding for appropriate studies Acquire local and Federal adoption of the detailed studies. 	<ul style="list-style-type: none"> Adams, Jay, and Wells County Surveyors FEMA High Cost 	<ul style="list-style-type: none"> FEMA and local approval will need to be obtained to finalize and adopt the studies. 	<ul style="list-style-type: none"> Prioritized areas have completed studies. Remaining areas are prioritized for future studies. Adequate local support is provided. <p>Anticipated Timeline 2010</p>
<p>Participate in National Floodplain Insurance Program's Community Ratings System (CRS) program.</p> <p>Moderate Priority</p>	<ul style="list-style-type: none"> Secure funding, prepare, and adopt Multi-Hazard Mitigation Plans for Jay and Wells Counties. Prepare CRS applications for all interested communities. Implement management measures outlined in MHMPs and needed items in the CRS application to ensure best 	<ul style="list-style-type: none"> Jay and Wells County EMAs Area Planning Commissions County and Local Governments within the River Basin. Adams, Jay and Wells County Surveyor's Offices NFIP Communities within the watershed 	<ul style="list-style-type: none"> Adoption of Completed MHMPs and CRS applications will need to be completed by County and Local Governments. 	<ul style="list-style-type: none"> Each County and/or Community involved has developed and adopted a specific Multi-Hazard Mitigation Plan. Interested communities have become CRS participants and received associated Flood Insurance discounts.

Management Measures	Action Plan	Resources/Cost	Legal Matters	Progress Indicators
	rating possible for each community.			Anticipated Timeline 2010
Maintain existing and increase the overall number of gaging stations in the watershed that monitor flow data Moderate Priority	<ul style="list-style-type: none"> Determine activity levels of stream gages currently in the watershed. Determine locations of active and inactive stream gages. Explore steps to re-activate 3 discontinued gages. Maintain central repository or electronic database for all stream gages in the watershed. 	<ul style="list-style-type: none"> United States Geological Survey Indiana Geological Survey Adams, Jay, and Wells County Surveyor's Offices UWRBC 	<ul style="list-style-type: none"> O&M contracts may be needed to discuss funding, responsible entity, and longevity matters. 	<ul style="list-style-type: none"> Number of stream gages increased due to local interest and efforts. Data from gages utilized to guide land use decision making in Adams, Jay and Wells Counties and Local Communities within those counties. Anticipated Timeline 2009
Stream gaging station on Ohio/Indiana line needs to remain active and permanent. Moderate Priority	<ul style="list-style-type: none"> Determine existence of stream gage located on the state line. Explore steps to have gage installed if not present; re-activate and/or made a permanent structure. 	<ul style="list-style-type: none"> United States Geological Survey Indiana Geological Survey Ohio Department of Geological Survey Adams, Jay, and Wells County Surveyor's Offices UWRBC 	<ul style="list-style-type: none"> O&M contracts may be needed to discuss funding, responsible entity, and longevity matters. 	<ul style="list-style-type: none"> Stream gage on Ohio – Indiana state line has been installed/re-activated or made permanent and data is continuously obtained and utilized for decision making processes. Anticipated Timeline 2008
Implement streambank stabilization techniques that utilize a combination of vegetation, bioengineering, and structural systems. Moderate Priority	<ul style="list-style-type: none"> Inventory 2nd and 3rd order waterways for erosion problems. Distribute educational materials on streambank stabilization. Identify funding sources to assist with stabilizing eroded banks. Develop economic incentive program to conduct streambank stabilization projects. 	<ul style="list-style-type: none"> Local Resources <ul style="list-style-type: none"> Adams, Jay and Wells County SWCDs NRCS DNR Adams, Jay and Wells County Surveyor's Office 319 Grant High cost 	<ul style="list-style-type: none"> Construction and maintenance easements may need to be obtained to complete necessary work. Permits may also need to be obtained for instream work. 	<ul style="list-style-type: none"> Future water quality sampling indicates a reduction of sediment, phosphorus, and nitrogen loadings and concentrations, within the Upper Wabash River Watershed. Anticipated Timeline 2009

