Wetlands Campaign

Description

The Wetlands Campaign focuses on the conservation of wetlands throughout Illinois, but with specific emphasis on priority Natural Divisions with the greatest wetland resources or potential (Schulthies and Eichholz 2014). More specifically, the Campaign will try to positively influence wetland Species of Greatest Conservation Need (SGCN; Appendix 9) through increases in wetland acreage, increasing wetland quality, and/or through wetland management. Additionally, wetland supportive administrative policy may provide the greatest wetland habitat benefits at broad landscape scales. Conservation actions are focused to impact wildlife species, but secondary results will have positive effects on ecosystems, plant communities, and society.

Wetlands are important habitats that provide a number of valuable ecological services.
By holding drainage waters and moderating storm water runoff, wetlands help to dampen changes in water levels in rivers and streams, reducing flooding (Demissie and Khan 1993), and recharging groundwater supplies. When allowed to persist naturally in structure and function, wetlands provide locations where water and nutrients pool, and are highly productive in plant and animal life. Similarly, by intercepting and slowly releasing runoff, wetlands allow physical and biochemical treatment of sediment and other pollutants that severely degrade natural features and ecosystem services.

Wetlands were historically a dominant feature of the Illinois landscape but have been reduced by more than 90% for agriculture, development, and other land uses (Dahl 2006). Of the remaining wetlands in Illinois, most have been highly degraded. Invasive plants and animals have reduced biodiversity and degraded the habitat structure and function. Remaining wetlands are increasingly isolated from other wetlands and other quality habitats. Sedimentation has reduced wetland volume. Changes in hydrology and drainage have starved some wetlands of water and overwhelmed others. Wetlands are naturally dynamic systems, and are dependent on disturbance (both flood and drought) to remain healthy and functional. However, the type, rate and severity of changes have often been outside of natural thresholds. Therefore, each of these stresses has reduced the ability of remaining wetlands to perform their ecosystem functions, including the provision of sustainable, diverse, and abundant wildlife populations.

Despite perceived changes in societal views of wetlands (Johnson and Pflugh 2008, Kim and Petrolia 2013), some sectors continue to perceive wetlands negatively as breeding grounds for mosquitoes or undesirable animals and as wastelands or marginal areas for “productive” uses. Thus, pressure to drain, fill, or otherwise eliminate wetlands as well as resistance to restoration or establishment remains high in many areas. In light of the increasingly-known benefits of wetlands, a focused and persistent educational component may prove valuable to raise public awareness of the benefits provided by wetlands. A number of regulations have emerged to protect remaining wetlands and mitigate for losses. Illinois’ Interagency Wetlands Act of 1989, for example, outlined a goal of no net loss of wetland acres or

functional value due to state-supported activities. In addition to mitigation regulations, many agencies, organizations and programs encourage the voluntary restoration of wetlands. In general, restored wetlands may have lesser ecological function than natural wetlands, though restoration techniques are improving. Restoring wetlands to former function (e.g., wildlife habitat) may not be possible by simply restoring historic physical attributes or conditions. Adjacent systems and landscapes have also changed substantially through time, thus, simply mimicking historic features may not result in desired conditions. Despite these challenges, a number of large-scale partnership wetland restoration projects have been underway in Illinois, including the Cache River project in far southern Illinois, and the Emiquon Complex and Hennepin & Hopper Lakes on the middle Illinois River. These restorations have resulted in high quality wetland systems recognized by the international community for their importance (see Status, page 215; Ramsar 2014).

Goals

The primary goals of the Wetlands Campaign include increasing wetland acreage, interconnectedness and quality in order to meet the requirements of SGCN, while promoting progressive, adaptable, sustainable, science-based management of existing wetlands to support all wetland wildlife. Achieving these goals will preserve natural features by restoring ecosystem processes that allow self-regulation, decrease habitat fragmentation and integrate best management practices on both public and private lands within selected opportunity areas. In addition, particular emphasis will be given to enhancing highly productive wetland and aquatic habitats to benefit wetland-dependent SGCN, especially migratory waterfowl and waterbirds. Management practices that emphasize high quality and highly productive wetland habitats and migratory birds will benefit all wetland-dependent species targeted within the Illinois Wildlife Action Plan (IWAP).

Habitat Goals

- A net gain of 20% of marsh wetland types is achieved through restoration, enhancement and management. These should be concentrated in priority Natural Divisions.
- A net gain of 40% of combined wetland types is achieved in the river bottomlands Natural Divisions of Illinois, primarily the Illinois and Mississippi River Sand Areas, Lower Mississippi River Bottomlands, Upper Mississippi River and Illinois River Bottomlands, Wabash River Border, and Coastal Plain.
- Review wetland habitat goals and deficits identified by the Upper Mississippi River and Great Lakes Region Joint Venture needed to achieve focal species population goals. Implement strategies to reduce or eliminate deficits in Illinois.
- Sufficient ephemeral and fishless semi-permanent wetlands (i.e. vernal pools, prairie potholes, landscape depressions) to support objectives for dependent species of wildlife (e.g., dragonflies, amphibians). Use acreage objectives developed for shallow semi-permanent marsh (185,750 acres) by the Upper Mississippi River and Great Lakes Region Joint Venture if specific acreage goals do not exist within each priority Natural Division (Pierce et al. 2014).

- Moist-soil management or other natural wetland management strategies (e.g., hemi-marsh) adopted on public waterfowl management areas and other sites to increase wading bird, waterfowl, shorebird, and other wildlife use.
- Water quality is maintained or improved through habitat management (in wetlands and uplands) in order to support SGCN.
- Increased wetland education in targeted locations (e.g., areas under pressure for wetland loss, with high wetland restoration potential, or with chronic flooding issues associated with local streams or rivers) will increase support for wetlands and wetland management regimes that benefit wildlife and society.
- Total sediment delivery to wetlands is reduced through the use of buffers along streams, ditches and other waterways, use of conservation easements on highly erodible lands, and adoption of other erosion control practices across broad regions.
- The distribution and impact of detrimental wetland invasive species is stabilized or reduced by active management or other conservation action.
- High-quality examples of all wetland communities, including all Grade A and B Illinois Natural Areas Inventory sites, are protected, restored and managed within the Natural Divisions within which they occur (White 1978).
- Increase wetland abundance to increase water storage capacity by 50% within targeted watersheds with persistent flooding issues (Demisse and Khan 1993). These wetlands should be structured to provide habitat for SGCN and function as natural systems where possible.

SGCN Goals

- Identify and develop monitoring programs for species guilds where we are able to recognize population trends at statewide, or ideally, finer spatial scales (i.e., Natural Division). Existing surveys (e.g., Breeding Bird Survey) may meet these needs for some guilds.
- Establish Odonate monitoring protocols throughout all priority Natural Divisions that will effectively monitor populations of common species as well as species of concern.
- Provide sufficient habitat to support stable Odonate SGCN populations in all priority Natural Divisions. It is assumed that meeting the needs of SGCN will also provide sufficient habitat for common species.

Amphibian & Reptile Goals

- The distribution and abundance of herpetofauna are understood with confidence, and sentinel monitoring can identify conservation needs.
- Provide sufficient complexes of wetland habitat of varying types (i.e., ephemeral – semi-permanent) within suitable spatial distribution to support diverse herpetofauna through their life cycle within each priority Natural Division. These wetlands should be connected with corridors to facilitate movement, distribution and population expansion.

Wetland Bird Goals

- Develop strategies to increase breeding populations of Wilson's Snipe, Black Tern, Willow Flycatchers, and Marsh Wrens by 50%. (Marsh, Vernal Pool)
- Recovery plans for state-listed wetland birds, including King Rail, Least Bittern, Black- and Yellow-crowned Night Herons, Forster's Tern, Common Gallinule, American Bittern, and Wilson's Phalarope, are developed. Habitat suitable to support at least two breeding populations of Black Rails is established. (Marsh, Sedge Meadow, Swamp)
- Maintain the number of multiple-species wading bird rookeries throughout Illinois (Hagy et al. 2014). (Swamp, Bottomland forest)
- Implement shorebird monitoring during migration periods to track statewide trends. Provide sufficient shorebird habitat (e.g., mudflat) during spring and fall migration to meet Upper Mississippi River and Great Lakes Region Joint Venture objectives. (Potter et al. 2007a; Mudflat, Vernal Pool, Marsh)
- Achieve and maintain 1970's levels (i.e., a time period of high waterfowl abundance used to set NAWMP population goals; Havera 1999) of use-days by migrant duck populations (September-January) on important waterfowl areas in the Illinois and Mississippi River valleys (an increase of 18.5 million duck use-days, or 50%). Assuming average weather conditions and continental duck populations at North American Waterfowl Management Plan goals. (Marsh, Mudflat, Moist-soil)
- Increase *Athya spp*. (i.e., diving duck) abundance during fall migration in the Illinois River valley by 50% from 1.2 million to 1.8 million duck use-days annually. Lesser Scaup should account for half of this increase (300,000 DUD increase). (Marsh, Moist-soil)
- Support breeding duck densities of 5.0 pairs/sq. km or annual breeding Mallard population of 20,000 in the Glacial Lakes region of northeastern Illinois. (Marsh, associated upland)
- Maintain, where stable or increasing, or increase, where declining, statewide nesting populations of Wood Ducks, Hooded Mergansers (Sauer et al. 2014) and other wooded wetland dependent SGCN (e.g., Prothonotary Warbler, Pileated Woodpecker). (Bottomland Forest, Swamp)

Status as of 2015

Despite strides towards wetland conservation in a few strategic locations within Illinois, wetlands remain well below historic acreages (Dahl 2006), and goals set in the 2005 Comprehensive Wildlife Conservation Plan & Strategy (CWCP). This deficit is reflected by a list of species classified as SGCN due to habitat limitations. Furthermore, Illinois experiences extreme fluctuations in stream flow due to wetland drainage, consolidation, and elimination (Bellrose et al. 1983, Demissie and Khan 1993). Flood pulses are more frequent and more pronounced (i.e., greater depth and duration) statewide, in nearly all watersheds. Flood pulses are not only more intense, but also occur during all periods of the year, as opposed to historic systems where spring rains and runoff caused dependable, annual flood pulses. While rivers, streams and their associated wetlands have become more unpredictable, water levels in many wetland systems have also been artificially stabilized, reducing the natural cycling that maintains

quality, diversity and productivity. Wetland systems and other interconnected habitats continue to degrade in Illinois for a variety of reasons.
Education and outreach is necessary to help the public understand water management at local and landscape scales. Typically, pooled water not associated with waterbodies is treated as unacceptable, and every effort is made to move this water to ditches, streams and rivers as quickly as possible. Rapid movement of water off the landscape exacerbates flooding and erosion in downstream areas. This is true of municipalities as well as agricultural areas. Many places where water pools were likely once natural wetlands that have been converted to other uses. Natural wetlands hold water and slowly release it to streams, rivers and groundwater, effectively storing precipitation or runoff. Flooding may still occur in unaltered wetland systems, but it is typically less intense and less frequent.

Six primary Actions were identified in the 2005 CWCP and are presented here along with their current status. Some of these actions have been and continue to be addressed, while others have largely languished, making little progress. Note, these are Actions identified in the 2005 CWCP, and not necessarily reflective of specific Actions included in this update, although many are related.

1. *Improve the condition of existing natural and artificial wetlands*.
   Status: As an indication of wetland importance, condition and quality, Illinois encompasses three wetlands that have been designated Wetlands of International Importance by the RAMSAR Convention. These include the Cache River and Cypress Creek wetlands in southern Illinois and the Emiquon Complex and the Sue and Wes Dixon Waterfowl Refuge at Hennepin and Hopper Lakes along the middle Illinois River. The two sites along the Illinois River were dedicated in 2012 following restoration of wetlands once drained for agriculture and contained within drainage and levee districts adjacent to the Illinois River. These wetland restorations and the biological and ecological responses observed represent exceptional examples of wetland conservation potential and are recognized as such by the international wetland community.

   The Wetland Reserve Program (WRP) administered by the U.S. Department of Agriculture's Natural Resource Conservation Service (NRCS) is a successful nationwide wetland conservation program that restores and protects wetland acres in perpetuity. In Illinois, over 16,000 acres have been added to the program between 2005 and 2015. A large percentage of these acres lie within Wetlands Campaign priority Natural Divisions.

