

# ***Integrated Management Plan for the Fox River Watershed in Illinois***



The following Plan for the long-term health of the Fox River Watershed In Illinois was developed as a collaborative effort of members of the **Fox River Ecosystem Partnership (FREP)**.

The Plan was developed by people living and working in the watershed who are directly or indirectly related to the river and its tributaries. The FREP Planning Committee and Action Teams shared equal responsibility for developing the Plan. The process included tours of the watershed, information gathering, presentations, discussions, and ultimately the development of a vision, critical factors, and Action Team strategies. The public was invited to participate and serve on Action Teams.

The Plan is divided into six Action Areas: Recreation, Habitat, Land Use, Water Quality, Stormwater, and Education. Within these Action Areas are recommendations and the strategies to accomplish implementation of the Plan.

Each community and governing body (stakeholder) within the Watershed is being asked to read, adopt, and follow the recommendations of the Plan when dealing with its own portion of the Watershed. Many of the strategies in the Plan are activities that will be coordinated by members of the corresponding FREP Action Teams/Committees. Stakeholders are encouraged to join and participate in FREP and the Action Teams, if they haven't previously been involved. All the communities of the Watershed need to be aware of this Plan, these strategies, and to actively participate in its implementation for the benefit of the entire Watershed.

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## ***Vision and Criteria for Recommendations***

***“Our vision for the Fox River watershed is to balance all the uses and demands on our natural resources while preserving and enhancing a healthy environment.”***

The 37 recommendations in this plan were evaluated in terms of the following criteria:

1. Lasting and enduring.
2. Feasible to accomplish, given the current political climate and/or resources available.
3. Fair.
4. Generate support and collaboration.
5. Cost-effective.
6. Time-effective.
7. Advances the vision.

# ***Sixteen Critical Factors for Achieving the Vision***

**The following are not in a priority order**

- 1) Establish universal standards for land planning and development for adoption by units of local government throughout the watershed, including innovative guidelines and Best Management Practices (BMPs) for future development (e.g. cluster developments) and educate government about these.
- 2) Identify funding and sources of support.
- 3) Define, expand and integrate data collection and research on Fox River water quality and quantity by municipalities, community organizations and state agencies.
- 4) Strong and continued media coverage.
- 5) All streams achieve B or better rating (Index of Biotic Integrity).
- 6) Where appropriate remove or modify dams to improve fish migration and non-motorized boating safety.
- 7) Protect and enhance biodiversity (aquatic and terrestrial), emphasizing native species.
- 8) Conservation of agricultural land.
- 9) Facilitate watershed-friendly revitalization of urban areas.
- 10) Educate public about real problems negatively affecting the river; create a public understanding of watersheds.
- 11) Identify, protect and manage surface and groundwater; educate public about their importance and what impacts groundwater.
- 12) Erosion control: streambanks and surface runoff.
- 13) Recognize businesses, groups, community leaders, elected officials and other individuals that help the environment.
- 14) Expand public access to the river and tributaries for land and water recreation.
- 15) Improve the management of stormwater quality and quantity, to protect water quality and reduce flooding.
- 16) Preserve and enhance drinking water supplies from surface and groundwater sources.

# Recreation

**Strategy: To enhance year-round, land- and water-based recreation, The Recreation Action Team will work with communities along the Fox River to inventory and evaluate public access to the watershed and dam modification or removal.**

Of the 16 critical factors identified in this Plan, **Recreation** focuses on the following:

- Where appropriate remove or modify dams to improve fish migration and non-motorized boating safety.
- Expand public access to the river and tributaries for land and water recreation.
- Identify funding and sources of support.

## **1. Identify areas along the shoreline of the Fox River and its tributaries for additional access for recreation.**

- (a) Identify existing land uses and ownership of areas along the Fox River and its tributaries. Note publicly held shoreline areas and areas to consider for additional shoreline access.
- (b) Identify canoeable areas along the Fox River and tributaries that have canoeable areas and/or are publicly owned. Canoeable areas are those that are generally free of obstructions and provide, under normal circumstances, sufficient water depth to permit canoe passage.
- (c) Identify and map areas that currently provide shoreline access (particularly publicly held lands), canoe access points, and shoreline areas that can be reasonably accessed by existing roadways.
- (d) Based upon above steps, identify and map recommended areas along the Fox River and its tributaries for additional access for recreation, particularly fishing and canoe areas. Additional considerations include:
  1. Canoe portages should double, wherever possible, as river access points.
  2. Consider existing wastewater treatment facilities as potential access points.
  3. Utilize existing dam areas, if safe and accessible.
  4. Highest priority access points must provide vehicular access and areas for parking.
  5. Locate canoe access points at intervals no greater than 5 to 8 miles.
  6. Coordinate recommendations with recommendations outlined in the Northeastern Illinois Planning Commission (NIPC) Fox River Water Trail Plan.
- (e) Consider natural features such as topography, vegetation, land forms, wetlands and flood plains which affect ease of access, safety, scenic quality and the ability to construct improvements.
- (f) Support the efforts of the Fox Waterway Agency to maintain the water depth throughout the Chain O' Lakes sufficient for viable motorcraft use north of the Algonquin spillway.

### **BENEFITS**

- Product provides necessary information.
- High benefit as a starting point for acquisition/capital development planning.
- Useful for many agencies.

- Final product can be available quickly.
- The final product is still a plan requiring action (potentially extensive and expensive) at the local level to implement recommended additional (or improved) access areas. Recommendations are of little benefit if local level implementation is not executed.

#### **COSTS**

- Minimal monetary expenditure involved.
- Minimal time investment required. Final product is an easily accomplishable task.
- The final product (maps and accompanying recommendations) can be produced for a low cost.

### **2. Prevent/reconcile multi-use conflicts (such as hiking, biking, snowmobiling, horse riding, motorized and non-motorized watercraft).**

- (a) Inventory accident statistics for areas along the Fox River and adjacent trails.
- (b) Identify high-use segments of the Fox River Trails which can be expanded to 10 feet to 12 feet widths to reduce user conflicts.
- (c) Identify trail/road crossings which lack adequate signage and pavement markings. Add signage and additional pavement markings where not currently provided and as necessary at existing dangerous locations.
- (d) Engage the proper local authority to post safe boating regulations, ordinances and safety considerations at all boat launches.
- (e) Encourage enforcement of existing laws and ordinances.
- (f) Promote no-wake restrictions in the vicinity of canoe access points.
- (g) Where practical, promote a 150-foot wide no-wake corridor along a designated river shoreline to coincide with the designated Fox River canoe trail.

#### **BENEFITS**

- Recommendations should reduce accidents on trails and on the river.
- Recommendations should improve the recreation experience of non-motorized river users, and trail users through heavily used trail segments.
- Compliance of no-wake areas difficult to enforce.
- Recommendations require action of proper local authority to post signage and enforce regulations.

#### **COSTS**

- Low cost to implement recommendations - costs involved include signage and trail widening.
- Recommendations can be implemented quickly.
- Compliance of no-wake areas difficult to enforce.
- Recommendations require action of proper local authority to post signage and enforce regulations.

### **3. Identify areas along the Fox River and its tributaries where greenways should be extended to provide additional passive recreation areas and preserve the character of the river and its tributaries.**

- (a) Identify existing land uses and land ownership along the Fox River and its tributaries (as in Recommendation #1).
- (b) Identify areas along the Fox River and its tributaries of high aesthetic quality.
- (c) Identify environmentally sensitive/significant areas along the Fox River and its tributaries such as wetlands, flood plain, woodlands and wildlife corridors, to plan appropriate uses.

- (d) Identify publicly held parcels along the Fox River and its tributaries which may offer potential for expansion and/or connection to other publicly held parcels.
- (e) Establish a priority for the expansion of existing publicly held parcels.
- (f) Identify greenways based upon consideration of available tools to secure/preserve greenways including purchase, donation, easements, homeowner's associations, special service areas, and land trusts.

#### **BENEFITS**

- Product provides necessary information.
- High benefit as a compliment to municipal and county land use plans, park district master plans, and pertinent develop plans.
- Useful for many agencies.
- The final product is still a plan requiring action (potentially extensive and expensive) at the local level to implement greenway recommendations. Recommendations are of little benefit if local level implementation is not executed.

#### **COSTS**

- Minimal monetary expenditure involved.
- Minimal time investment required; final product is an easily accomplishable task.
- The final product (maps and accompanying recommendations) can be produced for a low cost.

### **4. Establish a well-marked water trail along the Fox River with permanent, easily accessible, safe canoe portages.**

- (a) Identify all dams requiring portages.
- (b) Analyze the existing conditions around each portage area, especially dams which do not currently have established portages or where extensive repair/renovation is required. Considerations include steepness of banks, depth/location of channel, existing vegetation, and proximity to vehicular access/parking.
- (c) Formulate plans for each portage. Consideration include:
  - Floating docks where possible
  - Gravel rather than concrete as the landing material when docks are not feasible.
  - Minimizing distance of portage.
  - Preventing steep slopes.
  - Utilizing ramps rather than stairs where possible.
  - Where possible, providing parking in close proximity.
  - Establishing a defined portage path of appropriate material such as limestone screenings or asphalt.
- (d) Develop general cost estimates for portage improvements.
- (e) Identify potential funding sources.
- (f) Engage the appropriate public entity to assume the lead role in securing funding, finalizing the design for portage development/improvements, implementing construction, and providing maintenance.
- (g) Develop a legible signage package to inform paddlers of downstream portages and portage locations, and inform motorized crafts of canoe trail.
- (h) Work with pertinent government agencies and/or private landowners to locate portage signage in areas which maximize paddlers visibility.
- (i) Establish no wake zones in the vicinity of portages.
- (j) Develop a buoy system to assist in the identification or portages and signal no wake zones.

- (k) Create a map/information brochure for the entire trail, including depicting high, medium, and low power boat usage areas. Coordinate with the Northeastern Illinois Planning Commission's water trail initiative.

#### **BENEFITS**

- These strategies, a well-marked trail and a map can improve the canoe experience and river safety.
- Portage improvements can greatly enhance canoe safety.
- The canoe trail concept and supporting signage and mapping can greatly assist in securing portage/canoe landing grant projects.
- The well marked trail, map and portage improvements can lead to increased canoe activity, tourism, and support for access improvements, land acquisition and river enhancements.

#### **COSTS**

- The planning of such a trail can be accomplished in a relatively short period of time, especially as this effort is coordinated with the NIPC Fox River Water Trail.
- The cost for planning and mapping the canoe trail low.
- The cost for implementing portage improvements can be high and take years to secure funding and implement improvement.
- Signage and improvements to complete the trail requires cooperation and funding from a variety of agencies.

### **5. Extend multi-use trails along the Fox River and its tributaries, especially through, extending from, and connecting to, public lands.**

- (a) Identify and map all publicly held lands within the Fox River watershed.
- (b) Map all existing and proposed trails within publicly held lands.
- (c) Identify potential trail corridors such as railroad and utility rights-of-ways, utility easements, private easements, and road rights-of-ways. Initiate discussions where rights-of-way may have reverted to private landowners.
- (d) Recognize existing and future greenways (#3) as potential trail corridors.
- (e) Identify existing roadways which may provide suitable dual use as designated bicycle routes/connecting between public lands if continuous trail corridors are not available.
- (f) Identify potential funding sources.
- (g) Engage the appropriate public entity to assume the lead role in acquisition, securing funding, finalizing trail design, implementing construction, and providing maintenance.

