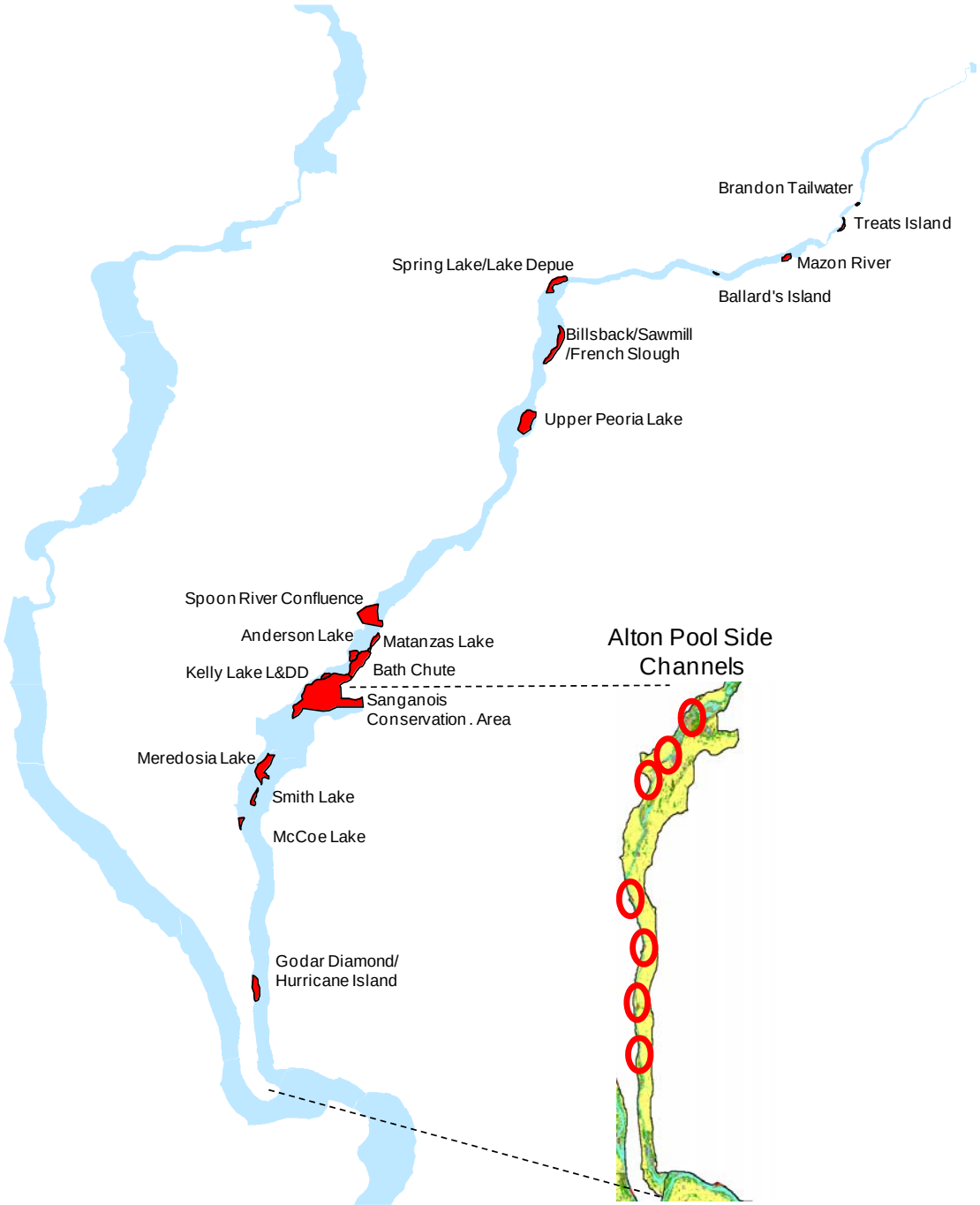
UPPER MISSISSIPPI RIVER SYSTEM
ECOSYSTEM RESTORATION OBJECTIVES 2009

APPENDIX D

ILLINOIS RIVER REACH PLAN

Contents

Ecosystem Restoration Priority Subareas



I. Executive Summary

The Upper Mississippi River System (UMRS) Illinois River Floodplain Reach includes the entire Illinois Waterway from Lake Michigan, through connecting canals and rivers, to the Illinois River proper down to the Mississippi river (Figure D-1). There is an Upper and a Lower Illinois River Reach that are quite different because of their separate glacial origins. Dams and levee and drainage districts significantly alter regional hydro-geomorphology.

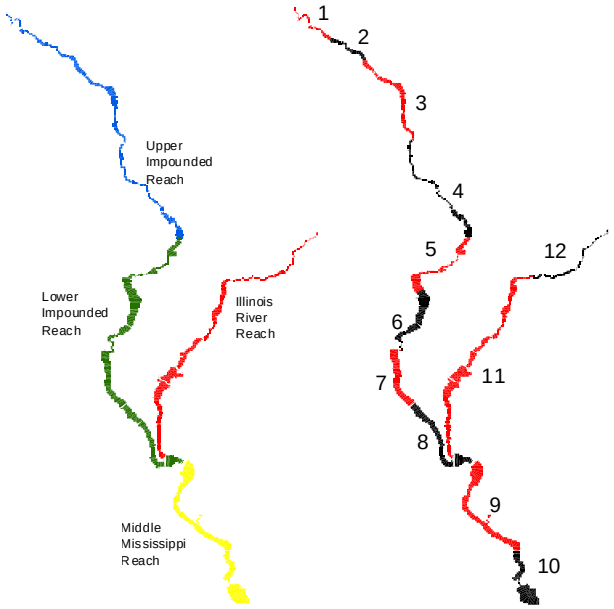


Figure D-1. Upper Mississippi River System Floodplain Reaches (left) and Geomorphic Reaches (right)

The Illinois River Work Group was the local coordinating team which met several times beginning in Spring 2009 to identify Unique Characteristics, Stressors, and Objectives for each geomorphic reach. Reach planning followed the top-down process recommended by the UMRS Navigation and Ecosystem Sustainability Program (NESP) Science Panel (SP) and outlined in the Reach Planning Workbook. Most regional team participants from state, Federal, and NGO agencies were participants in prior planning studies and had contributed site specific information during the 2000 Habitat Needs Assessment.

The UMRS Reach Planning process and system-wide results were summarized in the main report for this Appendix. Floodplain reach scale results are presented in this summary that includes priority ecosystem restoration subarea recommendations. Individual reaches, including unique characteristics, are described in separate sections to consider the relevant information at the right scale.

The Illinois River Reach Planning Team developed a single set of objectives for the entire Illinois Waterway (Table D-1). The objectives reflected the process and functions that interact to support their structural objectives that including plant and animal communities. The objectives are related to the UMRS ecosystem conceptual model and its set of Essential Ecosystem Characteristics: Geomorphology, Biogeochemistry, Hydrology, Habitat, and Biota that were recommended as fundamental drivers of large river processes (Figure D-2).

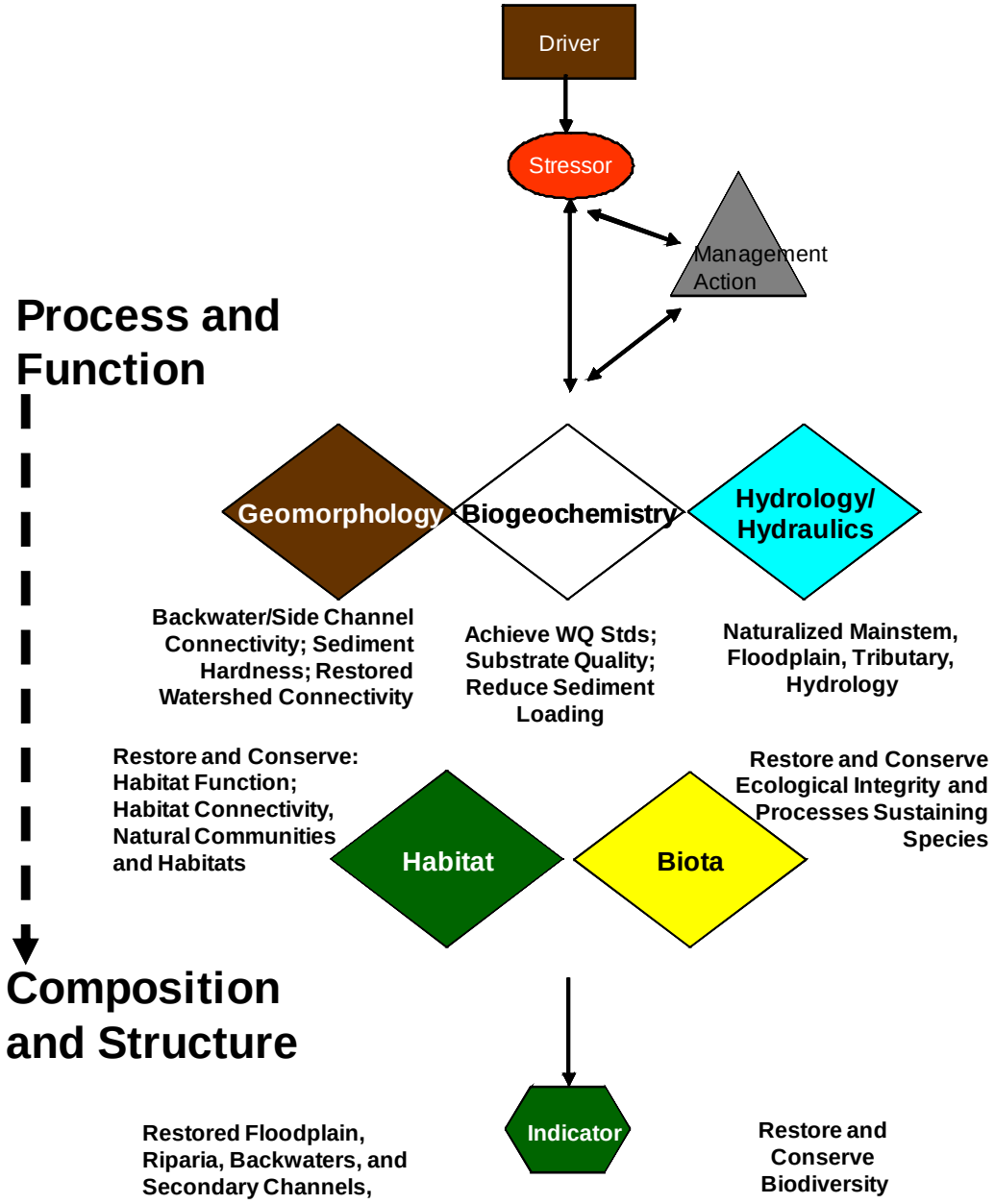


Figure D-2. UMRS ecosystem conceptual model helps organize process and function objectives that support structural habitat outcomes