   Since 2005, Ducks Unlimited has restored or enhanced 8,000 acres of wetland and 2,000 acres of associated upland habitat across Illinois, and protected another 6,400 acres of wetland habitat through fee-title acquisition, conservation easements, or long-term management agreements. Many of these projects improved water management capabilities as a strategy to enhance natural wetland functions, values and productivity. DU's wetland projects are most concentrated in the Upper Mississippi River & Illinois River Bottomlands, Lower Mississippi River Bottomlands and Northeastern Morainal Natural Divisions, all of which are identified as being statewide priorities. Ducks Unlimited's southern Illinois program has targeted the Coastal Plain and Lower Mississippi Bottomlands Natural Divisions.

2. *Develop and manage additional wetland habitat*.
   Status: Ducks Unlimited has acquired and developed approximately 750 acres of additional wetland habitat along the Illinois River, another 400 acres of wetland habitat along the Mississippi River, and 100 acres of wetlands in Northeast Illinois in partnership with the Illinois Department of Natural Resources, U.S. Fish and Wildlife Service, Natural Resources Conservation Service, U.S. Forest Service and local Forest Preserves/Conservation Districts. Since 2006, 812 acres have been enrolled in federal CP23 and CP9 programs and 4,185 acres of bottomland forest has been permanently protected through Illinois Conservation Reserve Enhancement Program (CREP).

   National Bird Conservation plans step down goals through bird Joint Ventures. These Joint Ventures develop conservation plans using a panel of regional experts for each bird group. In Illinois, the Upper Mississippi River and Great Lakes Region Joint Venture (UMRGLR JV) has developed bird conservation plans for waterfowl (Soulliere et al. 2007a), shorebirds (Potter et al. 2007a), waterbirds (Soulliere et al. 2007b) and landbirds (Potter et al. 2007b). These plans develop habitat objectives based on regional population objectives for focal species. Population deficits (i.e., regional populations have not reached objectives), are assumed to be habitat driven, and habitat deficits are calculated to reach population objectives. In the UMRGLR JV region of Illinois, approximately 325,000 acres of quality marsh, mudflat and open water habitat are needed to maintain current bird populations (Pierce et al. 2014).

   The major habitat deficits for wetland dependent birds include 18,000 acres of shallow semi-permanent marsh, hemi-marsh for waterfowl (Soulliere et al. 2007a), 64,000 acres of dry mudflat for shorebirds (Potter et al. 2007), and 2,200 acres of shallow semi-permanent marsh, hemi-marsh for waterbirds (Soulliere et al. 2007b). Habitat deficits exist for other habitat types as well, but these represent the greatest deficit for each wetland bird guild. The Joint Venture tracks habitat accomplishments from its partners in each UMRGLR JV state. Illinois has reached 92.1% of its marsh habitat goals, 16.6% of open water/beach goals, and only 3.5% of mudflat/shallows goals (Kahler 2014).

   Since 2010, over 40 ephemeral wetlands have been created in the Illinois River and Mississippi River Sands Area Natural Division, specifically in Mason and Tazwell counties to increase Illinois Chorus Frog habitat.

3. *Fill information gaps and develop conservation actions to address stresses.*
   Status: The Wetlands Campaign initiated a review of wetland wildlife habitat requirements throughout Illinois (Schulthies and Eichholz 2014). This report identified important wetland regions to focus conservation efforts (i.e., focus Natural Divisions) in the locations that were most important for wetland dependent wildlife. Specific results indicated that wetland habitat requirements were greatest for palustrine forested wetlands, followed by palustrine deep marsh. Wetland habitat requirements were greatest for beavers and waterfowl, and least for marsh rice rats, swamp rabbits, and waterbirds. Deepwater habitat requirements were also highest for beavers and waterfowl, and deep marsh habitat is most lacking statewide. Habitat quality considerations may increase habitat deficits by decreasing the effective acreage of current wetland areas. Finally, because waterfowl abundance can be so large, their energetic demands are also so great, and diverse, that they overwhelm the habitat needs of all other species groups. We assume that if habitat requirements are met for this group, then the habitat needs of other species groups should be met.

Wightman Lake, a former Ducks Unlimited project now owned and managed by the IDNR, serves as a demonstration site for wetland restoration, management and research associated with the Illinois River. Many natural resource professionals and private land managers have participated in DU led tours of the restored wetland, forest, and prairie habitats at this site. More opportunities exist to educate land managers about wetland management techniques utilizing demonstration sites like Wightman Lake.

A 2005 Wetlands Campaign goal identified increasing duck use-days by 38.9 million, or 147% from current averages (2005) in the Illinois and Mississippi River valleys. Current estimates indicate that this goal has been partially achieved; the deficit has been reduced by approximately 20.4 million use-days to a deficit of 18.5 million.

Critical Trends Assessment Program has continued to monitor plant, bird, and arthropod communities at randomly selected wetlands throughout Illinois. Since 2005, at least 150 wetland sites were visited throughout the state, most of them twice (Molano-Flores 2002). In 2012, Illinois Natural History Survey personnel initiated monitoring of plant community structure and bird communities at select CREP wetland restoration sites.

A range-wide monitoring program has been implemented for the Illinois Chorus Frog beginning in 2015, and will continue for 10 years.

Illinois Natural History Survey personnel are examining use of temporary and seasonal wetlands developed on agricultural lands using drainage water management. This technique involves installing water control structures on agricultural drainage tile to manage these waters. Spring migrating American Golden Plovers use these areas extensively, and the technique does not impact agricultural production.
Illinois Natural History Survey personnel conducted statewide aerial surveys of wading bird rookeries in 2012 and 2014 and found an increase of 37% from previous estimates last recorded in 2001. Although rookeries increased, mean number of nests per colony decreased, and several colonies in perceived high quality areas were vacant (Hagy et al. 2014).

4. *Inter-agency cooperation and coordination to ensure wetland programs do not have conflicting objectives.*
   Status: Numerous conservation entities representing federal, state, local government and non-profit organizations are working together in formal, or informal, partnerships to conserve vital wetland habitats through coordinated strategic action. Examples of these wetland focused partnerships include the Cache River Joint Venture, Middle Mississippi River Partnership, Friends of Hackmatack and the Middle Illinois River Conservation Partnership. IWAP Conservation Opportunity Area (COA) designations and objectives are utilized by many of these partnerships to help guide local conservation action.

5. *Emphasize multiple-resource benefits of wetland conservation*.
   Status: Although the benefits of wetlands are well known and accepted among managers, researchers, and conservationists, many sectors of society may remain unfamiliar or uncertain about wetland necessity and importance. Agencies, organizations and other groups should work to provide consistent positive messaging about wetlands in order to increase public awareness and knowledge.

6. *Increase water quality education efforts in areas under high development pressure, and/or within fragile geographic zones (i.e., karst terrain).*
   Status: Efforts to educate the public on wetlands issues are common, but may focus on specific segments of the population and not provide a comprehensive or standardized message. Targeted messaging may be the most effective means to educate specific groups about issues. However, a basic understanding of wetlands among society is needed to provide appropriate messaging. As part of the North American Waterfowl Management Plan, the waterfowl and wetland management community is currently conducting a nationwide evaluation of the public's wetland knowledge and attitudes. These results will likely shape the direction and messaging of wetland conservation toward non-wetland professionals in the future.

Stresses and Threats to Wildlife and Habitat

Habitat Stresses

Extent/Fragmentation

- Destruction (drainage/filling; Stressors are *Extent, Fragmentation* and *Disturbance/Hydrology*) due to land conversion for expanding urban/suburban areas, and agriculture.
- Although greater than 90% of Illinois wetlands have already been lost, continued loss is an issue in many areas. This pressure largely stems from agricultural production and continued urban/suburban expansion.
    - Continued pressure from agricultural producers often focusses on removing any standing water from the landscape that could hinder crop production, such as delaying working ground in the spring due to wet conditions, or allowing water to pool while crops are standing.
    - Unfortunately, these actions taken by producers are still viewed as "land improvements" and are not only allowed, but often encouraged to bolster land values and crop production potential.
    - Pressure on wetlands from development largely stems from desires of residents near urban areas to own homes on their own lot of land, which continues to spread (sprawl) urban areas into the surrounding landscape.
    - In Illinois this is most pronounced around the Greater Chicago Metro Area, and the Northeastern Morainal Natural Division, but other areas of the state are not immune.
- Fiscal and societal barriers to restoration/rehabilitation.
- Monetary land values are high in many areas and land use pressure (i.e., use for other purposes, particularly agriculture and development) prevents further restoration/rehabilitation, or costs are prohibitive to large scale wetland projects.
    - This varies regionally, often by land value and dominant land use. Unfortunately, the areas with the greatest barriers to restoration or rehabilitation are also the areas with the greatest need for wetlands, in terms of habitat for wildlife, and to provide societal benefits (e.g., flood storage, ground water recharge, nutrient sequestration).

Composition

- Wetland degradation, or loss of wetland quality, continues to be a problem in many areas.

- Wetlands remain intact, but either some function is lost/limited, or habitat changes which limit suitability, prevents use by some species, or makes them less attractive.
    - Such issues include unnatural hydrology (growing season flooding, prolonged flooding, lack of drying;), water quality (clarity, oxygen saturation, temperature, etc.), invasive species (carps;), and sedimentation (clarity, depth, substrate firmness).

<u>Hydrology</u>

- Unseasonable flooding
    - Floods exceeding the variability in timing, magnitude and duration of those that regularly occurred prior to human induced changes.
    - Reduces wetland quality by preventing or hindering growth of favorable vegetation adapted to historic conditions.
    - May favor undesirable plants and animals (i.e., non-native invasive carps),
    - Eliminate habitat at critical times of the annual cycle for some dependent wildlife species.
    - Exacerbated by increased water volume entering the river systems more rapidly through increased over-land or subsurface flows (i.e., runoff in developed areas and agricultural drainage), increased weather and precipitation variability due to climate change, and stream channelization.

- Unnatural Hydrologic Stability
    - Wetlands must cycle through periodic drying and flooding over appropriate (natural or artificial) time periods to affect vegetation and wetland substrates in order to retain their natural character or meet design specifications.
    - While some wetlands experience regular flooding and stable water levels, they may rarely experience drying which consolidates substrates, promotes some favorable plant species growth, and increases nutrient cycling and wetland productivity.
    - Artificial stabilization that deviates from pre-disturbance flooding and flow regimes, or a desired artificial water regime in natural or intensively managed wetland systems through stream flow manipulation and other processes further reduces the quality of an already scarce resource.

Pollution

- Sediment carried from uplands and stream bank and bed instability in runoff continues to increase siltation
    - Reduces: depth, clarity, substrate firmness and ability of submersed and emergent vegetation to establish roots in many wetlands.
- Thermal Pollution
    - Warm water inflows from many sources degrade or change wetland systems
- Chemical Pollution
    - Direct point source pollution as well as non-point source chemicals entering wetlands degrade systems and negatively impact wetland dependent species.
- Biological Pollution
    - Wastewater treatment plants inundated by floodwaters
    - Raw sewage flowing into waterways during significant runoff events.

Invasive Species

- Stress natural systems and species through predation, competition, or habitat alteration.
    - Non-native invasive plants often outcompete natives, disrupting wetland habitats, negatively impacting many wetland dependent species.
    - Invasive animals can further degrade habitat or displace native animal species.
- Diseases may stress species through direct mortality or reduced fitness.
- The following Invasive Species are of primary concern for the Wetlands Campaign:
    - Phragmites (*Phragmites australis*)
    - Reed canarygrass (*Phalaris arundinacea*)
    - Purple loosestrife (*Lythrum salicaria*)
    - Narrow-leaved and hybrid cattails (*Typha angustifolia* and *T. ×glauca*)
    - Disease/pathogens for herpetofauna such as *Ranavirus* and Chytrid fungus (*Batrachochytrium dendrobatidis*)
    - Common and grass carp (*Cyprinus carpio* and *Ctenopharyngodon idella*)

Focal Species

Focal species are a set of species selected for each campaign that represent the larger suite of SGCN addressed by the campaigns. They will be the primary focus of monitoring efforts to determine the success of campaign actions. Focal species were selected to represent specific habitat dependence or a species guild that has important conservation value, and are likely to show measureable change in response to campaign actions within the timeframe of this plan. Focal species may have been selected because populations are currently being monitored or could reasonably be monitored effectively and efficiently. The IWAP recognizes that there are limitations to accomplishing the recommended conservation and monitoring activities outlined in the Campaigns that are imposed by the availability of funding and existing staffing levels. The use of focal species provides a manageable approach to monitoring the effectiveness of conservation actions.

