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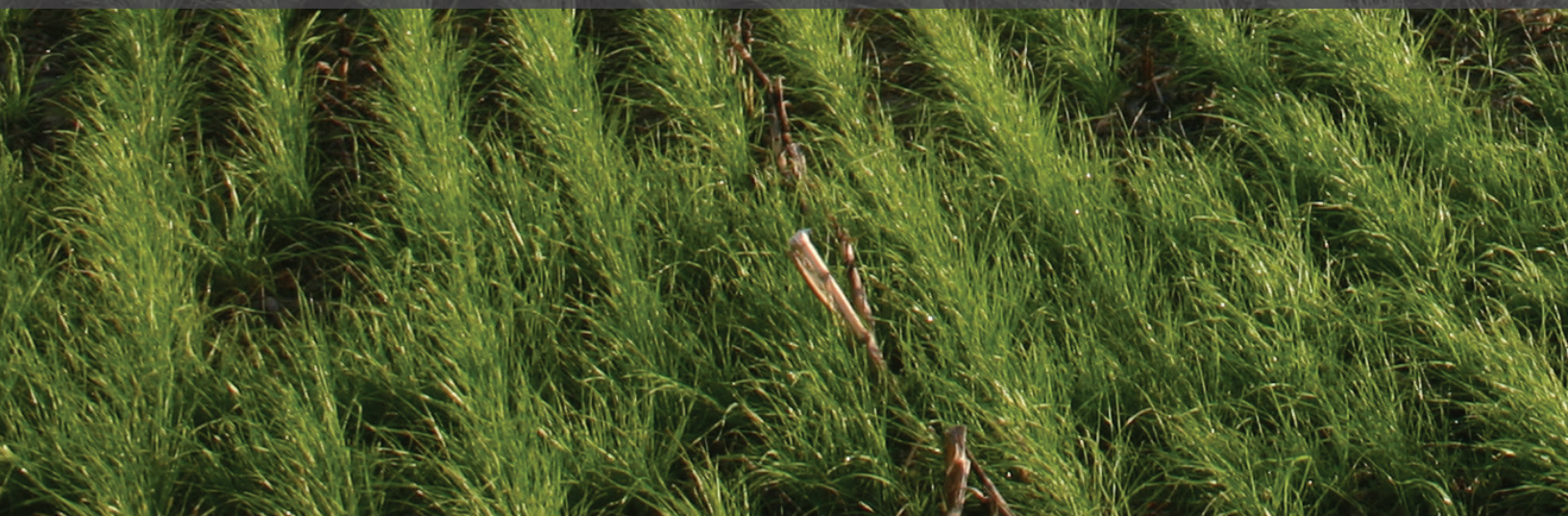
Photo: Cover crops can be planted alongside traditional row crops to build soil and retain essential nutrients. *Photo courtesy of Steve Berger.*



Introduction

In recent decades, communities and property owners in the English River watershed have been increasingly impacted by flood events, although flooding in the watershed has been adversely impacting landowners, and prompting discussion of better watershed management as early as the 1920's (refer to Appendix I for more information). These events have been increasing in frequency and severity; and with each event, homes, farms, and infrastructure are damaged, costing millions of dollars to rebuild and repair. Historically, flood mitigation has consisted of improving drainage in one area, resulting in adverse impacts on downstream neighbors. Additionally, runoff in watersheds carry phos¬phorus-rich topsoil, nutrients and other water contaminants downstream, not only impacting water quality and wildlife habitat locally, but other larger watersheds, including the Gulf of Mexico.

Reducing flood impacts and improving soil and water quality in the English River Watershed (ERW) are the over-arching goals of the English River Watershed Management Authority (ERWMA), its members, and this plan. The ERWMA is committed to education and development of partnerships with key stakeholders to make this happen. Development of this plan required a science-based approach to determine the unique issues affecting the watershed, and then outlining a plan to address them. The plan is intended to educate watershed stakeholders about the opportunities and challenges ahead of us, and build the foundation upon which stakeholders will hopefully continue the momentum for collaborative watershed improvement efforts needed to protect our watershed communities, families, and farms.