Table 5-3: Agricultural Priority Management Measures

Management Measures	Action Plan	Resources/Cost	Legal Matters	Progress Indicators
Establish vegetated buffer along natural streams and artificial drainage ditches. A total of 122 stream miles need buffered. High Priority	<ul style="list-style-type: none"> Identify landowners adjacent to natural waterways. Conduct a workshop and/or develop educational materials on benefits of riparian buffers and filter strips. Encourage participation in existing federal programs. Develop economic incentive program for landowners ineligible for Federal funding. Indicate buffers using GIS 	<ul style="list-style-type: none"> Local Resources <ul style="list-style-type: none"> Adams, Jay, and Wells County SWCDs Adams, Jay, and Wells County Surveyor's Office NRCS Department of Agriculture Purdue Extension Service Nature Conservancy Easements Land Trust Organizations Federal incentive programs High cost 	<ul style="list-style-type: none"> Development of easements, deed restrictions and/or contractual management agreements. 	<ul style="list-style-type: none"> Future water quality sampling indicates a reduction in nutrient concentrations and loadings in the Upper Wabash River Watershed. Conducive habitats for aquatic life: more consistent temperature ranges and dissolved Oxygen levels due to overhanging vegetation. Anticipated Timeline Ongoing

Management Measures	Action Plan	Resources/Cost	Legal Matters	Progress Indicators
<p>Increase the number of acres utilizing conservation tillage methods.</p> <p>High Priority</p>	<ul style="list-style-type: none"> • Provide educational materials at SWCD annual meetings, Ag Days, County Fairs • Research and promote incentive programs to improve participation in conservation tillage practices by 20%. • Develop economic incentive program to assist landowners with implementing conservation tillage. 	<ul style="list-style-type: none"> • Local Resources <ul style="list-style-type: none"> • Adams, Jay, and Wells County SWCDs • NRCS • Department of Agriculture • Purdue Extension Service • Adams, Jay, and Wells County Surveyor's Office • CTIC/CORE 4 programs • Federal incentive programs • 319 Grant • Moderate cost 	<p>NA</p>	<ul style="list-style-type: none"> • Future surveys, tillage transects, and correspondence indicate that stakeholders have changed behaviors and/or practices. <p>Anticipated Timeline Ongoing</p>
<p>Increase nutrient management and pest management practices among crop producers.</p> <p>High Priority</p>	<ul style="list-style-type: none"> • Identify 100 landowners and evaluate current manure, nutrient, and /or pest management practices. • Conduct a workshop and/or develop brochure addressing manure, nutrient, and pest management and highlighting NRCS standards. • Develop economic incentive program to provide land-owners with assistance in developing and implementing nutrient and pest management plans. 	<ul style="list-style-type: none"> • Local Resources <ul style="list-style-type: none"> • Adams, Jay, and Wells County SWCDs • NRCS • Department of Agriculture • Purdue Extension • Adams, Jay, and Wells County Surveyor's Office • CTIC/CORE 4 programs • Federal incentive programs • Section 319 Grant • Low cost 	<p>N/A</p>	<ul style="list-style-type: none"> • Follow up contact indicates that stakeholders attending workshops have changed behaviors and/or practices. • Future water quality sampling indicates a reduction in <i>E.coli</i>, phosphorus, and ammonia concentrations in the Upper Wabash River Watershed. <p>Anticipated Timeline Ongoing</p>
<p>Promote use of winter cover crops to reduce erosion and sedimentation within the watershed.</p> <p>High Priority</p>	<ul style="list-style-type: none"> • Target 50 fall plowed fields within the watershed. • Provide informational materials regarding benefits to water quality and soil health through establishing winter cover crops. • Obtain funding and provide economic incentives to landowners incorporating winter cover crops. • Complete pre and post implementation load reductions based on spreadsheets provided by IDEM and RUSLE 2 calculations. 	<ul style="list-style-type: none"> • Local Resources <ul style="list-style-type: none"> • Adams, Jay, and Wells County SWCDs • NRCS • Department of Agriculture • Purdue Extension • CTIC/Core 4 programs • Federal incentive programs 	<p>NA</p>	<ul style="list-style-type: none"> • Reduced sediment loadings to nearby streams and waterways • Enhanced water quality in stream segments near to participants. <p>Anticipated Timeline Ongoing</p>