The Wetlands Campaign selected 9 focal species. The Campaign team in cooperation with local and state taxa experts used the following process to select focal species:

1. Identified all SGCN dependent upon wetland habitats.
2. Identified specific habitats associated with all wetland-SGCN.
3. Compared Illinois wetland SGCN to other regional or national species conservation plans (e.g., Soulliere et al. 2007b), and focal species identified by those plans. When practical, those focal species were used in the Wetlands Campaign.

<u>Blanding's Turtle</u>

- Full life cycle
- Marsh, Sedge Meadow
- Northeastern Morainal

Black-crowned Night Heron

- Breeding, migration
- Swamp, Marsh
- Coastal Plain, Illinois and Mississippi River Sand Areas, Lower Mississippi River Bottomlands, Northeastern Morainal, Upper Mississippi and Illinois River Bottomlands, Wabash River Border

Black Tern

- Breeding, migration
- Marsh
- Northeastern Morainal, Upper Mississippi and Illinois River Bottomlands

Illinois Chorus frog

- Full life cycle
- Marsh, Vernal Pool
- Illinois and Mississippi River Sand Areas

Lesser Scaup

- Migration
- Marsh, Emergent Wetland
- Illinois and Mississippi River Sand Areas, Lower Mississippi River Bottomlands, Northeastern Morainal, Upper Mississippi and Illinois River Bottomlands, Wabash River Border

Odonates

- Full life cycle
- Marsh, Swamp, Bog, Fen, Sedge Meadow, Panne, Seep & Spring, Vernal Pool
- Coastal Plain, Illinois and Mississippi River Sand Areas, Lower Mississippi River Bottomlands, Northeastern Morainal, Upper Mississippi and Illinois River Bottomlands, Wabash River Border

Short-billed Dowitcher

- Migration
- Mudflat, Vernal Pool
- Coastal Plain, Lower Mississippi River Bottomlands, Northeastern Morainal, Upper Mississippi and Illinois River Bottomlands, Wabash River Border

Wilson's Snipe

- Breeding, migration
- Marsh, Vernal Pool, Mudflat
- Coastal Plain, Illinois and Mississippi River Sand Areas, Lower Mississippi River Bottomlands, Northeastern Morainal, Upper Mississippi and Illinois River Bottomlands, Wabash River Border

Wood Duck

- Breeding, migration
- Bottomland Forest, Swamp, Marsh
- All priority Natural Divisions (Coastal Plain, Illinois and Mississippi River Sand Areas, Lower Mississippi River Bottomlands, Northeastern Morainal, Upper Mississippi and Illinois River Bottomlands, Wabash River Border)

Focus Areas

To determine priority places for the Wetlands Campaign to target, we relied heavily on a final report produced through a cooperative project between IDNR and Southern Illinois University-Carbondale which outlined the spatial and energetic needs of several focal species and groups of wetland-dependent wildlife (Schulties and Eichholz 2013). Input from Wetlands Campaign Partners provided during an April 2013 meeting, subsequent correspondence, and expert opinion from the Campaign Lead and a number of other engaged partners determined three tiers in which to focus wetland conservation efforts (Figures 16 and 17, Wetlands Campaign Appendix 10). These ranged from statewide (Tier 1), to priority Natural Divisions and individual high quality wetlands (Tier 2), to specific sites within priority Natural Divisions (Tier 3). The priority tiers are identified and are listed in the Actions section of the Wetlands Campaign below (Appendix 10). Additionally, Conservation Opportunity Areas (*see* Conservation Opportunity Areas portion of this document) fall within several Tier 2 Natural Divisions and encompass several Tier 3 sites (highest priority).

Actions

Illinois has lost over 90% of its original wetlands (Dahl 2006), with the majority of remaining wetlands clustered in relatively small spatial areas within six Natural Divisions. For this reason, wetland work throughout the state should be considered (Tier 1 prioritization, Appendix 10). Special attention should be given to large acreages, wetland complexes (i.e., clusters of individual wetlands) that provide critical habitat where relatively little exists, and spatial relationship to existing wetlands that may increase wildlife value. Many wetland dependent wildlife species (i.e., birds) are highly mobile, and are able to find and exploit habitat patches, even isolated patches significant distances from other suitable habitat are used. Wetland habitat loss and degradation has become so prevalent throughout the state, restoration must not neglect any opportunities at any spatial scale, but priority must be given to those sites that produce the greatest landscape-scale benefits for targeted SGCNs.

Universal Management Recommendations

1. Conserve (protect, restore, rehabilitate, construct) wetlands throughout Illinois.
2. Promote wetland enhancement and management that increases wetland quality through vegetation establishment, management and manipulation.
3. Promote vegetated wetlands, especially marsh wetland types with complex vegetation heterogeneity, identified by Upper Mississippi River Great Lakes Region Joint Venture as greatest habitat deficit (Soulliere et al. 2007) which support more focal SGCN than other wetland types.
4. Promote natural habitat management (e.g., moist-soil, hemi-marsh) for managed wetlands as opposed to flooded row crops often used for waterfowl hunting management.
5. Support wetland conservation policy and regulations that offer additional protection, funding for conservation, or otherwise benefits wetland habitats and the species that depend on them.

Targeted Actions

Actions in this section are targeted toward priority Natural Divisions. The Wetlands Campaign Partners targeted six Natural Divisions (*Tier 2* locations; Figures 16 and 17, Appendix 10) based on their importance to wetland wildlife, wetland users, existing wetland habitat, and wetland habitat potential (Schulthies and Eichholz 2014). Targeted Actions should be focused within these Natural Divisions to have the greatest impact on SGCN. These Natural Divisions include: Coastal Plain, Illinois River and Mississippi River Sand Areas, Lower Mississippi River Bottomlands, Upper Mississippi River and Illinois River Bottomlands, Northeastern Morainal, and Wabash River Border. Other regions that warrant high priority consideration include the Middle Mississippi River Border Natural Division and the lower Kaskaskia River from the Carlyle Lake dam to its mouth at the Mississippi River. Additionally, several large reservoirs were believed to meet the criterion for inclusion in Tier 2 despite being located outside priority natural divisions. These include: Carlyle Lake, Clinton Lake, Crab Orchard Lake, Rend Lake, and Lake Shelbyville.

The highest priority sites (Tier 3) include specific sites within the Tier 2 Natural Divisions ranked as high priority. Not all sites received Tier 3 ranking due to wetland quality, potential wetland quality, habitat value, management capability, wildlife use, and other considerations. Tier 3 sites typically offer moderate to high quality wetland habitat, or have high habitat potential, have significant wetland wildlife use, wetland constituent use, and can significantly impact wetland dependent wildlife, particularly SGCN. Sites considered highest priority, by Natural Division, are included in Wetlands Appendix 10 and Figure 17.

Targeted actions and acreage goals in this section assume 2015 wetland acreages, quality, and that significant wetland loss does not occur during the implementation period. If significant losses occur, quality continues to degrade or is found to be too poor to support wetland SGCN, acreages need to be revised upward to account for additional lost or degraded habitat.

Habitat Actions

6. Acquire and protect existing wetlands or restorable wetlands.

    Need: Degradation of wetlands and/or conversion of wetlands to other uses continues despite educational efforts, regulatory protection, and voluntary incentives that are intended to encourage private landowners to preserve, maintain, and manage wetland habitats on their property. Also, very few private landowners are sufficiently motivated to restore prior converted wetlands on their property to their fullest function and value.

        a. Federal, state, local government and non-profit conservation organizations that have a conservation mission which includes wetland habitat preservation may purchase existing /restorable wetlands in fee-title, or protect them under a permanent conservation easement, in order to maintain wetland habitat in perpetuity.

b. Prioritization of wetland acquisition and protection is desirable to more efficiently achieve wetland and wildlife conservation objectives. When prioritizing wetland acquisition and protection, consideration may be given to:
    i. Expanding existing protected lands to establish/protect large wetland complexes;
    ii. Creating habitat "corridors" to connect already protected wetland sites;
    iii. High quality, rare, declining, vulnerable, or threatened wetlands;
    iv. Wetland habitats critical to specific wildlife species or needed to achieve specific wildlife conservation objectives;
    v. Land costs and alternative conservation actions.
c. Engage unconventional partners (e.g., Illinois Department of Transportation), who may conduct significant wetland conservation activities (e.g., mitigation banking), but may not focus efforts on maximizing benefits to SGCN.

Outcomes: Protecting existing wetlands is usually a more economically and ecologically sound approach than restoring or rehabilitating wetlands after conversion. Implementing these strategies will result in stabilizing wetland acres within Illinois, which is an essential first step towards increasing wetland acres to positively influence SGCN at statewide or broader scales.

7. Enhance habitat quality of existing wetlands.

Need: Wetland quality has likely declined statewide over the course of several decades (Stafford et al. 2010). These declines are not consistent throughout the state and among Natural Divisions; they are exacerbated by many factors along large rivers (Mills et al. 1966, Bellrose et al. 1979, 1983), but may impact all wetland systems.

a. Manage wetlands to promote native plant communities by removing, reducing or controlling invasive species, especially:
    i. Phragmites, purple loosestrife, reed canary-grass, Eurasian water milfoil, water hyacinth, narrow-leaf cattail, and others (*see* Invasives Campaign).
    ii. Common carp, grass carp, silver carp, bighead carp and other non-native fish.
b. Timber stand improvement of bottomland forest
    i. Reduce shade tolerant soft woods (i.e., cottonwood, green ash, silver maple, willow)
    ii. Increase mast producing hardwoods (i.e., oak, hickory, pecan) within floodplain sites that will support these tree species
    iii. Manage for diversity of stand density, age, and structure utilizing strategies that promote natural regeneration where appropriate (Knutson et al. 1996).
c. Reduction of undesirable plant species (river bulrush, cattail, perennial smartweed, etc.) in managed wetlands, manage for desirable seed producing annual plants.
d. Use disturbance (e.g., water level manipulation, prescribed fire, mechanical manipulation, herbicide) to control encroaching undesirable woody vegetation in open wetland types, and undesirable herbaceous plants where appropriate.
e. Increase historically abundant habitats, and duplicate historic habitat complexity and juxtaposition within wetlands (Stafford et al. 2010)
f. Restore floating leaved, submersed aquatic and emergent vegetation to backwater lakes and wetlands along Illinois and Mississippi rivers (Bellrose et al. 1983).

g. Increase water depth, water clarity, and substrate firmness of appropriate bottomland lakes and wetland management impoundments through consolidation of sediments by repeated annual dewatering and drying.
h. Reduce sediment inputs into streams, rivers, and wetlands from row crop field through minimum tillage, vegetated waterways, buffers, and wetland restoration.
i. Maintain and increase water control in lakes and wetlands within river floodplains through managed or partial connections which will isolate habitats from growing-season floods yet allow movement of aquatic species when appropriate.

Outcomes: Increasing wetland quality will simultaneously increase wetland habitat diversity and spatial arrangement within wetlands, more closely mimicking historic wetland conditions (Stafford et al. 2010). Many wetland dependent wildlife species were more abundant and more widely distributed under historic conditions, thus, managing for these lost wetland attributes will facilitate conservation of SGCN and other wildlife species.