#### **BENEFITS**

- Trail extensions can greatly expand a variety of recreational opportunities.
- Trail extensions can lead to increased recreational activity throughout the watershed which can provide support for additional land acquisition and watershed recreation/open space enhancements.
- Trail extensions can increase access to relatively undiscovered/underutilized sections of the watershed.

#### **COSTS**

- The cost of planning and mapping recommended additional trails is low.
- The cost for developing trails on publicly held properties is variable from low to high depending upon length and engineering/construction constraints.
- The cost for trail extension can be high if costly land acquisition is necessary.

# Habitat

**Strategy: Develop a comprehensive program to identify, protect, and restore natural habitats to promote diversity of fish and wildlife, and restore ecosystem functions of the Fox River Watershed.**

Of the 16 critical factors identified in this Plan, **Habitat** focuses on the following:

- Identify funding and sources of support.
- All streams achieve B or better rating (Index of Biotic Integrity).
- Where appropriate remove or modify dams to improve fish migration and non-motorized boating safety.
- Protect and enhance biodiversity (aquatic and terrestrial), emphasizing native species.

**Background:** The quality of aquatic habitat is the product of the chemical, hydrologic, and physical conditions of a stream and its watershed. Thus, in many ways, habitat integrates the results of the efforts of all the Fox River Ecosystem Partnership Action Teams. The habitat action team can recommend physical modifications (restoration) to a stream, lake, or wetland to improve habitat. However, if the hydrology of the watershed is substantially disrupted or the quality of the water is poor, the physical habitat improvements will either be short lived (due to hydrology induced erosion) or be insufficient (due to poor water quality) to attract high quality aquatic life. The quality of terrestrial wildlife is a function of the physical conditions of a particular site as well as the size of the site and the connections of the site to other habitats. Thus, it is essential that the Fox River Ecosystem Partnership consider habitat integrally with the recommendations of all the other Action Teams.

Land use decision-makers must recognize that above certain levels of urbanization (imperviousness), a watershed will no longer be able to support high quality aquatic habitats (Kane County 1998, Dreher 1996, Schueler 1994). Decision-makers must also recognize that fragmentation of habitats can significantly reduce their value to aquatic and terrestrial wildlife and that connections between habitats are essential.

Stormwater engineers, land planners, permit reviewers, and local government decision-makers should recognize that urban runoff can have profound impacts on streams, lakes, and wetlands. While conventional stormwater drainage and detention practices may address flood control and to a lesser extent water quality concerns, these practices do not fully mitigate the impacts of development and prevent aquatic habitat degradation. Conventional stormwater practices result in a shift from subsurface runoff dominated hydrology to surface runoff dominated hydrology. This leads to elevated water temperatures and higher high flows followed by lower low flows. The elevated high flows not only increase flood potential but can also lead to significant increases in streambank erosion and subsequent silt deposition. Lower low flows can cause formerly perennial streams to become intermittent streams. Headwater streams, lakes, and wetlands are particularly sensitive to these development impacts since the majority of their runoff is from surrounding upland areas rather than from upstream stream reaches.

While concerns over water quality impacts are traditionally focused on the potential chemical affects on aquatic organisms and human health, sediments carried to streams, lakes and, wetlands can seriously degrade physical habitat conditions through burial of natural substrates and spawning areas.

Agencies involved in water quality monitoring (through the Water Quality Action Team) must recognize that collecting data provides multiple benefits. Not only does it provide data for analysis of waterbody conditions and trends, utilizing volunteers also provides an opportunity to build stewardship of the resources. In terms of public education: *In the end, we will conserve only what we love, we will love only what we understand, we will understand only what we are taught* (Baba Dioum, Senegalese Conservationist). In addition to printed materials and seminars, the value of volunteer monitoring programs should not be overlooked for building stewardship.

There are a number of benefits to habitat protection and restoration efforts. Some of them are specific to a particular recommendation. Some of them are global to all of the recommendations of the Habitat Action Team. The global benefits are listed below.

## **BENEFITS**

- Protection of high quality streams, lakes, wetlands, and uplands for their habitat values.
- Protection of the natural hydrologic and water quality functions of streams, lakes, wetlands, and uplands to reduce flooding and water quality impacts downstream
- Improved recreational opportunities for residents and tourists.
- Economic development through tourism.
- Improved quality of life due to recreational opportunities and aesthetics.
- Increased property values and tax base.

## **Potential Funding Sources:**

- IDNR Conservation 2000
- IEPA Section 319 of the Clean Water Act for nonpoint source pollution control.
- IDNR LAWCON and OSLAD open space and acquisition funds.
- Kane County Stormwater Program for stream maintenance activities.
- Grand Victoria Foundation
- Northeast Illinois Wetlands Conservation Account (USFWS, The Conservation Fund)
- Northeast Illinois Wetlands Restoration Fund (USFWS, NFWF)
- USFWS Challenge Grants
- Illinois Clean Lakes Program
- Walmart Foundation
- Target
- Bersted Foundation
- Agricultural Landowner programs: Contact: USDA NRCS
- Conservation Reserve Program (CRP), Emergency Watershed Protection (EWP), Environmental Quality Incentives Program (EQIP), Wetlands Reserve Program, Wildlife Habitat Incentives program.
- Acres for Wildlife (for advice, planting materials, equipment loan).

## **1. Protect and restore instream habitat for selected reaches.**

**Background:** While a long term and ideal goal would be to protect and restore all stream reaches, realistically, the partnership must focus their efforts on selected reaches. Generally, headwater to medium size streams are most susceptible to detrimental stream modifications and at the same time are the most readily restorable given budget constraints. While the Fox River itself is a vital resource, there may not be a lot that can be done to directly restore its instream habitat (except removing dams, which is another recommendation). Instead, protection and restoration of the Fox River must focus on the watershed and tributaries as well as its shoreline and riparian areas.

In addition to the size of the stream, existing watershed and habitat conditions must be considered when targeting reaches for protection or restoration. For example, intensive protection efforts (such as acquisition) may best be focused on existing high quality streams within watersheds where development and other watershed impacts can realistically be controlled. Restoration efforts should generally be focused on enhancing already high quality streams and connecting existing high quality reaches to improve the overall quality of the stream.

Although intensive protection and restoration efforts should be targeted as described above, the remaining stream reaches within the watershed should not be ignored. Virtually all stream reaches should be protected from detrimental modifications during development and agricultural drainage projects to maintain their hydrologic and water quality benefits. Also, streambank stabilization efforts should be encouraged throughout the Fox River watershed to reduce sediment loads to the Fox River and its tributaries. Protection of stream habitat also requires programmatic activities that protect streams from development, drainage, and maintenance activities that would be detrimental to the instream habitat of the stream.

Restoration generally involves on-the-ground projects that purposely modify the stream in a manner that enhances the aquatic habitat. Restoration projects can include installation of lunkers, installation of artificial riffles, establishment of appropriate aquatic vegetation, re-establishment of meander patterns, etc. Restoration activities

must be performed based on sound geomorphic principles to avoid inadvertently destabilizing the stream and must also consider potential impacts on flood heights.

- (a) Identify, map and prioritize high quality and restorable stream reaches of the Fox River and its tributaries, noting those that are highlighted in regional and local greenway plans.
- (b) Encourage municipalities and counties to designate selected streams and corridors as conservation areas in comprehensive plans.
- (c) Work with Forest Preserve Districts, park districts, open space districts, and land foundations to include high quality stream reaches in their acquisition plans.
- (d) Collaborate with other agencies to acquire high quality stream reaches and/or apply for grants for restoration of appropriate stream reaches.
- (e) Develop design guidelines for bridges and culverts to minimize habitat disruption and impediments to fish migration, and encourage highway departments and municipalities to follow the guidelines for new and replacement bridges and culverts.
- (f) Discourage landowners from dumping yard and other waste into streams by developing a riparian landowner education program, using existing materials.
- (g) Work with drainage districts, municipalities, landowners, volunteer organizations, and others to provide ongoing coordination, management, restoration and maintenance of high quality and restored stream reaches, as well as guidelines for proper stream maintenance activities.
- (h) Implement model development ordinances that require adequate buffers and prohibit detrimental stream modifications, and work with developers to restore stream reaches as part of the development process.
- (i) Work with landowners to establish conservation easements, encourage land donations, etc. along stream reaches.
- (j) Over time, replace failing seawalls and other structural measures with vegetative and bio-technical stabilization measures.
- (k) Evaluate individual projects and the effectiveness of efforts watershed-wide by monitoring stream conditions.

#### **Benefits:**

- Improve drinking water quality and potentially reduce water treatment costs.
- Protect high quality stream and river habitats.
- Improve fisheries
- Improve recreational opportunities for residents and tourists
- Improve quality of life due to recreational opportunities.
- Improve aesthetics.
- Increase property values and tax base.
- Economic development through tourism.
- Protection provides substantial cost savings and effectiveness relative to later restoration.
- Restore stream reaches connecting existing high quality reaches increases contiguity of high quality reaches, improving fish migration and overall stream quality.
- Acquisition and easements provide long term protection of stream reaches.
- Job creation.
- Stream monitoring and maintenance activities by volunteer organizations, schools, etc. builds stewardship for stream resources.
- Project monitoring provides feedback regarding factors affecting project success that can guide future projects.

#### **COSTS**

- Mapping and prioritization effort.
- Open space agency costs associated with updating acquisition plans.
- Land acquisition costs.
- Stream restoration costs.
- Agency costs associated with educating and working with landowners.
- Development of maintenance guidelines.
- Maintenance and management costs.
- Agency costs associated with permit review and enforcement.
- Agency costs to coordinate with developers for stream restoration and protection.
- Agency time to educate residents, business organizations, and local officials regarding the link between high quality streams and property values, tourism, etc.

## 2. Improve riparian areas on selected stream reaches.

**Background:** Stream and riparian zone restoration projects serve the functions of stabilizing and improving streambanks and riparian zones, improving in-stream habitat through shading and organic matter input, providing data to further stream restoration techniques, and raising public awareness of the benefits of this type of restoration. Coupled with the criteria cited in the section "Instream Habitat" (prior section), this recommendation calls for selected sites to serve as demonstration projects in the Fox River watershed. Selection criteria for sites should be based on identification of the "high priority" areas of the Fox River watershed. High priority areas should include some of the following criteria: high water quality, existing high native species quality, restorability, value for public demonstration, partnering value, and variety in kind of land use (i.e. urban stream corridor.)

