

# **Hurricane Creek** **Watershed Implementation Plan**

## **Summary version**

### **Introduction**

In 1998, the Hurricane Creek watershed was identified as a candidate for participation in the Illinois Pilot Watershed Program. After local organizing efforts showed there was interest in improving the natural resources in the watershed, it was selected for participation in the program.

Overall, the resource planning committee is made up of landowners and operators within the basin, local representatives of state and federal agencies involved with conservation of natural resources, and coordinators from the Embarras River Management Association and the Embarras River Ecosystem Partnership. The local planning committee (LPC) is made up of landowner representatives from within the watershed. The Technical Advisory Committee (TAC) comprises state, federal and county professionals in resource and conservation practices.

A fundamental objective of the Planning Committee is to develop a comprehensive management plan for the natural resources in Hurricane Creek watershed. After adoption of the plan, they hope to unite private citizens, public groups and government agencies to address the resource problems related to areas within the watershed boundary.

One important component of the watershed planning effort was to determine the range of resource concerns in the minds of the local landowners and operators. A public hearing held on March 12, 1998 resulted in the following concerns from the attendees.

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**Resource Concerns developed by local landowners/operators (rank ordered):**

1. Flooding
  2. Erosion Control (structures)
  3. Log Jams and Obstructions
  4. Scour Erosion
  5. Streambank Erosion
  6. Future Development
  7. Increased Incentives to Retire Marginal Land
  8. Channel Capacity Maintenance
  9. Water Quality
  10. Wildlife Habitat Preservation
  11. Sediment Deposits
  12. Rural Water Supply and Quality
  13. Loss of Natural Character
  14. Endangered Species (impact on projects)
  15. Drainage
  16. Private Property Rights
  17. Wetlands
  18. Wildlife (destruction to private property)
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Members of the various federal, state and county agencies met, at a Pilot Watershed Workshop in Springfield, IL. One of the outcomes of the workshop was to develop a list of agency concerns for each of the Pilot Watersheds. The list of agency concerns follows.

**Resource Concerns developed by local agency personnel (unranked):**

- The need for stabilizing critical areas in the watershed ( i.e., eroding stream banks and general landscape)
- The need to identify and prioritize critical watershed areas
- Land use conversions and their destabilizing effect on the watershed
- Separation of streams from floodplains
- The need to restore the hydrological function of streams
- In-stream nitrate levels and sedimentation, and need to adopt BMP's to reduce these levels
- Loss of grassland/upland habitat
- Current tilling practices and the need to adopt no-till on w.r.t. soil types
- Public education about watershed resources
- Public education about agency programs
- Simplify process for landowners to access and participate in agency programs
- Citizen participation in the pilot program, with an opportunity for everyone to have an equal voice in prioritizing how watershed issues will be addressed
- Availability of funding – in general for planning
- Address technical needs from forestry perspective; also technical needs for wildlife habitat.

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## **Mission Statement**

*"To improve and enhance the watershed by using Best Management Practices (BMP) to conserve the natural resources and the well-being of the environment through partnerships, cooperation and education".*

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## **Prior Conservation Activities in the Watershed**

Prior conservation activities within the Hurricane Creek watershed have been well documented. This information provides a benchmark to which current and future conservation activities can be compared, in an effort to evaluate the effectiveness of Best Management Practice (BMP) implementation on reducing soil erosion, and improving both wildlife habitat and water quality. At this time, approximately 80% of the cropland is at "T".

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## **Recommendations and benefits**

### **Land Use**

#### **Recommendations:**

Update GIS coverage for land use, parcel ID, conservation implementation tracking and scientific monitoring database. Use current Digital Ortho Photo Quads for the mapping base.

#### **Benefits:**

Will provide a means for effective management of implementation tracking and the results of application of best management practices within the watershed project boundaries.

### **Waterbodies**

#### **Recommendations:**

1. Intensive surveying of the stream channel should continue.
2. Determine the extent and severity of logjams on Hurricane Creek. Any logjam removal should be accompanied with stream channel protection as needed.
3. Determine the location, extent and conditions of constructed levees along the stream system.
4. All in-stream practices should be investigated to determine feasibility and consequences of the action.

**Benefits:**

1. Intensive surveying, logjam and levee location and evaluation will help focus remediation efforts and funding.
2. Determination of feasibility and consequences of actions will help avoid adverse impact to the stream channel, aquatic biota and landowners.