8. Restore shallow wetlands.

Need: Shallow wetlands often promote greater primary productivity and can be more important than larger, more permanent wetlands to many wildlife species. They are also more easily eliminated from the landscape through drainage or filling, thus, are more imperiled. Additionally, herptiles are less mobile than some other wetland wildlife groups (i.e., birds), thus, depend on habitats that are more spatially clustered. Herpetofauna require a diversity of interconnected habitats within a landscape context to provide for habitat needs at every stage of their life cycle (Phillips et al. 1999).

a. Plug ditches and drain tiles or add water control weirs in agricultural areas to allow altered shallow wetlands to hold water for greater time periods and dewater naturally.
b. Provide wetland habitat complexes that support diverse herpetofauna communities.
    i. Restore ephemeral and other largely fishless, seasonal wetlands, including 5-10 per Illinois Department of Natural Resources region per year on public lands, for migratory shorebirds and waterfowl, amphibians, and other wildlife, focusing initially on Wabash Border, Coastal Plain, Illinois River and Mississippi River Sand Areas and Northeastern Morainal Natural Divisions to benefit amphibian SGCN.
    ii. To maintain or increase occupancy of Illinois Chorus Frogs, increase the number of ephemeral wetlands and upland sand prairie habitat in the Mason County COA (Illinois River and Mississippi River Sand Areas) by 10% (approximately 100 wetlands) during the next 10 years.
    iii. Provide diverse wetland habitats in close spatial proximity with upland buffers and corridors that provide for all herptile life stages.
    iv. Delay wetland dewatering until mid-summer to allow successful reproduction in spring and early summer.
c. Restore basin marshes in the Northeastern Morainal Natural Division and stream-side marshes in floodplain areas.

d. Use incentive-based, or voluntary programs (such as private land easement programs) and with technical assistance to establish shallow water wetlands on private lands.
e. Continue development of programs to better manage drainage water on agricultural lands through installation of water control structures on drain systems, this will provide additional water to crops (benefiting producers or land owners) while reducing agricultural runoff, and habitat for migratory waterbirds during appropriate times of the year (i.e., primarily spring migration).
f. Work towards eliminating wetland habitat deficits identified by Upper Mississippi River and Great Lakes Region Joint Venture - Shorebird, Waterbird, and Waterfowl conservation plans (Potter et al. 2007a, Soulliere et al. 2007a, b, Pierce et al. 2014).

Outcomes: Establishing additional shallow wetlands will greatly increase total available wildlife habitat for a variety of species, including herptiles, positively influencing their populations. Additionally, these wetlands will greatly improve the surface water storage capacity of the landscape to reduce flooding, nutrient sequestration and contribute to groundwater recharge. Private land is essential in making significant progress.

9. Manage existing wetlands to maximize wildlife benefits.

Need: Despite large wetland losses within Illinois, remaining wetland acreage is often not managed to maximize wildlife benefits (Stafford et al. 2011). Managed wetlands often focus on attracting individual species for hunting (i.e., planting and flooding corn to attract mallards), which greatly reduces wetland quality and limits value to most wetland dependent species. Impoundments managed for row crops must be drained early in, or prior to the growing season, often before spring migrants have departed and prior to herptile reproduction (i.e., in winter or early spring). These wetland units must be kept dry throughout the growing season to support row crops, often fertilizer and herbicides are used, and row crops provide very little habitat for most wetland dependent wildlife species, and essentially no habitat for SGCN.

a. Maintain water in managed wetlands through mid- to late-spring to maximize wetland habitat availability for a variety of species and mimic historic flooding regimes.
    i. Spring migration habitat and food resources may be limited for many species. Maintaining water through spring migration may greatly benefit migratory species, including waterfowl (Lesser Scaup), wading birds (Black-crowned Night Heron), and shorebirds (Short-billed Dowitcher, Wilson's Snipe), and resident herptiles (Illinois Chorus Frog), and mammals (Muskrat; Erb and Perry 2003).
    ii. Delay flooding of some managed moist soil until late winter or early spring for spring-migrating waterfowl, especially diving ducks (Greer et al. 2007).
b. Adopt moist-soil, or other natural wetland management strategies on public waterfowl management areas and other sites to increase wading bird, waterfowl, shorebird, and other wildlife use during spring, summer and fall.

c. Reduce acreage of wetlands planted to row crops and other planted waterfowl food plots.
    i. Natural vegetation can be managed, enhanced, or supplemented to produce abundant waterfowl foods that are more nutritious, often more preferred, more persistent, and used by a greater number of species (Fredrickson and Taylor 1982, Loesch and Kaminski 1989).
    ii. Moist-soil management allows wetlands to be inundated longer during the growing season which benefits more species of wildlife and provide more functions and values of wetlands (Fredrickson and Taylor 1982).
    iii. Plant with a purpose: when disturbance is necessary in moist-soil wetlands to set back succession(i.e., 1 in 3-5 years), tillage followed by planting "grassy corn" (minimal herbicide and fertilizer, wide row spacing, and late planting date to encourage natural vegetation to grow between corn rows) or millet may be used.

Outcomes: Maximize benefits of available wetland habitat for a variety of wildlife species. Wetlands that can be intensively managed should provide the best and most preferred habitat used by targeted SGCN, and implementing these changes will facilitate this goal.

10. Restore historic hydrology to wetlands associated with large rivers.

Need: The hydrology of large rivers in Illinois has been altered for commercial navigation, cropland protection, and other purposes (Bellrose et al. 1983, Havera 1999). These alterations have largely led to a decrease in wetland quality and quantity, and have altered natural processes which made wetlands associated with rivers excellent wildlife habitat (Mills et al. 1966, Bellrose et al. 1979, Havera 1999). Although altering large river hydrology to mimic historic flows is difficult, wetland management regimes should promote natural hydrological cycles where possible, and the conservation community may be able to induce change in some systems (Konrad 2010). Alternatively, in highly altered systems, wetlands may benefit from maintaining hydrologic separation (Jackson and Pringle 2010), while managing for high quality habitats.

a. Implement wetland management practices which restore or mimic historic wet/dry cycles annually and over longer time periods. This should include spring flooding of appropriate magnitude and duration followed by slow drawdown throughout summer, and shallow fall flooding annually, with periodic complete drying to mimic drought, and deep water to mimic flooding, preferably following several years of drawdown, which may support submersed aquatic vegetation.
b. Utilize managed connections between streams, rivers and floodplain wetlands when such connectivity will enhance wetland values, functions and quality and/or when the risks of wetland degradation by sediments and other pollutants, invasive species, and water level fluctuations associated with unhealthy streams and rivers can be controlled, minimized or reversed by management intervention.

Outcomes: Restoring or mimicking historic hydrologic regimes should result in habitat types and vegetation assemblages that are most beneficial to native wildlife along major rivers.

11. Identify and prioritize areas for wetland habitat management in the Wabash Border Natural Division. (Manage at least 1,000 acres of wetland habitat accessible to the public in the Wabash Border Natural Division.)

    Need: The Wabash Border Natural Division has been identified as an important migratory corridor and stopover location during spring and fall migration, and an important region for resident wetland wildlife. Additionally, this area remains one of the last major rivers with a largely intact floodplain (i.e., not separated by levees) and wetlands have the ability to fluctuate naturally with flood pulses and drying.

    a. Wetland habitat should exist in complexes interspersed with other bottomland habitats including grasslands and forests to benefit the greatest number of SGCN.
    b. Wetland habitat should be emergent marsh, following natural hydrologic regimes and timing for the area.

    Outcomes: These habitat assemblages will benefit a variety of SGCN during breeding, migration and wintering periods, including Wood Duck, Lesser Scaup, Short-billed Dowitcher, Black-crowned Night Heron, Wilson's Snipe, Muskrat, and Odonates.

<u>Policy/Advocacy Actions</u>

12. Support state and national wetland conservation legislation.

    Need: Wetlands are imperiled nationwide, and legislation impacting wetland policy and conservation will facilitate wetland conservation in Illinois as well.

    a. Protection of isolated wetlands through legislation preventing draining, filling, and destroying wetlands on private land. Implementation of an incentive or easement program for protecting farmable wetlands (USFWS; SWAP).
    b. Changes to restrictions on levee construction/creation/maintenance that encourage partial wetland connectivity along large river floodplains.
    c. Review and update floodplain inundation risk maps to more accurately characterize flood frequency zones (e.g., 100-year floodplain).
    d. Use U.S. Fish and Wildlife Service Small Wetland Acquisition Program as a model for farmable wetland conservation in Illinois. An easement agreement is entered by the landowner and USFWS; drainage features (e.g., tiles and ditches) are removed. Landowners may farm anything that is dry enough whenever possible, but drainage is not allowed, and land remains in private ownership. This is a popular and successful program.

    Outcomes: Greater protection for wetlands or funding for wetland conservation in Illinois and throughout the nation.

13. Adopt/support agricultural practices which are less detrimental to wetlands and wildlife.

    Need: Many practices on modern farms are detrimental to wetlands either directly (e.g., drainage), or indirectly (e.g., sedimentation). Slight modifications that do not significantly impact yield or production can make large differences if implemented at large scales.

    a. Support policies that reduce agricultural chemicals entering wetlands and waterways which negatively impact aquatic ecosystems locally and continentally.
    b. Implement lateral drainage to reduce nitrogen, phosphorus, and herbicide and pesticide runoff into waterways.
    c. Install water control structures on drain tile to hold water at times of the year when it is beneficial to crops or to wildlife.
    d. Establish field buffers to limit sediment and other undesirable runoff into waterways and wetlands and provide linear habitat for wildlife.
    e. Support policies linking crop insurance to conservation practices.
    f. Reexamine agricultural producer subsidies to provide greater benefits to those who provide wetlands and wildlife habitat on their properties and reduce benefits for those who do not.
    g. Restore farmable wetlands and allow seasonal wetlands within floodplains and uplands to maintain surface hydrology, slow water movement to streams and rivers, and capture sediments.

    Outcomes: Agricultural producers own and manage the majority of land in Illinois. Implementing small changes across broad areas will have measurable impacts on wildlife habitat and populations. Work with producer groups to identify strategies that will be acceptable or beneficial to producers and provide benefits to wetland dependent species.

14. Adopt/support economic and social development planning and strategies which are less detrimental to wetlands and wildlife.

    Need: Similar to agricultural areas throughout the state, urban and exurban areas continue to expand and negatively impact native habitats, including wetlands. Initiating strategies for development that facilitate natural habitats, rather than eliminate them will greatly benefit SGCN in these areas.

    a. *See* Green Cities Campaign (pages 100-104)

    Outcomes: Eco-friendly development and green infrastructure will benefit SGCN and human populations in urban and exurban environments.

15. Facilitate interagency communication to provide consistent messaging and information about wetlands and other wildlife habitats.

    Need: Agencies often have conflicting messages to media, the public, agricultural producers and other entities regarding wetlands and other wildlife habitat. Attitudes among people outside the conservation community regarding wetlands and other habitat types is likely inconsistent and poorly understood, potentially as an effect of misinformation or preconceived notions.

Outcomes: Positively influence the perception of wildlife habitats among constituents and society outside of the conservation community. Facilitate cooperation among and within state and federal agencies to provide accurate information and strengthen public support for conservation actions.

Research Actions

16. Conduct research to gain a greater understanding of wetland ecology, wetland wildlife and the relationship between wildlife and wetlands in Illinois.

    Need: Although the body of knowledge regarding wetlands and wildlife is extensive, there are many areas that remain unknown, and new questions are continually arising as habitats are degraded or restored, wildlife populations change, or research or management results lead to additional questions. The ability to investigate these issues is fundamental to our ability to effectively manage populations and habitats in an ever changing environment.

    Specific research topics include, but are not limited to:

    a. Gain a greater understanding of wetland quality throughout the state.
    b. Conduct research to better understand wetland hydrology throughout the state.
    c. Conduct research and monitoring to better understand wildlife (particularly SGCN) and wetland habitat relationships, especially at the landscape level within Tier 2 and Tier 3 wetland areas.
    d. Understand the effects of waterfowl management activities on other wetland-dependent wildlife (e.g., shorebirds, marshbirds, wading birds, songbirds, and herpetofauna).
    e. Compare traditional row crops, grassy corn, and moist-soil on managed areas for wildlife.
    f. Evaluate the assumption that meeting waterfowl habitat deficits will support all other wetland-dependent wildlife species.
    g. Evaluate whether harvest of waterfowl and furbearers provides a suitable metric for measuring waterfowl abundance in spring and relative habitat conservation priorities.
    h. Assess tradeoffs for focal species in wetland management practices (e.g., emergent marsh, moist soil, grassy corn, food plots, passive management, bottomland forest planting, etc.); which practices benefit which species?
    i. Examine effects of hunting and management to support fall hunting on food for spring-migrating ducks. Does hunting limit use and conserve food for spring migration?
    j. Understand and address the influence of subsurface drainage (drain tiles and groundwater depletion), groundwater withdrawal (especially where irrigation is prevalent), and groundwater depletion on statewide wetland hydrology.
    k. Evaluate drainage water management for spring migration habitat for shorebirds, impacts on agricultural production and feasibility of broad implementation.
    l. Examine the tradeoffs for wetland dependent wildlife and fish associated with floodplain isolation and connectivity.
    m. Assess the impacts of managed summer drawdown and drying of wetlands on unconsolidated sediments, substrate firmness, and wetland plant community response.

n. Understand establishment and maintenance approaches for submersed aquatic vegetation assemblages in backwater wetlands.
o. Determine potential impacts of mosquito control efforts on non-target Odonates and other wetland dependent SGCN.