- (a) In a two-year period, develop and implement three to five riparian restoration projects strategically located throughout Fox River Watershed as demonstration sites.
  1. Select projects which rate high on Illinois Department of Natural Resources Conservation-2000 Ecosystem Partnership grant criteria, with emphasis placed on site locations in high priority habitats, public education opportunities, and partnering of state, federal, business, public or private institutions, municipalities, advocacy groups and/or individuals.
  2. Advertise for projects through local media, contact existing sub-watershed groups, or select project from C-2000 application submissions, or other means.
  3. Select reaches to concur with the various land use demographics of Fox River watershed, including urban, suburban and agrarian sites.
  4. Publicize project details in news media, Farm Bureau publications, agency newsletters, etc.
  5. Develop signage to identify these projects and post on riparian corridor development areas.
  6. Conduct before/after and continuing site evaluations of restoration methods.
- (b) Encourage the use of buffer zones on all stream corridors, such as using the recommendations of Northeastern Illinois Planning Commission model ordinances.
- (c) Promote current filter strip cost-share and incentive and easement programs available to landowners (individual, farm, business, municipal) to create, restore, or enhance riparian buffers.
- (d) Increase supply/availability and lower costs of native plant materials through partnering agreements, funding sources.
- (e) Collect existing literature and/or develop literature to distribute to riparian landowners, municipalities, developers, and planners in the Fox River watershed.

### BENEFITS

- Improves quality of water entering stream from land directly surrounding stream.
- Creates habitat and food source for wildlife.
- Provides flood protection - reduces flood events.
- Provides corridors for aquatic and terrestrial life.
- Provides stewardship opportunities.
- Signs, field demonstrations, news articles encourage landowner participation, recognize contributions and publicize program.
- Demonstration projects provide public education.
- Provides land for passive recreation.
- Demonstration projects increase data base for future assessment of restoration techniques.

### COSTS

- Advice, expertise provided by state, federal agencies or cost of hiring restoration expert.
- Cost of materials, labor, planting, plant materials, equipment. Use existing publications or budget to produce literature for distribution to areas adjacent to demo sites.
- Mailing costs of literature.
- Minimal continuing maintenance/management costs.

## 3. Identify and restore areas with the highest restorability.

**Background:** While the preservation and management of existing natural areas is very important, restoration of degraded areas offers the opportunity to connect and expand existing natural areas and recoup historic losses of natural habitats. Most of our historic prairies, woodlands, and wetlands have been lost to urbanization and agricultural practices. Remaining open space has been degraded by hydrologic alteration (subsurface drain tiles and ditching), non-native plant invasion, fire suppression, and intensive grazing. Restoration can include

converting farm land to native prairie, re-establishing wetlands on drained hydric soils, and managing and improving degraded natural plant communities.

To maximize the benefits relative to the costs of this recommended activity, an assessment of “restorability” must be considered. Many areas have been converted to other land uses and it would not be desirable or cost effective to convert or restore them to natural areas. A restorability assessment would focus on finding intact natural soil profiles, intact natural hydrology or drainage systems that can be readily modified, and remnant native plant communities. Remnant native plant communities and intact soil profiles can be indicative of a viable, soil seed bank.

- (a) Develop a standardized method, based upon existing references, to assess the restoration potential of land parcels in the watershed.
- (b) Identify sites with the highest restoration potential (using existing watershed plans, ADID studies, Chicago Wilderness inventories, soil surveys, and other resources).
- (c) Prioritize identified restoration sites for protection and recommend additions to open space agency (i.e. forest preserve district, park districts, land foundations, etc.) land acquisition plans.
- (d) Work with public and private land owners to develop and implement management plans for restoring areas to a native plant community and wildlife habitat.
- (e) Secure funding for land acquisition and/or easement purchases.
- (f) Secure funding for restoration activities including planting, hydrologic restoration, and weed control by the responsible agency and/or owner.

### **BENEFITS**

- Expansion and connection of preserved natural areas in perpetuity.
- Wildlife habitat expansion and improvement with subsequent increase in resident wildlife.
- Increased wildlife viewing opportunities.
- Increased fishing and hunting opportunities.
- Economic benefits from wildlife viewing, fishing, hunting, photography, etc.
- Reduced water quality and flooding impacts in watershed accrued from non-impervious open space protection and restoration.
- Improved understanding of natural areas and their value through educational efforts and volunteer restoration activities.
- Increased land values due to proximity to preserved open space.
- Improved natural aesthetics from natural area restoration.

### **COSTS**

- Partnership/Agency staff time to develop and implement restorability assessment method.
- Partnership/Agency staff time to prioritize identified restoration sites.
- Development of outreach program to private and public landowners on restoration techniques and strategies.
- Agency/landowner costs to implement restoration activities at each site.
- Staff time to develop restoration plans for identified sites.
- Grant application and budget preparation for funding acquisition, restoration and management activities.

#### **4. Assess the feasibility of -- and develop a plan for -- removal or modification of all dams on the mainstem of the Fox River and its tributaries for safety and environmental reasons.**

As water quality is improving, demand for river-based recreation is increasing, particularly in Northeastern Illinois. Modification and/or removal of dams will make the Fox River more amenable to recreational activities such as canoeing and kayaking. Restoration of habitat and improved fish migration will also improve sport fish populations and increase angling opportunities<sup>1</sup>. Maintenance and replacement costs for dams can be excessive and prohibitive, making modification or removal viable alternatives. [This recommendation came from both the Recreation and Habitat action teams.]

Dam modification or removal has been shown to be a very cost-effective method for fish population improvement, when compared to other watershed practices (Wisconsin Department of Natural Resources). The Fox River has 15 mainstem dams and numerous tributary dams. Modification or removal of these dams, where feasible, is a critical feature of any watershed approach. As conditions improve, fish and mussels must be able to freely re-colonize previously degraded areas in order to effect full system recovery. Ideally, for the whole Fox River system to benefit, modifications should be made to all existing dams to enable the upstream migration of fish. Dam modification will aid in the recovery by potentially restoring miles of river habitat, improving water quality, and enhancing the river's ability to recover from natural and man-made perturbations. In order to logically address the potential for ecological, economic, safety and recreation benefits of dam modification, more information and awareness of the effects, benefits and cost is required.

- (a) Develop and distribute information to public, county and municipal agencies on the effects of dams and the potential aesthetic, recreational, economic, and ecological benefits of dam modification or removal.
- (b) Coordinate with and support design work related to Fox River dams and conditions:
  - 1. Ongoing development of model fish and canoe passage structures by Illinois Department of Natural Resources, Office of Water Resources.
  - 2. A standard optimum design for Fox River dam reconstruction has begun at the University of Illinois. Elements of this design should include combined fish ladder/canoe chute, drown-proofing, and fisherman and canoe access.
- (c) Discourage construction of new dams and on-line detention for stormwater and flood control.
- (d) Encourage permitting agencies to develop more stringent criteria for dam construction to discourage adding additional structures and also to streamline permitting for removal of existing structures.
- (e) Identify funding sources in the Ecosystem Partnership funding guide.
- (f) Submit proposal to available funding agencies to support dam evaluation study, described below:
  - 1. Compile existing information, in map and narrative form, on mainstem and tributary dams including: location, ownership, physical dimensions, age, historical and current function, present condition, and hazard ranking (Office of Water Resources, Illinois Department of Natural Resources – OWR/IDNR). Include recreational usage information above and below the dam, on adjacent lands and in the water: fishing, motorized and non-motorized watercraft, scenic vistas, gathering places, drownings and other accident occurrence data.

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<sup>1</sup> The Fox River is known to support very high aquatic biodiversity with 31 species of mussels and 93 species of fishes. After years of serious pollution problems, recent progress has led to improved water quality conditions. Based on recent IDNR collections, fish populations have responded positively, although problem areas persist. Mussel populations remain severely limited, particularly in the highly urbanized middle Fox River. Continued improvements will rely on watershed-based approaches including further reductions in point and non-point source pollution, particularly nutrients, reduction in water and sediment runoff, and dam removal or modification.

Dams are known to cause dramatic changes in river environments and are believed to be a major cause of the decline in aquatic biodiversity and sport fisheries in temperate rivers and streams. The most detrimental impacts of dams on aquatic communities are the loss of habitat, blockage of migration and effects on water quality. Dams block migration to critical spawning, nursery and feeding habitats within the river and in tributary streams. Mussels also rely on fish for distribution during larval stages by attaching to gills and fins of certain species, therefore, dams can also impact mussel movements and recolonization. The impounded areas create a slow moving lake-like condition, representing major habitat loss for river species. Dams also affect water quality, by increasing water temperature and lowering oxygen levels.

2. Evaluate effects of all dams on instream physical habitat features using maps, existing data and field study to determine length of pool, percent habitat loss, sediment deposition and composition.
  3. Document the effects of habitat loss on local fish and mussel communities by sampling impounded and riverine sections immediately above and below selected dams on mainstem and tributaries.
  4. Study potential effects of dam removal on selected fish and aquatic invertebrate species by determining distribution of species relative to dams (compare populations between dams using existing and additional field data), evaluating habitat needs (spawning, feeding, winter) and determining the effects of dams on accessibility to critical habitat areas on the mainstem and tributary streams.
  5. Based on above information, compile two priority lists for dam modification and/or removal in the Fox River Watershed: biological priorities (those having the greatest impact on aquatic habitat and fish migration) and recreation priorities (those with the most drownings, accidents attributed to the dammed conditions, recreation conflicts, or local lack of river-based recreation opportunities, or inadequate portages). The lists should include action scenarios (i.e. no action, removal, fish ladder, fish ladder and canoe passage, portage improvements) for individual dams by assessing feasibility based on biological priorities, current function, financial or social constraints, age and maintenance needs, recreation benefits, safety hazards for boaters, flood damage reduction, sediment movement and deposition, etc.
- (g) As a result of the findings in #6, above, engage the proper jurisdictions to fund and implement the projects that are identified, and also support projects such as those shown below, to:
1. improve safety at sites which have had a high incidence of drownings (and incorporate designs which allow for fish and canoe passage at the same time).
  2. support projects on Blackberry Creek, Brewster Creek, and Waubensee Creek, which enable fish migration into the tributaries.
  3. support proposed removal of North Avenue dam in Aurora, a non-functional mainstem dam.
  4. improve portages wherever possible.

#### **BENEFITS**

- The evaluation of dams will provide sound information for management decisions.
- Improve public safety.
- Improve fishing (improvement in game and non-game fish populations due to the accessibility of tributary streams to river fish for spawning and nursery areas; also better habitat for mussels).
- Improve public access within the river (fewer interruptions on the water and/or easier portages).
- Economic benefits to Fox River communities from increased recreational opportunities for paddle craft and sportfishing.
- Provide focal point and aesthetic amenity to riverside communities.
- Potential addition of riverfront parkland and access from recovered areas behind dams.

#### **COSTS**

- Funding for dam evaluation study.
- Time contributed by various agencies' personnel to provide and evaluate.
- Funding for recommended removal or modification projects: The costs associated with the design of dam modifications are relatively low compared to the cost of dam removal or reconstruction. Dam modification costs can be low for solutions such as the placement of boulders to allow fish migration.
- Restoration of recovered land associated with dam removal.
- The process to remove/modify dams can take many years and can be controversial. Some members of the public view dam removal as detrimental to the enjoyment of the river.

