Assessment of the Illinois River
Conservation Reserve Enhancement Program

I. I. Introduction to CREP Goals and Monitoring

The Illinois CREP has four goals:

A. Reduce the amount of silt and sedimentation entering the mainstem of the Illinois River by 20 percent.
B. Reduce the amount of phosphorus and nitrogen in the Illinois River by 10 percent.
C. Increase in the Illinois River watershed by 15 percent the populations of waterfowl, shorebirds, nongame grassland birds, and state and federally listed threatened and endangered species such as bald eagles, egrets, herons; and
D. Increase the native fish and mussel stocks by 10% in the lower reaches of the Illinois River (Peoria, LaGrange, and Alton Reaches).

The intent of the monitoring component of the Illinois CREP is to ensure that the program is effective in working towards the established goals. The monitoring results will also provide guidance for future modifications of the CREP rules should it be determined that the program is not providing the desired results. However, it should also be apparent from the discussions below that directly linking the ecological and physical responses in the basin to CREP will be difficult and for some aspects it will be impossible. However, we believe that it will be possible to demonstrate the projected impact of CREP and, in fact, provide verifiable quantification of the CREP impacts for some characteristics.

II. CREP Monitoring Design

The monitoring of the Illinois CREP takes a three-pronged approach: (1) intensively monitored experimental watersheds, (2) utilization of extant data and programs that currently provide data but that were established for purposes other than CREP monitoring, and (3) modeling of species responses to habitat modification. Each of these three approaches will be utilized to provide information on multiple goals.

A. Intensively Monitored Watersheds

Assessment of the efficacy of CREP in meeting the program's biological and water quality goals is initially focused in two study areas: the Court Creek watershed in the Spoon River basin and IDNR's Jim Edgar-Panther Creek Fish and Wildlife Area in the Sangamon River basin. Court Creek is one of four watersheds participating in the interagency Illinois Pilot Watershed Program (see below). One of the focal points of this program involves intensive monitoring to answer the following questions: 1) Is increased implementation of conservation practices (BMP) in the pilot watersheds effective in improving natural resource quality?, and 2) What level of BMP implementation is needed to achieve a "significant" improvement in stream quality?

To address these questions, a biological and water quality assessment program has been designed using a *paired watershed* approach (Stewart-Oaten et al. 1992) for Court Creek as well as the other pilot watersheds. In each pilot watershed basin, "treatments" (i.e., best management practices including CREP) will be applied to a single watershed (e.g., Court Creek) at an elevated intensity. The pilot watershed is then paired with a reference watershed (e.g., Haw Creek in the Spoon River basin) which is similar in size, location, land cover, and physical and biological attributes, and where BMPs will be applied at an ambient intensity. Identical monitoring protocols for a variety of parameters are then conducted at upstream and downstream sampling locations within each watershed.

1. Analytical Procedures

The pilot (e.g. experimental) and reference watersheds are divided into an upper and lower part. A monitoring site is located at the downstream end of the upper (P_U = pilot upper; R_U = reference upper) and lower (P_L = pilot lower; R_L = reference lower) subwatersheds, where a suite of biological, habitat, hydrological and water quality data are collected. To assess the effects of BMPs in the upper portion of the pilot watershed we calculate, for any parameter of interest (e.g., the number of fish species), the difference between the pilot and reference watershed ($d_U = P_U - R_U$) prior to the start of intensive BMP implementation within the pilot watershed. This establishes the baseline or typical difference between the upper portions of the two watersheds for that parameter of interest. Then, during the period following the intensive implementation of BMPs, test for a significant change in d_U for each parameter being monitored. This comparison is likewise repeated for the lower watershed monitoring sites.

2. Assessment Protocols

(a) Biological and Stream Habitat Assessments

Several stream components will be investigated including fish, macroinvertebrates, and instream and riparian habitat. These components will be sampled at study reaches approximately 20 bankfull widths of channel in length (Lyons 1992).

(1) Fish

The basic fish sampling methodology is one pass through each stream reach with electric seine. Sampling frequency is once per year (generally a low-water summer sample). Response variables are: species abundance, individual growth (from scale samples), assemblage composition and structure, multimetric indicies of biological integrity (IBI).

(2) Benthic Macroinvertebrates

Methodology includes sampling all major habitats sampled (riffle, run/pool, wood) using a combination of core and Hess samplers dependent upon habitat in the stream reach. Colonization of artificial substrates will also be examined. Reaches will be sampled using stratified random sampling (quantitative). Sample frequency is three times/year (early spring, early summer, late summer). Response variables include species abundance, assemblage composition and structure, indicies of biological integrity (single and multimetric).