Outcomes: Furthering our understanding of wetland wildlife and the systems they depend on will inform species and habitat management at local, Natural Division and landscape scales, leading to more effective conservation of SGCN.

Management Resources

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- North American Waterfowl Management Plan http://www.fws.gov/birds/management/bird-management-plans/north-american-waterfowl-management-plan/plan-documents.php

- Illinois Nutrient Loss Reduction Strategy http://www.epa.illinois.gov/Assets/iepa/water-quality/watershed-management/nlrs/nlrs-final.pdf

- North American Breeding Bird Survey https://www.pwrc.usgs.gov/bbS/

Performance Measures

Outcome performance measures are designed to assess the overall impact of undertaking conservation actions on Implementation Goals. Output performance measures are designed to assess how active the program is at working toward the Implementation Goals.

Overarching Goal	Type	Performance Measure
Viable Populations	Outcome	Focal Species abundance (or relative abundance) is maintained or increased
	Output	Implement monitoring for Focal Species and SGCN that are not currently monitored at statewide or finer spatial scales (Natural Division)
	Outcome	SGCN abundance is maintained or increased Statewide.
	Output	Conservation or Recovery Plans developed for T&E species (annual number)
Habitat Management	Outcome	SGCN distribution and populations are maintained or increased (resiliency) through habitat management and protection.
	Outcome	Net gain in acres of important habitat types within important natural divisions
	Output	Increased acres of specific habitat types (e.g., moist-soil) and quality achieved through management
	Output	Increased water quality through habitat management
	Output	Reduced sediment delivery to wetlands and streams through upland management
	Output	Reduce acres of wetlands degraded by invasive plant species
	Output	Increase wetland abundance to increase water storage capacity and reduce flooding
Habitat resiliency and connectedness	Output	Establish high quality examples of all wetland communities (INAI) within Natural Divisions within which they occur
	Outcome	Increase ecological connectivity among habitat patches to support distribution of less mobile species (e.g., herpetofauna)
Public Awareness, Appreciation, Connection	Output	Targeted wetland education to increase support for wetlands and wetland management that benefit wildlife and society
	Output	Support state and national wetland conservation legislation
	Output	Facilitate communication among agencies to provide consistent positive messaging for wetland conservation

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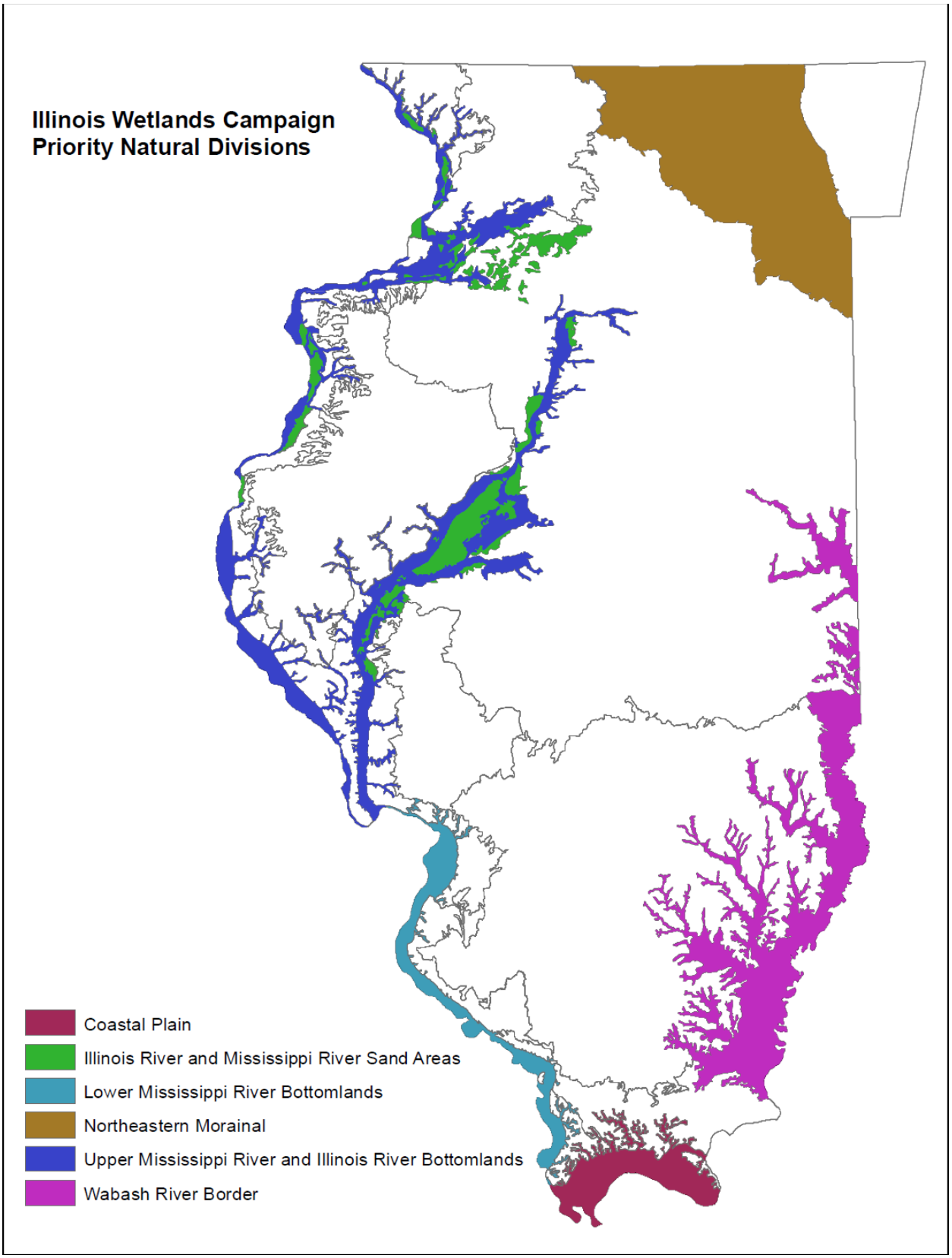

Figure 16. Wetlands Campaign six priority Natural Divisions.

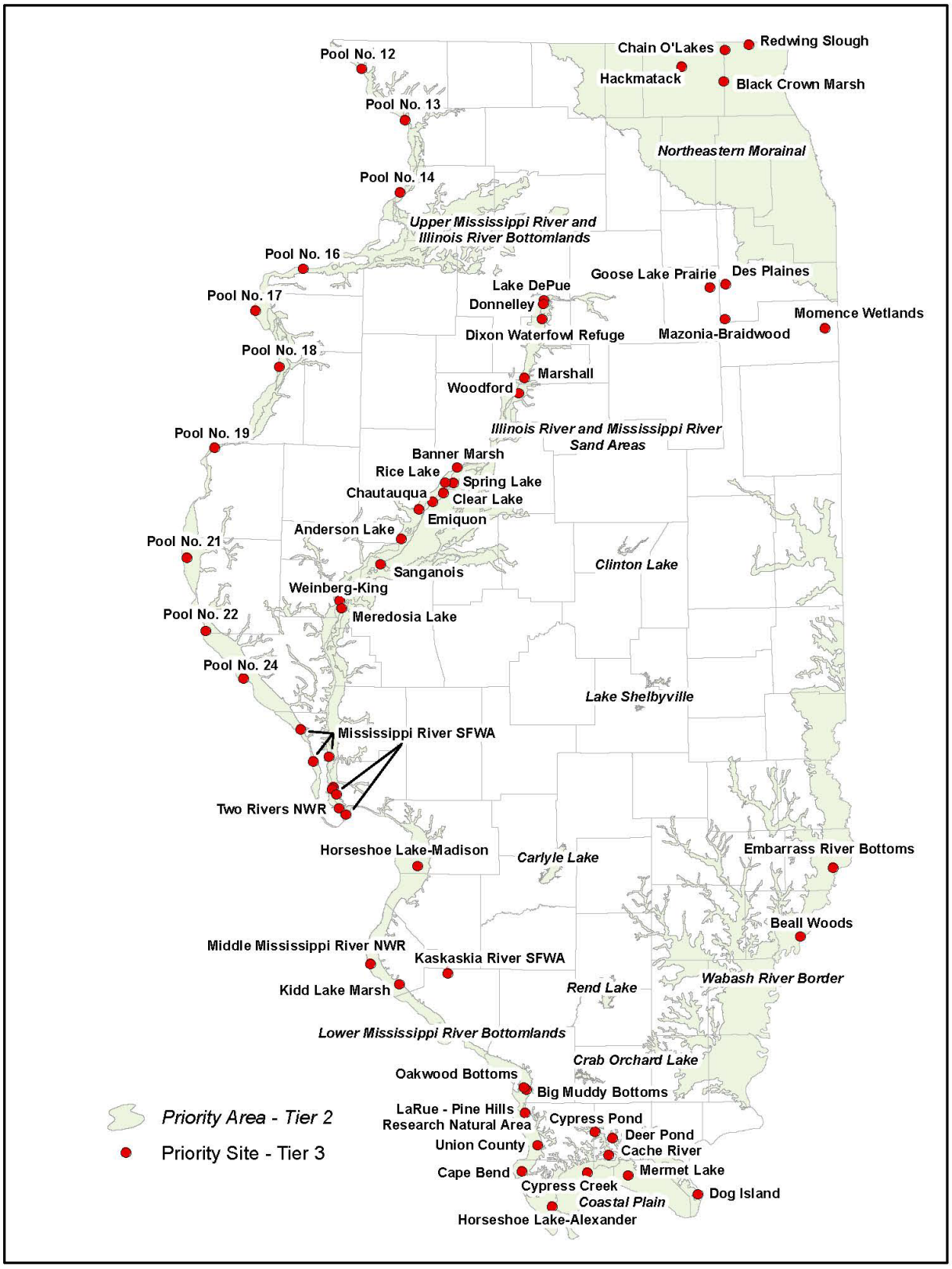

Figure 17. Wetlands Campaign Focus Areas (Tier 2) and sites (Tier 3).

Appendix 9a. Status and stresses to Illinois Wildlife Species of Greatest Conservation Need addressed in the Wetlands Campaign and Appendix 9b. Status and stresses to Illinois Species of Greatest Conservation Need addressed in the Wetlands Campaign. Definitions and methods:

Common Name: Commonly recognized name for the species.

Scientific Name: Currently recognized name for the species based on the most recently available literature.

Campaign Habitat: Major habitat type where the species occurs in Illinois.

Specific Habitat: More detail habitat location for species in Illinois.

Historic Status: Number of Counties, or HUC8 watershed for fish and mussels, with records from before 1980.

Current Status: Number of Counties, or HUC8 watersheds for fish and mussels, with recent records (last 20 years).

Trend: Trends were based on the change in distribution of the species by comparing their Current and Historic Status. If a change less than 25% was observed the trend was recorded as 0, changes with magnitudes between 25-49% were coded as +1 (distribution increased) or -1 (distribution decreased), changes greater than 50% were coded as +2 (distribution increased) or -2 (distribution decreased).

Stressors: Each stressor type was rated as either a recognized stressor (1), not a recognized stressor (0), or as having not enough information to make a rating (NMI=Need More Information).

Appendix 9a. Status and stresses to Illinois Wildlife Species of Greatest Conservation Need addressed in the Wetlands Campaign.