### **5. Maintain and enhance the Chain O' Lakes Ecosystem.**

**Background:** The Chain O'Lakes is one of the busiest recreational waterways in the nation, per the U.S. Army Corps of Engineers, Chicago District. (1994) *Final Environmental Impact Statement – Recreational Boating Impacts*. The report raises issues concerning the number of boats and the speed of boats. The report notes how boats traveling in areas of less than two meters in depth at above no-wake-speeds significantly increase resuspension of sediment in the lakes, adversely affecting water quality and habitat. Continuing construction of seawalls, as compared to bioengineering shore protection, removes shoreline habitat and results in increased

erosion on other properties and rougher boating conditions due to the reflection of wave energy. Concerns were also raised in the COE report about enforcement of existing regulations. Unmonitored application of herbicides by individual shoreline owners and homeowner associations also impacts aquatic habitat.

- (a) Support existing maintenance and enhancement efforts on the Fox Chain O' Lakes.
- (b) Evaluate and develop no-wake areas to create quiet zones for habitat recovery.
- (c) Rebuild and/or protect eroding islands, such as Grass Island.
- (d) Improve enforcement of existing regulations/ordinances through additional staffing, training, and public education.
- (e) Enhance land management programs and grants for bioengineering shore protection. Develop programs to encourage replacement of failed seawalls with bioengineering shore protection measures.
- (f) Create procedures to monitor and control herbicide application in lakes.
- (g) Continue monitoring water quality and habitat impacts due to sediment resuspension, developmental pressures, and erosion.
- (h) Dampen or stop winter drawdowns due to the Stratton Lock & Dam operation.
- (i) Encourage retrofitting of buffer strips along the lakes and the responsible use of household hazardous materials, such as used oil, pesticides, and paints, through educational efforts.

### **BENEFITS**

- Reduction of erosion and resuspension of sediment created by power boats.
- Improvement in water clarity and aquatic habitat as a result of reduced erosion and sediment resuspension.
- Protection of aquatic habitat from improper or excessive use of herbicides.
- Improved aesthetics.
- Increased opportunities for passive recreation, fishing, and non-motorized boating.
- Improved boater safety.
- Reduced costs for long-term shoreline maintenance.
- Improved over wintering habitat for fish and benthic organisms.
- Improved littoral habitat zones.
- Improved duck hunting opportunities.

### **COST**

- No-wake/shallow zone buoys - \$175 each.
- Salary and equipment (boat) for additional enforcement
- Administrative costs for designing and implementing herbicide monitoring and regulation program.
- Agency costs to promote and educate shoreline owners on bioengineering erosion control methods.
- Landowner costs for shoreline stabilization projects (lower than traditional seawall construction).
- Agency costs for continued water quality and habitat monitoring programs.

# Land Use

**Strategy: Protect the watershed through urban revitalization, innovative development standards, preservation of open space, acquisition of public lands, and voluntary preservation of agricultural lands.**

Of the 16 critical factors identified in this Plan, **Land Use** focuses on the following:

- Establish universal standards for land planning and development for adoption by units of local government throughout the watershed, including innovative guidelines and Best Management Practices (BMPs) for future development (e.g. cluster developments) and educate government about these.
- Identify funding and sources of support.
- Conserve agricultural land.
- Facilitate watershed-friendly revitalization of urban areas.

## **1. Develop a map of existing and potential conservation lands within the Fox River watershed.**

The critical trends assessment program reported in 1994 that the condition of natural systems in Illinois is rapidly declining as a result of fragmentation and continued stress. A map of existing/potential conservation lands can be vitally important as a tool to use in conserving an interconnected network of natural systems within the Fox River watershed. The map can be used to guide decisions regarding which lands to protect in order for the network of natural systems to eventually take form and have substance.

Conservation lands should include floodplains, wetlands, areas of steep slope, mature woodlands, groundwater recharge areas, hydric soils, existing and planned greenways and trails, the river and stream corridors, wildlife habitats and travel corridors, historic sites and structures, existing public/private open space, well-head protection areas, and other noteworthy features. Core areas (natural areas with ecological significance and high-quality streams) should be identified. Actions to further this goal in the Fox River watershed include:

- (a) Identify a lead agency to coordinate the project.
- (b) Develop the map of conservation lands by partnering with other agencies and groups working to identify and conserve natural areas and high quality streams. Agencies and groups include the Fox River Ecosystem Partnership, Chicago Wilderness, The Nature Conservancy, and state, county, township and local agencies, among others. Include multiple jurisdictions, citizens, landowners, and business and development interests within the watershed to balance economic, ecological, social and other objectives, and to comply with local, state, and federal rules and regulations.
- (c) Develop an implementation strategy, including funding, to enhance efforts to expand and conserve the core areas, and to realize the eventual completion of the network of conservation lands. Use public forums to finalize development of the map and the implementation strategy.
- (d) Use educational materials and other services provided to inform decision-makers, citizens, land owners, and business and development interests about the benefits of conserving natural resources, purpose of the map, how it was developed, and steps to implement creation of the network of conservation lands.
- (e) Monitor effectiveness of the use of the map as a tool to create an interconnected network of conservation lands within the watershed.

## **BENEFITS**

- Vision statement and planning tool for use in promoting connectivity of conservation lands within the watershed.
- Tool for use in building coalitions to support the acquisition/protection of conservation lands.
- Framework for action; improved coordination and targeting of funds to acquire/protect conservation lands.
- Education/promotional tool.

## **COSTS**

- Staff time for participating agencies.
- Production costs.
- Promotion/distribution costs.

### **3. Promote sensible growth and development by ensuring that the map of potential conservation lands has sustained attention in the future throughout the watershed, through an organization created for this purpose.**

The land use strategy of the Fox River Ecosystem Partnership is to, "Protect the watershed through urban revitalization, innovative development standards, preservation of open space, acquisition of public land, and voluntary preservation of agricultural lands." The ability to sustain an effort to influence land use will depend on increased public awareness and participation in project initiatives, effective coordination and communication between decision-makers in multiple jurisdictions, and between agencies which influence those decisions. Actions to further this goal in the Fox River watershed include:

- (a) Review known local, county, state and federal institutional frameworks that can effectively implement and sustain attention to the land use objective. Survey agencies' jurisdictions in order to identify current roles, responsibilities, and available resources to implement the land use objective. Identify gaps in services and delivery, key stakeholders already involved in the process, and stakeholders who need to be a part of the initiative to back projects which support the land use objectives.
- (b) Establish an organization using a formal or informal alliance. Create organization's rules of operation. Create the organization, including rules of operation, in a manner that would contribute to the successful implementation of the land use strategy.

## **BENEFITS**

- Build coalitions and promote cooperative planning.
- Increase awareness of issues/opportunities concerning conservation lands within the watershed, and protecting and enhancing biodiversity within the region.
- Strengthen the Fox River Ecosystem Partnership.
- Reduce conflicts between stakeholders in the watershed.

## **COSTS**

- In-kind services from participating agencies to create the organization.
- Marketing/promotion costs.
- Fees associated with offering seminars/conferences.

### **4. Support land development and management practices that protect and conserve the biologic diversity and water resources within the Fox River watershed.**

The six main counties through which the Fox River and its tributaries flow - Lake, McHenry, Kane, Kendall, DeKalb and LaSalle - form one of the most dynamic urban growth areas and one of the most diverse agricultural regions in the state. This six county area, home to 11% of the state's population forms the western edge of the Chicago metropolitan area. Between 1970 and 1990, the amount of land converted to urban land uses in the greater metropolitan area increased by 46%, compared to a 4.1% increase in population growth. At the same time, three out of four acres in the six counties comprising the Fox River watershed remain in agricultural use.

Certain urban development and urban/rural land management practices threaten the biologic diversity and water resources within the Fox River watershed. However, there are ongoing efforts to promote sensible urban growth

strategies and “best management practices” that do protect and conserve biologic diversity and water resources. Actions to further this goal in the Fox River watershed include:

- (a) Promote urban development policies that give priority to redevelopment opportunities in the built city and conservation design practices in new subdivisions through partnering with regional planning organizations. Support the expansion and improvement of cost-share and tax incentive programs that promote urban and rural land management practices which have watershed benefits.
- (b) Promote farm management practices that provide environmental benefits through partnering with the Farm Bureau, Illinois Department of Agriculture, USDA Natural Resources Conservation Service, Soil and Water Conservation Districts, and the agricultural community.

#### **BENEFITS**

- Protect and promote the biodiversity and health of the Fox River watershed.
- Enhance water quality within the watershed.
- Revitalize urban areas and make efficient use of existing infrastructure.
- Promote compact and contiguous growth and development at the periphery of urban areas.
- Improve coordination and cooperation between state natural resource and agricultural agencies.

#### **COSTS**

- Staff time for participating agencies, in-kind services.
- Membership costs to join and partner with organizations promoting urban and rural best development and management practices.
- Cost associated with marketing, promotion, and lobbying efforts in support of urban and rural best development and management practices.

### **5. Protect, manage, or acquire quality natural resource areas including upland habitat, lakes and wetlands throughout the watershed.**

The Fox River watershed contains some of the most significant, high quality, natural resources in Illinois. These natural resources include fens, seeps, wetlands, aquifers, lakes, streams, prairies, woodlands, and endangered and threatened species.<sup>1</sup> The state has designated the northernmost subbasins of the Fox River as a “resource rich” area because they contain significant natural community diversity. In our suburban and agricultural watershed, precious little of these natural habitats remain, making those still in existence of increasing importance. Certain urban and rural land and water management practices also threaten these natural resources. It is important to note that upland and wetland natural areas not only provide important wildlife habitat and have natural aesthetic value, but also buffer water quality and slow surface water runoff. [This recommendation came from both the Land Use and Habitat action teams.]

Many resources and studies currently exist that can be utilized in identifying areas that should be protected and managed. Management may include activities such as prescribed burning, selective brush removal, water level changes, etc. Most of these natural resource areas have been identified and are mapped. A variety of public and private organizations, jurisdictions and landowners are working to preserve these natural resource areas.

- (a) Using existing watershed plans, ADID studies, Chicago Wilderness inventories, the Illinois Natural Areas Inventory, and other resources, identify high quality natural areas throughout the watershed that remain unprotected and unmanaged (also see Land Use recommendation #1).
- (b) Prioritize identified natural areas for protection and recommend additions to open space agencies (e.g. forest preserve districts, conservation districts, park districts, land foundations, etc.) land acquisition plans.
- (c) Secure funding to protect and manage natural resources using a variety of voluntary methods (willing seller easement or acquisition, management agreements, incentive programs, etc.).

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<sup>1</sup> . The Fox River Area Assessment Volume 3 (IDNR 1998) summarizes many of these resources. Eighteen lakes and streams were identified in that assessment as biologically significant in Illinois. In addition, at least 153 state threatened and endangered species occur within the Fox River watershed.

- (d) Work with public and private landowners and organizations to develop and implement conservation and management plans for protected natural resource areas.
- (e) Develop a strategy to effectively convey to decision-makers and landowners the value of preserving high quality natural resources:
  - 1. Develop and implement educational programs on the importance, value, and management of natural areas in the watershed, using existing resources.
  - 2. Encourage local governments to protect natural areas through ordinances and comprehensive plans.

### **BENEFITS**

- Preservation of natural resources throughout watershed.
- Increased opportunities for fishing, hunting, wildlife viewing, photography; economic benefits.
- Reduced water quality impairment and flooding impacts due to open space protection.
- Greater understanding of natural areas and their value through educational efforts.
- Voluntary natural resource protection and stewardship initiatives.
- Increased land values due to proximity to preserved open space.
- Preserve unique Illinois natural and cultural heritage.
- Coordinated planning and management.
- Research opportunities.
- Enhanced quality of life.