(3) Habitat assessment

Instream and riparian habitat conditions will be evaluated following a modified version of the Stanfield method (Stanfield et al., 1998). Habitat parameters will be measured along ten equally spaced transects/reach. Sample frequency is once/year, concurrent with the fish sampling. Response variables include stream morphology (e.g., % riffle, water depth, channel width, depth heterogeneity, channel slope), stream bottom characteristics (e.g., composition, amount of wood, shading) and bank and riparian zone characteristics (e.g., bank vegetation, bank stability, riparian vegetation).

(b) Hydrology and Water Quality Assessment

Additional studies in the CREP area will monitor changes in sediment and nutrient yields and hydrology associated with changes in land use associated with CREP. Monitoring stations with a

continuous streamgage recorder and automatic water sampler will be installed at the lower subwatershed sampling site in each pilot and reference watershed. For the Spoon River study basin an additional monitoring station is also planned for the upper pilot subwatershed sample station in Court Creek. At the Jim Edgar-Panther Creek Fish and Wildlife Area study basin, monitoring stations will be located in the lower subwatersheds of the pilot watershed (Panther Creek) and reference watershed (Cox Creek). Each monitoring station will provide the following hydrologic data:

- continuous water level, instantaneous streamflow,
- discharge measurement during the initial study phase to establish rating curves for each station,
- calculate continuous streamflow.

Water quality data will include: Nutrient Concentration (mass per unit volume)

- Nitrate-N, Ammonia, and ortho-Phosphate, based on automatic single point samples, collected weekly as well as during storm events and manual cross-section, integrated samples collected every eight weeks
- Nitrite-N, total Kjeldahl Nitrogen, total Phosphorus, and total dissolved Phosphorus based on manual cross-section, integrated samples collected every eight weeks

Suspended Sediment Concentration:

- automatic, single point samples collected daily and more frequently during high flow conditions
- manual, depth and width integrated samples from the stream cross-section every eight weeks
- manual, depth integrate samples during all monitoring station visits to verify the adequacy of samples from the automatic water sampler.

(c) Data Calculations/Analyses

- Daily Streamflow and Sediment Load
- Weekly Nutrient Loads
- Peak flows, flood volumes, sediment and nutrient loads during floods
- Annual and seasonal sediment and nutrient loads for the pilot and reference watersheds

(d) Modeling

Despite the intensive monitoring efforts underway in the Illinois River CREP area, it is recognized that all streams and uplands cannot be monitored. Therefore, in areas where monitoring is limited, simulations or models are being used to assess the potential effectiveness of CREP. One component outlined in the CREP proposal includes sediment. However, sediment is influenced by other factors, including movement of water across the land and stream channels. The two models being developed to address these issues are focused on the Court Creek Watershed, within the Spoon River Basin. Intensive monitoring for both sediment and hydrology began in 1999 and both parameters have been highlighted as issues of concern by the Court Creek Watershed Planning Committee.

The hydrology model (Borah et al. Illinois State Water Survey) functions by dividing the Court Creek watershed into discrete units (overlands) and stream channel units. This model uses physically-based equations to simulate movement of water as well as transport of sediment and agricultural chemicals. Initial verification of the model has been made using data collected in a previous study of this watershed. The on-going hydrologic and nutrient data collection effort will be used to further validate and calibrate the model. Incorporation of a streambank erosion component is anticipated in future versions.

In a second modeling project, areas of erosion and sediment deposition are identified using a variety of approaches including USLE/RUSLE and more complicated models such as USPED (Unit Stream Power Based Erosion Deposition) and SIMWE

(Simulation of Water Erosion). Refinement of the model will be done using higher resolution Digital Elevation Models (DEM's). These models can be reviewed at the following web-address: www2.gis.uiuc.edu:2280/modviz/courtcreek/cc.html

Because these models independently address related features of the watershed (flow and sediment) it will be important to the overall CREP assessment to consider the interrelationship of these parameters. Therefore, the next procedure, now underway, is to merge the two models. This will allow evaluation of both sediment and flow, so that practices can be applied which will address the issue of concern.

B. Utilization of Extant Data: other data collections efforts within the CREP area

Additional data collection efforts and scientific studies, not directly related to CREP, have or are currently being conducted in the Illinois River basin by the Illinois Department of Natural Resources and other state and federal agencies (Table 1). The following data sets have been identified to date as potential sources of baseline or supplemental data on the status of silt and sediment loading, nutrient yield, and natural resources (waterfowl, non-game birds, threatened or endangered species, and native fish and mussel stocks) within the Illinois River basin. Locations of these sampling sites are shown on the following pages:

Table 1. Agencies and programs that include data collection that is relevant to the assessment of the objective of the Illinois CREP.