							Habitat Stresses						Community Stresses							Population Stresses				Direct Human Stressors		
Common Name	Scientific Name	Campaign Habitat	Specific Habitat	Historic Status	Current Status	Trend	Extent	Fragmentation	Composition-structure	Distrubtion/Hydrology	Invasives/Exotics	Pollutants-Sediment	Competitors	Predators	Parasites/Deisease	Prey/Food	Hosts	Invasive/Exotics	Other Symbionts	Genetics	Dispersal	Recruitment	Mortality	Killing	Disturbance	Structures/Infrastructure
BIRDS																										
American Bittern	*Botaurus lentiginosus*	Marsh	Marsh	13	17	1	1	1	1	1	1	1	0	0	0	1	0	0	0	0	0	1	1	0	1	1
American Black Duck	*Anas rubripes*	Marsh	Forested Stream, Lake	NMI	NMI	0	1	1	0	1	1	1	1	0	1	1	0	1	0	1	0	1	0	0	0	0
Black Rail	*Laterallus jamaicensis*	Wet Meadow	Marsh	0	2	2	1	1	1	1	1	1	0	0	0	1	0	0	0	1	1	1	1	0	0	1
Black Tern	*Chlidonias niger*	Marsh	Marsh	12	29	2	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	1	1	0	1	1
Black-crowned Night-Heron	*Nycticorax nycticorax*	Swamp	Swamp	31	32	0	1	1	1	1	1	1	0	0	0	1	0	0	0	0	0	1	1	0	0	1
Buff-breasted Sandpiper	*Tryngites subruficollis*	Wet Mudflat/Moist-soil Plants	Vernal pool, mudflat, marsh	NMI	NMI	0	1	1	1	1	1	1	0	0	0	1	0	0	0	0	0	1	1	0	1	0
Canvasback	*Aythya valisineria*	Marsh	River, Lake	NMI	NMI	0	0	0	1	1	1	1	0	0	1	1	0	0	0	0	0	1	1	0	1	1
Common Gallinule	*Gallinula galeata*	Marsh	Marsh	11	23	2	1	1	1	1	1	1	0	1	0	1	0	0	0	0	0	1	0	0	0	1
Common Tern	*Sterna hirundo*	Beach	Beach	5	11	2	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0	1	1	0	1	1
Forster's Tern	*Sterna forsteri*	Marsh	Marsh	7	28	2	1	1	1	1	1	1	0	1	0	1	0	0	0	0	0	1	1	0	1	1
King Rail	*Rallus elegans*	Marsh	Marsh, Grassland	10	16	2	1	1	1	1	1	1	0	1	0	1	0	0	0	0	1	1	1	0	0	1
Least Bittern	*Ixobrychus exilis*	Marsh	Marsh	21	29	1	1	1	1	1	1	1	0	0	0	1	0	0	0	0	0	1	1	0	0	1
Least Tern	*Sternula antillarum*	Beach	River, Shoreline	1	16	2	1	1	1	1	0	1	0	1	0	1	0	0	0	1	1	1	1	0	1	1
Lesser Scaup	*Aythya affinis*	Marsh	River, Lake	NMI	NMI	NMI	0	0	1	1	1	1	0	0	1	1	0	0	0	0	0	1	1	0	1	1
Lesser Yellowlegs	*Tringa flavipes*	Wet Mudflat/Moist-soil Plants	Vernal pool, mudflat, marsh	NMI	NMI	NMI	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Marsh Wren	*Cistothorus palustris*	Marsh	Marsh	20	31	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	1
Pectoral Sandpiper	*Calidris melanotos*	Wet Mudflat/Moist-soil Plants	Vernal pool, mudflat, marsh	NMI	NMI	NMI	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Pied-billed Grebe	*Podilymbus podiceps*	Marsh	Marsh, Lake	32	40	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Red Knot	*Calidris canutus*	Wet Mudflat/Moist-soil Plants	Vernal pool, mudflat, marsh	NMI	NMI	NMI	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Sandhill Crane	*Grus canadensis*	Marsh	Marsh	6	21	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Short-billed Dowitcher	*Limnodromus griseus*	Wet Mudflat/Moist-soil Plants	Marsh, Vernal Pool, Mudflat	NMI	NMI	NMI	1	1	1	1	1	1	0	0	0	1	0	0	0	0	0	1	1	0	1	0
Trumpeter Swan	*Cygnus buccinator*	Marsh	Marsh, Lake	0	5	2	0	1	1	1	1	1	0	1	0	0	0	0	0	0	0	1	1	0	0	1
Whooping Crane	*Grus americana*	Marsh	Marsh	NMI	NMI	NMI	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1
Wilson’s Phalarope	*Phalaropus tricolor*	Wet Mudflat/Moist-soil Plants	Marsh, Vernal Pool	1	12	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	1
Wilson's Snipe	*Gallinago delicata*	Wet Mudflat/Moist-soil	Marsh, Vernal Pool	16	17	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1

							Habitat Stresses						Community Stresses							Population Stresses				Direct Human Stressors		
Common Name	Scientific Name	Campaign Habitat	Specific Habitat	Historic Status	Current Status	Trend	Extent	Fragmentation	Composition-structure	Distrubtion/Hydrology	Invasives/Exotics	Pollutants-Sediment	Competitors	Predators	Parasites/Deisease	Prey/Food	Hosts	Invasive/Exotics	Other Symbionts	Genetics	Dispersal	Recruitment	Mortality	Killing	Disturbance	Structures/Infrastructure
Yellow Rail	*Coturnicops noveboracensis*	Marsh	Marsh	NMI	NMI	NMI	1	1	1	1	1	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	Marsh	Marsh	13	12	0	1	1	1	1	1	1	1	1	0	1	0	0	0	1	1	1	1	0	1	1
HERPTILES - Amphibians																										
Blue Spotted Salamander	*Ambystoma maculatum*	Sedge Meadow	Fish-free Vernal Pool	33	29	0	0	1	1	1	1	1	0	1	0	0	0	1	0	0	1	1	0	0	1	1
Bird-voiced Treefrog	*Hyla avivoca*	Swamp	Swamp	6	6	0	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
Eastern Narrow-mouthed Toad	*Gastrophryne carolinensis*	Floodplain	Open Floodplains, Ephemeral Wetland	6	3	-2	1	1	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1
Eastern Newt	*Notopthalmus viridescens*	Floodplain Lake, Slough Backwater	Semi-Permanent Ponds, Slough	27	19	-1	0	1	1	1	1	1	0	1	0	0	0	1	0	0	1	1	0	0	1	0
Four-toed Salamander	*Hemidactylium scutatum*	Sedge Meadow	Seep, Sedge Meadow, Vernal Pool	13	8	-1	1	1	1	1	1	1	0	0	1	0	0	1	0	1	1	1	1	0	1	1
Illinois Chorus Frog	*Pseudacris illinoensis*	Sand Prairie/Emphemeral Wetland	Ephemeral Wetland in Sandy Soil Grassland, Prairie	10	10	0	1	1	1	1	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
Lesser Siren	*Siren intermedia*	Swamp	Swamp, Ditch, Lowland, Wetland, Pool	35	20	-1	1	1	1	1	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	0
Pickerel Frog	*Lithobates palustris*	Sedge Meadow	Wet Meadow	25	16	-1	1	1	1	1	0	1	0	0	1	0	0	0	0	1	0	1	0	0	0	0
HERPTILES - Reptiles																										
Blanding's Turtle	*Emydoidea blandingii*	Marsh	Nesting in Upland Habitat, Numerous Types of Wetland	31	21	-1	1	1	1	1	1	1	0	1	1	0	0	0	0	0	1	1	1	1	1	1
Eastern Ribbonsnake	*Thamnophis sauritus*	Swamp	Swamp	10	7	-1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1
Mississippi Green Watersnake	*Nerodia cyclopion*	Swamp	Swamp	2	1	-2	1	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1
Red-bellied Mudsnake	*Farancia abacura*	Swamp	Swamp	7	6	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1
Southern Watersnake	*Nerodia fasciata*	Swamp	Swamp	1	0	-2	1	1	1	1	0	1	1	0	0	0	0	0	0	1	0	1	1	0	1	1
Spotted Turtle	*Clemmys guttata*	Marsh	Marsh, Sedge Meadow, Wet Grassland	2	2	0	1	1	1	1	1	0	0	1	1	0	1	1	0	1	1	1	1	1	1	0
INVERTEBRATE - Crustaceans																										
Neglected Fairy Shrimp	*Eubranchipus neglectus*	Wet Meadow	Ephemeral Wetland	NMI	3	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI

							Habitat Stresses						Community Stresses							Population Stresses				Direct Human Stressors		
Common Name	Scientific Name	Campaign Habitat	Specific Habitat	Historic Status	Current Status	Trend	Extent	Fragmentation	Composition-structure	Distrubtion/Hydrology	Invasives/Exotics	Pollutants-Sediment	Competitors	Predators	Parasites/Deisease	Prey/Food	Hosts	Invasive/Exotics	Other Symbionts	Genetics	Dispersal	Recruitment	Mortality	Killing	Disturbance	Structures/Infrastructure
INVERTEBRATE - Hemiptera (True Bugs)																										
a leafhopper	*Cosmotettix delector*	Wet Meadow	Wet Prairie	NMI	6	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
a leafhopper	*Destria fumida*	Wet Meadow	Wet Prairie	NMI	5	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
a leafhopper	*Draeculacephala inscripta*	Swamp	Swamp, Marsh	NMI	3	NMI	1	1	1	1	1	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
a leafhopper	*Limotettix parallelus*	Wet Meadow	Wet Prairie, Freshwater Marsh	NMI	5	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
a leafhopper	*Limotettix truncatus*	Wet Meadow	Wet Prairie	NMI	4	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
a leafhopper	*Memnonia panzeri*	Wet Meadow	Wet Dolomite Prairie	NMI	3	NMI	1	1	0	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
INVERTEBRATE - Lepidoptera (Butterflies & Moths)																										
a borer moth	*Papaipema limpida*	Wet Meadow	Mesic/Wet Prairie	NMI	4	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
a noctuid moth	*Photedes enervata*	Wet Meadow	Wet Prairie	NMI	3	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
an owlet moth	*Bagisara gulnare*	Wet Meadow	Wet Prairie, Opening in Floodplain Forest, Along Stream	NMI	NMI	NMI	1	1	1	1	1	1	0	0	0	0	1	NMI	NMI	0	1	0	1	NMI	NMI	NMI
Appalachian Eyed Brown	*Lethe appalachia*	Swamp	Wooded Swamp, Forest Edge	NMI	6	NMI	1	1	1	1	1	1	0	0	0	1	1	NMI	NMI	1	1	1	0	NMI	NMI	NMI
Blazing Star Clearwing Moth	*Carmenta anthracipennis*	Wet Meadow	Mesic/Wet Prairie	NMI	6	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
Blazing Star Stem Borer	*Papaipema beeriana*	Wet Meadow	Prairie, Fen	NMI	2	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
Byssus Skipper	*Problema byssus*	Wet Meadow	Mesic/Wet Prairie	NMI	NMI	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
Canadian Sphinx Moth; Clemens' Hawkmoth	*Sphinx luscitiosa*	Wet Meadow	Meadow, Boreal Forest, Riparian	NMI	3	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
Cluvers Root Borer	*Papaipema sciata*	Wet Meadow	Prairie, Fen	NMI	5	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
Duke's Skipper	*Euphyes dukesi*	Swamp	Bog, Fen, Forested Wetland	NMI	3	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
Ironweed Borer Moth	*Papaipema cerussata*	Wet Meadow	Wet Prairie, Fen	NMI	3	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
Poweshiek Skipperling	*Oarisma poweshiek*	Wet Meadow	Wet Prairie	NMI	3	NMI	1	1	1	1	1	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Rattlesnake-master Borer Moth or Eryngium Stem Borer	*Papaipema eryngii*	Wet Meadow	Wet, Mesic Prairie	1	7	2	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
Sensitive Fern Borer Moth	*Papaipema inquaesita*	Wet Meadow	Wet Prairie	NMI	4	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
Slender Flower Moth or Iva Flower Moth	*Schinia gracilenta*	Wet Meadow	Wet Prairie	NMI	2	NMI	1	1	1	1	1	1	0	0	0	0	1	NMI	NMI	0	0	0	1	NMI	NMI	NMI
Spartina Borer Moth	*Photedes inops*	Wet Meadow	Wet Prairie	NMI	6	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
Straight-lined Argyria Moth	*Argyria critica*	Wet Meadow	Wet Prairie	NMI	3	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
Swamp Metalmark	*Calephelis muticum*	Wet Mudflat, Moist-soil	Fen, Marsh	NMI	4	NMI	1	1	1	1	1	1	0	0	0	1	1	NMI	NMI	1	1	1	0	NMI	NMI	NMI