**Groundwater****Recommendations:**

Recognition of limited groundwater with unknown future contamination possibilities deserves further consideration and investigation.

**Benefits:**

Clean water for all residents of the watershed will result in fewer water related problems for all residents.

**Hydrologic Modifications****Recommendations:**

A survey should be done concerning the extent and effects of hydrologic modifications throughout the watershed

**Benefits:**

Knowledge of the effects of hydrologic modifications will allow focused remediation on the affected reaches.

**Storm water Management****Recommendations:**

Encourage landowners to implement practices that will assist in responsible routing of storm water to the local tributaries.

**Benefits:**

Benefits of responsible storm water routing include reduced flooding, reduced sediment yield from farmlands, with accompanying reduction in economic loss for farmers and reduction of habitat loss in and around the riparian zone.

**Drainage****Recommendations:**

1. Develop permanent easements for floodplain protection, most notably in lower Hurricane Creek.
2. Reconnect floodplains to the stream by removing or infiltrating constructed levees, or raising water levels using riffle structures.
3. Remove land falling within the floodplains from agricultural production and replace with perennial grasses, trees, and wetlands.

**Benefits:**

Following recommendations listed above will help develop a more natural drainage regime in the watershed. This should help to reduce extremes in flooding. Extremes in high and low stream flow should also be reduced, providing added benefit to stream biota.

**Soil Erosion****Recommendations**

1. Concentrate any land treatment alternatives on sloping ground (>5% slope areas) for most effective land treatment application. In other words, the “flat” land doesn’t really produce much sediment that reaches the Embarras River
2. If needed, select a “pilot” subwatershed and concentrate land treatment or structural control efforts here. From this “base” a better estimate as to effectiveness of these controls could be made for the remainder of the entire watershed.
3. Select highly visible or locally “known” eroding sites for demonstration areas, particularly if streambank stabilization is included as part of the project. Easier to “point” at these to show how “effective” local efforts have been.
4. If structural measures are used, remember they generally will “control” the sediment produced from all types of erosion above them in their subwatershed.
5. Streambank stabilization projects “attack” the sediment production probably the most directly, but sometimes cost more per foot for construction.

**Benefits:**

1. By concentrating efforts on the most highly erodible land, initially in a monitored, pilot subwatershed, we can better evaluate the effectiveness of implementation strategies.
2. Demonstration projects may contribute to additional implementation of practices that may reduce overall soil erosion in the watershed.

**Riparian Corridors****Goals:**

Protect and enhance existing riparian zones along all permanent stream reaches in watershed that consist of native woody vegetation (trees & shrubs). Provide high quality wildlife habitat.

**Recommendations:**

Establish corridors of native vegetation at least 100' wide (per streambank) on all perennial stream reaches.

**Benefits:**

1. The benefits of riparian protection are well established. Consistency with historical landcover is necessary for re-establishing the naturally occurring organisms to the watershed, both terrestrial and aquatic.
2. Increased wildlife habitat quality and quantity
3. Improved overland erosion control
4. Improved streambank protection & erosion control

**Wetlands****Goals:**

Provide wetlands of sufficient size and location to enhance hydrologic storage and provide biologically meaningful wildlife habitat.

**Objective:**

1. Provide hydrologically-connected floodplain along “25%” of lower H.C. (below moraine, on IL tillplain).
2. Increase non-forested wetland acres (palustrine emergent vegetation) from 27 acres to 270 acres (10x).
3. Create at least one wetland/wetland complex of 25+ acres and 2-3 of 12+ acres.

**Recommendations:**

Listed are some land management options that would be beneficial to wildlife in the Hurricane Creek Watershed. As with other management options, all of these are not feasible for everyone.

1. Obtain planning assistance from the Soil & Water Conservation District. Seek solutions that address problems and utilize natural solutions, such as riparian reforestation and wetland reconstruction.
2. Leave a buffer zone of uncut timber along your stream – at least 100 feet wide. Supplement this buffer with filter strips.
3. To the maximum extent possible, reserve your floodplains for natural flood storage, water quality protection and wildlife (and its major habitat here – bottomland forest).
4. Limit floodplain development to compatible uses such as compatible recreation and forestry. Avoid incompatible uses such as home sites, businesses, flood-sensitive crops, etc.