Agency	**Project or Program**
Illinois Environmental Protection Agency	(1) Ambient Water Quality Monitoring Network (2) Intensive River Basin Surveys
Illinois Natural History Survey (INHS) w/USGS	Long Term Resource Monitoring Program (LTRMP) for the Upper Mississippi River System
Illinois Dept. Natural Resources	(1) Aerial censuses of waterfowl (2) Basin surveys of stream fisheries (3) EcoWatch volunteer stream monitoring program (Riverwatch, Prairie watch, Forest Watch)
Illinois Natural History Survey	Long-term Illinois River electrofishing data set Statewide Critical Trends Assessment Program (CTAP)
Illinois State Water Survey	Water and Atmospheric Resources Monitoring Program (WARM)
U.S. Geological Survey (USGS)	(1) National Water-Quality Assessment Program (NAWQA) for the Upper Illinois and Lower Illinois River Basins (2) Stream Gaging Network (3) National Stream Quality Accounting Network (NASQAN)

C. Tracking conservation practices within CREP

In order to differentiate between the effects of CREP and that of the many other conservation practices and land use changes constantly occurring in the Illinois River basin, it has been proposed that the responsible agencies develop a GIS-based conservation practices tracking system. This system would track the precise location, type, extent, and duration of conservation practices funded by CREP, as well as other state and federal incentive programs. Federal programs proposed for inclusion besides CREP are CRP, EQIP, WHIP, WRP. State programs include the IDNR Conservation 2000 Ecosystem program, IDOA Conservation Practices Cost-Share Program (CCP), IDOA Streambank Stabilization and Restoration Program (SSRP), and IEPA Nonpoint Source Management Program (Section 319). In addition to providing the basis for the CREP assessment, this system would provide invaluable support for conservation planning, watershed restoration, landuse modeling, and other land management planning exercises.

An interagency committee with representatives from the USDA-Farm Service Agency, USDA-Natural Resources Conservation Service, Illinois Dept. of Agriculture, Illinois Dept. of Natural Resources, and the Illinois Environmental Protection Agency has began initial exploration of the development of this tracking system. CREP practices (state and federal contracts) are currently tracked at the section (1 mi^2) level. Streambank stabilization activities (primarily IDNR Ecosystem Program grants and IDOA SSRP projects) are tracked through a similar database but this system also includes characteristics that provide for assessment of the efficacy of the practice (e.g., current status of structure).

Unfortunately, the tracking system is currently being stymied by access to more specific data from federal contracts due to the USDA interpretation of the Privacy Act and Freedom of Information Act. State CREP contracts are public information and contract language permits access to property where practices have been implemented. The current USDA interpretation considers federal contracts as private and, therefore, provides no access to this information. It is hoped that we can develop a mutually acceptable agreement that will allow access to this information for purposes of CREP assessment but yet protect sensitive information in order to maintain appropriate privacy for landowners.

III. Preliminary Reporting by Goal

A. Goal 1: Reduce the amount of silt and sedimentation entering the mainstem of the Illinois River by 20 percent, and

B. Goal 2: Reduce the amount of phosphorus and nitrogen in the Illinois River by 10 percent.

Data used to address these goals will be through the Pilot Watershed program and through analysis of extant data sets as described above. However, it should be recognized that a wide variety of influences act upon the water quality and sediment load of the Illinois River. Urban development and other land use changes, sewage and industrial discharges from urban centers, stream channel modifications, application of nutrients for agricultural production, aberrant weather systems, and many other factors all will contribute to the conditions. At the same time, other restoration activities such as regular Conservation Reserve Program, EPA Section 319 programs, improved tillage systems, precision agriculture and many other activities will have a positive impact upon the system. Delineating the effects of CREP through direct

measurements on the main channel of the Illinois River will, indeed, be difficult, if not impossible, given this wide set of possible influences.

Table 2. The sediment load contributed by tributaries to the Illinois River varies significantly (data from DeMissie et al. 1992; with total basin size estimates revised using USEPA's River Reach File 3 database (RF3) coverages for Illinois):

Basin	Total Basin Size (mi^2)	Annual Discharge (1000 cfs)	Sediment Yield (1000 tons/yr)	Sediment Contribution (tons/mi^2)	Area within CREP boundary (mi^2)	River Miles in CREP Area (RF3 data)
Fox	2,658	837.5	552.6	208	1,096	1,143
Kankakee	5,165	2,105.9	872.8	169	2,148	2,273
Vermilion	1,321	407.2	932.0	706	1,321	1,390
Mackinaw	1,138	329.8	834.7	733	1,138	1,319
Spoon	1,845	504.3	2,729.3	1,479	1,845	2,393
Sangamon	5,272	1,492.0	1,551.7	294	344	468
La Moine	1,336	381.4	1,371.2	1,026	1,336	1,714

Other	10,171				3,725	4,700
Illinois River at Valley City	26,564	9,073.7	5,648.8	213		

Table 3. Acres of the Illinois River Watershed Potentially Eligible for Enrollment in CREP. Using the extent of the 100-year floodplain as an approximation of the total acres of land eligible for enrollment in the CREP program, the following is a summary by basin of land eligible for enrollment. Note that the floodplain acreage includes only those streams and rivers for which the 100-year floodplain has been defined.