Table D-1. Illinois River ecosystem restoration objectives

Geomorphology
Restore aquatic habitat diversity of side channels and backwaters, including Peoria Lakes, to provide adequate volume and depth for sustaining native fish and wildlife communities (Goal 2)
Restore and maintain side channel and island habitats (Goal 2b)
Maintain all existing connections between backwaters and the main channel (connections at the 50 percent exceedance flow duration; Goal 2b)
Compact sediments to improve substrate conditions for aquatic plants, fish, and wildlife (Goal 2e)
Hydrology/River Hydraulics
Naturalize Illinois River and tributary hydrologic regimes and conditions to restore aquatic and riparian habitat (Goal 5)
Water Quality
Improve water and sediment quality in the Illinois River and its watershed (Goal 6)
Reduce sediment delivery to the Illinois River from upland areas and tributary channels with the aim of eliminating excessive sediment load (Goal 1)
Eliminate excessive sediment delivery to specific high-value habitat both along the main stem and in tributary areas (Goal 1c)
Habitat
Improve floodplain, riparian, and aquatic habitats and functions (Goal 3)
Restore up to an additional 150,000 acres of isolated and connected floodplains along the Illinois River main stem to promote floodplain functions and habitats (Goal 3a)
Restore up to 150,000 acres of the Illinois River Basin large tributary floodplains (Goal 3a)
Restore and/or protect up to 1,000 additional stream miles of riparian habitats (Goal 3c)
Restore aquatic connectivity (fish passage) on the Illinois River and its tributaries, where appropriate, to restore or maintain healthy populations of native species (Goal 4)
Restore main stem to tributary connectivity, where appropriate, on major tributaries (Goal 4a).
Restore passage for large-river fish at Starved Rock, Marseilles, and Dresden Lock and Dams where appropriate (Goal 4c).
Biota
Restore and maintain ecological integrity, including habitats, communities, and populations of native species, and the processes that sustain them (Overarching Goal)
Restore and conserve natural habitat structure and function (Overarching Goal)

For the Illinois River the process of setting ecosystem objectives was completed in 2007 as part of the planning process undertaken to complete the Illinois River Basin Restoration Comprehensive Plan (Comprehensive Plan). The Comprehensive Plan presents the vision, goals, objectives, desired future, and identifies the preferred alternative plan to restore the ecological integrity of the Illinois River Basin System. The USACE (Rock Island, St. Louis, Chicago and Detroit Districts), Illinois Department of Natural Resources, and other agencies drafted the plan. The Comprehensive Plan identifies twenty-six ecosystem objectives to support seven system goals. The Comprehensive Plan addresses ecological problems at the Basin level; however several of the system goals and associated objectives address the critical nature of the floodplain and geomorphic reach levels of the Illinois River. These elements are clearly separable and able to satisfy the requirements of the many ecosystem restoration authorities which may be limited to the mainstem floodplain of the UMRS-IWW only.

With the Illinois River Basin Restoration Comprehensive Plan as the starting point, a group of resource managers with expertise in the Illinois River convened in January 2009 to evaluate the relationship between the established goals and objectives of the Illinois River Basin and the 42 system objectives developed for the system scale under NESP. The most important process and function objectives listed on the conceptual model influence composition and structure outcomes exhibited by desired habitats and animal populations.

Illinois River Subareas
Subareas are natural or culturally defined units that represent ecologically related management areas. They are the scale to be used for large ecosystem restoration project planning and may include many management actions. They may be recognized as individual levee districts, refuge or park boundaries, island-side channel complexes, or backwater lakes for example (Figure D-3). They may have familiar place names and local relevance to managers and the public.

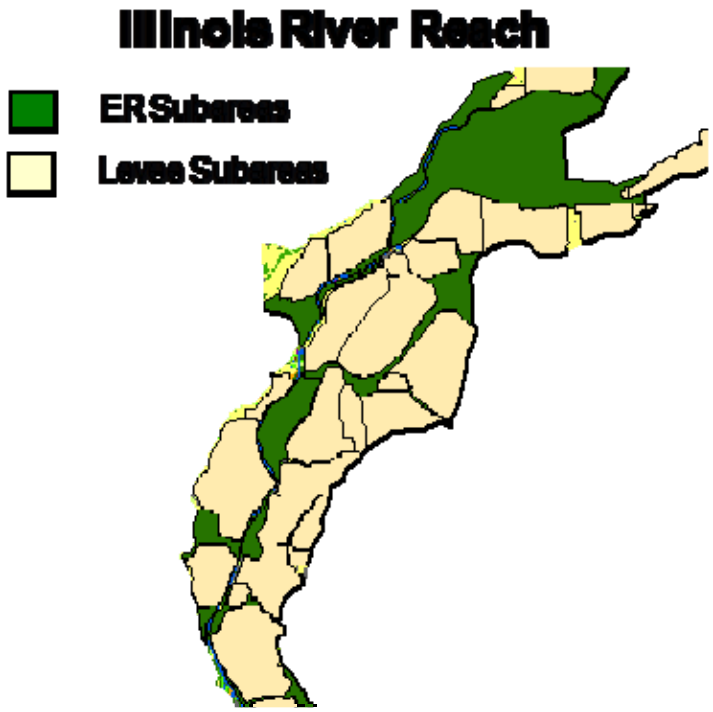


Figure D-3. Representative Illinois River Reach subareas.

There are 74 individual districts in the levee database. Most are smaller districts less than 1,000 acres. The number of units gets smaller as levee district size increases (Table D-2). The number of landowners typically increases in larger districts, which makes planning for floodplain restoration difficult. There is great interest in floodplain restoration, but the opportunities for large scale restoration are rare. They become a high priority when opportunities arise, and many public and private entities are participating in large scale restoration.

There are 81 ecosystem management subareas delineated for the Illinois River (Table D-3). The Illinois River Basin Comprehensive Plan identified 17 mainstem projects in 2007 (Table D-4). The Illinois River Work Group prioritized 7 ecologically important subareas to be considered for Corps ecosystem restoration programs during the current 4-year planning cycle.

Table D-2. Number of Illinois River Reach levee districts by size

Levee District Size	Number of Levee Districts
<1,000	31
1,000 - 5,000	21
5,000 - 10,000	13
10,000 - 15,000	9
>15,000	0

Table D-3. Illinois River Reach priority subarea distribution

Geomorphic Reach	Total Subareas	2010 Priority
Upper Illinois	25	4
Lower Illinois	56	13

Table D-4. Illinois River high priority ecosystem restoration subareas – 2010

Main Stem - Backwaters, Side Channels, & Islands
Dresden Pool - Brandon Road Tailwater RM 286
Dresden Pool - Treats Island RM 280
Marseilles Pool - Mazon River Confluence RM 264
Marseilles Pool - Ballards Island RM 248
Peoria Pool - Spring, Depue, Turner Lakes RM 210-216
Peoria Pool - Billsbach and Weis Lakes, Big Sand Creek
Peoria Pool - Upper Peoria Lake RM 177-182
LaGrange Pool - Kelly Lake Drainage & Levee District Water
LaGrange Pool - Matanzas and Anderson Lakes RM 110-116
LaGrange Pool - Bath Chute and Snicarte Slough RM 107
LaGrange Pool - Sanganois and Sangamon Confluence RM 90-
LaGrange Pool - Spoon River Confluence RM 84
Alton Pool - Meredosia F&W Refuge RM 71-77
Alton Pool - Smith Lake RM 67-69
Alton Pool - McCoe Lake RM 61-63
Alton Pool - Godar Refuge RM 23-29
Alton Pool - Side Channels and Island

II. Reach Characteristics

The lower Illinois River is characterized as an "underfit" stream, which means it carried less flow volume now than the large valley can accommodate. The wide valley is an artifact of much higher glacial meltwater discharge. The presettlement river was a highly productive floodplain wetland mosaic intermingled with forested riparian corridors and prairie on the higher elevations. The river provided the means for developing the region, but that development had significant consequences for the river. Massive pollution, hydrologic diversions, dams, and levees impose huge cumulative effects on the Illinois River.

Unique Characteristics

The Illinois River has many unique characteristics (Table D-5) and ancient geomorphology that includes periods when it carried glacial Mississippi River flows that created the oversized valley below the "Great Bend" at Hennepin, Illinois. The floodplain aggraded through time to develop a diverse mosaic of channels, sloughs, backwaters, and wetlands that supported exceptionally high productivity of many aquatic, terrestrial, and avian communities, including massive migratory waterfowl populations and abundant fisheries.

The modern Illinois River is unique in the types and degree of development that have occurred. The Illinois Waterway incorporates several rivers and canals in the Chicago Region, including the Chicago Sanitary and Ship Canal that breeched a watershed divide to reverse the flow of the river away from Lake Michigan to transport waste away from the city. The canal had very significant commercial and ecological impacts. Pollution has been cleaned up to a large extent compared to the extremes of the recent past, but the waterways have become pathways for a variety of aquatic migrants including Asian carps which are approaching Lake Michigan from downstream.

Table D-5. Illinois River unique characteristics

Reach 11
- Interbasin connection/diversion
- Pollutional history and recovery
- Starved Rock
- Grand Marsh/Kankakee
- Glacial history
- Urbanization

Reach 12
- Glacial origin and changes
- Underfit stream
- Low gradient
- Peoria backwaters
- Peoria Lake
- Bottomland lakes
- Large forest blocks
- Historically diverse aquatic vegetation
- Commercial fish harvest
- Commercial waterfowl harvest
- Commercial mussel harvest and recovery
- Geomorphic diversity
- Tributary deltas
- Sanganois alluvial fan
- Alton Pool levees
- Alton Pool side channels (lack of)
- Low abundance public land
- Concentration of loess hill prairies
- High concentration of Asian carp

III. Geomorphic Setting

The Illinois River arises at the confluence of its headwater basins, the Des Plaines, and Kankakee, and winds southwesterly through northern Illinois (Figure D-4). Along this stretch, known as the "Upper Illinois," currents are swift because the river flows down a fairly steep incline through a narrow, young valley flanked by glacial terraces. The upper river flows to Hennepin in Putnam County, where it encounters the "Great Bend," which marks the beginning of the Lower Illinois River.