Overview of the English River Watershed Management Authority

In 2010, the state of Iowa authorized Watershed Management Authorities (WMAs) to form as part of the Surface Water Protection & Flood Mitigation Act. WMAs are voluntary interagency partnerships of cities, counties, and soil & water conservation districts in Iowa, formed through a 28-E agreement, who collaborate on shared water resource concerns. These collaboratives are permitted by the state to assess and reduce flood risk and water quality issues; they can monitor federal flood risk planning; they educate the public on flood and water quality issues; and leverage available funds for watershed improvement efforts. State code prohibits WMAs from acquiring land through eminent domain or serving as a taxation authority.

Membership in the ERWMA

Iowa Code defines eligible WMA members as Cities, Counties, and Soil and Water Conservation Districts (SWCDs). At the time this watershed plan was completed, the ERWMA had 13 member organizations. The ERWMA is governed by its Board of Directors, and Representatives from the ERWMA's Member Organizations are given opportunities to serve on the Board at the annual meeting in November. Funding to support the ERWMA is primarily dependent on competitive grants, and donations its from Member Organizations. Membership in the ERWMA is completely voluntary, as is making financial contributions to the organization, and it gives organizations the opportunity to take part in planning and decision-making.

Overview of the Watershed Assessment and Improvement Planning Project

The primary goals of the watershed assessment were to establish baseline indicators of water quantity, flooding, and public awareness in the watershed; and, to identify watershed improvement priorities for the years to come. This plan is a voluntary call to action, and was informed through extensive research, primary and secondary data sources, and advisory team input. The recommendations of the plan are designed to guide stakeholders in the watershed to be stewards in protecting and improving this valuable local resource in the years to come.

Highlights from the English River Watershed (ERW) Assessment

Primary contributors of the watershed assessment were watershed staff and project partners from the Iowa Flood Center – IIHR Hydroscience and Engineering at the University of Iowa, Iowa Department of Natural Resources, Iowa Geological Survey, Iowa Department of Agriculture and Land Stewardship, and Iowa Soybean Association. The table below highlights some key research findings:

Table 1. Key Research Findings from Comprehensive Watershed Assessment	
General	The ERW is part of the Lower Iowa River watershed, and consists of 20 smaller tributary-sized subwatersheds
	About 409,000 acres of southeastern Iowa drain into the watershed (or 639 square miles)
	There are approximately 1,447 miles of rivers and streams in the watershed
	Nearly half of the land in the watershed is considered "Highly Erodible"
Demographics	The watershed covers portions of 6 counties, and includes 14 communities
	Kalona (population of 2,363) is the largest community in the watershed
	Of the approximately 21,700 residents in the watershed, 60% live in the rural areas
	The majority of those renting farmland in the watershed live within 5 miles of the land they rent out
	Slightly over half (16 of 30) of the townships in the watershed have experienced population decline in the last decade
Land Use	Row crop agriculture, primarily corn and soybeans, is the predominate land use in the watershed
	In the mid-1800s, the watershed landscape was approximately 83% prairie
	The average Corn Suitability Rating (CSR) across the watershed is about 50
Water Quality Indicators	Sediment loading in the watershed is higher than the statewide median, and indicates significant erosion from streambanks and upland
	Total phosphorus levels in the watershed have consistently exceeded EPA benchmark values in the last 28 years, and are higher than the statewide median
	Bacteria levels (E. coli) in the watershed have exceeded benchmark values over 50% of the time, since testing began in 1999
	Nitrate levels in the watershed have been consistently below the state median, and 1/3 of subwatersheds tested below the EPA drinking water standard (10ppm) in 2014
	Chloride levels in the watershed have been significantly declining over the last 14 years
	The Deer Creek and Town of Tilton subwatersheds are recommended *high* priority watersheds for nitrate
	Several subwatersheds, specifically Dugout Creek (aka North English Headwaters), Upper South English River, Upper English River, Jordan Creek, and Deep River subwatersheds are recommended *high* priority areas for phosphorus reduction
Flooding Indicators	Flooding events have occurred in 25 of the last 75 years, with most flood events occurring between the months of May and July
	Runoff has increased flood severity, due in part to the conversion of both urban and rural land from more absorbent land uses to less absorbent uses
	The upper third of the watershed is most vulnerable to runoff (and soil erosion), due to steeper slopes and a highly erodible landscape
	The convergence of the North and South English River is the largest area in the watershed highly prone to annual flooding events
	The Deep River, Deer Creek, Upper South English River, Town of Tilton, Dugout Creek (aka North English Headwaters), and Middle English River were identified as high priority subwatersheds for combined water quality improvement *and* flood reduction
Social Indicators	The majority of surveyed landowners in the watershed feel that the drinking water on their property is safe to drink
	The majority of those surveyed also agree that we need to improve water quality in the watershed
	Nearly 42 percent of landowners surveyed have been impacted by flooding in the last 10 years
	The most popular farming best management practices in the watershed are crop rotation, grassed waterways, and no-till
	Less than 10% of those surveyed indicated that they wanted to learn more about additional BMPs they could use on their urban and farm properties; barriers to practice include lack of cost-share incentives, project expense, education or technical assistance, and tenant farmers
	From a list of current "policy issues;" those surveyed were *most* likely to be "Very concerned" about soil erosion, loss of agricultural land, and soil fertility compared to other issues
	Policy issues those surveyed were *least* concerned about, included extreme temperatures, severe weather, and impacts of water quality on recreation and tourism
	The majority (70%) of those surveyed were unfamiliar with Iowa's Nutrient Reduction Strategy (NRS); 60% of those who identified as farmers were unfamiliar with the NRS