Basin	Total Basin Area within CREP boundary (acres)	Basin 100-yr. Floodplainwithin CREP boundary (acres)
Fox	701,440	33,920
Kankakee	1,374,720	93,440
Vermilion	845,440	62,720
Mackinaw	728,320	47,360
Spoon	1,180,800	69,120
Sangamon	220,160	34,560
La Moine	855,040	48,640
Other tributaries combined:		
Upper Illinois	1,078,400	98,560
Middle Illinois	1,050,880	142,720
Lower Illinois	254,080	33,280
TOTAL	8,289,280	664,320

C. Goal 3: Increase in the Illinois River watershed by 15 percent the populations of waterfowl, shorebirds, nongame grassland birds, and state and federally listed threatened and endangered species such as bald eagles, egrets, herons.

1. Waterfowl and Shorebirds:

The single greatest contribution the Illinois River Watershed makes to waterfowl and shorebird populations is as a stopover site for migrating birds during fall and spring migrations. Potentially large numbers of waterfowl and shorebird species are dependent upon resting and feeding sites in Illinois, but do not nest in Illinois. Therefore, in addressing waterfowl and shorebird populations with respect to CREP, we will be referring to the migratory populations of these bird species.

The number of migrating waterfowl and shorebirds present in Illinois during the course of one migratory season is extremely variable. For example, five year averages of peak fall migrations of all ducks in the Illinois River Basin range from 373,744 (1993-1996) to 1,520,569 (1953-1957) (Havera 1999). The numbers of these migratory birds seen in Illinois each year are a result of the interaction between

continental population sizes and the migration schedule and pattern in any given year, both of which are influenced by multiple factors. Breeding success at sites north of Illinois, food conditions on the wintering grounds south of Illinois, weather conditions and patterns north (in the fall) and south (in the spring) of Illinois, and simultaneous weather conditions in Illinois influence the number of birds stopping in the state in any given year.

The great magnitude of continental population fluctuations, due primarily to factors external to Illinois, largely masks the contribution the state makes to the condition and status of migratory populations. Nevertheless, Illinois resources are important for these birds. If weather conditions encourage migrating birds to stop in Illinois, the feeding sites available here will determine whether or not they actually stop, and for how long. Furthermore, the quality, quantity and distribution of feeding sites in Illinois will impact the condition of the birds as they continue their migration. Abundant Illinois food resources can help maintain good condition in migratory waterfowl and shorebirds, and the condition of birds entering the breeding season in turn influences their success, and ultimately the number of birds produced that season.

Given the complex nature of population and migration patterns in these birds, directly measuring Illinois' contribution to migratory populations is unrealistic. The most logistically feasible and biologically meaningful approach is to focus on available habitat for migratory waterfowl and shorebirds. CREP has the potential to significantly increase wetland habitat, much of which could be important to migrating waterfowl and shorebirds. By quantifying changes in the amount, quality, and configuration of important migratory waterfowl and shorebird habitat within the basin, we can indirectly monitor the program's impact on populations of these birds.

2. Nongame Grassland Birds:

Many Midwestern nongame and game grassland birds have experienced population declines in the past several decades (Herkert 1995). Habitat loss and fragmentation are top among the factors implicated in these declines. CREP acres enrolled in practices that create grassland or grassland-like habitat could benefit these species. However, the same qualifications that apply to wetlands apply here. The size, quality and distribution of grassland patches created will determine their impact on grassland bird species.

As with most wide-ranging and especially migratory wildlife species, it is logistically impractical to try to measure direct grassland bird population response to habitat changes. However, models exist that allow us to predict species response to habitat, so our approach with grassland species will also be to document changes in available habitat due to CREP.

Most grassland practices will be implemented on highly erodible land in the uplands, although some grass will be put in filter strips and other practices in the floodplain. The upland acreage erodible land) allowed under CREP is currently limited to 15,000, and enrollments in this category are very low thus far. Grassland practices will have the most positive impact on grassland bird species in general if they are placed near other grasslands and distant from trees, creating a complex that can support a variety of species. However, if the number of enrolled acres remains low, it will be difficult to predict any marked increase in grassland bird populations.

3. Threatened and Endangered Species

There are records of occurrences of 28 faunal threatened or endangered), and occurrences of 31 threatened or endangered plant species within the CREP 100-year floodplain (Table 4). In the entire land area within the CREP boundary there are 27 faunal occurrences and 85 plant occurrences (Table 5). It should be noted that after a recent revision to the list of Illinois threatened and endangered species, there are no longer any egrets on the list (IESPB 1999).