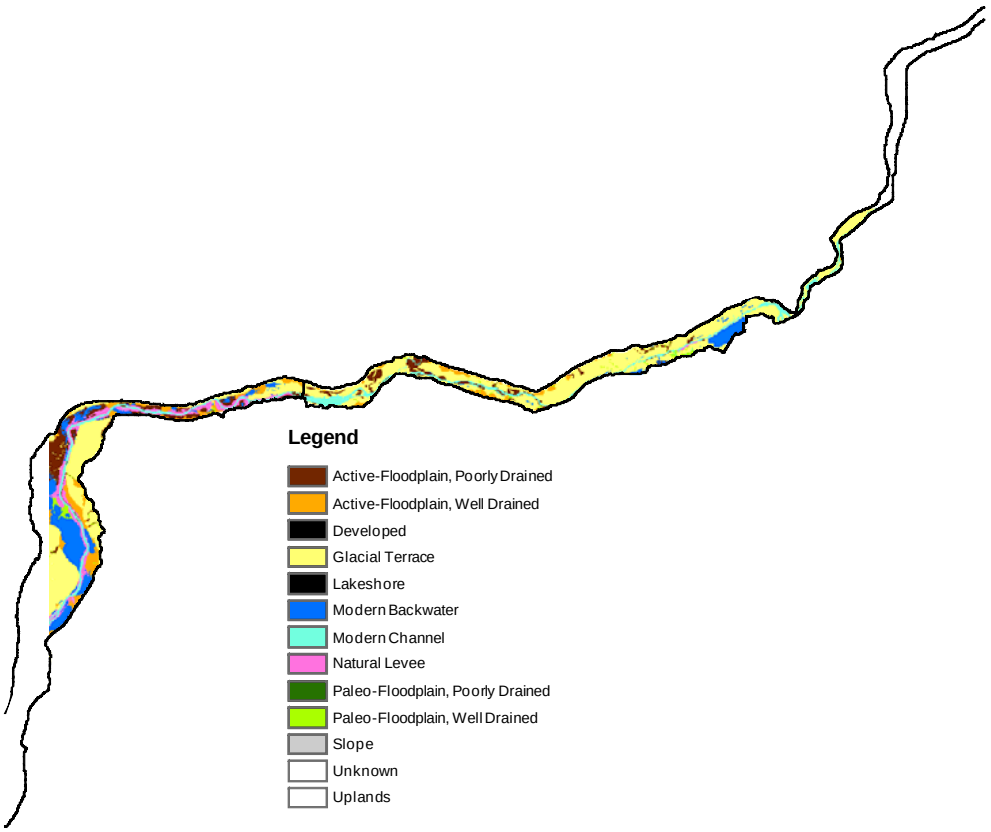


Figure D-4. Illinois River upper geomorphic reach

The Middle Illinois River turns southward and flows past Peoria to Beardstown below the Sanganois River alluvial fan. The reach has a very gentle gradient through a broad, shallow valley 3 to 6 miles wide, the ancestral Mississippi River Valley. There are abundant large terraces (Figure D-5). Large alluvial fans impound the mainstem Peoria Lakes. The floodplain downstream to the Sanganois River had dozens of lakes and backwaters.

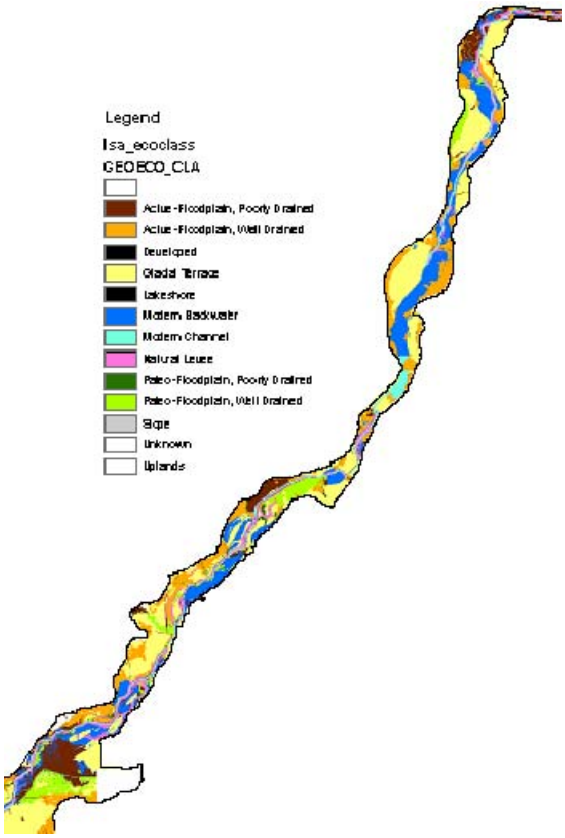


Figure D-5. Illinois River middle geomorphic reach

The lower river extends from Beardstown to Grafton and was also once rich with backwaters. The reach is influenced by many small tributaries that have created a diverse floodplain geomorphology with abundant natural levees (Figure D-6).

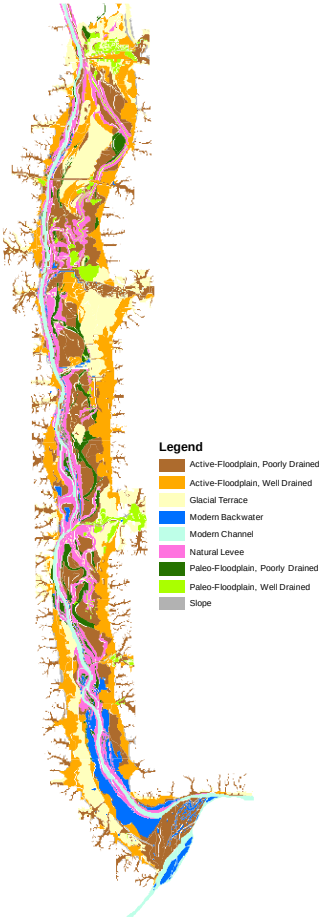


Figure D-6. Illinois River middle geomorphic reach

The diverse habitat (Figure D-7) and abundant fauna of the Lower Illinois River was noted by many early explorers: "We have seen nothing like this river…as regards to its fertility of soil, its prairies and woods, its cattle, elk, deer, wildcats, bustards, swans, ducks, parroquets, and even beaver. There are many small lakes and rivers." Father Jacques Marquette, 1673.

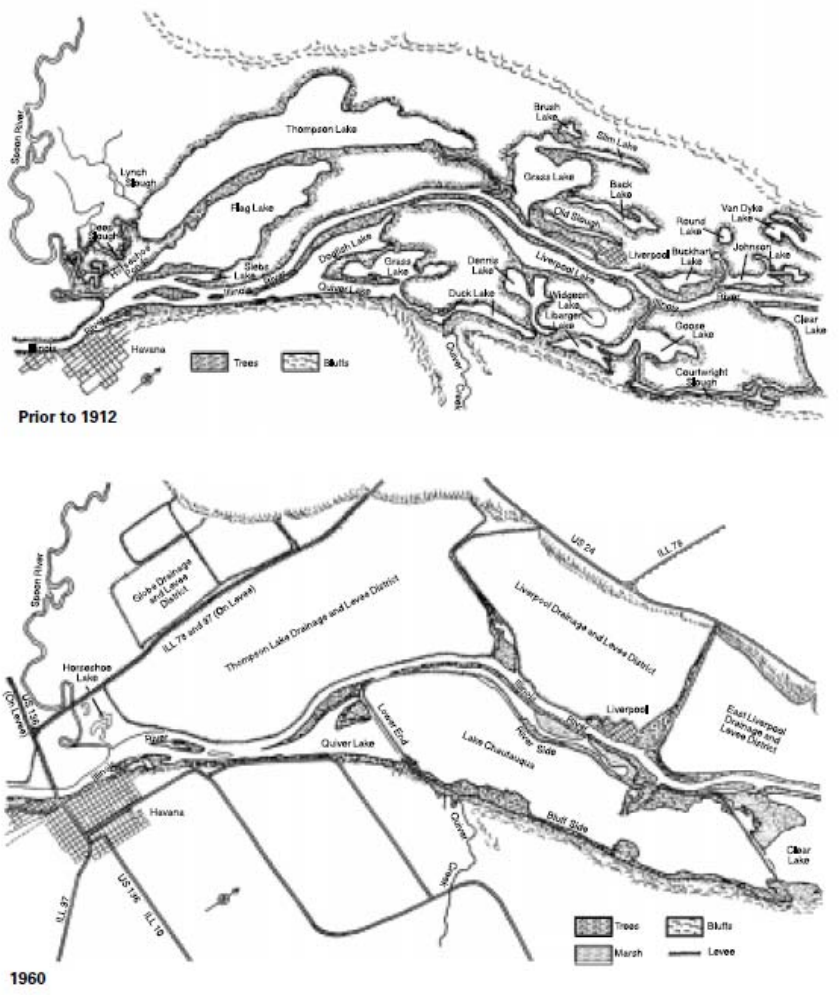


Figure D-7. The Illinois River floodplain was transformed from a channel and lake mosaic to uniform leveed crop fields

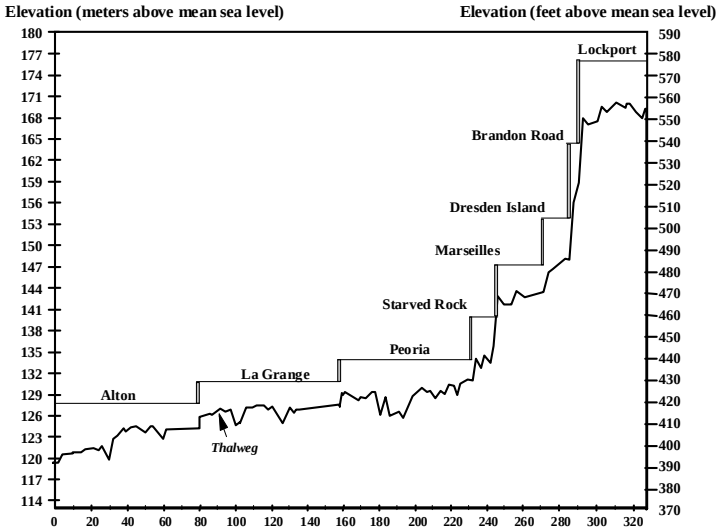


Figure D-8. Illinois River thalweg profile

The slope of the Lower Illinois River Reach through Alton, La Grange, and Peoria Pool is very gradual compared to the Upper Illinois River Reach. The low gradient channel (Figure D-8) and floodplain and tributary influences are responsible for the diverse floodplain geomorphology and resulting plant communities. The hydrogeomorphic characteristics of the Lower Illinois River resulted in significant interaction between the river and the floodplain.

The Illinois River is the largest tributary of the Mississippi River above the mouth of the Missouri River. Major tributaries to the Illinois include the Des Plaines, Kankakee, Fox, Vermilion, Mackinaw, Spoon, Sangamon, and La Moine Rivers. Agriculture and urban development impacted and changed the landscape of the Illinois River Basin and the river itself.

IV. Land Cover

The predevelopment Illinois River floodplain was a complex mosaic of prairies, forests, wetlands, marshes, and clearwater lakes (Figure 9). A broad view of the Illinois River Basin prior to intensive settlement illustrates the abundance of prairies across the landscape (figure D-9). Riparian corridors formed along waterways, and the middle and lower reaches of streams and rivers were lined with forests. Densely wooded regions occurred in the Spoon and LaMoine River watersheds, topographically diverse areas compared to the rest of the basin. In the main stem river floodplain, the main channel threaded through a variety of connected and isolated backwater lakes, bottomland forests, prairies, marshes, and swamps. Bottomland lakes, sloughs, and marshes supported abundant beds of aquatic plants, such as pondweeds, coontail, and water lilies. Common emergent plants were duck potato, marsh smartweed, river bulrush, as well as other, less common plants, including wild rice. The abundance of aquatic plants attested to the water clarity and organic sediments. Scores of small lakes and ponds, rather than large lakes, dominated the floodplain. In this system, there was relatively free movement among scales or to similar habitats in different locations through stream channels, riparian corridors, or frequently spaced wetlands.