Going Forward: Summary of English River Watershed Improvement Priorities and Recommendations

The following recommendations (or goals) for future English River Watershed improvements are categorized by (1) water quality improvements, (2) disaster resiliency, and (3) capacity building, and are informed by the watershed assessment and ranked via stakeholder involvement. Recommendations should be re-evaluated at least every 5 years, and adjusted as needed to keep pace with changing local, state, and federal priorities, and resources available to achieve these goals. In addition to resources lasting watershed improvements will also depend upon:

- Leadership in the watershed promoting and supporting these goals;
- Stakeholder commitment to stewardship of the watershed they live, do business, and farm in;
- Federal, state, and local priorities supportive of water and soil resources.

Responsibility for moving watershed improvement initiatives forward is that of all watershed stakeholders (both individual and organizational), but it is anticipated that the English River Watershed Management Authority will facilitate development of partnerships needed to make it happen, as well as providing leadership, and pursuing the resources needed to implement the plan.

Recommendation #1: Water Quality Improvement

Continue monitoring water quality parameters at the subwatershed level.

Ongoing water quality monitoring on the subwatershed level is needed to establish long-term water quality baselines, and provide opportunities for landowners and watershed stakeholders to participate in volunteer water monitoring programs (i.e. IOWATER, tile outlet monitoring programs for producers). Longer-term data accounts for more variability in weather, development, and farming trends and will help stakeholders reevaluate the priority subwatersheds for targeted efforts, evaluate the impact of projects on the subwatershed-level, and allow for resources to be redirected as needed. Stakeholders will also need easier access to public water quality data to assist them in making these decisions.

Recommendation #2: Water Quality Improvement

Reduce phosphorus loading in the English River watershed from non-point sources by 29% from 2010 levels.

Phosphorus reduction in the English River Watershed can be achieved through education on Iowa's current Nutrient Reduction Strategy (NRS), and proven best management practices (BMPs) that reduce erosion and resulting phosphorus loading in local waterways. As with a focus on reducing nitrates in our waterways, collaboration with other organizations in these efforts is key to efficient use of limited resources, and greater outreach and effectiveness. Current priority subwatersheds for phosphorus reduction are based on available erosion data and are the same priority watersheds for sediment reduction (below): Deer and Camp Creeks, the South and Upper South English Rivers. Additional priority subwatersheds include: Gritter, Dugout, Jordan, and Birch Creeks; and, Deep River, the Middle English, and Middle South English Rivers. Water quality monitoring on the subwatershed level for Total Phosphorus will assist stakeholders with evaluating the effectiveness of subwatershed-level efforts, and in reprioritizing target subwatersheds, if needed.

Recommendation #3: Water Quality Improvement

Reduce nitrate loading in the English River watershed from non-point sources by 41% from 2010 levels.

A sustained commitment is needed in the watershed to educate stakeholders about Iowa's NRS and the BMPs proven by science that can reduce nutrients from entering waterways. Collaboration with other organizations in programming, program evaluation and ongoing prioritization of subwatersheds for NRS-related implementation projects is recommended. The priority subwatersheds identified for nitrate reductions include: Deer, Dugout (headwaters of the Upper North English River), Camp and Lime Creeks; Lower, Middle and Upper South English Rivers; the Middle and Upper English River; Deep River, and Town of Tilton. Sustained water quality monitoring on the subwatershed level for nitrates is needed to evaluate effectiveness of subwatershed-level efforts, and to reprioritize target subwatersheds, if needed.