Because the vast majority of acres enrolled in CREP are in the floodplain, we are focusing on species

that have also been known to occur there (Table 4). The habitat preferences of the faunal species on this list (Table 6) suggest that an increase in wetland and/or wooded riparian habitat could have a positive impact on many of the species. Because by definition these species populations are small and often difficult to locate, estimates of numbers of individuals do not exist, and it would be difficult to demonstrate a 15% increase in population. However, as with waterfowl, shorebirds, and grassland birds, it is possible to evaluate an increase in potential preferred habitat for these species. Some of these listed species require wetlands of a certain minimum size, so once again, it is critical to map the locations of enrolled acres, especially relative to existing wetlands. It is also important to monitor the practices implemented and how the acres are managed over time.

4. Monitoring Approach

To accurately determine the program's impact on wetland birds (migratory waterfowl and shorebirds), appropriate listed faunal species, and grassland birds, documenting amount of newly created habitat is not adequate. It is critical to map, classify, and monitor newly-created habitat. Mapping should be done with reference to existing wetland and grassland sites, some of which may have to be mapped as well. Our proposed methodology in this endeavor is elucidated below. Because most of the work involves developing new data sets, the proposal is subject to revision in response to any obstacles that might hinder data collection.

First, all available information on wetland and grassland habitat in the watershed prior to the initiation of CREP should be compiled. The Wetlands Inventory (USFWS and IDNR 1988) is a reasonable representation of wetlands that existed in the watershed in the 1980's, and the Landcover Database of Illinois (Luman et al. 1996) lends insight to what wetlands and grasslands existed in the early 1990's. These data sets and any others we identify will be examined and their limitations and usefulness for the project assessed.

Second, wetlands and grasslands created under CREP will be mapped in order to evaluate their importance. Large habitat complexes are more important to most of the wildlife species we are targeting than small, isolated habitat patches. A given amount of habitat acreage could be of minimal value to target species if it exists in highly isolated small patches. Alternatively, the same acreage, even if in small patches, could be of significant value if the patches are placed near existing similar habitat. Wetlands and grasslands not enrolled in CREP should also be mapped if they appear to not be in existing databases such as the Wetlands Inventory or Landcover Database.

Third, wetlands created under CREP will be classified according to their features that are important for the species of interest. Under the CP23 practice (wetland restoration), many different technical practices exist, some of which would clearly benefit waterfowl, shorebird and listed species, others which would not.

Fourth, the long-term maintenance and management of restored wetlands and grassland habitat will be documented. Prime feeding habitat for many waterfowl and shorebird species requires gradual exposure of mudflats, allowing moist-soil plant production and good access to the food produced. Some restored wetlands may naturally flood in a regime that produces excellent waterfowl habitat, but others may require active management if migratory wetland bird habitat is a central goal to be achieved. Grassland habitat also needs to be managed to discourage woody growth, which is considered hostile to grassland bird species (Herkert et al. 1996).

Table 4. Threatened or endangered species occurring in the 100-yr floodplain of the CREP area, excluding the LaMoine watershed (data from IDNR 1999 and ISWS 1996). Note that this floodplain delineation does not include many of the smaller streams and, therefore, may not be a complete list of all species in these categories. Status codes are as follows: ST = State Threatened; SE = State Endangered; FT = Federally Threatened; FE = Federally Endangered

FAUNA:

Scientific Name	Common Name	Status	# of Occurrences
Pseudacris streckeri illinoensis	Illinois Chorus Frog	ST	1
Kinosternon flavescens	Illinois Mud Turtle	SE	1
Podilymbus podiceps	Pied-billed Grebe	ST	6
Ixobrychus exilis	Least Bittern	ST	1
Nycticorax nycticorax	Black-crowned Night-heron	SE	2
Haliaeetus leucocephalus	Bald Eagle	ST, FT	12
Buteo lineatus	Red-shouldered Hawk	ST	1
Gallinula chloropus	Common Moorhen	ST	1
Grus canadensis	Sandhill Crane	ST	2
Chlidonias niger	Black Tern	SE	1
Certhia americana	Brown Creeper	ST	4
Thryomanes bewickii	Bewick's Wren	SE	1
Xanthocephalus xanthocephalus	Yellow-headed Blackbird	SE	2
Myotis sodalis	Indiana Bat	SE, FE	2
Lontra canadensis	River Otter	ST	3
Ichthyomyzon fossor	Northern Brook Lamprey	SE	2
Acipenser fulvescens	Lake Sturgeon	SE	1
Hybopsis amnis	Pallid Shiner	SE	1
Notropis chalybaeus	Ironcolor Shiner	ST	9
Notropis texanus	Weed Shiner	SE	3
Moxostoma carinatum	River Redhorse	ST	11
Moxostoma valenciennesi	Greater Redhorse	SE	7
Lepomis miniatus	Redspotted Sunfish	ST	3
Ammocrypta clara	Western Sand Darter	SE	1
Alasmidonta viridis	Slippershell Mussel	ST	12
Elliptio dilatata	Spike	ST	8