**Benefits:**

Increased flood storage  
 Improved sediment & nutrient retention  
 Increased wildlife habitat quality and quantity

## **Designated use Support/Impairments**

### **Recommendations:**

Cause of impairment is listed as siltation from agriculture and hydrologic/habitat modification. Therefore, implemented practices should be designed to combat this problem. The practices available include, but are not limited to the following:

1. Upland practices such as no-till, application of various government programs, contour farming, terracing, and grassed waterways.
2. Riparian buffer strips. 100% riparian protection is recommended. These areas should be planted with trees or perennial grasses based on historical land cover.
3. In-stream practices such as bank stabilization using willow posts, stream barbs, stone toe protection, and lunger structures. Most importantly, constructed riffles for grade control in areas where down cutting is found.

### **Benefits:**

1. Upland practices, especially on highly sloping ground, reduce overland siltation input.
2. Riparian buffers also act as a barrier to overland siltation input.
3. Instream practices reduce bank erosion and sediment bedload in the stream.

## **Water Chemistry**

### **Recommendations:**

Reports indicate total nitrate levels higher than the Embarras basin-wide mean. So, nitrate reduction should be recommended. Possible measures may include the upland practices mentioned earlier, livestock exclusion, riparian buffers, and constructed wetlands. These wetlands are constructed at field borders adjacent to the stream. Field tiles are interrupted and redirected into the constructed wetland. Overland flow may also be directed to the constructed wetland. Water from field runoff is “naturally processed” within the wetland to reduce nutrient levels and allow sediment to settle out before entering the stream.

### **Benefits:**

Recommendations will reduce nutrient levels and sediment in the stream. This will benefit overall water quality and stream inhabitants. Constructed wetlands have shown to be utilized by migrating waterfowl.

## **Sediment Chemistry**

### **Recommendations:**

Conservation farming practices may reduce dieldrin concentrations in stream sediment. Riparian buffers and constructed wetlands may also be of value here. Technical resources that work with sediment chemistry should be consulted for more specific practices.

### **Benefits:**

Recommendations will benefit overall water quality and stream inhabitants.

## **Stream Habitat**

### **Recommendations:**

1. Implement sediment-reduction practices mentioned earlier.
2. Prevent any further channelization and dredging practices in the watershed.
3. Exclude all livestock from riparian areas and the stream.
4. Add grade stabilization (i.e., pool-riffle sequences) where required to reduce streambed degradation.

### **Benefits:**

1. Sediment reduction will improve stream habitat for fish and macroinvertebrates.
2. Prevention of further channelization and dredging will allow the stream to recover naturally from past work.
3. Exclusion of livestock will prevent damage to stream habitat.
4. Development of pool-riffle sequences will create habitat, especially in areas that have been channelized and areas where stream bed instability is occurring.

## **Fish and Macroinvertebrates**

### **Recommendations:**

1. Implement sediment-reduction practices .
2. 100% riparian protection.
3. Implement in-stream practices, where needed, for sediment reduction and grade control.
4. 100% livestock exclusion from the streams and riparian zones.

### **Benefits:**

1. Practices that reduce sediment will most likely greatly benefit the fish and macroinvertebrate populations that utilize the stream substrate for food, shelter, and reproduction. Sediment seems to be the most significant stressor at this time.
2. A higher percentage of riparian areas planted in trees will certainly benefit fish populations through bank stabilization, sediment and nutrient reduction, habitat through woody debris, food source of terrestrial insects, and temperature buffering by shading.
3. The in-stream practices are fairly new, so little is known about their direct effects on fish populations. In theory, these practices which utilize rip-rap should also provide some habitat for fish. However, it has not been proven with any certainty that fish do actually utilize these as habitat. Implementation of these practices may provide the opportunity to demonstrate or refute their added benefit as fish habitat.
4. Livestock exclusion will reduce sedimentation, nutrient levels, and damage to habitat.

## **Wildlife**

### **Threatened & endangered species**

#### **Goal:**

Provide habitats that can support successful reproduction of state-listed species.