### **COSTS**

- Staff time to compile and review existing studies of wetlands and natural areas in watershed.
- Staff time to prioritize identified natural areas.
- Development of outreach program to landowners regarding legal protection mechanisms and benefits.
- Agency costs to acquire, manage and monitor natural areas.
- Nominal costs of preparing and filing legal protection instruments.
- Staff time to develop management plans for protected natural areas.
- Grant application and budget preparation for funding acquisition, protection, and management.
- Development of educational program on natural areas in watershed, including printed material, classroom resources, etc.

# Water Quality

**Strategy: Develop strategies to preserve and enhance ground and surface water quality and quantity, in order to provide for adequate drinking water supplies and natural habitat within the Fox River Watershed.**

Of the 16 critical factors identified by the Planning Committee, **Water Quality** focuses on the following factors:

- Define, expand and integrate data collection and research on Fox River water quality and quantity by municipalities, community organizations and state agencies.
- All streams achieve B or better rating (Index of Biotic Integrity).
- Identify, protect and manage surface and groundwater; educate public about their importance and what impacts groundwater.
- Preserve and enhance drinking water supplies from surface and groundwater sources.
- Identify funding and sources of support.

**Background:** The Fox River Basin is one of the most unique and most studied watersheds in Illinois<sup>2</sup>. One of its unique characteristics is the number of glacially formed lakes in the northern part of the basin, most notably the Fox Chain of Lakes in northwestern Lake County. Water quality in these lakes and along the Fox River has long been a concern. The general public's perception of water quality problems has ranged from concern about aesthetics, due to turbidity and dense algae growth during the summer, to beliefs that the river is a toxic dump site. At the same time, nearly 100,000 people rely on the Fox River for their drinking water. Those potable water facilities meet all drinking water standards and one facility won a Taste Test award from the Illinois Section of the American Water Works Association. Nonetheless, there are some people who refuse to drink water from the Fox River, due to the negative perceptions cited above.

Urban development along the western fringe of the Chicago metropolitan area has placed additional pressure on water quality, especially from construction practices and urban drainage. But the most notable impacts of urbanization are the increased need for river water for public water supply and the use of the river for assimilation of treated wastewater.

Numerous agencies are involved in water quality monitoring and evaluation. As a result, it is necessary to review what data has been collected, assimilate that data in a usable and meaningful format, and determine where gaps in data exist. Additionally, it will continue to be an important task to define, expand and integrate data collection and research on Fox River water quality and quantity by municipalities, community organizations, and State and Federal agencies. It will also be important to define key parameters to continue to measure the health of the watershed and water quality trends. The more that water quality issues are addressed on a universally accepted scientific and technical basis, the easier it will be to gain consensus on remedial actions from the diverse users of the watershed. One key goal is for all streams in the Fox River watershed to achieve B or better rating through the current measurement by the Index of Biotic Integrity. More than one half of the river miles within the Fox River watershed have achieved this rating in the past. Work needs to be done to determine what obstacles exist to achieving a "B" rating on the remaining stream segments, related to habitat, water quality, or other factors.

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<sup>2</sup> In 1998, a comprehensive report was published by the Illinois Department of Natural Resources on the water quality of the Fox River under the Critical Trends Assessment Program as one of five volumes of the Fox River Area Assessment. Volume 2, Water Resources, discusses the surface and ground water resources. In addition, Volume 1, Geology, also discusses the geology and the potential for contamination of the ground water resources.

# 1. Formulate a watershed-wide database for water quality and fish data using Geographic Information Systems with station coding system of data generated following EPA-accepted protocol for nonpoint source and point source discharges.

- (a) Develop the scope of the database and determine its essential components and constituents of concern (e.g. nutrients, priority pollutants, bacteriological/viral, pH, temperature, flow, etc.)
- (b) Identify the sources (i.e. IEPA, ISWS, IDNR, IDPH, County Health Depts., etc.) and uses of the water quality data. This will include assembling the data for specific years so that historical trends may be analyzed (include pre-1972 and most current and complete years).
- (c) Evaluate the specific water quality data through an integrated modeling effort for the watershed. A new U.S. Environmental Protection Agency regulatory program is on the horizon to evaluate rivers nationwide (Total Maximum Daily Loads – TMDLs) that will be using the BASINS<sup>3</sup> model, therefore it may appropriate to use BASINS for modeling water quality in the Fox River watershed. Furthermore, BASINS is a holistic environmental analysis system for use by regional, state, and local agencies in performing watershed- and water-quality based studies. This new software (originally released in September 1996) makes it possible to assess large amounts of point source and nonpoint source data. This software is available free from the U.S Environmental Protection Agency and can be installed on a personal computer. BASINS allows the user to assess water quality at selected stream sites or throughout an entire watershed. It is expected to be an invaluable tool that integrates environmental data, analytical tools, local knowledge, and modeling programs to support development of cost-effective approaches to environmental protection. Because the Fox River system includes the Chain of Lakes and additionally has other stream segments that resemble lakes where dams are located, it is important to evaluate the effectiveness of BASINS in terms of these areas that are generally referred to as semi-impounded streams.
- (d) Evaluate the results of any modeling effort for completeness and determine whether additional monitoring efforts are needed.
- (e) Identify any specific water quality problem areas and possible mitigation strategies. Evaluate significant point sources, such as wastewater treatment plants, for both positive and negative water quality impacts. Evaluate the suitability of alternative technologies, such as natural wastewater systems for publicly owned treatment work effluent enhancements.

**BENEFITS** The dollar benefits for pollution prevention or mitigation are difficult to assess especially since the current impact of impairment is unclear. We do know that the estimated value of recreation for state facilities in the Fox Valley alone is over \$36 million per year<sup>4</sup>. Huff cited the value of an incremental water quality improvement on the Lower Fox to be as much as \$5.8 million annually<sup>5</sup>. Although the study is fifteen years old, population and inflation would probably offset any water quality improvements achieved since that time. In general, water quality mitigation may bring about the following benefits:

- Water supply treatment costs may decline or provide additional opportunities for future users.
- Improve public health by the reduction of pollution-related illnesses and by increased worker productivity (due to reduced absenteeism).
- Enhance recreational uses of the river.
- Extend lifetime of materials in contact with river water.
- Enhance (or prevent reduction of) real estate values along the river.
- Pollution control savings by understanding the controlling factors that degrade certain reaches of the river or its tributaries. For example, standards may be unnecessarily strict for non-problem pollutants.

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3 Better Assessment Science Integrating Point and NonPoint Sources (BASINS)

4 IDNR Critical Trends Assessment Program, 1998.

5 "Measurement of Water Pollution Benefits - Do We Have the Option?", Huff & Huff, May 1983, p.12.

**2. In order to measure the health of the river and watershed consistently over the years, develop a standard list of indicators that can be used to characterize the water quality of the Fox River watershed.**

The Index for Biotic Integrity is recognized at the state and federal level as an appropriate means of evaluating the health of rivers and streams. However, with the presence of dams on the Fox River and some tributaries, the passage of fish is prevented. Therefore, due to the absence of one or more key fish species, an area with good water quality may not be ranked as high as it could be, solely because fish that could survive in that stream segment are not present due to the physical barrier.

- (a) Identify locations where the Index for Biotic Integrity is not an appropriate measurement of water quality.
- (b) Evaluate other possible methods for measuring the health of the watershed, ultimately leading to a better and/or more consistent way to represent the health of the Fox River ecosystem and its water quality. This will include looking at all possible indicators such as trophic index, invertebrate populations, swimmable, fishable, aesthetic factors, as well as the extent of impervious surfaces in the surrounding subwatersheds.

**BENEFITS** The dollar benefits of this action are closely related to those of Recommendation No. 1. However, an additional benefit would be the complimentary relationship of scientific water quality criterion with observable water quality improvements by the public. This may enable the technical community to move ahead confidently that chemical water quality improvements will be noticed and appreciated by the public. Another benefit would be the assurance that the water quality ratings adequately address the unique flow characteristics in the Fox River watershed.

**3. Encourage proactive efforts to protect ground water, surface water, and sensitive recharge area, particularly preserving the drinking water supplies in the watershed.**

- (a) Promote IEPA's source water protection program that encourages the evaluation of potential risks to drinking water supplies and management efforts to reduce risks. This can include making available existing resources/literature, actively promoting through public education, or working with local planning agencies to factor in drinking water protection areas into comprehensive land use planning.
- (b) Encourage the use of best management practices and education for the reduction of surface water runoff sources. This can include compiling a list of local contacts or resources for Best Management Practices and broad education and distribution to encourage action by local communities.
- (c) Utilize existing resources as much as possible, such as IEPA's Pollution Prevention Intern Program that places graduate level students in businesses to evaluate current wastestream processes and to recommend ways to reduce waste discharges into the environment.

**BENEFITS**

- Targets the most appropriate educational materials which can be effective in water quality issues in the Fox River watershed.
- Potential pollution reduction possibilities at specific sources.
- Improves communication between local communities and local planning contacts.
- Improved communication can lead to pollution reduction and overall water quality improvement benefits.

**4. Develop a Water Budget for the surface and ground water sources in the Fox River watershed and determine long-term water use goals (i.e. maximum recreational load, publicly-owned treatment plant discharge capabilities, and drinking water facility water withdrawals).**

- (a) Gather information and explore funding sources that will be necessary to develop a water budget for the Fox River Watershed or factors that should be considered as part of the water budget. This can include:
  1. Research surface water withdrawals for reaches between water intakes and wastewater outfalls and evaluate temperature effects, recreational volume, and ecological volume required for sustaining habitat. If

research has not been done to determine the effects of surface water withdrawals, then seek assistance from agencies such as the Illinois Environmental Protection Agency, Illinois State Water Survey, and Illinois State Geological Survey.

2. Integrate the impact of surface water withdrawals with the operation of the Stratten Dam (i.e. will there be periods in the future when the low flow releases from Stratten Dam are insufficient to meet the water uses downstream?)
3. Formulate limitation on surface water withdrawals within certain reaches of the river or its tributaries.
4. Review water balance information from any water quality modeling effort, such as BASINS and evaluate capability for water quantify evaluation.
5. Determine major ground water aquifers and if long-term capacity has been calculated. If research has not been done to determine the effects of ground water withdrawals, then seek assistance from agencies such as the Illinois Environmental Protection Agency, Illinois State Water Survey, and Illinois State Geological Survey.
6. Calculate ground water and surface water sustainability on a sub-watershed basis.
7. Determine maximum point and non-point discharge pollutant mass loading based on pollutant volume (mass) basis from modeling effort (BASINS), not flow volume (due to dilution).
8. Determine maximum flow acceptance and impact ground water may have on surface water, effect on fish, or bank ecology.
9. Determine maximum sustainable population for water resources of the Fox subwatersheds.

(b) Disseminate and evaluate the resulting water budget to enable organizations and agencies to plan accordingly.