Scientific Name	Common Name	Status	# of Occurrences
Plethobasus cyphyus	Sheepnose Mussel	SE	4
Villosa iris	Rainbow Mussel	SE	3

FLORA:

Scientific Name	Common Name	Status	# of Occurences
Aster furcatus	Forked Aster	ST	2
Boltonia decurrens	Decurrent False Aster	ST, FT	26
Arenaria patula	Slender Sandwort	ST	1
Stylisma pickeringii	Patterson Bindweed	SE	1
Sambucus pubens	Red-berried Elder	SE	1
Symphoricarpos albus var albus	Snowberry	SE	2
Utricularia intermedia	Flatleaf Bladderwort	SE	1
Iliamna remota	Kankakee Mallow	SE	1
Malvastrum hispidum	False Mallow	SE	1
Amelanchier sanguinea	Shadbush	SE	2
Filipendula rubra	Queen-of-the-prairie	SE	3
Tomanthera auriculata	Earleaf Foxglove	ST	1
Mimulus glabratus	Yellow Monkeyflower	SE	3
Veronica scutellata	Marsh-speedwell	ST	1
Styrax americana	Storax	SE	2
Valerianella umbilicata	Corn Salad	SE	1
Thuja occidentalis	Arbor Vitae	ST	2
Carex aurea	Golden Sedge	SE	1
Carex communis	Fibrous-rooted Sedge	ST	1
Carex cryptolepis	Sedge	SE	1
Carex viridula	Little Green Sedge	ST	1
Cyperus grayioides	Gray's Umbrella Sedge	ST	1
Eleocharis rostellata	Beaked Spike Rush	ST	1
Scirpus hallii	Hall's Bulrush	ST	3
Triglochin maritima	Arrow-grass	ST	1
Triglochin palustris	Arrow-grass	ST	1

Scientific Name	Common Name	Status	# of Occurences
Cypripedium candidum	White Lady's-slipper Orchid	ST	1
Cypripedium reginae	Showy Lady's-slipper Orchid	SE	1
Platanthera flava var herbiola	Tubercled Orchid	SE	1
Spiranthes lucida	Yellow-lipped Ladies' Tresses	SE	1
Isoetes butleri	Quillwort	SE	1

Table 5. Threatened or endangered species occurring in the entire CREP area, excluding the LaMoine watershed (data from IDNR 1999 and ISWS 1999)

FAUNA (not including fish or invertebrates):

Scientific Name	Common Name	Status	# of Occurrences
Podilymbus podiceps	Pied-billed Grebe	ST	14
Botaurus lentiginosus	American Bittern	SE	2
Ixobrychus exilis	Least Bittern	ST	4
Nycticorax nycticorax	Black-crowned Night-heron	SE	5
Haliaeetus leucocephalus	Bald Eagle	ST,FT	15
Buteo lineatus	Red-shouldered Hawk	ST	2
Buteo swainsoni	Swainson's Hawk	SE	1
Rallus elegans	King Rail	SE	2
Gallinula chloropus	Common Moorhen	ST	7
Grus canadensis	Sandhill Crane	ST	5
Bartramia longicauda	Upland Sandpiper	SE	12
Chlidonias niger	Black Tern	SE	2
Asio flammeus	Short-eared Owl	SE	2
Certhia americana	Brown Creeper	ST	5
Thryomanes bewickii	Bewick's Wren	SE	1
Lanius ludovicianus	Loggerhead Shrike	ST	17
Ammodramus henslowii	Henslow's Sparrow	SE	6
Xanthocephalus xanthocephalus	Yellow-headed Blackbird	SE	8
Myotis sodalis	Indiana Bat	SE,FE	5
Lontra canadensis	River Otter	ST	7
Hemidactylium scutatum	Four-toed Salamander	ST	1

Scientific Name	Common Name	Status	# of Occurrences
Pseudacris streckeri illinoensis	Illinois Chorus Frog	SE	17
Kinosternon flavescens	Illinois Mud Turtle	SE	8
Clonophis kirtlandii	Kirtland's Snake	ST	2
Heterodon nasicus	Western Hognose Snake	ST	4
Crotalus horridus	Timber Rattlesnake	ST	1
Sistrurus catenatus catenatus	Eastern Massasauga	SE	2

FLORA:

Scientific Name	Common Name	Status	# of Occurences
Asclepias meadii	Mead's Milkweed	SE, FT	1
Asclepias lanuginosa	Woolly Milkweed	SE	2
Aster furcatus	Forked Aster	ST	6
Boltonia decurrens	Decurrent False Aster	ST, FT	35
Cirsium hillii	Hill's Thistle	ST	18
Liatris scariosa var nieuwlandii	Blazing Star	ST	2
Microseris cuspidata	Prairie Dandelion	SE	2
Solidago sciaphila	Cliff Goldenrod	ST	1
Hymenoxys herbacea	Lakeside Daisy	SE, FT	1
Lesquerella ludoviciana	Silvery Bladder Pod	SE	1
Arenaria patula	Slender Sandwort	ST	1
Hypericum adpressum	Shore St. John's Wort	SE	3
Stylisma pickeringii	Patterson Bindweed	SE	4
Cornus canadensis	Bunchberry	SE	1
Sambucus pubens	Red-berried Elder	SE	3
Symphoricarpos albus var albus	Snowberry	SE	2
Viburnum molle	Arrowwood	ST	3
Drosera intermedia	Narrow-leaved Sundew	ST	3
Vaccinium macrocarpon	Large Cranberry	SE	1
Astragalus tennesseensis	Tennessee Milk-vetch	SE	1
Trifolium reflexum	Buffalo Clover	SE	3
Corydalis aurea	Golden Corydalis	SE	1
Utricularia intermedia	Flatleaf Bladderwort	SE	1

Scientific Name	Common Name	Status	# of Occurences
Iliamna remota	Kankakee Mallow	SE	1
Malvastrum hispidum	False Mallow	SE	1
Comptonia peregrina	Sweet-fern	SE	1
Orobanche fasciculata	Clustered Broomrape	SE	1
Orobanche ludoviciana	Broomrape	ST	3
Polygala incarnata	Pink Milkwort	SE	4
Polygonum careyi	Carey's Smartweed	SE	1
Plantago cordata	Heart-leaved Plantain	SE	3
Cimicifuga racemosa	Black Cohosh	SE	1
Rhamnus alnifolia	Alder Buckthorn	SE	1
Amelanchier sanguinea	Shadbush	SE	2
Filipendula rubra	Queen-of-the-prairie	SE	3
Rubus setosus	Bristly Blackberry	SE	4
Sanguisorba canadensis	American Burnet	SE	1
Galium labradoricum	Bog Bedstraw	ST	1
Agalinis skinneriana	Pale False Foxglove	ST	5
Tomanthera auriculata	Earleaf Foxglove	ST	5
Besseya bullii	Kitten Tails	ST	3
Mimulus glabratus	Yellow Monkeyflower	SE	3
Veronica americana	American Brookline	SE	3
Veronica scutellata	Marsh-speedwell	ST	2
Styrax americana	Storax	SE	2
Ulmus thomasii	Rock Elm	SE	1
Valerianella umbilicata	Corn Salad	SE	1
Viola primulifolia	Primrose-leaf Violet	SE	3
Thuja occidentalis	Arbor Vitae	ST	8
Pinus resinosa	Red Pine	SE	1
Echinodorus tenellus	Small Burhead	SE	3
Tradescantia bracteata	Prairie Spiderwort	ST	3
Carex aurea	Golden Sedge	SE	1
Carex communis	Fibrous-rooted Sedge	ST	3

Scientific Name	Common Name	Status	# of Occurences
Carex cryptolepis	Sedge	SE	1
Carex viridula	Little Green Sedge	ST	1
Carex woodii	Pretty Sedge	ST	1
Cyperus grayioides	Gray's Umbrella Sedge	ST	9
Eleocharis rostellata	Beaked Spike Rush	ST	1
Fimbristylis vahlii	Vahl's Fimbristylis	SE	3
Scirpus hallii	Hall's Bulrush	ST	21
Scirpus purshianus	Weak Bulrush	SE	2
Scirpus paludosus	Alkali Bulrush	SE	1
Sisyrinchium atlanticum	Blue-eyed Grass	SE	3
Triglochin maritimum	Arrow-grass	ST	1
Triglochin palustris	Arrow-grass	ST	2
Luzula acuminata	Wood Rush	SE	1
Melanthium virginicum	Bunch-flower	ST	6
Tofieldia glutinosa	False Asphodel	ST	1
Calopogon tuberosus	Grass Pink Orchid	SE	3
Corallorhiza maculata	Spotted Coral-root Orchid	ST	1
Cypripedium candidum	White Lady's-slipper Orchid	ST	4
Cypripedium reginae	Showy Lady's-slipper Orchid	SE	2
Platanthera clavellata	Wood Orchid	SE	1
Platanthera flava var herbiola	Tubercled Orchid	SE	5
Platanthera leucophaea	White Fringed Orchid	SE, FT	2
Spiranthes lucida	Yellow-lipped Ladies' Tresses	SE	1
Dichanthelium columbianum	Panic Grass	SE	1
Poa languida	Woodland Bluegrass	SE	1
Poa wolfii	Meadow Bluegrass	SE	2
Potamogeton pulcher	Pondweed	SE	1
Sparganium americanum	Bur-reed	SE	3
Sparganium chlorocarpum	Greenfruited Bur-reed	SE	1
Isoetes butleri	Quillwort	SE	1
Lycopodium clavatum	Common Clubmoss	SE	1
Lycopodium dendroideum	Ground Pine	SE	2

Scientific Name	Common Name	Status	# of Occurences
Thelypteris phegopteris	Long Beech Fern	SE	1

Table 6. Habitat needs of faunal threatened or endangered species known to occur in the CREP 100-year floodplain, excluding the LaMoine watershed (data from IDNR 1999 and ISWS 1999).