Management Measures	Action Plan	Resources/Cost	Legal Matters	Progress Indicators
<p>Promote use of grassed waterways, concentrated flow areas, and critical seedings to reduce erosion and sedimentation within the watershed.</p> <p>High Priority</p>	<ul style="list-style-type: none"> • Provide informational materials regarding benefits to water quality and soil savings through establishing grassed waterways, concentrated flow areas, and critical seeding areas. • Obtain funding and provide economic incentives to 25 landowners to stabilize areas of concern. • Complete pre and post implementation load reductions based on spreadsheets provided by IDEM and RUSLE 2 calculations. 	<ul style="list-style-type: none"> • Local Resources <ul style="list-style-type: none"> • Adams, Jay, and Wells County SWCDs • NRCS • Department of Agriculture • Purdue Extension • CTIC/Core 4 programs • Federal incentive programs 	<p>NA</p>	<ul style="list-style-type: none"> • Reduced sediment loadings to nearby streams and waterways • Enhanced water quality in stream segments near to participants. <p>Anticipated Timeline Ongoing</p>
<p>Explore benefits of Wetland/Reservoir Sub-Irrigation Systems in the Upper Wabash River watershed.</p> <p>Moderate Priority</p>	<ul style="list-style-type: none"> • Research existing systems for efficiency, benefits to both water quality and crop production and cost/benefit. • Determine best location(s) for 2 demonstration projects. • Develop monitoring program for water quality as well as crop productivity. 	<ul style="list-style-type: none"> • Local Resources <ul style="list-style-type: none"> • Adams, Jay, and Wells County SWCDs • NRCS • Department of Agriculture • Purdue Extension • Federal incentive programs • Section 319 Grant • 	<p>NA</p>	<p>Anticipated Timeline 2009</p>
<p>Secure funding for livestock and crop producers to implement conservation BMPs.</p> <p>Low Priority</p>	<ul style="list-style-type: none"> • Research funding sources and develop economic incentives to implement BMPs on 25 operations. 	<ul style="list-style-type: none"> • Local Resources <ul style="list-style-type: none"> • Adams, Jay, and Wells County SWCDs • NRCS • DNR • Purdue Extension • Federal incentive programs • 319 Grant • High cost 	<ul style="list-style-type: none"> • Requirements of funder must be followed and necessary reports completed and submitted. 	<ul style="list-style-type: none"> • Future water quality sampling indicates a reduction in <i>E.coli</i> and nutrient concentrations and loadings in the Upper Wabash River Watershed. • Increased watershed wide participation in conservation programs. <p>Anticipated Timeline Ongoing</p>

Table 5-4: Land Use/Development Management Measures

Management Measure	Action Plan	Resources/Cost	Legal Matters	Process Indicators
Limit development in 100 & 500 year floodplains. High Priority	<ul style="list-style-type: none"> Determine critical areas and prioritize them for focused efforts and expenditures. Determine limitations to be proposed based on type of development, amount of development, current and proposed land use changes. Investigate utilizing Conservation and Development Right easements to obtain land in floodplains. Author ordinances for the limitation of development within the 100-year and 500-year floodplains. 	<ul style="list-style-type: none"> Adams, Jay, and Wells County Surveyor's Offices Adams, Jay and Wells County Commissioners Area Planning Commissions Low Cost 	<ul style="list-style-type: none"> Proposed ordinances will need to be adopted by County and Municipal Governments. Contractual agreements for easement purchase/lease and management procedures 	<ul style="list-style-type: none"> Ordinances are developed and adopted by all County and Local Governments. Floodplain for the Upper Wabash River and tributary streams is protected. <p>Anticipated Timeline 2010</p>
Coordinate with Federal NRCS/FSA programs and land use conversion programs to reduce flood damages. High Priority	<ul style="list-style-type: none"> Create ad hoc committee to investigate correlations of needs and opportunities. Determine critical areas based on previous flooding, land uses within the 100 year floodplain, and repetitive loss properties. Utilize combined effort to inform landowners of programs and funding available for proposed activities. 	<ul style="list-style-type: none"> Adams, Jay, and Wells County Surveyor's Offices Adams, Jay, and Wells County SWCD/NRCS Local media outlets (print, TV, and radio) for information transfer Low Cost 	<ul style="list-style-type: none"> Guidelines set forth by Federal Entities must be followed and operations must be eligible for participation. 	<ul style="list-style-type: none"> Increased application and participation in Federally funded agricultural incentive and enrollment programs. <p>Anticipated Timeline Ongoing</p>
Evaluate urban areas subject to repetitive flooding for existing structural relocation, buy out and flood-proofing. High Priority	<ul style="list-style-type: none"> Investigate repetitive loss properties. Determine critical areas based on previous flooding and land uses within the 100 year floodplain. Inform landowners of programs and funding mechanisms available Create upland storage areas and develop passive land uses that would experience little monetary damage if flooded 	<ul style="list-style-type: none"> Adams, Jay, and Wells County Surveyor's Offices Adams, Jay, and Wells County SWCDs Adams, Jay, and Wells County EMA Directors IDHS 	<ul style="list-style-type: none"> Contractual agreements for purchase or private properties. 	<ul style="list-style-type: none"> Repetitive Loss properties mitigated to reduce future flood damages. <p>Anticipated Timeline 2008</p>
Wetland preservation, restoration and enhancement activities. Moderate Priority	<ul style="list-style-type: none"> Identify critical areas for wetland construction or preservation Inform landowners existing Federal funding programs 	<ul style="list-style-type: none"> Adams, Jay, and Wells County Surveyor's Offices Adams, Jay, and Wells County SWCD/NRCS offices. Local Land Trust Organizations Moderate to High Cost 	<ul style="list-style-type: none"> It may be necessary to purchase conservation easements prior to construction of wetlands. Contractual agreements will need to be obtained. 	<ul style="list-style-type: none"> 50 acres of constructed or restored wetlands are providing additional storage capacity in critical areas of the watershed. Flooding damages have been reduced due to this project. <p>Anticipated Timeline Ongoing</p>