Recommendation #4: Disaster Resiliency

Reduce flood severity in the English River watershed through education and promotion of BMPs that reduce runoff in targeted subwatersheds.

Sustained efforts are needed to educate stakeholders on how their land use practices can impact flooding in the watershed, and the best management practices they can implement on their landscapes that can actually reduce the impacts of flooding on communities and farms during heavy rain events. Runoff reduction projects should target identified priority subwatershed for greater efficiency in application of limited resources. The priority subwatersheds for targeted runoff reduction include: Jordan, Birch, Deer and Dugout Creeks (aka headwaters of the North English River); as well as the Upper English, Upper South English, South English Rivers, and Deep River. To achieve these goals, the ERWMA should utilize existing partnerships, and develop new ones with organizations that can help increase access to financial and technical resources.

Recommendation #5: Disaster Resiliency

Reduce flood severity in the English River watershed through education and promotion of BMPs that increase water-holding capacity and promote infiltration on both urban and rural landscapes.

The ERW will conduct outreach on the practices that help reduce flood severity by promoting infiltration during rain events. Implementation of practices should focus on the subwatersheds most prone to flooding: the area where the English River at the English River Wildlife Area and the South English River converge, the area downstream of the English River/Gritter Creek convergence, and areas in the western section of the watershed where high runoff areas overlap with high annual flood areas (headwaters of the North English River, and Deep River). The ERW will utilize existing partnerships and grow new ones with landowners and local, state and federal organizations to increase available resources to implement projects, and utilize resources more efficiently. The existing hydrologic monitoring network should be expanded so more parts of the English River Watershed are included. The network is capable of providing data and tools that decision-makers and individual stakeholders can use to better understand the hydrology of their region. This data can also be used to evaluate projects and reprioritize efforts as needed.

Recommendation #6: Water Quality Improvement

Reduce sediment loading in the English River watershed by 30% from current levels.

Reducing sediment loading in the English River Watershed through education and promotion of land uses and BMPs that reduce soil loss from streambanks, farm fields, and construction sites, is a vital component of this plan. Educational efforts should be directed towards improving soil health and promoting infiltration, which can bolster farm productivity, improve water quality, and aid in flood hazard reduction. Collaboration with other organizations in these efforts is essential to outreach and program effectiveness. The highest priority subwatersheds for sediment reduction implementation in the English River Watershed include: Deer and Camp Creeks, the South and Upper South English Rivers. Additional priority subwatersheds to consider include: Gritter, Dugout, Jordan, and Birch Creeks; and the Middle English, Middle South English, and Deep River.

Recommendation #7: Capacity Building

Increase the organizational capacity of the English River WMA.

The ERWMA needs sustained leadership and staff to facilitate networking, communication, engaging stakeholders, and project leadership in the watershed improvement initiatives proposed in this plan. The organization's Board of Directors can provide this leadership by directing watershed staff, holding regular, open meetings, and supporting ongoing opportunities for watershed stakeholders to participate in events and engage with the organization. The Board of Directors should consider reaching out to important stakeholder groups with opportunities to join the ERWMA and participate in decision-making. The ERWMA and its leadership should also be proactive in pursuing available technical and financial resources needed to support administrative functions and implementing the plan.

Recommendation #8: Capacity Building

Expand partnerships for education, outreach, and project collaboration.

Partnerships are a key component of effective plan implementation. Increased collaboration with political, environmental, agricultural, community and other organizations can assist with streamlining messaging about watershed stewardship and localized projects, increasing outreach capacity through shared networks, engaging diverse stakeholder groups, and using limited resources more efficiently.

Conclusion

It is up to the watershed's stakeholders to determine the best way to implement the recommendations for improvements in their watershed. Locally-driven efforts are important to achieving buy-in from stakeholders. This locally developed watershed plan was designed to engage diverse stakeholders and promote water quality improvements in a cooperative manner that encourages voluntary action and collaboration, versus more top-down approaches. However, this strategy requires watershed stakeholders on the organizational and individual level to recognize the economic value of their local water resources, promote these resources, support and engage in outreach and education, adjust their land management practices as able, consider emerging science, and be open to change.