<b>Species</b>	<b>Habitat</b>	<b>Practice</b>
Swamp metalmark butterfly	Wetlands w/swamp thistle	Wildlife Wetland Habitat
Kirtland's snake	Wetlands & riparian zones	Wildlife Wetland Habitat, Forest Est.(riparian)
Least bittern	Wetlands, emergent	Wildlife Wetland Habitat
Barn Owl	Grassland & wetland w/nest sites	Grass & Forb Est, Nest Boxes
Loggerhead shrike	Short grassland w/scattered Trees/shrubs	Grass & Forb Est, Savanna
Indiana bat	Riparian forests w/snags	Forest Est. (riparian)

#### **Objective:**

1. Establish corridors of native vegetation at least 100' wide on all perennial stream reaches.
2. Increase non-forested wetland acres (palustrine emergent vegetation) from 27 acres to 270 acres (10x).
3. Create at least one upland/wetland complex of 25+ acres and 2-3 of 12+ acres per year for five years.
4. Install 5 barn owl boxes / year for five years.

#### **Recommendations:**

Surveys for these species should be conducted in all suitable habitats in the watershed. This work can be carried out in a manner similar to the fish and aquatic insect surveys funded through the IDNR and performed by the Illinois Natural History Survey. Management recommendations, based on the results of these surveys, should emphasize protection of existing populations and habitat creation and enhancement in adjacent or nearby areas. Plans can be developed by the Natural Heritage staff, with input from other interested parties.

#### **Benefits:**

1. Increase habitat available to listed species.
2. Increased wildlife habitat quality.
3. Improved overland erosion control.
4. Improved streambank protection & erosion control.

### **Natural Communities/Wildlife Habitat:**

#### **Goals:**

1. Restore natural landscape patterns and processes to non-ag lands thereby increasing and enhancing native plant communities and improving wildlife habitat quality.
2. Reduce habitat fragmentation, correct/reverse natural community degradation, control exotic species, and restore fire to fire-dependent communities and habitats.
3. Encourage enrollment of CRP-eligible land in Hurricane Creek, above the moraine. Work with NRCS/FSA to make this area higher priority for sign-up eligibility. The land eligible will need to be delineated.
4. Encourage enrollment of CRP-eligible land or use of voluntary conservation easements in bottomlands (below the moraine) for reforestation or grassland establishment where appropriate, based on pre-settlement vegetation.

### **Woodlands**

#### **Recommendations:**

1. Avoid converting existing woodland to other habitats.
2. Add any needed habitat features or structures in existing open land.
3. Plan property developments in open areas too, and near existing roads or other disturbances.
4. Leave the largest possible wooded area undisturbed from residences and associated pets, noise, livestock and roads.
5. Enhance species diversity by planting additional native trees and shrubs.
6. Eliminate mowing in woodlands.
7. Fence selected woods areas from grazing. Eliminate woodland grazing wherever possible.
8. Plan all development in existing openings and where it will least impact existing woodlands.

### **Grasslands**

#### **Recommendations:**

1. Plant additional permanent, high-quality grassland habitat.
2. Convert existing grasslands (especially fescue) in selected areas to better grasses.
3. Develop additional old field areas.
4. Renovate existing old fields by mowing, tillage or other disturbance.
5. Avoid mowing and disking during nesting season.
6. Mow or till areas needing renovation; disk strips to promote use by bobwhite quail and other ground-nesting birds. Disk in August or September to avoid completely nesting wildlife.
7. Create a scheduled rotation for disturbance, leaving some grassland habitat undisturbed each year.

## Fragmentation

### Recommendations:

1. Efforts and programs that increase the acreage of permanent natural vegetation and wildlife habitat (e.g. tree plantings) should focus on tracts adjacent to or near existing habitat.
2. Attempts should be made to connect nearby areas of vegetation by establishing permanent vegetation connecting them.
3. Efforts should be made to consolidate small plantings into tracts of at least 10 acres in size (this can occur across ownership boundaries).
4. Creating habitat areas of 50 acres or more by creating new or adding to existing vegetation should be a high priority for forests and grassland (both native and introduced).
5. Wetlands will also benefit from larger sizes but locating several smaller wetlands within 1/8 – 1/4 of a mile of each other or existing wetlands can be beneficial for wetland wildlife and vegetation.
6. River bottom (floodplain) wetlands are particularly valuable and special efforts should be made to restore these valuable habitats.
7. Create 1 area of quality forest wildlife habitat of at least 100 acres/year for five years, and 1 area of at least 500 acres in watershed.
8. Create 1 area of quality grassland wildlife habitat of at least 100 acres/year for five years, and 1 area of at least 400 acres in watershed.
9. Encourage thicket, late successional fields on small (<5a) and/or isolated tracts.