Species Common Name	General Habitat Needs	Specific Habitat Needs
Illinois Chorus Frog	prairie, wetland	open sandy areas of river lowlands
Pied-billed Grebe	wetland, aquatic	fairly large, well vegetated lakes, ponds, sluggish streams, and marshes
Least Bittern	wetland	shallow freshwater lakes and marshes
Black-crowned Night-heron	wetland, forest, aquatic	bottomland forest
Bald Eagle	forest, wetland, aquatic	undisturbed areas near large rivers and lakes
Red-shouldered Hawk	forest, wetland	moist and riparian forests including wooded swamps
Common Moorhen	wetland, aquatic	freshwater marshes, canals, quiet rivers, lakes and ponds with emergent aquatic vegetation
Sandhill Crane	wetland, prairie	large undisturbed freshwater marshes and prairie ponds
Black Tern	wetland, aquatic	freshwater marshes and shallow ponds and lakes
Brown Creeper	forest, wetland	deciduous and mixed woodlands, cypress swamps and floodplain forests
Bewick's Wren	forest, savanna	thickets, brushy areas, hedgerows and thickets in farming country, and open and riparian woodlands
Yellow-headed Blackbird	wetland	moderately dense stand of cattails and bulrushes with interspersed open water for nesting
Indiana Bat	forest, wetland, aquatic, cave	winter habitat, caves and mines, summer habitat includes a variety of wooded and riparian settings
River Otter	forest, aquatic	riparian habitat with extensive woodlands, good water quality, and the presence of suitable den sites and open water in winter
Illinois Mud Turtle	prairie, savanna, wetland, aquatic	sand areas that are interspersed with semi-permanent or permanent ponds and sloughs

D. Goal 4: Increase the native fish and mussel stocks by 10% in the lower reaches of the Illinois River (Peoria, LaGrange, and Alton Reaches).

Both excessive sediment and nutrients within the Illinois River basin and the Illinois River and its backwaters have been identified as deleterious to aquatic life. Through installation of best management practices in the small watersheds, it is anticipated that corresponding improvements will be transferred to receiving waters, including the Illinois River. The assessment efforts in the uplands are being addressed through the establishment of the paired watershed (Court Creek and Haw Creek) discussed earlier in this report (Dodd et al. 1999).

Assessment for this goal is obtained through two sampling programs on the Illinois River. The Illinois River Long-Term Electrofishing program was initiated in 1957 by Dr. William Starrett of the IDNR-Illinois Natural History Survey and encompasses annual surveys at a total of 20 stations located from Starved Rock Dam (River Mile 231) to the mouth of the Illinois River (Koel and Sparks 1999). The second data collection effort is the USGS Long-Term Resource Monitoring Program (LTRMP) includes fish, water quality and vegetation with approximately 500 fish samples collected annually in the 79 mile LaGrange Pool (Burkhardt, et al. 1998).

The Illinois River mainstem and contiguous backwaters are biologically and hydrologically dynamic. This river is also a major waterway for commerce, receiving heavy use by barges. Thus, this system is complex and is influenced by numerous factors beyond the mainstem. Further, the interconnectedness of this riverine system allows for the movement of fishes and other biota, among rivers and to headwater streams. Fish can move great distances throughout a year and habitat use may be dependent upon season, water conditions and other factors. The complex life-history of mussels and their reliance upon fish as hosts for their young contributes to the difficulty of evaluating the association of implementation of best management practices on the fish and mussel populations in the Illinois River mainstem.

IV. Summary and Conclusions

This initial report outlines, in very general terms, the primary assessment efforts for the Illinois River Conservation Reserve Enhancement Program. Due to the recent initiation of the monitoring as well as the young nature of the Illinois CREP it is premature to report any data or findings in this report. Over the course of the next several years, the researchers and agency staff involved in the assessment efforts will be continuing their efforts and the findings will be detailed in subsequent annual reports. However, as suggested earlier in this report, the high variance and delayed response times associated with many of the parameters being measured may prevent early indications of response. Therefore, it is strongly suggested that monitoring continue throughout the implementation phase of CREP and for several years afterwards. In addition, we will continue to utilize extant and new data collection efforts to better understand the impacts of CREP and to assist in the continual refinement of CREP.

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