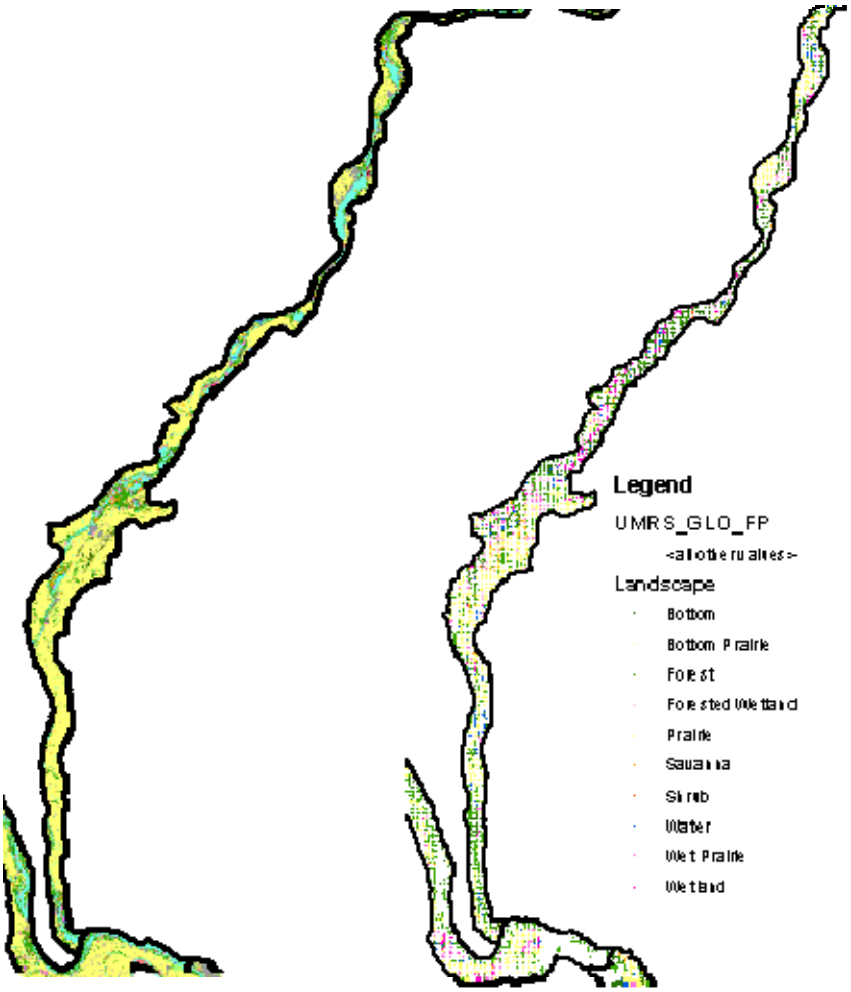


Figure D-9. Illinois River land cover for modern (2000; left) and presettlement (<1850; right

V. Stressors

The Illinois River Reach Planning Team identified many large scale stressors affecting natural processes and biota in the Illinois River (Table D-6). Site specific or regional examples of many stressors are included to illustrate the areas impacted. The stressors were evaluated to understand existing conditions and the ecological processes responsible for maintaining existing conditions. Understanding these processes helps identify the actions required to change successional trajectories.

Table D-6. Stressors Affecting Natural Processes and Biota in the Illinois River Reach.

- Excessive sedimentation
- Loss of productive backwaters, side channels, and channel border areas
- Loss of floodplain, riparian, and aquatic habitats and functions
- Loss of aquatic connectivity (fish passage) on the Illinois River and its tributaries
- Altered hydrologic regime
- Water and sediment quality (point and non-point sources of pollution)

A. Sedimentation

Excessive sedimentation rates and accumulation in Illinois River backwater lakes is a primary natural resource concern (Figures D-10 and D-11). There are many studies documenting the extent of the problems, the Peoria Lake example is typical of many backwater lakes.

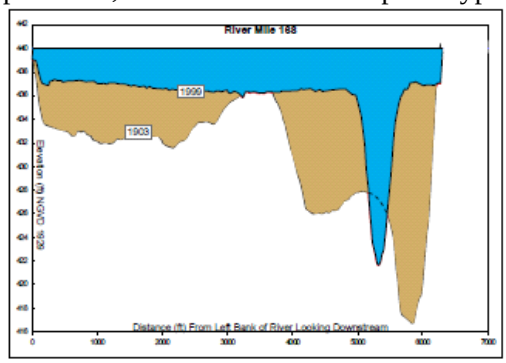
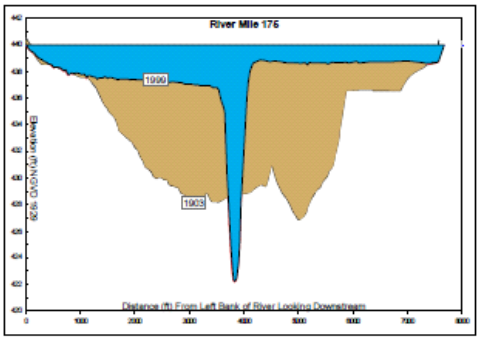


Figure 3-5a. Typical Cross Sections from Peoria Lakes Showing Dramatic Sedimentation Between 1903 and 1999, RM 168



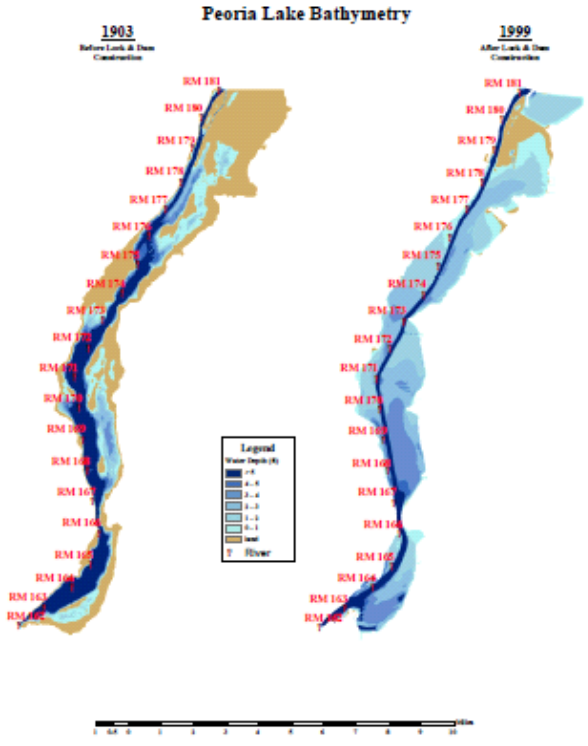


Figure D-10. Illinois River dams increased surface water area, but created conditions that trapped large volumes of sediment (tan area in left panels) in backwaters and channel border areas

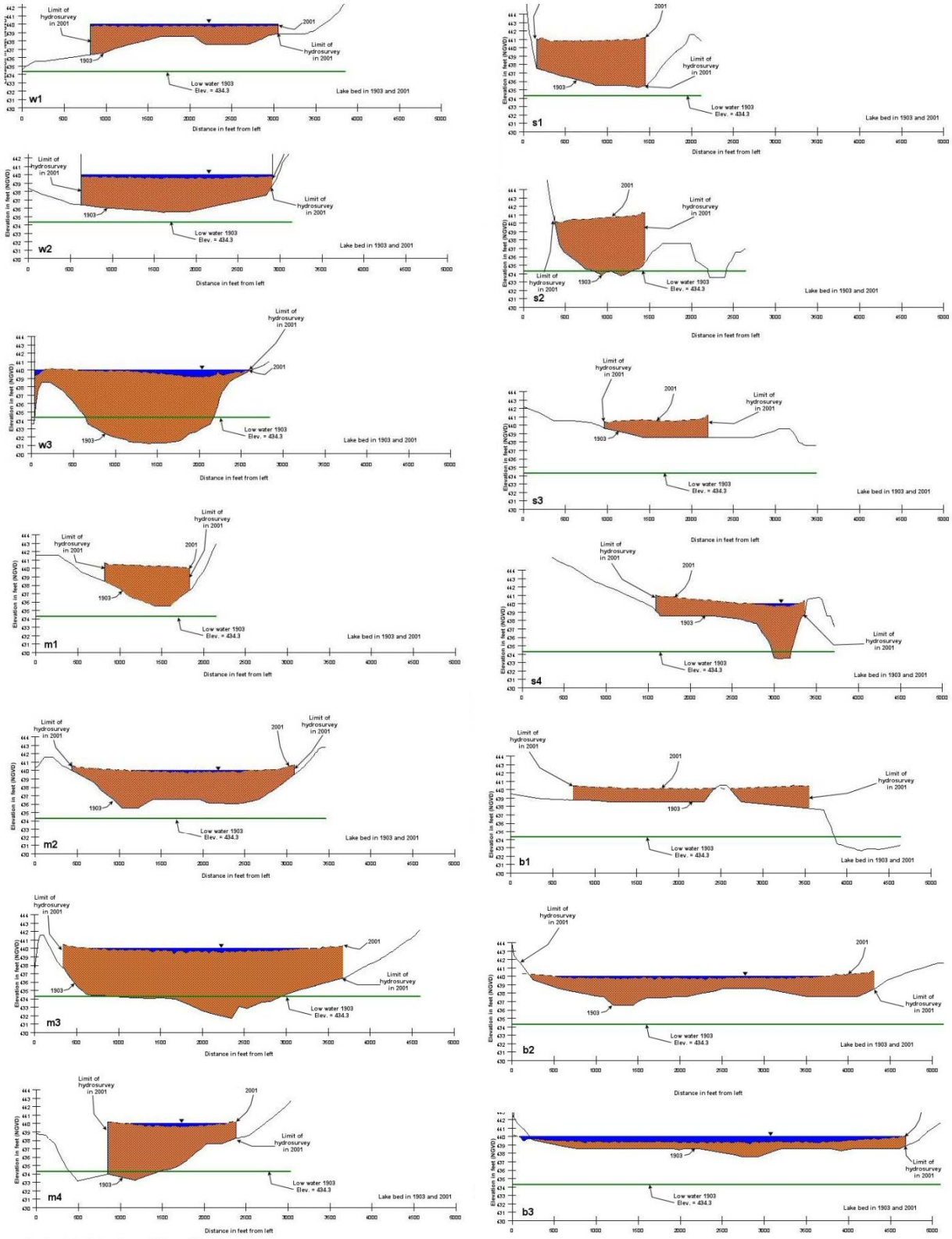


Figure D-11. Post dam sedimentation (tan shaded area) in Illinois River backwater lakes

Sedimentation has affected nearly every backwater lake and secondary channel in the Illinois River. Natural Resource managers identified secondary channel and backwater loss, including both depth and connectivity characteristics during the Habitat Needs Assessment (Figure D-12).