**BENEFITS** The benefits of this recommendation are preventative in nature. They are intended to prevent the over-utilization of the Fox watershed's limited water resource. Otherwise, the potential impacts of water over-mining are decreased habitat, decreased water quality, increased water supply costs (additional treatment, or Lake Michigan water?), decreased recreation usage and local spending associated with recreation, decreased real estate values, future restrictions on growth, and increasing litigation between communities.

## **5. Promote the development of public/private partnerships to best match sources of funding for enhancement of water quality monitoring, education, and awareness within the watershed.**

- (a) Determine a means of identifying participating organizations.
- (b) Meet with leaders of stakeholder groups on a regular basis to discuss methods of partnering with stakeholders, including reviewing successful examples of local and regional partnerships with a water quality focus, such as the Hamilton-Butler County Groundwater Consortium, in Ohio.
- (c) Collaborate among multiple organizations to seek funding for water quality projects.

### **BENEFITS**

- educational benefits for both the FREP representatives and the stakeholders;
- listening to one another;
- involvement in stakeholder groups, which creates ownership and hopefully financial investment; has the potential to create private motivation for water quality enhancement.

# Stormwater

**Strategy:** Improve management of stormwater in the watershed in order to reduce soil erosion, flooding and to improve stormwater quality:

- collect and review existing efforts;
- restore natural hydrologic function;
- disseminate stormwater management strategies.

Of the 16 critical factors identified in this Plan, **Stormwater** focuses on the following:

- Identify funding and sources of support.
- Erosion control: streambanks and surface runoff.
- Improve the management of stormwater quality and quantity, to protect water quality and reduce flooding.

## 1. Reduce existing discharge rates of stormwater runoff from urban, developing and agricultural land uses.

(a) Encourage methods to increase infiltration rates using non-structural methods such as:

- Increased use of deep rooted native vegetation on public and private lands,
- Creation of buffer zones along wetlands, streams and drainage ways,
- Maintain or increase use of high crop residue levels on agricultural lands,
- Modify ground maintenance procedures so as to permit taller native and non-native vegetation (i.e. greater height to turf vegetation) that will slow runoff rates on private and public lands, call attention to the economic benefits (savings) from less turf management practices and inputs, and modify local weed ordinances that hinder the use of (and maintenance of) vegetation that will allow reduced runoff rates.

(b) Encourage methods to increase infiltration and detention rates on agricultural lands using methods such as:

- Promote proper maintenance of existing drainage systems, including grassed waterways and terrace systems,
- Maintain and create buffer strips around field borders and drainage ways including lakes, wetlands and streams.

(c) On agricultural lands, evaluate the effectiveness of methods such as

- Install restrictors on surface inlets to subsurface drain tile systems,
- Restrict discharge rates from the drainage tile systems, during the non-growing season,
- Surface storage of stormwater during the non-growing season,
- Installation of low head and permeable dams in drainage systems that will reduce flow rates and permit settlement of suspended solids.

(d) Encourage, where practical and appropriate, retrofitting existing stormwater storage systems to:

- Increase detention volumes and restrict discharge rates from more frequent storm events (i.e. 1-year events rather than 2-year events),
- Maintain detention/retention basins to store the original storage capacity,
- Encourage the use of structural infiltration systems (i.e. French drains), and
- Where practical, redirect stormwater discharges from structural to non-structural systems such as: surface water ways, wet bottom basins or depressional areas (this will slow runoff rates and permit increase infiltration).

(e) Modify existing regulations to minimize impervious areas and reduce soil compaction during earthwork, construction and maintenance activities to permit better infiltration, growth of vegetation.

## **2. Develop new and innovative stormwater management practices to control runoff rates, quantity and quality at its origins.**

(a) Through an education and public information program:

- Compile and develop education materials which promote alternate landscaping, methods, materials and maintenance practices that will reduce surface runoff rates,
- Promote the use of pervious surfaces in construction and development projects,
- Promote the use of Illinois Urban Manual, Northeastern Illinois Planning Commission's best management practices, and
- Development of demonstration projects using innovative stormwater management practices.

(b) Identify significant hydric soil and groundwater recharge areas and encourage the development of hydric soils and groundwater recharge zones protection ordinances that will compensate the land owner and protect these areas from development.

(c) Encourage the modification of existing ordinances that will promote onsite infiltration instead of surface runoff. Examples of such actions are:

- Discourage the use of storm sewer systems in any 1st order streams,
- Promote infiltration design of drop boxes at storm sewer grates and other locations within the storm sewer system where soils allow,
- Use of above ground waterways that will permit infiltration, slow velocity of runoff and emulate natural hydrological processes (i.e. natural landscape features, depressional areas and shallow water wetlands),
- Allow new local regulations for new or alternative ideas and methods for innovative stormwater management,
- Enlarge water storage areas at a rate 1.5 times the area of hard and impervious surfaces and reduce discharge rates to 0.1 cfs/acre or less, and
- Direct new stormwater discharge outlets through buffer zones.

## **3. Develop incentive packages for the reduction of existing discharge rates and the development of new and innovative stormwater management practices.**

(a) Develop Fox River Watershed Grant, Matching Fund and/or Revolving Loan program(s) for land developers emphasizing the research and implementation of new stormwater management practices. These program(s) could be developed at the municipal, county and/or watershed level. The Traverse City, Michigan Chamber of Commerce loan program and the State of Illinois Water Pollution Control Revolving Fund program would serve as good examples for the establishment of similar programs in the watershed.

(b) Encourage State and/or Federal agencies to establish a grant program for local governments that meet defined discharge reduction rates (e.g. 20% reduction in peak discharge rates from sizable storm sewer outlet structures (36" and larger in diameter) and/or improve water quality standards (e.g. installation of devices for the removal of floatables and suspended solids, installation of oil and grit separators, etc.).

(c) Provide property tax "breaks" for actions that reduce runoff and increase infiltration. Examples are:

- Land converted for stormwater management uses to reduce discharge rates in existing developments where no detention/retention of stormwater previously existed,
- Efforts by individual home owners, corporate/commercial businesses, industrial facilities, agricultural land owners, etc. to install infiltration basins, leaching facilities, sand filters, native vegetation, filter (buffer) strips, grassed swales, biofiltration facilities, etc., and
- The implementation of permeable parking and road surfaces at existing and/or proposed residential, commercial and industrial developments.

(d) Encourage local municipalities to provide a development fee “rebate” and/or other incentives to land developers using new and innovative stormwater management practices, building excess detention capacity, and/or using pollutant removing outlet devices.

(e) Encourage local government agencies to provide materials such as native grass seed and other plant material to property owners interested in implementing vegetative best management practices such as filter strips, grassed swales and bioretention facilities. Develop a cost-share program that will promote the use of native vegetation on private and public property.

#### **4. Promote and implement non-structural (natural) stormwater management techniques to reduce streambed and streambank erosion and flooding.**

Identify and map locations of streambed and streambank erosion and flooding within the watershed. After all known locations have been identified and mapped, perform the following:

(a) Assess and prioritize locations based on the severity of erosion and flooding. Some examples of criteria that may be used for determining the level of severity and priorities are: size of affected area, location of affected area (residential, commercial, industrial, agricultural), economic impact (property damage, cleanup costs, etc.), and whether proposed work is economically feasible.

(b) Encourage the use of velocity control structures to reduce runoff velocity and to reinstall pool and riffle sequences.

(c) Retrofit as many existing storm sewer discharge points as possible using energy reduction techniques to reduce scouring velocities.

(d) Incorporate channel and side channel wetland areas as well as increase and/or restore natural buffer zones to minimize flooding impacts to developed properties. Protect green ways of significant size to allow streams to meander over time. This may include establishing land buy out programs from willing sellers for known flood hazard areas.

(e) Permanently stabilize drainage ways by reshaping and revegetating using A-Jacks, lunkers, bio-logs, native plants, seeding with geotextile reinforcement, etc. Encourage local government agencies to provide staff expertise and guidance to land owners concerning bank stabilization concepts.

(f) Expand existing upland soil erosion control programs to meet soil loss goals in agricultural and development areas.

#### **5. Maintain, stabilize, enhance and restore the natural integrity to streams, creeks, and drainage ways in urban, developing and agricultural areas.**

(a) Expand and publicize a stream clean-up program (similar to those administered by Friends of the Fox and Riverwatch) which encourages local citizens and organizations to participate in periodic Stream Clean-Up Days. Identify all streams which have significant particulate pollution. Prioritize the inventory of polluted streams and begin by focusing on those streams with the highest levels of pollution. Send out flyers to property owners along the stream and coordinate incentives such as free garbage bags and free next day pickup of all trash collected. Advertise the clean up days in the local paper/newsletter and encourage the local media to write an article on the conservation/clean up effort in their area.

(b) Coordinate with land owners and local agencies who have jurisdiction in the waterways to develop new standards and goals for restoration and maintenance. The ideas to be encouraged are:

- Re-establishing the “sinuosity” in streams (re-create the meanders),
- Restoring native vegetation in and around streams to create a “buffer zone” that is reserved for wildlife and floodwater conveyance,

- Management of thick canopies over ditches to allow the shorter, more dense vegetation to flourish along banks, and
  - Establish an active stream maintenance program to remove non-natural debris (i.e. cars, refrigerators, sofas, etc.) as well as selective natural debris from all stormwater drainage system channels (both man-made and natural).
- (c) Encourage all agencies with jurisdiction over stormwater storage facilities to convert all dry bottom detention facilities (except those serving as multi-use open space/parks) in to either open water (pond/lake) or wetland bottom type storage facilities.
- (d) Encourage all government agencies with property ownership within the watershed to allow vegetated areas to become habitats for deep-rooted native vegetation. Recommend revisions to maintenance programs to curb vegetation control practices so that ditches and channels will support dense vegetation to aid in erosion control and removal of the pollutant load in stormwater runoff.
- (e) Map the locations of subsurface tile and storm sewer systems throughout the watershed.

## **6. Identify and preserve significant stormwater storage areas within the watershed.**

- (a) Prepare an inventory and map(s) of all significant stormwater storage areas within the watershed where large contiguous areas of wetlands, marshes, lakes, forests or open spaces occur. (Potential areas may be delineated using information from the following sources: United States Geological Survey (USGS) 7.5 Minute Series Topographic maps, U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory maps, local municipalities' Geographic Information Systems (GIS) and aerial topography, etc.) After the inventory and maps are completed, perform the following:
- Evaluate the hydraulic/hydrologic characteristics of the stormwater storage areas, as well as their impact on the surrounding environment, based on existing conditions. Quantify the amount of existing storage in each of the identified areas,
  - Evaluate potential alterations to the hydraulic/hydrologic characteristics of the stormwater storage areas and the potential impact of these modifications on the surrounding environment. Quantify the amount of potential storage in each of the identified areas,
  - Assess and prioritize locations based on the significance of the stormwater storage areas. Some examples of criteria that may be used for determining the significance are: quantity of existing or potential storage, location of storage area (residential neighborhood vs. open field), and the performance of an economic impact analysis (cost of potential alterations vs. cost for projected flood damages which would be mitigated by constructing the alterations), and
  - Acquire the identified stormwater storage areas, proceeding from the highest to the lowest priority if shown to be economically feasible.
- (b) Incorporate the preservation of significant stormwater storage areas into the open space planning process at the local government level. Emphasize the importance of wetland preservation/restoration and hydric soils. Encourage local government bodies to preserve--and guide development away from--the identified areas.
- (c) Initiate a program for the protection of floodplain, wetland and stormwater storage habitats using the following voluntary methods:
- Purchasing conservation easements and/or development rights from a willing seller,
  - Easement acquisition,
  - Management agreements, and
  - Incentive programs for the preservation of these areas.
- (d) Examine potential existing funding sources (e.g. "EPA Catalog of Federal Funding Sources for Watershed Protection": EPA 841-B-97-008) and/or establish new, local funding sources for the implementation of this program.