## Degradation

### Recommendations:

1. Local DNR staff can assist landowners in identifying management needs, developing a management plan, and providing technical assistance in plan implementation.
2. The DNR Ecoteam can assist landowners in plan execution.
3. Sources of planting stock, some available at no cost through the IDNR, can be made available.
4. Several demonstration sites should be established throughout the watershed, demonstrating the types of management that should occur and assisting local participants in addressing their own areas.
5. Identify and control invasive species on 100 acres of upland oak-hickory woodland per year.

## **Exotic Species Invasion**

### **Recommendations:**

1. Initiate an awareness program for the primary exotic species of concern in the watershed through education of all agency staff and cessation of planting of any of these species.
2. Develop identification guides and control guidelines for landowners, and hold field days to demonstrate the level of problem, plants involved, and control measures.
3. Utilize IDNR EcoTeam to implement exotic species control in the watershed.
4. Continue programs for the conversion of fescue plantings to diverse grass and forb mixtures.
5. Expand programs to include the conversion of autumn olive or honeysuckle-infested fields and forest to native shrub and tree species.
6. Provide 5 demonstration areas for exotic species control projects/year utilizing the IDNR EcoTeam.
7. Control exotic species on 100 acres / year for five years.
8. Provide ID and control methods for common exotics to land owners.
9. Convert 50 acres/year of fescue to native prairie or tame cool season grass/legumes (for five years).

## **Lack of Fire**

### **Recommendations:**

1. Train agency staff and interested landowners in prescribed burning.
2. Develop a watershed level "cache" of tools to assist with prescribed burning in the Pilot area.
3. Train a "hot shot" crew that could conduct prescribed burns in the watershed with the assistance of the landowner. Perhaps the local fire protection district staff can be enlisted for assistance.
4. Local DNR staff can assist with the technical details of burning in the watershed (timing, season, frequency) since some of these will vary based on several factors.
5. After suitable training, county level agency staff should be able to assist with this as well.
6. Initiate periodic prescribed burning on 50 acres of grasslands and 50 acres of oak-hickory woodland/year.

### **Benefits:**

1. Establishment of large areas of wildlife habitat in the upper part of the watershed, improved retention of rainfall and reduced soil erosion/stream sedimentation, creation of large blocks of wildlife habitat for sensitive wildlife species.
2. Establishment of large areas of wildlife habitat in the lower part of the watershed will help improve retention of floodwaters in forested wetlands, reduce streambank erosion, increase infiltration of sediments/chemicals by establishing large permanent riparian buffers.
3. Increase natural successional dynamics and plant community composition.
4. Increased wildlife habitat quality.

### **Natural Heritage Resources:**

**Goals:** Protect existing high quality areas and manage to perpetuate these very rare resources.

**Objectives:**

1. Implement management plan for Sargent's Woods NA.
2. Provide interpretive access to Hutton Geologic Area and determine feasibility of similar efforts at Center School Geologic Area

**Recommendations:**

As the last example of its type in the entire area, Sargent's Woods is protected through a lasting conservation agreement. Further, a vegetation survey should be performed and, based on this information, a management plan developed and implemented. The two geological natural areas would benefit from protection efforts and increased educational or interpretive uses.

**Benefits:**

1. Preservation of exceptionally rare natural area.
2. Increased educational value of local resources.

### **Socio-Economic/Human Resources**

**Recommendations:**

It would benefit the watershed and the Pilot Watershed Program if a social profile were collected, using those people whom either own land, reside in the watershed or work the ground in the watershed.

**Benefits:**

A better understanding of the views of people interacting within the watershed will allow focused efforts to improve the social, economic and quality of life factors for people, while at the same time optimizing efforts for improving wildlife habitat.