<p>Incorporate water quality BMPs into future construction and flood control projects designed and implemented in the watershed.</p> <p>Moderate Priority</p>	<ul style="list-style-type: none"> Update existing Comp Plans, Zoning Ordinances, and Subdivision Control Ordinances. 	<ul style="list-style-type: none"> Local Resources <ul style="list-style-type: none"> Area Plan Commissions, Surveyors, Town Councils, and Drainage Boards Adams, Jay, and Wells County SWCDs Moderate Cost 	<ul style="list-style-type: none"> Approval and adoption of updated planning documents and ordinances. 	<ul style="list-style-type: none"> Updated ordinances and comprehensive plans address water quality issues. <p>Anticipated Timeline 2010</p>
<p>Minimize soil erosion and sedimentation of waterways with better construction management and practices.</p> <p>Moderate Priority</p>	<ul style="list-style-type: none"> Update Adams, Jay and Wells Counties existing ordinances to require ESC from sites disturbing greater than or equal to one acre of land. Implement an educational program on the benefits of implementing ESC measures. Create and distribute a handbook identifying appropriate BMPs. 	<ul style="list-style-type: none"> Local Resources <ul style="list-style-type: none"> Adams, Jay, and Wells County SWCDs Area Plan Commissions, Surveyors, Town Councils, and Drainage Boards Local Builders Associations Purdue Planning with POWER Moderate cost 	<ul style="list-style-type: none"> Approval and adoption of updated planning documents and ordinances. Enforcement methods of existing fines for construction violations. 	<ul style="list-style-type: none"> Post construction practices implemented in 100% of developments greater than or equal to one acre in the Upper Wabash River Watershed. <p>Anticipated Timeline Ongoing</p>
<p>Develop and adopt a Greenways Plan to maintain a system of healthy riparian/aquatic buffers along the Upper Wabash River.</p> <p>Moderate Priority</p>	<ul style="list-style-type: none"> Work with landowners, planners, SWCD staff, and interested group to develop a basin-wide Greenways Plan. 	<ul style="list-style-type: none"> Local Resources <ul style="list-style-type: none"> Area Plan Commissions Adams, Jay, and Wells County SWCDs Wabash River Corridor Heritage Commission Local Land Trust Organizations Secure additional funds to pay for study writing, and distribution of plan. Moderate cost 	<ul style="list-style-type: none"> Amendments to the Zoning Ordinance and Comprehensive Plan, and adoption of those amendments may be necessary. 	<ul style="list-style-type: none"> Greenway Plan developed and riparian buffers maintained. <p>Anticipated Timeline Ongoing</p>
<p>Minimize the water quality impacts associated with transportation corridors.</p> <p>Moderate Priority</p>	<ul style="list-style-type: none"> Work with INDOT to implement hydrocarbon removing BMPs along US Hwy 27 roadside ditches. Encourage state and local Highway Departments to utilize a substitute for road salt along stretches of US Hwy 27 near the Wabash River and its tributaries. 	<ul style="list-style-type: none"> Local Resources <ul style="list-style-type: none"> Adams, Jay, and Wells County Highway Departments INDOT Medium cost 		<ul style="list-style-type: none"> Implementation of BMPs, and change in salt/sand application policies. <p>Anticipated Timeline 2010</p>