**7. Form a Fox River Watershed Stormwater Management Committee with at least one representative from each county located in the watershed to address stormwater management concerns within the watershed as a whole.**

- (a) Establish quarterly conference meetings for the Committee to discuss development practices/ordinances and land use activities, cumulative effects of development, what's happening in the watershed, changes in management practices and changes in agricultural practices.
- (b) Survey appropriate local, state and federal agencies in order to identify current roles, responsibilities and available resources for solving watershed problems.
- (c) Identify patterns of population density, land use, water retention efforts and flood hazard areas in the watershed.
- (d) Create a Fox River Watershed Library. The library archives should be accessible to the general public (both "in-person" and on the Internet). The library archives should contain continuously updated water-related maps and information (e.g. Federal Emergency Management Agency (FEMA) maps, applicable Letters of Map Revision (LOMR), state and federal publications regarding water resources, as well as real-time and historical precipitation and stream flow data for all gages in the watershed). Local drainage studies for individual developments and larger regional studies should also be archived and made available to the public upon request at minimal cost.
- (e) Coordinate appropriate agencies to develop watershed and sub-watershed hydraulic models to tie together the river-stream system as a continuous, dynamic network. Form interactive models that can be used to evaluate flood characteristics for various storm events. Encourage local municipalities to use these hydraulic models to plan development expansion within the watershed or a particular sub-watershed. This will allow local officials and land developers to visually see the impacts of the proposed development on the watershed and/or sub-watershed.

# Education

**Strategy: Develop an effective education and awareness program by focusing on multiple methods of communication to reach residents of the watershed.**

Of the 16 critical factors identified by the Planning Committee, the **Education Action Team** focused on the following factors as the team developed its recommendations:

- Strong and continued media coverage.
- Educate public about real problems negatively affecting the river; create a public understanding of watersheds.
- Recognize businesses, groups, community leaders, and individuals that help the environment.
- Identify funding and sources of support.

## **1. Expand the network of groups/individuals interested in protecting the Fox River watershed so they can share information and other resources, and seek grants in partnership.**

- (a) Identify watershed groups with a contact person (address, phone, fax, email, etc.), allocate personnel to develop/maintain network, and establish/maintain a computer sortable database of network members and their programs/projects. Database should be sortable by geographic location, type of projects/grants, type of organization (non-profit, government agencies, individual, etc.), and other criteria.
- (b) Develop network newsletter.
- (c) Ensure network members know about Illinois Department of Natural Resources two-volume list of grantors for watershed protection projects.
- (d) Provide annual grant writing workshops to network members.

### **BENEFITS**

Provides a centralized communication network for individuals and organization to exchange information and enhance protection of Fox River Watershed and increase opportunities for securing grant funds.

### **COSTS**

Start-up: Identify watershed groups, develop network and computer database  
Ongoing: Staff to maintain network and database, develop quarterly newsletter  
Quarterly Newsletter - Printing, postage, design, etc.  
Annual Grant Writing Workshop-Staff time & Expenses (Copies, refreshments, etc.)

## **2. Develop a high quality information packet for the media with a map of the entire Fox River Watershed and use it, with consistent press releases, to establish and maintain rapport with a contact at each media outlet.**

- (a) Develop media advisory board with media representatives, experienced public relations experts, and representatives from other watershed groups with media experiences.
- (b) Determine appropriate elements of packet - particularly a map of the entire Fox River Watershed.
- (c) Identify media outlets (radio, TV, newspaper) - Illinois Department of Natural Resources has comprehensive list of contacts.
- (d) Coordinate entertaining, outdoor event for media representatives.
- (e) Develop on-going media relations procedure.
- (f) Revise packet as needed.

- (g) To respond to public inquiries prompted by the media coverage, prepare a brochure for mailing that describes the organization.

**BENEFITS**

- Increased awareness of Fox River Watershed.
- Increased accuracy and consistency in media coverage.
- Enhanced relationship with media.
- Increased contact with an expanded audience.

**COSTS**

- Staff Annual Outdoor Media Event
- Packet elements, folders, envelopes, postage, etc. (twice a year)

**3. Establish a connection between urban, suburban, and rural populations in the Fox River Watershed by getting involved in existing outreach programs.**

- (a) Identify existing rural, suburban, and urban outreach programs.
- (b) Coordinate hands-on/cooperative/educational workshops around existing restoration activities (i.e. streambank stabilization) in rural, suburban, and urban areas to illustrate to these populations the effects of land-use choices in all three regions of the watershed.
- (c) Plan meetings between rural, suburban, and urban high school students.
- (d) Establish directory of rural, suburban, and urban parties interested in supporting Fox River watershed outreach programs.
- (e) Create website that publicizes rural, suburban, and urban watershed efforts and special events and also provides basic watershed information incorporating all aspects of the watershed (i.e. Stormwater, Recreation, Habitat, Water Quality, etc.). This website may be linked to other Internet websites (e.g. United States Geological Survey (USGS), Army Corps of Engineers - Water Resources Programming (ACOE-WRP), Illinois Department of Natural Resources (IDNR), Illinois Environmental Protection Agency (IEPA), Water Environment Federation (WEF), etc.), however, the website must be maintained and updated regularly.
- (f) Solicit involvement of agricultural leaders on how to reach rural populations.
- (g) Identify periodicals/publications that are appropriate to bridging gap between rural, suburban, and rural populations and contribute articles.
- (h) Develop traveling exhibit regarding Fox River watershed reflecting concerns of rural, suburban, and urban populations.
- (i) Develop forum for rural, suburban, and urban populations to discuss land-use issues that effect the Fox River watershed.

**BENEFITS**

- Increases awareness of Fox River watershed.
- Establishes an interested and action oriented population to protect and enhance the resources of the watershed.
- Enhances friendship opportunities and shared commitment for improving the watershed.
- Provides opportunities for rapid (perhaps real time) sharing of ideas and information.
- Establishes a personal relationship with agricultural leaders making more effective watershed improvements possible.

**COSTS**

- Start Up: Develop website and develop three traveling exhibits
- Ongoing: Staffing

**4. Collaborate with existing groups to sponsor a variety of watershed awareness events i.e. clean ups, canoe trips, Earth Day, etc.) with an education component. Involve the media.**

- (a) Inventory existing watershed awareness events.
- (b) Identify educational component of awareness events.
- (c) Identify educational gaps/needs of awareness events.

- (d) Inventory available watershed education resources.
- (e) Supply samples of educational resources to event coordinators.
- (f) Promote expansion of awareness programs of existing groups.
- (g) Ensure media is informed of the events.
- (h) Distribute calendar of existing awareness events.

#### **BENEFITS**

- All existing events and groups can be found in one place.
- Allows for advance media notification for the events.
- Expansion of existing programs will reach more people.
- Higher media coverage for all events in the Fox River Watershed.
- Higher regard for the river and tributaries.
- More volunteers.
- Increased public awareness of the Fox River watershed.
- Reach large numbers of the general public.
- Provide informal education for non-school groups.
- Provide free or low costs to science educators.
- Collaboration and partnerships between agencies and organizations.
- In-kind and labor costs would be available for cost share grants (technical assistance, construction help, labor to do the planting, etc.)
- Demos and workshops could provide hands-on labor, this also adds to experience from public works, municipalities, etc.

#### **COSTS**

Staff to Create/Maintain database/events calendar  
 Printing/Distribution of database and calendar

### **5. Establish a speakers bureau with a list of speakers who are qualified and appropriate experts (incorporate existing lists and provide incentives to speakers).**

- (a) Research existing speakers bureaus.
- (b) Identify ranges of topics for speakers bureau.
- (c) Identify expertise needed in speakers' backgrounds (agriculture, industrial, etc.)
- (d) Cross reference speakers and topics - match appropriate backgrounds with appropriate topics.
- (e) Develop a working agreement between speakers and bureau:
  1. Provide guidelines to speakers (i.e. be sure your audience is aware of what a watershed is, the watershed boundaries, demographics of watershed).
  2. Ask for criteria from speakers (i.e. fees required if any, maximum driving distance, preferred audience, expense reimbursement requirements, etc.).
- (f) Create a thank-you certificate to be given to all speakers.
- (g) Implement speaker evaluation process.

#### **BENEFITS**

- Provides reliable, accurate information sources and support for education events for Fox River Ecosystem Partners and affiliated groups.
- Improves communication and networking among experts, environmental groups, governmental agencies, businesses, chambers of commerce, recreation and agricultural organizations, and homeowners groups.
- Provides opportunities to emphasize and explain issues relating to the Fox River Watershed which are not necessarily available through other mediums.
- Provides opportunity to interested individuals and groups who are not aware of the issues of the Fox River Watershed. (Could result in increased volunteerism from audience members.)
- Provides a relatively inexpensive way to communicate "up close" to a large audience.

#### **COSTS**

Start Up Costs: Staff requirements to start up and organize the bureau  
 Ongoing Costs: Printing/Distribution of speaker's list

**6. Encourage development of subwatershed advocacy groups, where they do not exist, to promote watershed education, volunteer, and stewardship opportunities.**

- (a) Identify sub watershed for the Fox River.
- (b) Determine which sub-watersheds have advocacy groups and which do not - Call Soil & Water Conservation Districts.
- (c) Contact EcoWatch for contacts for sub-watershed where there are no groups in place. Coordinate with EcoWatch to provide programming events in areas without such groups.
- (d) Encourage involvement of municipalities in budding groups.
- (e) Place advertisements in newspapers to find interested participants and coordinate a first meeting.
- (f) Provide list of helpful hints to budding groups - based on experience of established groups.
- (g) Provide list of contacts to new groups - who to call, who's doing what, who's got what.
- (h) Develop mentorships between old and new groups.
- (i) Encourage inclusion of education in events of new groups.

**BENEFITS**

Builds capacity for good work in watershed.  
 Increases number of watershed education events throughout entire Fox Basin thereby minimizing behaviors causing degradation.  
 Improves networking capabilities of members.

**COSTS**

Ongoing Costs:

Staff Requirements

- Identify contact person for sub-watershed advocacy groups
- Contact RiverWatch and encourage programs

Communication/advertising/printing of "helpful hints" and contact list for events

**7. Develop and disseminate to educators a list of watershed education resources (including map of entire Fox River Watershed) for use in K-16 classrooms.**

- (a) Tap into the Internet to compile list of resources.
- (b) Survey environmental organization and agencies to discover existing educational resources.
- (c) Format list with description, order information, etc.
- (d) Obtain list of schools from Illinois State Board of Education.
- (e) Determine appropriate dissemination procedure: to Environmental Science Coordinator

**BENEFITS**

- Heightens teacher awareness of existing watershed education resources; thereby increasing the potential for inclusion of watershed activities in the classroom.
- Improves science education at little or no cost to individual schools.
- Proposal is useful at all grade levels (K-16).
- Proposal would be appropriate for all areas of the watershed (upper, lower, etc.) and could be utilized in other areas of the state.
- Student enthusiasm creates a ripple effect generating interest in the watershed at home.
- Low cost.