## **Problem Statement**

*Human occupancy of any area causes changes in numerous parts of local ecosystems. These changes result in degradation of natural areas and place stresses on the physical and biological components of the system. We must strive to maintain, as much as we can, the natural characteristics of the watershed, while at the same time, provide for the economic needs and quality-of-life aspirations of residents within the watershed.*

# Goals and Objectives

Working Goals and Objectives discussed by the LPC include improvements to:

- 1) **Erosion Control**
- 2) **Wildlife Habitat**
- 3) **Water Quality and Water Courses**
- 4) **Best Management Practices**
- 5) **Economics**
- 6) **Flooding**
- 7) **General Health of the Environment**

Through implementation of the plan, we hope to improve conditions of the watershed in the following areas. As conservation implementation proceeds and more data are collected and analyzed on the results of the implementation, we expect to set additional objectives. As soon as possible, demonstration projects should be developed that can illustrate a variety of important practices. The following list of goals is not rank ordered.

## ***Goal 1: Erosion Control***

Reduce, as much as possible, the amount of erosion from farmland, pasture, residential and woodland areas in the watershed.

### **Objective 1.1:**

Utilize the expertise of local extension agents and county/state/federal agency representatives to educate and actively promote more widespread use of no-till/conservation tillage practices.

### **Objective 1.2:**

Promote maintenance of existing grade stabilization structures in upland areas and provide financial assistance for implementing new structures.

### **Objective 1.3:**

Use modeling, scientific data and expertise of agency personnel to target specific areas of highly erodible land for treatment. Promote the use of CRP and other programs to reduce the problems associated with tilling of HEL.

### **Objective 1.4:**

Build approximately 100 sediment control structures of various sizes (dry-dams, wetlands and other sediment control structures).

### **Objective 1.5:**

Through financial assistance and education, promote the use of terraces on appropriate sloping land.

### **Objective 1.6:**

Target a sub-watershed for maximum conservation implementation and create demonstration project areas.

**Goal 2: Flooding**

Reduce runoff peaks within the watershed through BMP's.

**Objective 2.1:**

Promote practices that will slow runoff from upland areas.

**Objective 2.2:**

Build approximately 100 water control structures (dry-dams, wetlands and other water retention structures).

**Objective 2.3:**

Promote connection of streams to floodplains.

**Goal 3: Water Quality and Stream Channels**

Improve the conditions of the stream channels in the watershed, while at the same time improving the water quality throughout the basin.

**Objective 3.1:**

Increase the amount of wetlands, grassed waterways, filter strips and riparian buffers.

**Objective 3.2:**

Promote BMP's related to nutrient management.

**Objective 3.3:**

Identify areas of excessive log jams or sedimentation, remediate and treat stream channel to reduce impacts on the stream, adjacent land and wildlife.

**Objective 3.4:**

Identify areas of excessive downcutting or streambank erosion and utilize proper techniques to mitigate the problems.

**Objective 3.5:**

Maintain and improve existing practices through education and funding.

**Objective 3.6:**

Identify methodology, technology and funding for livestock exclusion from stream channels.

**Objective 3.7:**

Determine extent and severity of groundwater contamination of wells.

**Goal 4: Wildlife & Habitat**

In conjunction with other conservation practices and as unique projects, create and maintain high-quality wildlife habitat throughout the entire watershed

**Objective 4.1:**

Promote and fund planting of native species that will provide suitable food and shelter for the wildlife in the watershed.

**Objective 4.2:**

Identify and target sensitive habitats and species in the watershed and use available funding to enhance the habitat.

**Objective 4.3:**

Inform landowners about saving and/or enhancing critical habitats and sensitive species.

**Objective 4.4:**

Create the maximum acres of wildlife-friendly water retention structures within the watershed.

**Objective 4.5:**

Provide education and funding for control of invasive exotic species.

**Objective 4.6:**

Promote habitat corridors, field borders and food plots through education and prioritized funding of such practices.

**Objective 4.7:**

Promote enhancement of breeding and spawning areas through education and funding of conservations practices.

***Goal 5: Economics and Social***

Ensure that landowners are provided the maximum cost share allowable for any practices implemented on their land, and that property rights are not infringed upon.

**Objective 5.1:**

Ensure that landowners are provided with as high a cost share as possible when implementing conservation practices. This includes re-evaluation of the spirit and requirements of existing funding opportunities and practices already in place.

**Objective 5.2:**

Actively promote the benefits of the Hurricane Creek Watershed Implementation Plan and conservation practices to all residents of the watershed.

**Objective 5.3:**

To evaluate the success of the program, at the end of the evaluation period, distribute and analyze the results of another social profile/landowner attitude survey.