<p>Update current Comprehensive Plans, Zoning Ordinances, and Subdivision Control Ordinances to address water quality issues including:</p> <ul style="list-style-type: none"> • Wetland protection • Riparian corridor protection • Tree preservation/protection • Setbacks and buffer protection • Limiting impervious areas • Conservation design • Drainage (ROW) easements • Treatment of sewage (septic/sewer) • Flexible development standards <p>Low Priority</p>	<ul style="list-style-type: none"> • Participate in future updates of the Comprehensive Plans for Adams, Jay and Wells Counties. • Participate in future updates of Zoning Ordinances, Subdivision Control Ordinances, and Floodplain Ordinances. • Update Flood Insurance Rate Maps. • Develop digital zoning maps. 	<ul style="list-style-type: none"> • Model ordinances. • Local Resources <ul style="list-style-type: none"> • Local Builders Association • Area Plan Commissions • Adams, Jay, and Wells County SWCDs • Adams, Jay, and Wells County Surveyor's Offices • Purdue Extension • Moderate cost 	<ul style="list-style-type: none"> • Approval and adoption of updated planning documents and ordinances. 	<ul style="list-style-type: none"> • Updated ordinances and comprehensive plans address water quality issues. <p>Anticipated Timeline 2010</p>
<p>Use GIS to assist with establishing future land use and zoning districts based on appropriateness for development, agriculture, and open space.</p> <p>Low Priority</p>	<ul style="list-style-type: none"> • Develop watershed wide GIS layer to assist in future planning and decision making efforts. 	<ul style="list-style-type: none"> • Digital soil, property, and drainage layers • Local Resources <ul style="list-style-type: none"> • Information Technology Departments • Area Plan Commissions • Adams, Jay, and Wells County SWCDs • Adams, Jay, and Wells County Surveyor's Office • Moderate cost 	<ul style="list-style-type: none"> • Interested offices and agencies must be granted full or limited access to the information. 	<ul style="list-style-type: none"> • Watershed wide GIS layer developed and utilized in future land use decisions. <p>Anticipated Timeline Ongoing</p>
<p>Improve water quantity and quality management through effective storage and treatment of urban, suburban, and rural stormwater runoff including:</p> <ul style="list-style-type: none"> • On-site stormwater treatment • Bioretention • Rain Gardens • Constructed wetlands • Detention/retention ponds • Infiltration basins/trenches • Vegetated filters strips/swales • Stream buffers • Limit impervious areas • Tree conservation/protection <p>Low Priority</p>	<ul style="list-style-type: none"> • Review existing drainage ordinances and make recommendations for improvement to the Drainage Boards and Town Councils. • Implement educational program focusing on benefits of stormwater BMPs in new development. • Distribute handbook identifying appropriate stormwater BMPs. • Develop economic incentive to developers implementing stormwater BMPs. 	<ul style="list-style-type: none"> • List of definitions suggested language, and model ordinances. • Local Resources <ul style="list-style-type: none"> • Adams, Jay, and Wells County SWCDs • Area Plan Commissions, Surveyors, Town Councils, and Drainage Boards • Local Builders Associations • 319 Grant • High cost 	<ul style="list-style-type: none"> • Approval and adoption of updated planning documents and ordinances. 	<ul style="list-style-type: none"> • Post-construction practices implemented in 100% of developments greater than or equal to one acre in the Upper Wabash River Watershed. <p>Anticipated Timeline 2009</p>