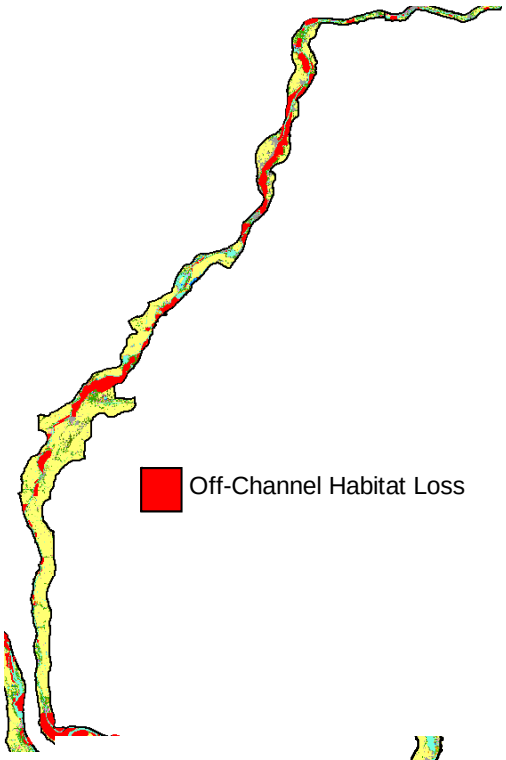


Figure D-12. Illinois River backwater lakes impacted by excessive sedimentation

B. Floodplain Connectivity

Aquatic habitat connectivity has increased by diverting and impounding water so more floodplain area is permanently inundated than in the past. The impounded lakes do not benefit from the physical and ecological functions of seasonal low river stages. Sediments remain saturated and become low quality, unconsolidated silt. Water clarity, is degraded when benthic fish, waterfowl, or wind-waves disturb and resuspend the sediments.

Levees operate at the higher stages of the hydrograph to reduce flooding in low elevation floodplain crop fields. Levee building was ad-hoc initially when natural levees were connected to form barriers. Since the 1880's flood protection was organized and expanded under the jurisdiction of Levee and Drainage Districts that designed and managed the flood protection infrastructure (Figure D-13). Internal drainage and pump systems mange internal drainage and groundwater infiltration.

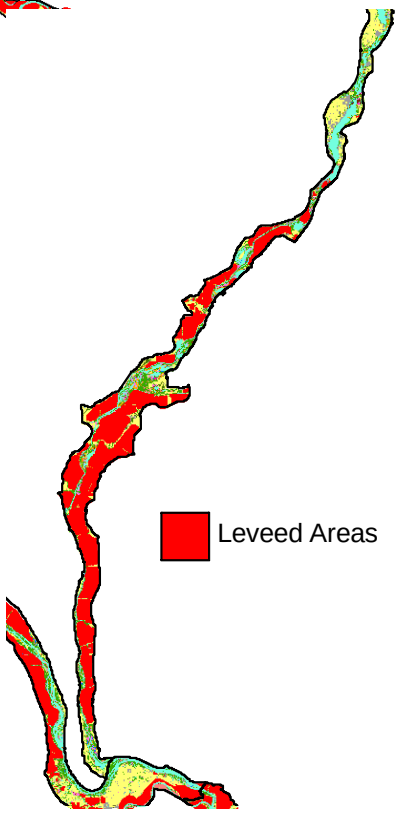


Figure D-13. Lower Illinois River leveed areas

C. Hydrology

Hydrologic alteration on the Illinois River began in the late 1800s with dredging in rapids and shallows, mainstem weirs to raise water levels and diversions from the Illinois and Michigan Canal to increase transportation opportunities. The Chicago Sanitary and Chip Canal was a significant hydrologic diversion of more than 10,000 cubic feet per second which increased water levels several feet along the entire river (Figure D-14). The US Army Corps of Engineers was tasked with creating the 9-Foot Channel Project which stabilized low flow river stages during 50 percent of the time when flow alone in not sufficient to maintain navigable channel depths. Impoundment creates within pool hydrologic gradients in which river stage in the upper pool has a more naturalistic hydrograph than the lower pool which is more regulated by the dam.

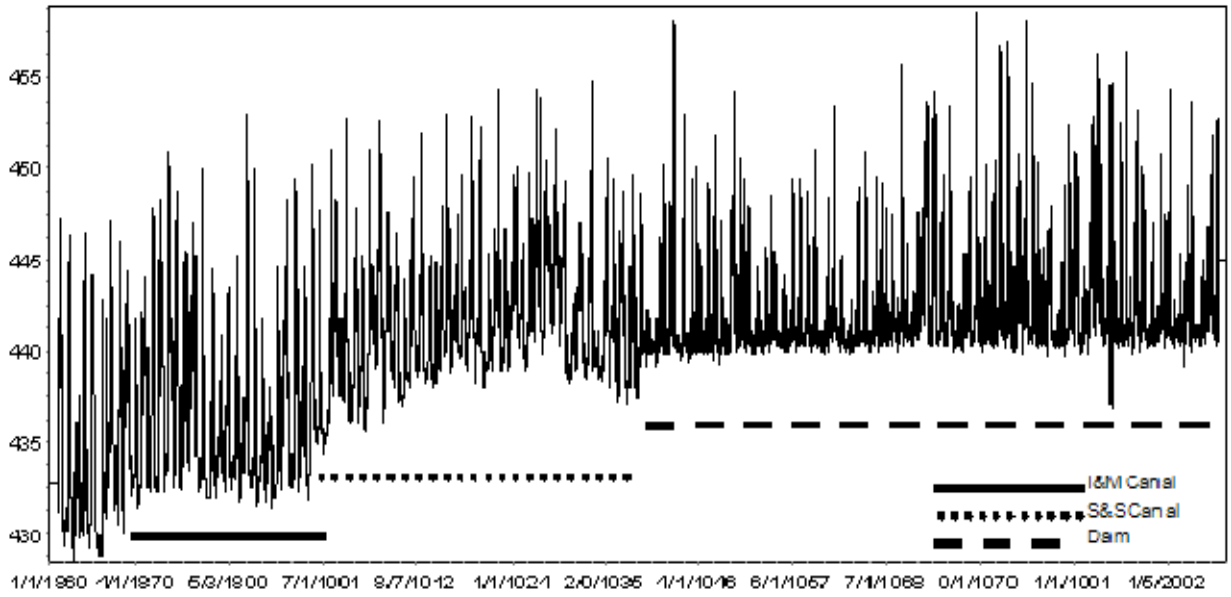


Figure D-14. Long term stage hydrograph at Henry, Illinois, on the Illinois River Peoria Pool

Dam impacts are apparent and relatively simple to document. Illinois Basin hydrology is also highly altered by upland urban and agricultural development (Figure D-15). Whereas discharge was historically concentrated around snowmelt and spring rain, the modern hydrology is less predictable. Because Illinois River navigation dams have little influence during much of the year, basin hydrology is a major influence of river-floodplain hydrology.

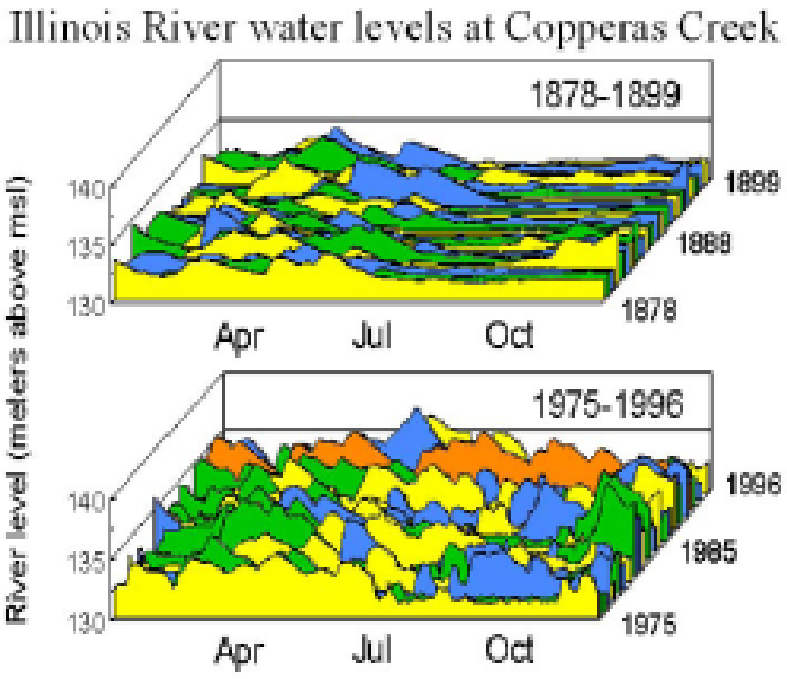


Figure D-15. Historic and contemporary hydrographs illustrate the altered Illinois River hydrology

The stressors affecting the Illinois River operate on very large scales that have affected floodplain, riparian, and aquatic habitats and functions process and function river-wide. Floodplain functions are reduced by their isolation in many parts of the river and inundation in others. Riparian functions are degraded because the riparian habitat is subject to a highly altered hydrologic regime that is saturated by impounded groundwater and also subject to frequent river stage fluctuation and increased sedimentation rates in the constrained floodplain between levees. Aquatic habitats are degraded by many hydro-geomorphic influences. The general degradation of impounded aquatic habitats is termed pool aging, where flocculent sediment accumulates and aquatic habitat structure and aquatic plant communities degrade. When the basic hydro-geomorphic functions are impaired, the entire river ecosystem is impaired.

While there are many stressors still affecting the Illinois River, its pollutional history and recovery are remarkable. Aquatic life in the river was nearly killed as far down as Chillicothe, Illinois and the river water was frequently described as filthy, stinky, with solid waste mats floating. The river recovered and declined several times with Chicago's population growth and sewage treatment upgrades. The modern Clean Water Act resulted in dramatic improvements in surface water quality and the distribution and abundance of sensitive aquatic critters. Similarly, recent floodplain restoration of agricultural areas indicates there is great potential for floodplain wetland restoration.

VI. Identifying Restoration Sites

Establishing ecosystem restoration objectives for the system is important, but the next step after that is to identify locations to achieve the objectives. Sometimes it is obvious where to start, but often there are many options for places to work and sites need to be prioritized according to need or benefit. Several historic documents, databases, and spatial analyses were used to refine the high priority ecosystem restoration subareas.

A. Side Channels

Illinois River geomorphology objectives are to increase diversity of aquatic areas to provide suitable volume and depth for fish and wildlife. The geomorphology of the Alton Pool in particularly altered because the entire floodplain is isolated and there are relatively few side channels and backwaters in the reach. While the aquatic features may be present, as shown in the buffer analysis, the quality of these areas is unknown. Most are known to be very degraded. Sediment quality is degraded throughout the river and connected floodplain.