***Goal 6: General Health of the Environment***

The sum of all conservation activities in the watershed should lead to a betterment of the total environment. Utilize the talents of the Local Planning Committee and the Technical Advisory Committee and other interested parties, to evaluate, holistically, the general health of the environment of the Hurricane Creek watershed area. This requires addressing the physical, economic and social environments of the area.

**Objective 6.1:**

Inform, on an annual basis, all landowners and interested public about the incremental progress of the Hurricane Creek Pilot Watershed Program.

**Objective 6.2:**

Periodically inform all landowners and interested public about sign-up periods for various practices and actively promote and educate about the enhancement effects of the practices.

**Objective 6.3:**

At the end of the ten-year period of evaluation, provide the landowners and interested public a final report of the successes and failures of the project.

## Implementation Strategies

To attain the goals set by the LPC, implementation strategies will include the use of standard BMP's in use today. It is hoped that this pilot project will provide information that will assist agencies in assessing the applicability of their programs in diverse watersheds with unique needs and social compositions.

1. **Animal waste storage facilities.** These facilities will protect nearby land and water bodies from manure runoff by utilizing appropriate storage technologies until conditions are optimum for field application.
2. **Contour buffer strips.** Strips of grass or legumes planted parallel to the contours of a field, helping to reduce the runoff of water, sediment and nutrients.
3. **Contour farming.** Tilling with row patterns following the contours of the landscape.
4. **Contour strip cropping.** Crop rotation and contour farming, combined in equal-width strips of corn and soybeans, alternating with strips of oats, grass, or legumes.
5. **Cover Crop.** A close-growing crop that will temporarily slow soil erosion when crop residues are not adequate.
6. **Critical area planting.** Planting of grasses or other vegetation, to slow erosion and protect areas suffering from high erosion rates.
7. **Crop residue management.** Allowing the previous year's crop residue to remain on the soil surface through no till or low till practices.
8. **Field border.** Providing a strip of grass at the edge of a row cropped field. Useful as sediment/nutrient traps and wildlife enhancement.
9. **Filter strips.** A strip of grass or trees placed where it can filter runoff (sediment, nutrients and pesticides) before they can reach local water bodies.
10. **Grade stabilization structures.** Useful to control the grade and runoff from gullies, thereby preventing gullies from forming or enlarging, reducing water velocities and trapping sediment.
11. **Grassed waterways.** Shaping natural drainageways from fields and establishing a grass cover to slow soil erosion, trap sediments and nutrients, and to prevent gullies from forming.
12. **Nutrient and pest management.** Application of the correct amount and form of plant nutrients and pesticides to allow optimum yield with minimum impact on water quality.
13. **Pasture planting.** Planting grasses and legumes to reduce soil erosion and improve production.

14. **Planned grazing system.** Utilization of systematic planting and grazing rotations in order to maximize production while reducing sediment and nutrient runoff.
15. **Stream and steep slope protection.** Protecting streams and steep slopes by excluding livestock with fencing and establishment of buffer zones of vegetation to filter runoff.
16. **Streambank stabilization.** Structures or vegetation protection that stabilize and protect the banks of streams. Includes bendway weirs, longitudinal peak stone protection, Newbury weirs, and pool and riffle structures.
17. **Terraces.** Earthen embankments following the contour of a hillside. They interrupt water flowing down long slopes, allowing for slower velocity runoff.
18. **Water and sediment control basins.** Short, earthen dams built across a drainage path from a tilled field, effective in reducing water and sediment flows from the land. Structures include dry-dams that hold water for a period of time with slow release of water while trapping some sediment; and, wet-dams that hold water for a long period of time and are useful for wildlife enhancement and sediment traps.
19. **Wetland and pond development and restoration.** In areas with naturally poorly-drained soils, wetlands and ponds provide habitat for wildlife that are dependent upon water-loving plants. These areas provide natural filtration for agricultural runoff, and retain water to lessen effects of downstream flooding.
20. **Wildlife upland habitat.** Planting, improving or maintaining shelter and food in upland habitats. This may include establishment of warm season grasses, forbs, etc.
21. **Woodland management.** Improves the quantity and quality of existing woodland and ground cover, resulting in less soil erosion and increased water quality. Livestock should be excluded.
22. **Exotic and invasive species control.** This practice may involve several techniques (eg. chemical, mechanical, fire) to control or eradicate exotic and invasive species.
23. **Forest establishment.** In appropriate areas, establish new stands of trees for wildlife, soil protection, water quality enhancement, etc.