							Habitat Stresses						Community Stresses							Population Stresses				Direct Human Stressors		
Common Name	Scientific Name	Campaign Habitat	Specific Habitat	Historic Status	Current Status	Trend	Extent	Fragmentation	Composition-structure	Distrubtion/Hydrology	Invasives/Exotics	Pollutants-Sediment	Competitors	Predators	Parasites/Deisease	Prey/Food	Hosts	Invasive/Exotics	Other Symbionts	Genetics	Dispersal	Recruitment	Mortality	Killing	Disturbance	Structures/Infrastructure
Two-spotted Skipper	*Euphyes bimacula*	Wet Meadow	Mesic/Wet Prairie	NMI	NMI	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
Umbellifer Borer Moth	*Papaipema birdi*	Wet Meadow	Wet Prairie, Fen	NMI	4	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
INVERTEBRATE - Mollusks (Lymnaeidae)																										
Spindle Lymnaea	*Acella haldemani*	Wetland	Sedge Meadow	NMI	NMI	NMI	0	1	1	1	1	1	0	0	0	0	0	1	0	1	1	1	1	0	0	0
INVERTEBRATE - Odonata (Dragonflies & Damselflies)																										
Elfin Skimmer	*Nannothemis bella*	Wet Meadow	Fen, Seep	NMI	2	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
Hine's Emerald Dragonfly	*Somatochlora hineana*	Wet Meadow	Fen, Seep	NMI	3	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
INVERTEBRATE - Orthoptera (Grasshoppers, Katydids, Crickets)																										
Broad-Winged Bush Katydid	*Scudderia pistillata*	Wet Meadow	Wet, Mesic Prairie	NMI	4	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
Low-ridged Pygmy Grasshopper	*Nomotettix parvus*	Wet Meadow	Wet Groundcover	NMI	3	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
Seaside Grasshopper	*Trimerotropis maritima*	Beach, Dunes	Dunes	NMI	8	NMI	1	1	1	1	1	1	0	0	0	0	0	NMI	NMI	0	0	0	0	NMI	NMI	NMI
MAMMALS																										
Marsh Rice Rat	*Oryzomys palustris*	Marsh, Swamp, Wet Meadow	Marsh, Swamp, Wet Meadow, Upland Bording Wetland	13	10	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Appendix 9b. Status and stresses to Illinois Plant Species of Greatest Conservation Need addressed in the Wetlands Campaign.

							Habitat Stresses						Community Stresses							Population Stresses				Direct Human Stressors		
Common Name	Scientific Name	Campaign Habitat	Specific Habitat	Historic Status	Current Status	Trend	Extent	Fragmentation	Composition-structure	Distrubtion/Hydrology	Invasives/Exotics	Pollutants-Sediment	Competitors	Predators	Parasites/Deisease	Prey/Food	Hosts	Invasive/Exotics	Other Symbionts	Genetics	Dispersal	Recruitment	Mortality	Killing	Disturbance	Structures/Infrastructure
PLANTS																										
Alder Buckthorn	*Rhamnus alnifolia*	Bogs, sand prairie, fens	Calcareous bogs, sand prairie, fens	7	1	-2	1	1	1	1	NMI	1	1	1	NMI	NMI	NMI	1	NMI	1	1	1	1	1	1	1
American Brooklime	*Veronica americana*	Wet ground of springs, seeps, streams, marshes, fens	Wet ground of springs, seeps, streams, marshes, fens	5	3	-1	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	NMI	1	NMI	NMI	1	1	1
American Bur-reed	*Sparganium americanum*	Muddy and peaty shores, shallow water	Muddy and peaty shores, shallow water	9	1	-2	1	NMI	1	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	1
American Slough Grass	*Beckmannia syzigachne*	Wet prairie	Wet prairie	3	1	-2	1	1	NMI	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	1	1	1
Arkansas Mannagrass	*Glyceria arkansana*	Floodplain and swamp	Wet floodplain and swamp	2	1	-2	1	1	1	1	NMI	NMI	1	1	NMI	NMI	NMI	1	NMI	NMI	1	1	NMI	1	1	1
Arrowhead	*Sagittaria australis*	Seeps	Wooded seeps	3	0	-2	1	1	1	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	1	NMI	1	1	1
Autumn Willow	*Salix serissima*	Bogs, marshes, peaty areas	Bogs, marshes, peaty areas	2	1	-2	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Beaked Rush	*Rhynchospora alba*	Fens, bogs, interdunal swales	Fens, bogs, interdunal swales	4	2	-2	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Beaked Spike Rush	*Eleocharis rostellata*	Seeps, graminois fenss	Calcareous seeps, graminois fens	5	5	0	1	1	1	1	NMI	NMI	1	1	NMI	NMI	NMI	1	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Bloodleaf	*Iresine rhizomatosa*	Floodplain forest	Floodplain forest	5	4	0	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Blue Jasmine	*Clematis crispa*	Floodplain forest	Swamp, floodplain forest	3	2	-1	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Bog Clubmoss	*Lycopodiella inundata*	Sand prairie, disturbed sites	Wet sand prairie, disturbed sites	3	1	-2	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Bog Rosemary	*Andromeda glaucophylla*	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Brownish Sedge	*Carex brunnescens*	Bogs	Bogs	1	1	0	NMI	NMI	NMI	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Buckbean	*Menyanthes trifoliata*	Bogs, marshes	Emergent aquatic of bogs, marshes	7	2	-2	1	1	1	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Bulrush	*Scirpus hattorianus*	Wetlands	Open wetlands	3	2	-1	1	1	1	1	NMI	NMI	1	1	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	1	1	1	1
Bunchberry	*Cornus canadensis*	Bogs, sandstone canyons	Forested bogs, sandstone canyons	5	1	-2	1	1	1	NMI	NMI	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	1	NMI	1	1	1

							Habitat Stresses						Community Stresses							Population Stresses				Direct Human Stressors		
Common Name	Scientific Name	Campaign Habitat	Specific Habitat	Historic Status	Current Status	Trend	Extent	Fragmentation	Composition-structure	Distrubtion/Hydrology	Invasives/Exotics	Pollutants-Sediment	Competitors	Predators	Parasites/Deisease	Prey/Food	Hosts	Invasive/Exotics	Other Symbionts	Genetics	Dispersal	Recruitment	Mortality	Killing	Disturbance	Structures/Infrastructure
Butler's Quillwort	*Isoetes butleri*	Wet areas in thin soil over dolomite bedrock	Wet areas in thin soil over dolomite bedrock	1	1	0	1	1	1	1	NMI	NMI	1	1	NMI	NMI	NMI	1	NMI	1	1	NMI	1	1	1	1
Clustered Beak Rush	*Rhynchospora glomerata*	Sandy soils	Wet sandy soil	3	2	-1	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Common Bog Arrowgrass	*Triglochin maritima*	Fens, interdunal swales	Fens, interdunal swales	6	3	-2	1	1	1	1	NMI	NMI	1	1	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Cordroot Sedge	*Carex chordorrhiza*	Bogs	Bogs	2	1	-2	1	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Crawford's Sedge	*Carex crawfordii*	Marsh	Marsh	1	1	0	NMI	NMI	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	1
Creeping Loosestrife	*Lysimachia radicans*	Swamp, wet floodplain forest	Swamp, wet floodplain forest	2	1	-2	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Cuckoo Flower	*Cardamine pratensis var. palustris*	Floating mats and marshes	Calcareous floating mats and marshes	2	0	-2	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Cynosciadium	*Cynosciadium digitatum*	Floodplain forest, flatwoods	Swamp, floodplain forest, flatwoods	1	1	0	1	1	1	1	NMI	NMI	1	1	NMI	NMI	NMI	1	NMI	NMI	1	1	NMI	1	1	1
Cypress-knee Sedge	*Carex decomposita*	Swamp forest	Swamp forest	5	4	0	1	1	1	1	NMI	1	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	1	1	1
Decurrent False Aster	*Boltonia decurrens*	Prairie and marshlands	Alluvial prairie and marshland	19	17	0	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	1	1	1	NMI	NMI	NMI	1
Downy Willow Herb	*Epilobium strictum*	Bogs, fens, seeps	Calcareous bogs, fens, seeps	5	2	-2	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Dull Meadow Beauty	*Rhexia mariana*	Meadow, seeps, sandy fields, acidic soils	Wet meadow, seeps, sandy fields, acidic soil	6	3	-2	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Eryngo	*Eryngium prostratum*	Shores	Muddy and sandy shores	5	5	0	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1
False Asphodel	*Tofieldia glutinosa*	Wetlads, fens, interdunal swales	Wetlads, fens, interdunal swales	5	4	0	1	1	1	1	NMI	NMI	1	1	NMI	NMI	NMI	1	NMI	NMI	NMI	1	NMI	1	1	1
Few-flowered Spikerush	*Eleocharis pauciflora*	Fens, calcareous dune swales	Fens, calcareous dune swales	3	0	-2	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Few-seeded Sedge	*Carex oligosperma*	Bogs	Bogs	3	1	-2	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	1	NMI	NMI	NMI	NMI	1	1	1
Flat-leaved Bladderwort	*Utricularia intermedia*	Bogs, fens, interdunal swales	Bogs, fens, interdunal swales	6	4	-1	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Golden Sedge	*Carex aurea*	Meadows, interdunal swales	Wet meadows, interdunal swales	5	4	0	1	1	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	1	1

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Common Name	Scientific Name	Campaign Habitat	Specific Habitat	Historic Status	Current Status	Trend	Extent	Fragmentation	Composition-structure	Distrubtion/Hydrology	Invasives/Exotics	Pollutants-Sediment	Competitors	Predators	Parasites/Deisease	Prey/Food	Hosts	Invasive/Exotics	Other Symbionts	Genetics	Dispersal	Recruitment	Mortality	Killing	Disturbance	Structures/Infrastructure
Green-fruited Bur-reed	*Sparganium emersum*	Muddy and peaty shores, shallow water	Muddy and peaty shores, shallow water	8	3	-2	1	1	1	1	NMI	NMI	1	1	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	1	1	1	1
Hair Bladderwort	*Utricularia subulata*	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Halberd-leaved Tearthumb	*Tracaulon arifolium*	NMI	NMI	4	1	-2	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	1	NMI	1	1	1
Hedge Hyssop	*Gratiola quartermaniae*	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Hemlock Parsley	*Conioselinum chinense*	Fens	Forested fens	3	1	-2	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Horned Bladderwort	*Utricularia cornuta*	Bogs, fens, wet peaty sands	Bogs, fens, wet peaty sands	3	1	-2	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Large Cranberry	*Vaccinium macrocarpon*	Bogs	Acidic bogs	4	2	-2	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Large Sedge	*Carex gigantea*	Forest, swamp	Floodplain forest, swamp	5	2	-2	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Leafy Bulrush	*Scirpus polyphyllus*	Woods and upland openings	Dry woods and upland openings	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Lea's Bog Lichen	*Phaeophyscia leana*	Floodplains	Floodplains	5	5	0	1	1	1	1	NMI	1	1	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	1	1	1
Leatherleaf	*Chamaedaphne calyculata*	Bogs, peaty sand deposits	Bogs, peaty sand deposits	5	3	-1	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Little Green Sedge	*Carex viridula*	Swales, spring runs, marl flats, disturbed sitess	Dune swales, spring runs, marl flats, disturbed sites	6	6	0	1	NMI	1	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Log Fern	*Dryopteris celsa*	Wetlands	Swamp, wetlands	1	0	-2	1	1	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Marsh Speedwell	*Veronica scutellata*	Marsh, graminoid fens, other wetlands	Marsh, graminoid fens, other wetlands	9	4	-2	1	1	1	1	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Marsh Valerian	*Valeriana uliginosa*	Fens	Calcareous fens	1	1	0	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Moccasin Flower	*Cypripedium acaule*	Mesic forest, forested fens, bogs	Wet-mesic forest, forested fens, bogs	4	1	-2	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	NMI	1	1	1
Mock Bishop's Weed	*Ptilimnium nuttallii*	Floodplain	Floodplain	5	1	-2	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Mud Plantain	*Heteranthera reniformis*	Wetlands, floodplains	Wetlands, floodplains	6	2	-2	1	NMI	NMI	1	NMI	1	1	1	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Narrow-leaved Sundew	*Drosera intermedia*	Bogs, wet sand prairie	Peat bogs, wet sand prairie	7	4	-1	1	1	1	1	NMI	1	1	1		NMI	NMI	1	NMI	NMI	NMI	1	1	1	1	1
Northern Gooseberry	*Ribes hirtellum*	Bogs, swamp forest	Bogs, swamp forest	7	1	-2	1	1	1	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	1	1
One-flowered Hydrolea	*Hydrolea uniflora*	Swamp, wet shores	Swamp, wet shores	6	2	-2	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Opaque Oval Sedge	*Carex opaca*	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI

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Panic Grass	*Dichanthelium joori*	Swamp	Swamp	2	1	-2	1	1	1	1	NMI	1	3	1	1	NMI	NMI	3	NMI	1	1	1	1	1	3	1
Pitcher Plant	*Sarracenia purpurea*	Bogs, fens, calcareous floating mats	Bogs, fens, calcareous floating mats	3	2	-1	1	NMI	1	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	1	1	1
Pole Manna-Grass	*Torreyochloa pallida*	Swamps and marshes	Shallow standing water in swamp and marsh	2	1	-2	1	1	1	1	NMI	NMI	1	1	NMI	NMI	NMI	1	NMI	NMI	1	1	NMI	1	1	1
Queen-of-the-Prairie	*Filipendula rubra*	Mesic sand prairie, seeps	Fens, mesic sand prairie, seeps	16	9	-1	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	NMI	1	1	1
Richardson's Rush	*Juncus alpinoarticulatus*	Fens, wet sand prairie, interdunal swales	Fens, wet sand prairie, interdunal swales	5	2	-2	1	1	NMI	NMI	NMI	NMI	1	1	NMI	NMI	NMI	1	NMI	1	NMI	1	1	1	1	1
Round-leaved Sundew	*Drosera rotundifolia*	Wet peaty sand	Bogs, wet peaty sand	5	1	-2	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	1	1	NMI	NMI	1	NMI
Rusty Cotton Grass	*Eriophorum virginicum*	Bogs	Acidic bogs	2	2	0	1	NMI	1	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Screwstem	*Bartonia paniculate*	Seep springs	Seep springs	1	1	0	1	1	1	1	NMI	1	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	1	1	1	1
Sedge	*Carex diandra*	Wetlands, marshes	Wetlands, marshes	2	2	0	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Sedge	*Carex echinata*	Meadows, interdunal swales	Wet meadows, interdunal swales	5	2	-2	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Sedge	*Carex atlantica*	Seeps	Wooded seeps	1	1	0	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Sedge	*Carex bromoides*	Woods, swamps, bogs	Wet woods, swamps, bogs	13	5	-2	1	1	1	1	NMI	1	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	1	1	1
Sharp-scaled Sedge	*Carex oxylepis*	Swamp forest	Swamp forest	7	5	-1	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Shore St. John's Wort	*Hypericum adpressum*	Peaty soil	Damp peaty soil	4	4	0	1	1	1	1	NMI	1	1	NMI	NMI	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Shortleaf Sedge	*Carex disperma*	Bogs	Bogs	3	2	-1	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Silvery Sedge	*Carex canescens*	Bogs	Bogs	1	1	0	NMI	NMI	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Slender Bog Arrowgrass	*Triglochin palustris*	Spring runs in fens, interdunal swales	Spring runs in fens, interdunal swales	9	5	-1	1	1	1	1	NMI	NMI	1	1	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Small Bladderwort	*Utricularia minor*	Calcareous floating mats, fens, swales	Bogs, calcareous floating mats, fens, swales	5	2	-2	1	1	1	1	NMI	NMI	1	1	NMI	NMI	NMI	1	NMI	NMI	NMI	1	NMI	1	1	1
Small Burhead	*Echinodorus tenellus*	Margins of shallow ponds	Sandy margins of shallow ponds	3	1	-2	1	1	NMI	1	NMI	1	1	NMI	NMI	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Small Cranberry	*Vaccinium oxycoccos*	Bogs	Sphagnum bogs	2	2	0	1	1	1	1	NMI	NMI	1	NMI	1	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	1	1	1

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Small Enchanter's Nightshade	*Circaea alpina*	Ravine or bluffs	Dolomite ravine or bluff	4	0	-2	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	1
Small Yellow Lady's Slipper	*Cypripedium parviflorum*	Fens, prairie	Fens, prairie	5	2	-2	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	1	1	NMI	1	1	1
Small-fruited Bulrush	*Scirpus microcarpus*	Wet grounds, marshes, swamps	Wet grounds, marshes, swamps	1	1	0	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Snake-mouth	*Pogonia ophioglossoides*	Sand prairie, bogs, fens	Wet sand prairie, bogs, fens	6	3	-2	1	1	1	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Speckled Alder	*Alnus incana subsp. rugosa*	NMI	NMI	6	2	-2	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Star-flower	*Trientalis borealis*	Bogs, mesic sand forest	Bogs, mesic sand forest	6	3	-2	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	1	1	1	1	1
Storax	*Styrax americana*	Floodplain forest, swamp	Floodplain forest, swamp	10	7	-1	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Swollen Sedge	*Carex intumescens*	Woodlands	Forested woodlands	12	7	-1	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Tall Sunflower	*Helianthus giganteus*	Fens, sedge meadows	Fens, sedge meadows	5	1	-2	1	1	1	NMI	NMI	1	1	1	NMI	NMI	NMI	1	NMI	1	1	NMI	1	1	1	1
Tamarack	*Larix laricina*	Bogs, forested fens	Bogs, forested fens	3	2	-1	1	1	1	1	NMI	1	1	1	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	1	1
Three-seeded Sedge	*Carex trisperma*	Acidic bogs	Acidic bogs	1	1	0	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Tubercled Orchid	*Platanthera flava*	Forest, swamp	Floodplain forest, swamp	15	7	-2	1	1	1	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	1	1	1
Tufted Bulrush	*Trichophorum cespitosum*	Fens	Graminoid fens	2	1	-2	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Vahl's Fimbry	*Fimbristylis vahlii*	Sandy depressions	Wet sandy depressions	1	1	0	1	1	NMI	1	NMI	1	1	NMI	NMI	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Vasey's Rush	*Juncus vaseyi*	Prairie, sedge meadow, stream banks	Wet prairie, sedge meadow, stream banks	3	1	-2	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Water Arum	*Calla palustris*	Shallow water	Swamp, shallow water	1	1	0	1	1	NMI	1	NMI	NMI	1	NMI	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	NMI	NMI	1	1
Water Elm	*Planera aquatica*	Swamp, floodplain forest	Swamp, floodplain forest	5	3	-1	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Water Hickory	*Carya aquatica*	Wet lowland woods	Swamp, wet lowland woods	6	4	-1	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Water Willow	*Justicia ovata*	Swamp, floodplain forest	Swamp, floodplain forest	2	2	0	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1

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White Melanthera	*Melanthera nivea*	Floodplains, mesic ravine forests	Floodplains, mesic ravine forests	2	2	0	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	1	1	1	1	1	1	1
Winged Sedge	*Carex alata*	Floodplain forest	Swamp, floodplain forest	4	1	-2	1	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI	NMI
Yellow Monkey Flower	*Mimulus glabratus*	Seeps	Calcareous seeps	13	3	-2	1	1	1	1	NMI	1	1	1	1	NMI	NMI	1	NMI	NMI	2	NMI	NMI	1	1	1
Yellow Sedge	*Carex cryptolepsis*	Fens	Fens	4	3	-1	1	1	1	1	NMI	NMI	1	1	NMI	NMI	NMI	1	NMI	NMI	NMI	NMI	1	1	1	1

Appendix 10. Wetlands Campaign Priority Tiers in Illinois.

To rank priority sites for the Wetlands Campaign, we will rely heavily on the planning document written by Schulties and Eichholz (2013), input from Wetlands Campaign Partners provided during an April 2013 meeting and subsequent correspondence, and expert opinion from the Campaign Lead and a small number of other engaged partners.

Here, we present a 3-tiered ranking, including justification, for wetland conservation in Illinois. We anticipate significant revision to this ranking as additional information is gathered and wetland conservation priorities are refined.

Tier 1 – Low priority.

Tier 1 includes any wetland habitat in the state of Illinois. Illinois has lost over 90% of its original wetlands, with the majority of remaining wetlands clustered in relatively small spatial areas. For this reason, wetland work throughout the state should be considered, with special attention given to large acreages, wetland complexes that create critical habitat where relatively little exists, or connectivity to existing wetlands that may increase wildlife value. Many wetland dependent wildlife species (i.e., birds) are highly mobile, and are able to find and exploit habitat patches, even isolated patches significant distances from other suitable habitat are used.

Tier 2 – High priority.

Tier 2 includes any sites that fall within important Natural Divisions as determined by A Multi-scale Wetland Conservation Plan for Illinois (Schulthies and Eichholz 2013). This document used information on wetland dependent wildlife abundance and harvest to rank Natural Divisions throughout the state (Figures 1 and 2). Additionally, the Wetlands Campaign Partners determined at their April 2013 meeting that 2 additional Natural Divisions should be included. These areas likely did not have significant abundance or harvest data to increase their ranking, but Partner consensus was that these areas are indeed very important to wetland dependent wildlife.

Based on these criteria, wetlands within the following Natural Divisions will be included in Tier 2:
Coastal Plain
Illinois River and Mississippi River Sand Areas
Lower Mississippi River Bottomlands
Upper Mississippi River and Illinois River Bottomlands

The two additional Natural Divisions that should be included are the:
Northeastern Morainal
Wabash River Border

Partners debated including the lower Kaskaskia River floodplain (Mississippi River to Carlyle Lake dam). This area includes many high quality wetlands, and has high wetland potential. Wetlands in this area have been deemed priority in other Illinois wetland conservation plans (Ducks Unlimited, The Nature Conservancy, IDNR Conservation Opportunity Area), thus, may warrant inclusion here as well.

Finally, some of our most important wetlands in terms of wildlife value and constituent use are large reservoir lakes and the associated wetlands scattered throughout the state. Although these wetlands serve as islands, as opposed to complexes, the wetlands associated with the lakes may be extensive, and form a relatively large, although isolated, complex.

The sites that should be considered in this tier include:
Carlyle Lake
Rend Lake
Lake Shelbyville
Clinton Lake
Crab Orchard Lake

Tier 3 – Highest Priority

Tier 3 includes specific sites within the Tier 2 Natural Divisions ranked as high priority. Not all sites received Tier 3 ranking due to wetland quality, potential wetland quality, habitat value, management capability, wildlife use, and other considerations. Tier 3 sites typically offer moderate to high quality wetland habitat, or have high habitat potential, have significant wetland wildlife use, wetland constituent use, and can significantly impact wetland dependent wildlife, particularly Species of Greatest Conservation Need.

Sites considered highest priority, by Natural Division, include:
Northeastern Morainal –

- Black Crown Marsh
- Chain O'Lakes State Park
- Redwing Slough/Deer Lake State Natural Area
- Des Plaines State Fish and Wildlife Area (SFWA)
- Mazonia SFWA
- Momence Wetlands
- Goose Lake Prairie State Natural Area/Morris Wetlands
- Hackmatack National Wildlife Refuge (state purchase area)

Upper Mississippi and Illinois River Bottomlands

- Anderson Lake SFWA
- Banner Marsh SFWA
- Donnelley SFWA
- Lake DePue SFWA

Marshall SFWA
Mississippi River Pools 12, 13, 14, 16, 17, 18, 19, 21, 22, 24 (State and Federal)
Rice Lake SFWA
Spring Lake SFWA
Woodford SFWA
Clear Lake SFWA
Mississippi River SFWA (and satellites)
Meredosia Lake SFWA and Meredosia NWR
Sanganois SFWA
Weinberg King SFWA (Spunky Bottoms Unit)
Hennepin and Hopper Lakes (Wes and Sue Dixon Waterfowl Refuge)
Chautauqua NWR (Including Cameron-Billsbach Unit)
Emiquon Preserve and Emiquon NWR
Two Rivers NWR

Lower Mississippi River Bottomlands
Cape Bend SFWA
Horseshoe Lake State Park
Kaskaskia River SFWA
Middle Mississippi River NWR
Kidd Lake State Natural Area
Union County SFWA
Oakwood Bottoms (Shawnee National Forest)
Big Muddy Bottoms (Shawnee National Forest)
LaRue Swamp (Shawnee National Forest)
East Cape Wetlands (Shawnee National Forest)

Coastal Plain
Cache River State Natural Area
Cypress Creek NWR
Cypress Pond State Natural Area
Deer Pond State Natural Area
Dog Island State Wildlife Management Area
Horseshoe Lake SFWA
Mermet Lake SFWA

Wabash River Boarder
Beall Woods State Park
Embarrass River Bottoms State Habitat Area