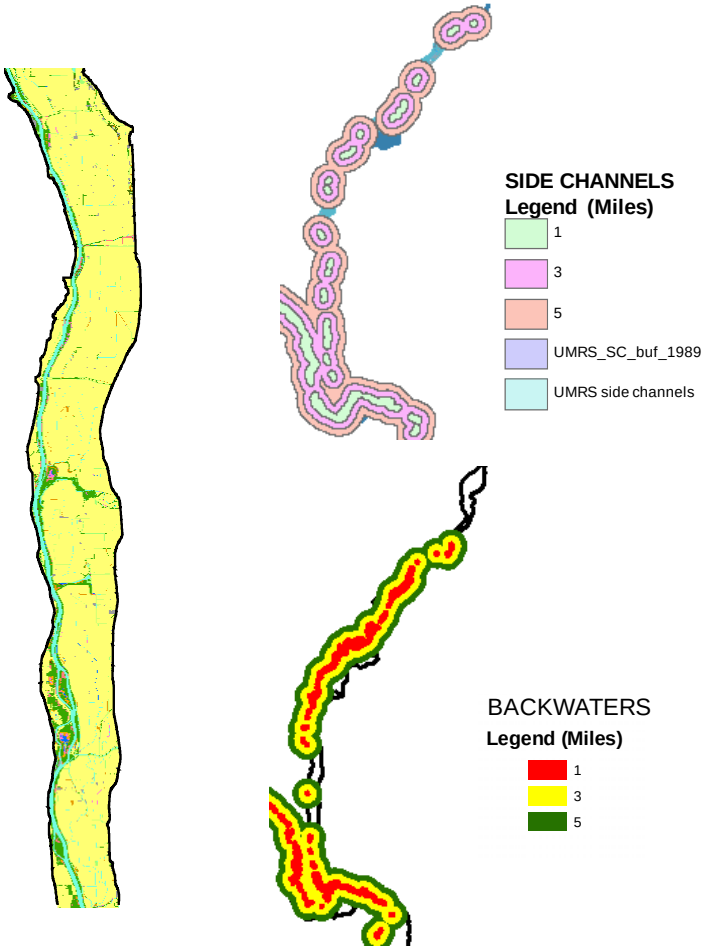


Figure D-16. Illinois river, Alton Pool side channels are rare with several gaps greater than 5 miles, whereas backwaters are generally space less than one mile apart

B. Backwaters

Maintaining connected backwaters in an important objective for lentic fishes. Natural resource managers identified backwaters where sedimentation at the connection with the river is threatening their year-round connectivity(Figure D-17).

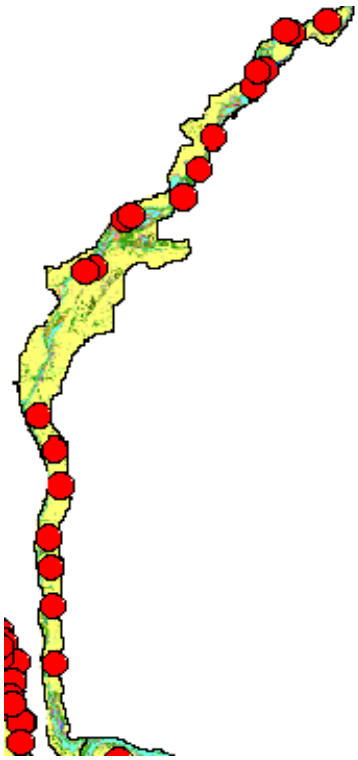


Figure D-17. Illinois River backwaters with excessive sedimentation rates

C. Hydrology

The long term average annual hydrograph displays a seasonal pattern similar to the historic average annual hydrograph, but it is elevated several feet over the pre-dam hydrograph. The historic range of variation meets the current average spring flood, but water levels in other seasons are higher than in the past (Figure D-18). The average annual hydrograph masks the variability in the contemporary hydrology.

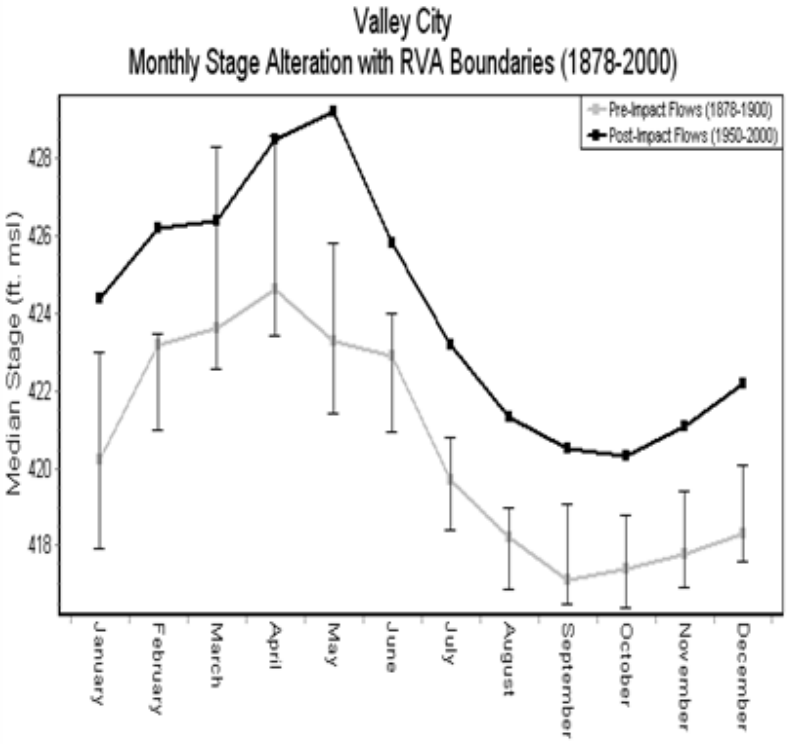


Figure D-18. Lower Illinois River historic and contemporary annual hydrology

D. Water Quality

Water quality objectives are primarily related to sediment and nutrient delivery from the watershed and the quality of sediments in the river. Several major tributaries are large sediment sources (Figure D-19), but the small bluff-side tributaries deliver significant sediment load to floodplains and backwater lakes.

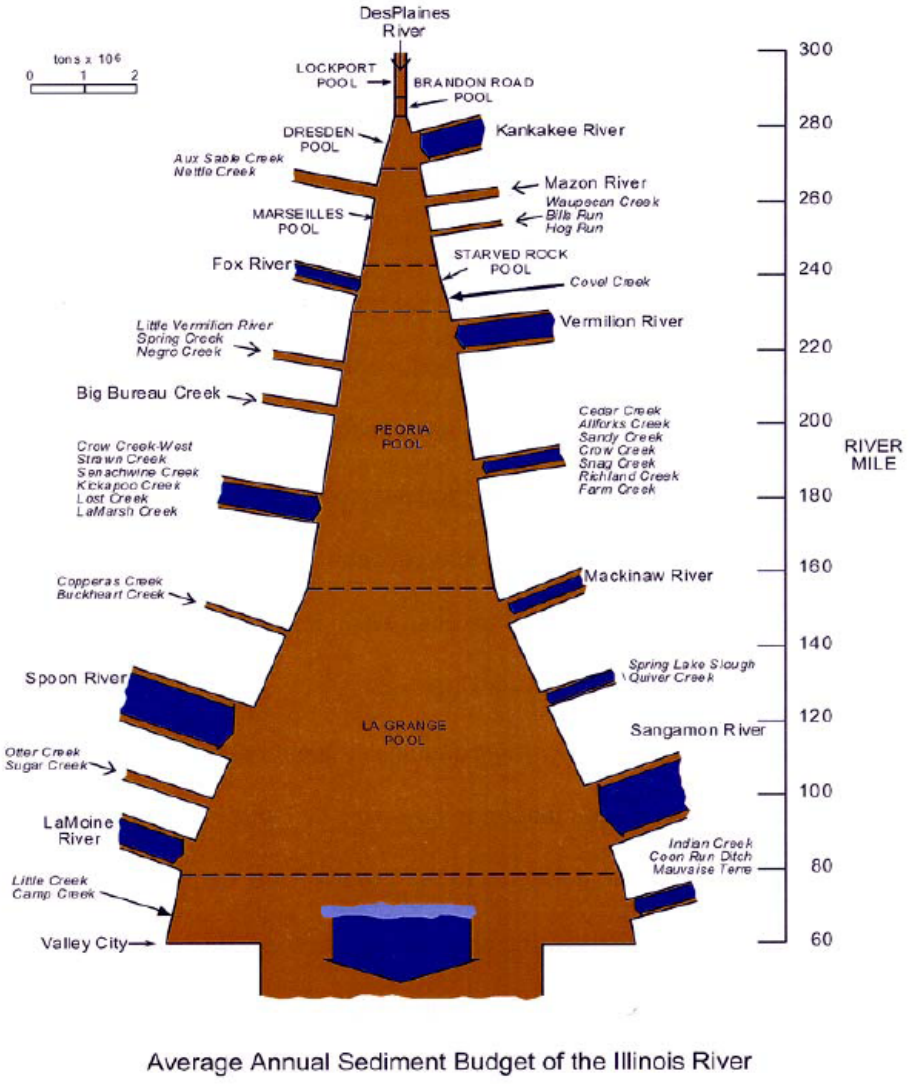


Figure D-19. Illinois River sediment budget

The Illinois River Basin Restoration Program is authorized to address sedimentation throughout the watershed. Upland treatments maintaining soil in place or reducing transport in surface waters are the most important restoration actions, but sediment and nutrients can also be sequestered in floodplains. Levee and Drainage Districts incur substantial costs cleaning ditches, the same sediment transport processes filling ditches can be used to manage alluvial habitat development also. Tributaries redirected into adjacent levee districts(Figure D-20) may provide opportunities to intercept sediment and nutrients that are otherwise shunted directly to the mainstem.

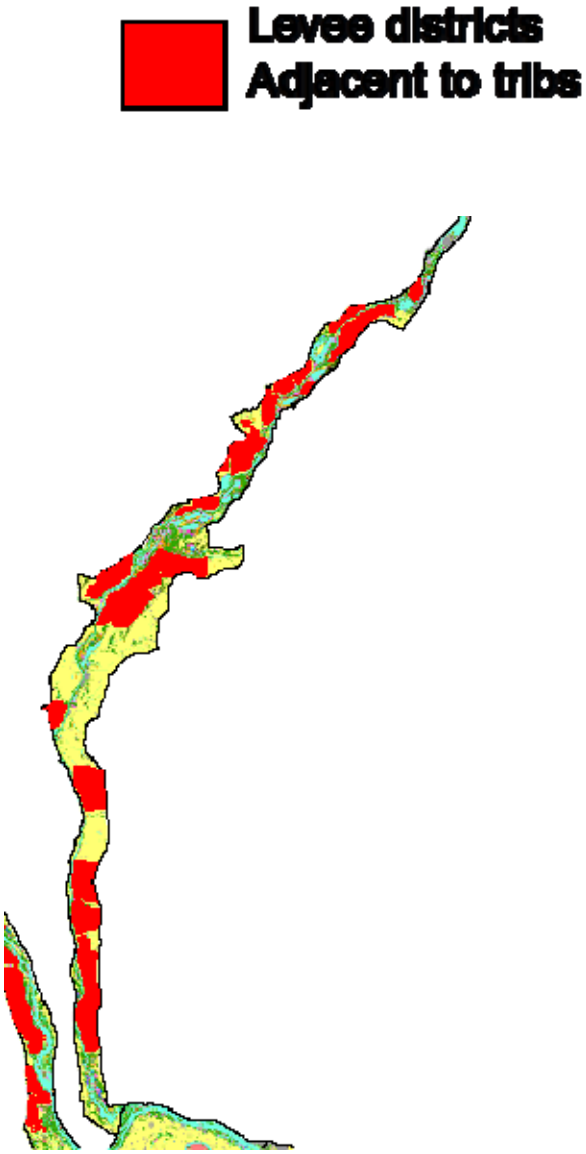


Figure 20. Levee districts adjacent to Illinois River tributaries.