**COSTS**

Start Up Costs:

Staff Requirements

Printing/Mailing of survey, list of resources, clearinghouses, etc.

**8. Determine how to recognize watershed efforts by such groups as:  
a) industry, b) business, c) schools, d) private citizens, e) elected officials, and  
f) environmental groups,**

**Using categories such as:**

**1) monetary donations given to watershed efforts, 2) insight, intelligence and ideas, 3) education-instilling others to help, and 4) extraordinary effort and time, 5) outstanding stormwater management practices in a variety of land use categories (e.g. residential, commercial, industrial, agricultural, etc.), and 6) a directory of outstanding watershed management projects.**

- (a) Recruit recognition committee members from the Fox River Ecosystem Partnership.
- (b) Establish recognition committee with representatives from all six group categories and from upper, middle and lower regions of the watershed. First tasks of the committee will be to:
  - determine meeting logistics for committee (place, frequency, etc.)
  - structure 2-year staggered terms for committee members
  - determine a nomination process for the award
  - ensure recognition awards are equitably distributed geographically
  - limit number of awards per year to maintain meaning of award
  - determine form awards will take (plaque, money, equipment for schools, etc.)
  - hold an award ceremony annually (e.g., Earth Day, media, banquets, college day, etc.)
- (c) Publish a directory of "Outstanding Fox River Watershed Management Projects" in various categories such as wetland mitigation, stormwater management, landscaping improvements, erosion control, etc. The directory should list the following: owner, contractor, engineer, location of project, project cost, economic benefit, and a brief project description.

**BENEFITS**

- Award winners serve as models for other efforts.
  - Recognizes other significant efforts in the watershed.
  - Provides a positive reinforcement for outstanding efforts.
  - Increases communication among Fox River Ecosystem Partners.

**COSTS**

Staff Requirements to Recruit recognition committee members  
Awards (plaques, trophies, etc.) and Award ceremony  
(Additional expenses for ceremony could be covered by donations, fees, etc.)

**9. Develop an education and information program that identifies the benefits of stormwater management to the public (stakeholders) in the watershed.**

- (a) Create a "Guide for Responsible Stormwater Management in the Fox River Watershed." This handbook or pamphlet (i.e., "How to . . . for Dummies") should be written to inform individual landowners about the current problems in the watershed and identify basic, small-scale practices the average citizen can adopt to reduce stormwater runoff from their property and improve the water quality of runoff that they pass to their downstream neighbors (based on "50 Things You Can Do to Save the Planet").
- (b) Develop, market and sell a computer based, interactive simulator that allows the user to plan and construct development in a "virtual" watershed and then observe the relationship between the watershed and various development scenarios (e.g. how various parts of the watershed are impacted by the development and how the watershed (i.e. flooding) in turn impacts development). The user will need to balance development and conservation of natural resources to maintain the original, pre-development flood levels and flow rates at various locations in the watershed. This program could be developed using grants for sources such as the Conservation 2000 program administered by the Illinois Department of Natural Resources (IDNR). The purchase cost would be the cost necessary to produce each copy (unless test marketing indicates a demand that could bring in profits to refund the C2000 grant program).

- (c) Organize and fund a series of technical workshops targeted towards separate stakeholders: government officials, developers, professional consultants (engineers, landscape architects, etc.) and private citizens. The workshops should educate each group as to what the current problems are in the watershed, what caused the problems and what actions each target group can do to facilitate a solution. These technical workshops may be sponsored by various organizations such as Northeast Illinois Planning Commission (NIPC), Illinois Water & Environment Association (IWEA), Illinois Environmental Protection Agency (IEPA), American Public Works Association (APWA), Illinois Society of Professional Engineers (ISPE), etc.
- (d) Coordinate the publication and distribution of a professionally produced watershed-awareness video developed to educate concerned citizens and students via classroom science classes.
- (e) Encourage local units of government to hold “Stormwater Open Houses” where local engineers, consultants and planners who are willing to share their knowledge of the local drainage systems and overall stormwater management concepts. This will allow citizens to actively participate and understand the watershed planning process.

**Acknowledgment of Endorsement of the Integrated Management Plan  
for the Fox River Watershed in Illinois**

WHEREAS, the Watershed Planning Committee of the Fox River Ecosystem Partnership has developed the Integrated Management Plan for the Fox River Watershed in Illinois; and

WHEREAS, the vision of the Integrated Management Plan for the Fox River Watershed in Illinois is to balance all of the uses and demands on our natural resources while preserving and enhancing a healthy environment; and

WHEREAS, the plan promotes sensible growth and development, improves stormwater management, and preserves and enhances ground and surface-water quality and quantity; and

WHEREAS, the plan maximizes the aesthetic and year-round recreational potential of the Fox River watershed; promotes development of a comprehensive program to identify, protect and restore natural habitats, and promotes the development of an effective program of education and awareness to reach residents and decision makers in the watershed; and

WHEREAS, the Integrated Management Plan for the Fox River Watershed in Illinois was developed through a consensus-bases process and involved businesses, non-profit organizations, individuals, agencies, and governments; and

WHEREAS, the Integrated Management Plan for the Fox River Watershed in Illinois is consistent with the goals and objectives the Draft Kane County Stormwater Management Ordinance, the Blackberry Creek Watershed Management Plan, the Nippersink Creek Watershed Plan, and the Chicago Wilderness Biodiversity Recovery Plan.

NOW, THEREFORE IT BE RESOLVED that the «**OrganizationName**» offers an acknowledgement of endorsement of the Integrated Management Plan for the Fox River Watershed in Illinois

Enacted and approved on this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_ at \_\_\_\_\_, Illinois.

BY: \_\_\_\_\_

ATTEST: BY: \_\_\_\_\_

**PLEASE FORWARD A COPY OF YOUR PASSED & SIGNED RESOLUTION TO:**  
FREP c/o  
Kane-DuPage Soil & Water Conservation District  
2315 Dean Street  
St. Charles, Illinois 60174

# FOX RIVER WATERSHED COUNTIES & CITIES LIST

*Alpha by County*

COUNTY	CITY
COOK	Barrington Hills*
COOK	Barrington*
COOK	Bartlett*
COOK	Hanover Park
COOK	Hoffman Estates
COOK	Inverness
COOK	Schaumburg
COOK	South Barrington
COOK	Streamwood
DEKALB	Hinckley
DEKALB	Sandwich
DEKALB	Shabbona
DEKALB	Somonauk*
DEKALB	Waterman
DUPAGE	Bartlett*
DUPAGE	Naperville
DUPAGE	Warrenville
DUPAGE	Wayne*
DUPAGE	West Chicago*
KANE	Aurora
KANE	Batavia
KANE	Carpentersville
KANE	East Dundee
KANE	Elburn
KANE	Elgin
KANE	Geneva
KANE	Gilberts
KANE	Hampshire
KANE	Lily Lake
KANE	Montgomery
KANE	North Aurora
KANE	Pingree Grove
KANE	Sleepy Hollow
KANE	South Elgin
KANE	St. Charles
KANE	Sugar Grove
KANE	Wasco
KANE	Wayne*
KANE	West Dundee
KENDALL	Boulder Hill
KENDALL	Millington*
KENDALL	Newark
KENDALL	Oswego
KENDALL	Plano
KENDALL	Yorkville
LAKE	Antioch
LAKE	Deer Park

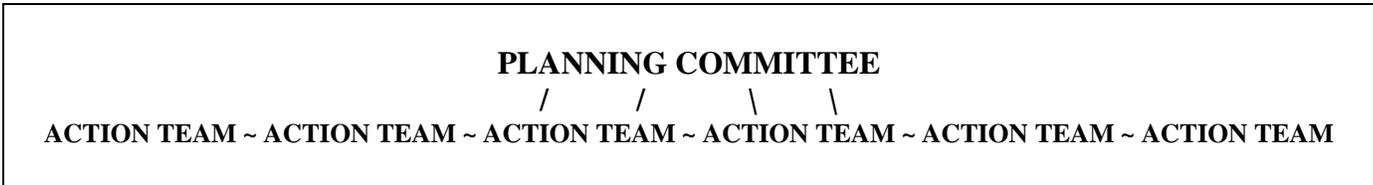
LAKE	Fox Lake
LAKE	Grayslake
LAKE	Hainsville
LAKE	Hawthorn Woods
LAKE	Island Lake
LAKE	Island Park*
LAKE	Kildeer
LAKE	Lake Barrington
LAKE	Lake Villa
LAKE	Lake Zurich
LAKE	Lindenhurst
LAKE	North Barrington
LAKE	Round Lake
LAKE	Round Lake Beach
LAKE	Round Lake Heights
LAKE	Round Lake Park
LAKE	Third Lake
LAKE	Tower Lakes
LAKE	Volo
LAKE	Wauconda
LASALLE	Earlville
LASALLE	Leland
LASALLE	Millington*
LASALLE	Ottawa
LASALLE	Sheridan
LASALLE	Somonauk*
LEE	Paw Paw
MCHENRY	Algonquin
MCHENRY	Bull Valley
MCHENRY	Cary
MCHENRY	Crystal Lake
MCHENRY	Fox River Grove
MCHENRY	Greenwood
MCHENRY	Hebron
MCHENRY	Holiday Lakes
MCHENRY	Johnsburg
MCHENRY	Lake In The Hills
MCHENRY	Lakemoor *
MCHENRY	Lakewood
MCHENRY	McCullom Lake
MCHENRY	McHenry
MCHENRY	Oakwood Hills
MCHENRY	Prairie Grove
MCHENRY	Richmond
MCHENRY	Ringwood
MCHENRY	Spring Grove
MCHENRY	Wonder Lake
MCHENRY	Woodstock

\* Borders within more than one county

## The Process of Developing an Integrated Plan for the Fox River Watershed\*

People who live and work in the watershed, directly and indirectly related to the river and its tributaries, contributed to the plan. The Planning Committee and Action Teams shared equal responsibility for developing the plan.

- Jan.-Feb. '98      *Planning Committee* toured watershed; gathered information.
- March 9-10, 1998      *Planning Committee* presentations, discussions; determined vision, critical factors, and Action Team strategies. Following the meeting, public notices were issued to invite participants to serve on Action Teams.
- April-July '98      *Action Teams* met several times; gathered information/drafted recommendations.
- August 5, 1998      *Planning Committee* provided direction back to the Action Teams.
- Aug.-Oct. '98      *Action Teams* met several times and prepared detailed action plans.
- November 16-17, 1998      *Planning Committee* met to finalize recommendations.



\*process outlined is generally based on the system developed by Lawrence Huggins Associates, Seattle, WA. The Fox River Partnership's year-long planning effort was facilitated by Gretchen Bonfert, Green Strategies, Springfield, Illinois.

**A complete listing of the participants in the Fox River Watershed Planning Process can be found on page 10 of the Executive Summary, a copy of which is included with this Resource Kit.**