Table 5-5: E. coli Reduction Management Measures

Management Measure	Action Plan	Resources/Cost	Legal Matters	Progress Indicators
<p>Improve the planning process to minimize impacts of residential septic systems on water quality.</p> <p>High Priority</p>	<ul style="list-style-type: none"> Ensure Health Departments continue to participate in review and approval process. Create GIS layer identifying land suitable for septic systems. Include language in updated Comprehensive Plans addressing impacts of septic systems on water quality. Promote existing assistance programs for homeowners replacing and repairing inadequate septic systems. Require documentation of properly functioning system prior to real estate transfer. 	<ul style="list-style-type: none"> Local Resources <ul style="list-style-type: none"> Adams, Jay, and Wells County Commissioners Adams, Jay and Wells County Health Departments Purdue Extension Service USDA RCAP Local Realtors Secure additional funds to provide economic incentives for repairing failing septic systems. Moderate cost 	<ul style="list-style-type: none"> Will need to gain legal authority to require landowners to provide documentation that their septic systems are working properly prior to selling their property. 	<ul style="list-style-type: none"> Secure funding for low-income landowners that may need financial assistance in installing, repairing, or operating and maintaining their septic systems. Future water quality sampling indicates a reduction in <i>E.coli</i> and nutrient concentrations and loadings in the Upper Wabash River Watershed. <p>Anticipated Timeline Ongoing</p>
<p>Increase detection and enforcement of illicit discharges.</p> <p>High Priority</p>	<ul style="list-style-type: none"> Create GIS database to track operational status of septic systems in Adams, Jay and Wells Counties. Conduct dye testing to identify failing systems and illicit connections. Require septic system contractors, inspectors, and haulers be certified. Develop County wide Long Range Plan for IDDE actions 	<ul style="list-style-type: none"> Local Resources <ul style="list-style-type: none"> Adams, Jay, and Wells County Health Departments Adams, Jay, and Wells County Commissioners Purdue Extension Secure additional funds to develop and amend a watershed wide GIS database. Moderate-High cost 	<ul style="list-style-type: none"> Develop and adopt an ordinance requiring homeowners to document proof of septic system maintenance. Provide necessary enforcement actions and authorities. Certification procedures for contractors, haulers and inspectors approved by Indiana State Department of Health. 	<ul style="list-style-type: none"> Future water quality sampling indicates a reduction in <i>E.coli</i> and nutrient concentrations and loadings in the Upper Wabash River Watershed. 50 residential septic system upgrades/replacements within 5 years. Ordinance for septic maintenance in place. Certification process in place. <p>Anticipated Timeline 2009</p>
<p>Secure funding or cost-share assistance to assist interested landowners with connecting to local wastewater treatment plants.</p> <p>High Priority</p>	<ul style="list-style-type: none"> Work with Regional Sewer Districts to identify priority landowners. Secure funds to provide support to landowners to connect to local wastewater treatment plants. Develop and conduct an education and marketing campaign on the benefits of connecting to wastewater treatment plants. 	<ul style="list-style-type: none"> Local Resources <ul style="list-style-type: none"> Adams, Jay, and Wells County Commissioners Regional Sewer District Adams, Jay, and Wells County Health Departments USDA RCAP State Revolving Loan Funds. High cost 	<ul style="list-style-type: none"> Requirements of funder must be followed and necessary reports completed and submitted. 	<ul style="list-style-type: none"> Secure funding to assist interested landowners with connecting to local wastewater treatment plants and proper septic system abandonment procedures. <p>Anticipated Timeline 2011</p>
<p>Secure funding for landowners installing, repairing, or operating and maintaining residential septic systems.</p> <p>High Priority</p>	<ul style="list-style-type: none"> Research and secure funds for addressing septic systems issues including sewer extensions and private WWTP. 	<ul style="list-style-type: none"> Local Resources <ul style="list-style-type: none"> Adams, Jay, and Wells County Health Departments. Purdue Extension USDA RCAP High cost 	<ul style="list-style-type: none"> Requirements of funder must be followed and necessary reports completed and submitted. 	<ul style="list-style-type: none"> Funding for septic improvements and maintenance secured. Septic systems are being repaired/upgraded and/or increased amount of sewer connections where possible.

				<p>Anticipated Timeline 2011</p>
<p>Improve pasture management techniques including rotational grazing, livestock exclusion fencing and/or alternative watering sources.</p> <p>Moderate Priority</p>	<ul style="list-style-type: none"> • Create educational materials for livestock producers about pasture management and limiting access to waterways. • Develop economic incentive for exclusion fence and provide alternative watering mechanisms. 	<ul style="list-style-type: none"> • Local Resources <ul style="list-style-type: none"> • Adams, Jay, and Wells County SWCDs • NRCS • Department of Agriculture • Purdue Extension • Federal incentive programs • Section 319 Grant • High cost 	<p>NA</p>	<ul style="list-style-type: none"> • Future water quality sampling indicates a reduction in <i>E.coli</i> and phosphorus concentrations in the Upper Wabash River Watershed. • Increase in participants in Federal Programs, such as exclusion fencing. <p>Anticipated Timeline Ongoing</p>

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