Improving floodplain, riparian, and aquatic habitats and functions is a very broad objective statement because it includes the entire river ecosystem. The objective identifies several specific habitat classes where ecosystem function may be impaired, but the single function integrating them all is the flood pulse hydrology that connects them and transports material and fauna among them. The current flood extent for common floods (i.e., 2-yr flood; Figure 21) is significantly reduced by levees which disrupts many floodplain processes. Longitudinal connectivity along the mainstem and tributaries is an important objective for migratory fishes that has been documented in the Comprehensive Plan and Navigation Study fish passage report.

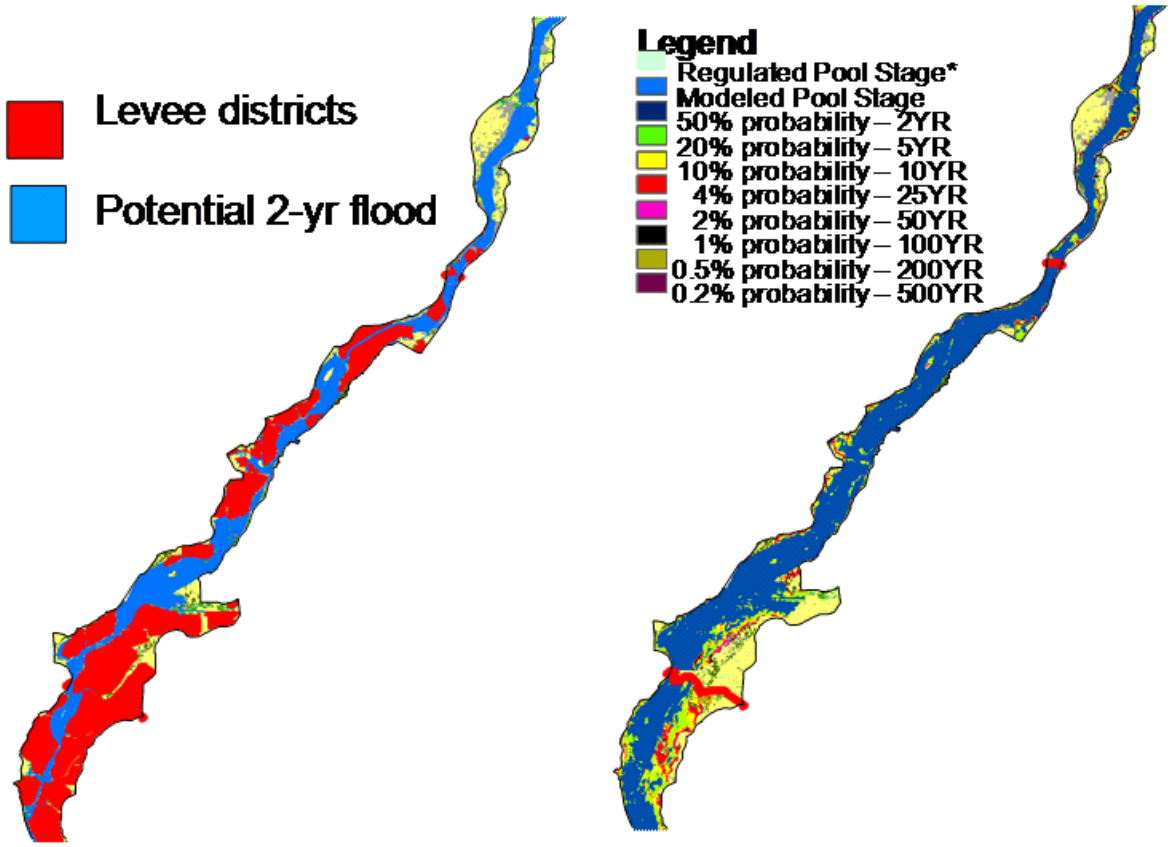


Figure 21. Illinois River levee districts (left) and potential flood distribution (right).

Illinois River biota are addressed by two broad objectives: restore and maintain ecological integrity; and restore and conserve natural habitat structure and function. These broad objectives are targeted at the natural habitats and native animal communities. The Illinois River Reach Planning Team recognized that a productive ecosystem for biota stems from highly functioning habitats and ecosystem processes.

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Ecosystem Restoration – High Priority Subareas

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Upper Illinois River

The Upper Illinois River is a highly regulated reach with higher head dams in the steep valley reach above Starved Rock, Illinois. The ecosystem restoration needs are in backwater and side channel habitat in the Brandon Road Tailwater, secondary channels at Treat's Island and Ballard Island, and tributary confluence restoration at the Mazon River.

Brandon Road Tailwater

The Brandon Road Dam Tailwater is a high quality channel and braided channel subarea that is a Illinois Department of Natural Resources designated Resource Rich Area. Ecosystem restoration objectives for side channel restoration include increasing depth diversity to support native fishes. This subarea supports objectives to increase fish overwintering habitat and reduce distances between overwintering sites. It also contributes to objectives to maintain connected aquatic habitat. Achieving physical habitat objectives should help achieve objectives to improve biotic integrity and ecological function.

Treats Island

The Treats Island Side Channel is a high quality side channel subarea that is a designated Illinois Department of Natural Resources Resource Rich Area. Ecosystem restoration objectives for side channel restoration include increasing depth diversity to support native fishes. This subarea supports objectives to reduce distances between fish overwintering sites and contributes to objective to maintain connected aquatic habitat. Achieving physical habitat objectives should help achieve objectives to improve biotic integrity and ecological function.

Mazon River Confluence

The Mazon River confluence is a high quality meandering tributary confluence that is still connected with the river and supports riparian forest and wet prairie habitat. The tributary subarea is part of a broader watershed management plan. Physical process objectives include reducing sediment transport to the Illinois River to improve habitat in the delta area and downstream. Floodplain restoration coupled with upstream restoration can help naturalize tributary hydrology also. The subarea includes more than 1,000 acres of floodplain habitat that contribute to objectives to increase connected floodplain and tributary habitat quality. The diverse habitat at tributary deltas supports many biological composition and process objectives.

Ballards Island

Ballards Island is a side channel and small backwater complex in a river reach with little habitat diversity. The site ranks highly because it fills gaps in floodplain and aquatic habitat classes that are rare upstream from the site. The site has an organized stakeholder group that supports restoration at this site. Restoring this subarea can help achieve side channel and backwater aquatic habitat objectives that support fish and wildlife.

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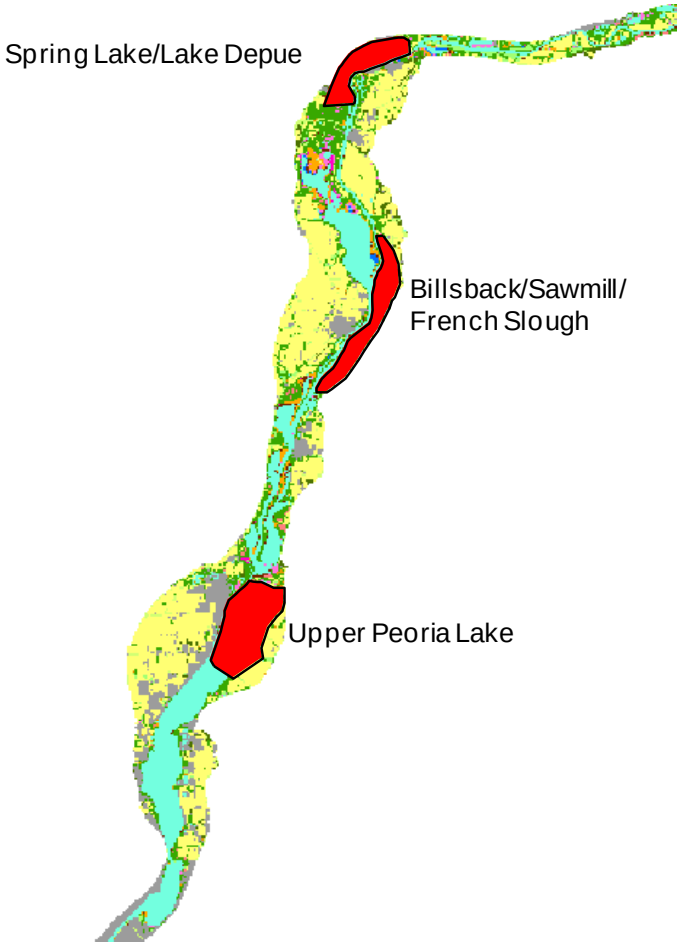
Peoria Pool Projects

Peoria Pool has been the focus of several ecosystem restoration studies that focus effort on Peoria Lake itself, but other lakes are well known also. Reach Planning incorporated that knowledge and concentrated new effort on backwaters in the upper part of the pool. The Peoria Pool Backwaters Feasibility Study investigated a 10-mile reach above Peoria Lake and prioritized two lakes for this sequence of project planning. The feasibility study identified restoration needs for the entire 10-mile reach. Starved Rock Tailwater and upper pool habitat is also important for sport fishing.



Spring-Depue-Turner Lakes

This Spring, Depue, and Turner Lakes backwater complex is a high quality backwater complex in Upper Peoria Pool. The backwaters are intermediate in proximity to other floodplain habitat, but the lakes fill a large gap in available fish overwintering sites. Excessive sedimentation into the backwaters degrades high quality habitat which can be protected and enhanced with geomorphic adaptation. Managed connections, like j-hook entrance to downstream connecting channels, can reduce sedimentation. The subarea provides diverse terrestrial habitat that supports many biological objectives.

Billsbach & Sawmill Lakes and French Slough

The backwater lake complex historically supported high quality habitat that has degraded in response to hydrologic alteration in the river and increased sedimentation from upland development. The subarea is intermediate in proximity to waterfowl habitat, but it potentially fills a gap in fish overwintering sites. The entire Peoria Pool backwaters reach has support local stakeholders and agencies. Restoration activity in Illinois River backwaters can support water quality, geomorphology, and hydrology ecosystem objectives. Optimizing these physical process objectives can then support habitat and biological objectives.

Upper Peoria Lake

Peoria Lake is a historic feature in the Illinois River Valley. The upper Lake provides important wetland and backwater habitat that has been filling with sediment for more than 100-years since the first large scale hydrologic perturbations. The subarea is an Illinois Department of Natural Resources designated Resource Rich Area. Backwater restoration could address backwater habitat and fish overwintering objectives. There is widespread support for ecosystem restoration in the Peoria region.