## Detailed Cost Summary

### Estimated Conservation Needs for Hurricane Creek, IDNR - Office of Resource Conservation, March 2002

Practice	Amount	Total Est. Cost
Bank Stabilization <sup>2</sup>	\$20-40/linear foot	
Create at least 1 forest habitat areas of 500+ acres	500a @ \$1000/acre	\$500,000 <sup>1</sup>
Create at least 5 grassland habitat areas of 80+ acres	400a @ \$300/acre	\$120,000 <sup>1</sup>
Create at least 5 wetland marsh areas of 30+ acres	15a @ \$8,000	\$120,000 <sup>1</sup>
Exotic species control	2,000a @ \$50/acre	\$100,000
Floodplain Wetlands <sup>2</sup>	\$650/acre	
Newbury Weirs (constructed riffles) <sup>2</sup>	\$3000-8000/riffle	
Oak woodland restoration / enhancement	2,000a @ \$50/acre	\$100,000
Permanent Easements/Forested Riparian Buffers	1000a @ \$1,500/acre	\$1,500,000
Prairie Restoration	200a @ \$1,000/acre	\$200,000
Prescribed Fire Management Practices	500a/yr @ \$300/acre	\$150,000
Prescribed fire management (woodlands)	1000a/yr @ \$300/acr	\$300,000
Reforestation	600-1200a @ \$373/acre	\$223,800 to \$447,600
Reforestation Borders <sup>3</sup>	60-120a @ \$210/acre	\$12,600 to \$25,200
Riparian Buffers at least 100-foot wide on all perennial stream reaches <sup>2</sup>	\$125/acre; \$150-175/acre for stock	
Shallow Water Wetlands w/DOS-IR Valve	70a @ \$8,000	\$560,000
Upland Habitat Establishment	200a @ \$300/acre	\$60,000
Upland Sediment-reduction Practices <sup>2</sup>		
Woodland Edge/Shrub Enhancement	100a @ \$500/acre	\$50,000
Woodland Management <sup>4</sup>	400-1,000a @ \$50/acre	\$20,000 to \$50,000
<b>Total estimated costs</b>		<b>\$4,016,400 to \$4,282,800</b>

<sup>1</sup>These are estimated maximum values and may be considerably less depending on amount of management needed to restore and / or maintain, and ability to combine with other practices

<sup>2</sup>Further surveying is required to determine placement and numbers of the above-mentioned practices. This is merely a starting point with per unit cost estimates.

<sup>3</sup>Reforestation borders consist of cover compatible with wildlife nesting cover that also serves as fire- breaks and plantation access.

<sup>4</sup>Woodland management consists of assistance to woodland owners to cover proper management practices that include: pre-commercial thinning, cull tree removal and crop tree release.

**Estimated Conservation Needs for Hurricane Creek,  
NRCS, Toledo Office Estimates, February 2002**

<u>PRACTICE</u>	<u>AMOUNT</u>	<u>UNIT COST</u>	<u>TOTAL</u>
Grass Waterway	80 ac	\$ 2,400	\$192,000
Grade Stabilization Structures	95	\$ 4,500	\$427,500
Ponds	70	\$ 8,000	\$560,000
Water/Sediment Control Basins	120	\$ 1,500	\$180,000
Nutrient Management	10,500 ac	\$ 10	\$105,000
No-till	3,200 ac	\$ 40	\$128,000
Stream bank stabilization	19,000 ft	\$ 20	\$380,000
Filter Strips	150 ac	\$ 210	\$ 31,500
Riparian Buffers	1,150 ac	\$ 400	\$460,000
Conservation Cover	500 ac	\$ 210	\$105,000
Field Borders	250,000 ft	\$ 0.20	\$ 50,000
Terraces	30,000 ft	\$ 3	<u>\$ 90,000</u>
<b>NRCS estimate Total:</b>			<b>\$2,709,000</b>

**The conservation needs for Hurricane Creek watershed, estimated by IDNR and NRCS total between \$6,725,400 to \$6,991,800. These are 2001 estimates and may not reflect increases in costs through the life of the grant.**

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