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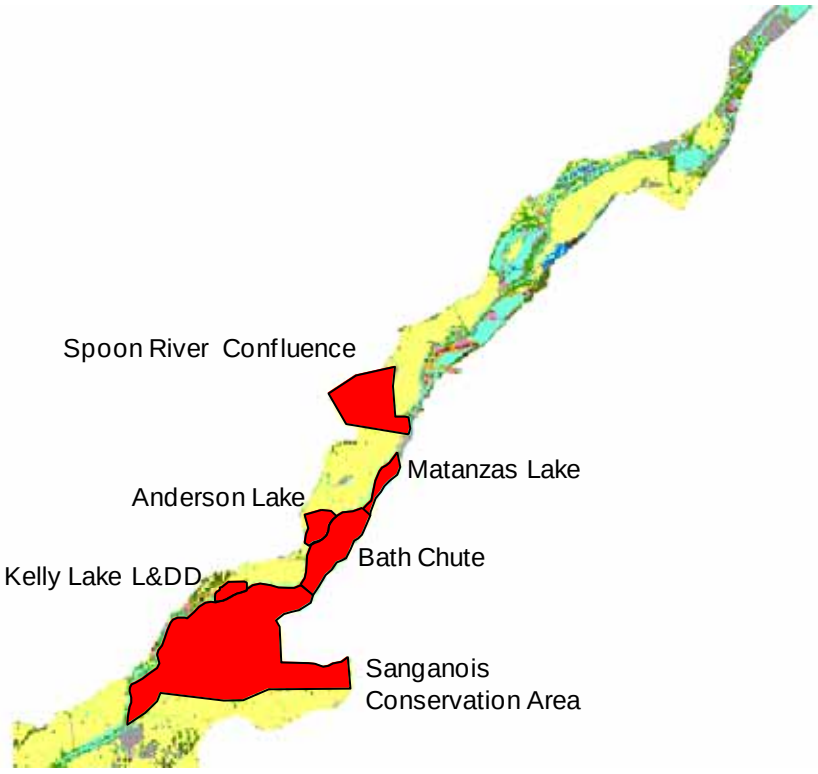
La Grange Pool

Ecosystem restoration priority subareas in the La Grange Pool include two important tributary confluence areas, two historically productive connected backwater lakes. Bath Chute provides important side channel habitat in a unique six-mile long channel that also influences the Sanganois area downstream. The Sanganois Conservation area is a large tributary delta of the Sangamon River. The subarea includes aquatic, wetland, and terrestrial habitat and unique hydrogeomorphic diversity that supports diverse plant communities also. Kelly Lake Levee and Drainage District is a potential floodplain restoration opportunity that could achieve wetland habitat and biota objectives in a former slough in a small levee district. These subareas compliment existing management areas in the upper part of the pool.

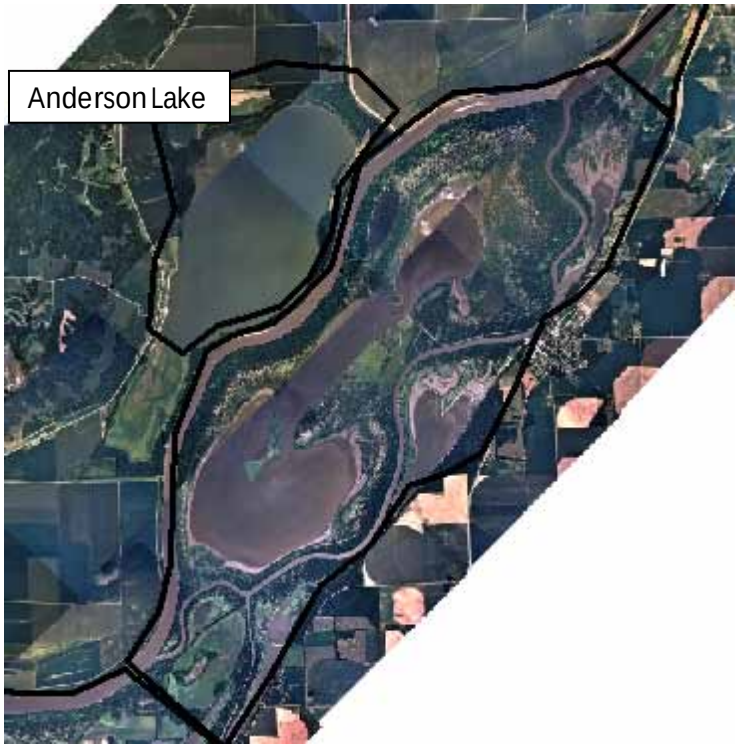


Spoon River Confluence

The Spoon River is a meandering lowland tributary to the Illinois River, it is an Illinois Department of Natural Resources designated Resource Rich Area. The Spoon River has high sediment transport capacity and has been the focus of sediment reduction and stream restoration programs. There is a very active watershed protection effort. Adjacent farmland at the confluence was acquired for conservation in recent years and the region offers very high potential habitat benefits. Floodplain habitat is relatively abundant, but the Spoon provides overwintering habitat and access to fish spawning habitat. Water quality sediment reduction objectives, hydrology objectives, and floodplain habitat objectives can all be met in the Spoon River confluence.

Matanzas and Anderson Lakes

Matanzas and Anderson Lakes are historic waterfowl hunting and fishing areas that are degraded by excessive sedimentation like most Illinois River backwaters. They are designated Resource Rich Areas that provide connected backwater habitat. Ecosystem restoration in the lakes can achieve water quality objectives by reducing sediment resuspension and moderating sediment transport into the lakes. Geomorphic objectives to restore connected backwaters can be achieved in both lakes. Restored physical processes can maintain habitats to achieve biological objectives.



Bath Chute

Bath Chute is one of the longer side channels in the Illinois River. It is one of the few persistent side channels, so it is listed as a Resource Rich Area. The side channel provides consistent fish habitat. Snicarte slough in the center of the island can provide wetland and fish overwintering habitat. There is high stakeholder interest in the subarea. Channel and backwater wetland classes in the subarea support many physical process, habitat structure, and biological composition objectives.

Kelly Lake Levee and Drainage District

Kelly Lake Levee and Drainage District is a small levee district with former sloughs that have good potential to achieve floodplain wetland benefits. The site is an Illinois DNR Resource Rich Area with other agency interest. Many floodplain wetland objectives can be achieved, but connectivity would require levee alterations. The drainage district infrastructure can help achieve hydrology objectives and protect interior wetlands from excessive sedimentation. Isolated wetlands support many biological benefits.

Sanganois Conservation Area

The Sanganois Conservation Area is a 10,000 acre complex of tributary delta, complex channels, and backwater lakes. The site is a large contiguous forest with high topographic diversity that supports high quality forests. Many qualities qualify the area as a Resource Rich Area. Maintaining the physical processes can support forested wetland communities.

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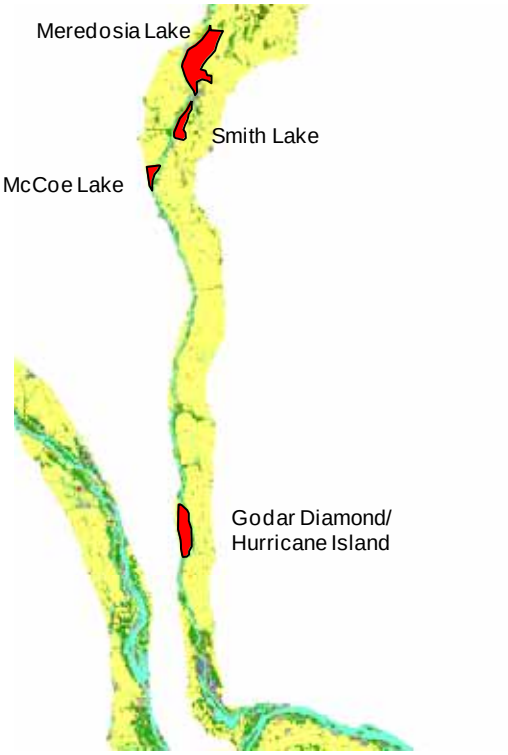
Alton Pool

Alton Pool high priority subareas ecosystem restoration subareas are concentrated in the upper part of the reach where there is some connected floodplain habitat. The rest of the reach down to the lower 15 miles is lined with levees on the East bank and the bluff on the West bank. There is little connected backwater or floodplain habitat. Several degraded side channels in the reach are considered as a single subarea because they share common physical and ecological functions. Their restoration sequence will be determined when more is known about their status. The Godar Diamond-Hurricane Island subarea is another large side channel with interior wetlands. It is the most significant connected habitat for more than 60 river miles. The lowest end of the Alton Pool is highly influenced by the Melvin Price Locks and Dam which maintains several large aquatic lakes and backwater complexes managed as wildlife refuges and hunting areas. These lakes have already been the focus of recent restoration work.



Meredosia Lake

Meredosia Lake is a large backwater wetland complex that is a designated Resource Rich Area. The US Fish and Wildlife Service and Illinois DNR cooperate in managing the area. Restoring backwater physical structure and fish overwintering conditions would increase the abundance of fish habitat which is lacking for many miles. Restoration objectives for the site include backwater geompoghology and sediment transport to the subarea from tributaries. Temporary drawdowns may help consolidate sediment and restore emergent vegetation that supports many fish and wildlife objectives.

Smith Lake

Smith Lake is a smaller isolated backwater lake and wetland complex. The subarea supports forested wetland and emergent wetlands that qualify it as a Resource Rish Area. Restoration activity could incorporate a small tributary to help manage sediment reduction objectives. Increasing backwater quality would increase fish overwintering opportunities. Physical habitat objectives include improving backwater depth and sediment quality which should improve water quality. Improved water quality is important to support aquatic plant communities. Maintaining wetlands in the subarea can help address many fish and wildlife objectives.

Mc Coe Lake

Mc Coe Lake is a small management area and connected sloughs that are listed as a Resource Rich Area. Restoration activity at the site could address backwater and side channel geomorphology objectives. Improving aquatic habitat conditions could increase fish overwintering in a reach with little off-channel habitat. Restored secondary channel habitat would support river fish objectives, enhancing the wetland complex could benefit a variety of wetland dependent critters also.

Godar-Diamond/Hurricane Island

This island and side channel complex is another of the few large, persistent Illinois River secondary channels. The interior wetland at Hurricane Island is a managed hunting area that is part of a complex of state and Federal management areas nearby at the confluence with the Mississippi River. The subarea is an Illinois Resource Rich Area and it has a very strong constituent group. Its proximity to other refuges reduced its ranking in the prioritization matrix. Objectives for secondary channels and flow diversity can be achieved to support fisheries objectives. The potential to support wetland objectives is very high.

Alton Pool Side Channels

Secondary channels in Alton Pool are degraded by excessive sedimentation in an impounded environment. Sedimentation in the reach is notorious as the flow from the watershed is concentrated down the narrow mainstem floodway between levees. The Melvin Price Locks and Dam maintain stable river stages at low flow and the Mississippi River can also act like a hydraulic dam backing up the Illinois River during large floods. Heavy sediment loads then drop out in the low velocity environment and fill contiguous floodplains, backwaters, and channels. There are seven or more secondary channels that can achieve channel habitat objectives. A general reconnaissance of the subareas is required to prioritize based on need, potential benefits, and program.