STREAMS AND OPEN WATERS CAMPAIGN

INTRODUCTION

Campaign Scope

The Streams and Open Waters Campaign aims to provide a roadmap for conserving SGCN and their habitats within streams, rivers, lakes, ponds, artificial impoundments, Lake Michigan, aquatic cave, and spring natural community types. More than 190,000 kilometers of streams and rivers, 10,000 artificial impoundments (including approximately 2400 larger than 0.04 square kilometers), and 4,050 square kilometers of Lake Michigan occur within Illinois. The number of lakes, ponds, aquatic cave and spring natural community types is more difficult to determine, but based on known examples of these, thousands more waters of these types occur on the surface and within the subterranean landscapes of Illinois. Together, these waters provide habitat and other resources necessary for the continued persistence of Native Species in Illinois.

Objectives, monitoring strategies, and conservation action strategies of this campaign are intended to provide a roadmap for IDNR and partners to make progress towards Plan goals. Although Plan goals are set for a 20-year horizon, objectives are intended to identify 10-year milestones, and the scope of conservation action strategies are achievable within a timeframe that facilitates objectives.

Relationship to Plan Goals

Objectives and action strategies of the Streams and Open Waters Campaign support Plan goals by managing landscapes, waters and species to enhance viability of SGCN populations.

- Increase the extent and quality of shared landscapes by 30%. Enhancing waters of all landscape types is likely to increase suitability of habitat for SGCN. Campaign Conservation Action Strategies supporting this goal are those addressing habitat-degrading stressors and land and water protection.
- Maintain native wildlife and plant species populations (no loss). Campaign conservation action strategies targeting SGCN include proactive measures that reduce take, those which maintain or enhance ecological processes important to population viability, and enhancement of habitat.
- Increase the connection and appreciation of the public to native species and their habitats by 30%. Progress towards campaign objectives, especially in working and developed lands, relies upon public participation. Campaign conservation actions strategies that provide conservation guidance to public and private partners support this goal.

OBJECTIVES

Objectives for Natural Communities

- Maintain or create natural vegetation buffers of an appropriate Natural Community Type around all streams, lakes, and ponds on publicly-owned properties.
- Delineate groundwater contribution zones for all aquatic cave and spring natural communities.
- Implement conservation practices that maintain or enhance Natural Communities and Native Species on all state-owned lands used for agriculture to serve as a model for conservation.

Objectives for Native Species

- Increase Subnational Conservation Rank (i.e., S-rank; NatureServe 2015) by at least one rank for 10% of all SGCN and campaign stewardship species and maintain S-rank of all other species.
- Rescue nonviable statewide populations of SGCN.
- Develop expertise in the propagation of SGCN fishes in the Illinois Hatchery System
- Identify areas critical for continued persistence of SGCN and protect those areas through conservation and regulatory mechanisms (e.g., endangered species essential habitat, aquatic life preserves, mussel preserves).
- Develop conservation guidance documents for SGCN frequently-impacted by development.
- Develop IDNR Species Status Assessments (SSAs) for all SGCN.
- Obtain necessary information to Develop S-ranks for all SGIN.

SPECIES OF GREATEST CONSERVATION NEED

The Streams and Open Waters Campaign focuses on four categories of Native Species (Table S&O1). Some of these species may overlap with those in the Perennial and Seasonal Wetlands Campaign, but all are found as part of Natural Communities associated with this Campaign.

Table S&O1. Number of SGCN, SGIN, and state-listed (as endangered or threatened) species associated with the Streams and Open Waters Campaign.

Taxon	SGCN	SGIN	Total (state-listed)
Fish	62	6	68 (40)
Birds	2	0	2 (0)
Mammals	1	0	1 (0)
Mussels	29	1	30 (26)
Non-mussel Mollusks	3	2	5 (3)
Crustaceans	8	2	10 (5)
Insects and other Invertebrates	76	26	102 (2)
Herptiles	5	0	5 (5)
Plants	40	0	40 (24)

Species of Greatest Conservation Need (SGCN). SGCN are those listed as Illinois endangered or threatened and those whose conservation status suggests they are at risk of extirpation (S-rank of S1, S2, S1S2, or S1S23). Conservation action strategies in this campaign target this category of species or their habitats to maintain or enhance their conservation status in Illinois. Two hundred sixteen species from seven higher-level taxa are represented in Campaign SGCN (Table S&O1, Appendix I).

Species of Greatest Information Need (SGIN). SGIN are those with S-ranks of SU (ranking unknown) or SH (species status includes only historic occurrence records). These species require survey effort (i.e., information) to develop or confirm conservation status. Fifty-seven species from six taxa fit this criterion and are targeted for information gathering actions (Table S&O1, Appendix II).

Illinois Stewardship Species (ISS). These species are expected to require direct management to persist in Illinois and whose Illinois populations are important to regional persistence (Appendix III). Five species within this campaign meet these criteria and have been selected for targeted stewardship activities: Illinois Cave Amphipod, Sheepnose, Lake Sturgeon, Annual Wild Rice (*Zizania aquatica*), Lake Cress (*Rorippa aquatica*). A propagation and augmentation strategy has been pursued for Sheepnose and Lake Sturgeon to enhance populations in Illinois and regional viability for both species. Targeted actions for Illinois Cave Amphipod include protection of watersheds where the species is present and restoration and reintroduction in habitats where the species is extirpated. Annual Wild Rice and Lake Cress would benefit from habitat enhancement, invasive control, and reintroduction or introduction.

Campaign Focal Monitoring Species and Taxa. Campaign focal monitoring species were selected to provide a barometer of stressor extent, frequency, and intensity within natural community types. As stressors are alleviated through conservation actions these species should exhibit a measurable response making them preferred candidates for use in effectiveness monitoring. For monitoring of species, distribution, total and population abundance, number of viable populations, Element Occurrence rank, and S-rank may be used as response measures. For monitoring of taxa, species or higher-taxonomic order counts and number of locales meeting a species or taxa count target may be used. Campaign natural communities and their associated monitoring species and taxa are:

- **Spring.** Shawnee Hills Cavefish (*Forbesichthys papilliferus*), Three-spined Forestfly (*Nemoura arctica*), Net-spinning Caddisfly (*Chimarra aterrima*), Cavespring Crayfish (*Cambarus tenebrosus*)
- **Pond.** Starhead Topminnow, native aquatic plant diversity
- **Lake.** Blacknose Shiner, Blackchin Shiner, native aquatic plant diversity
- **Ephemeral Stream.** Spotted Dusky Salamander, aquatic invertebrate diversity

- **Small Stream.** Iowa Darter, Central Mudminnow, Kentucky Crayfish, Alta Needlefly (*Leuctra alta*), Brook Needlefly (*Leuctra sibleyi*), Northern Needlefly (*Zealeuctra narfi*)
- **Medium Steam.** Mudpuppy, Largescale Stoneroller, Indiana Crayfish, Pistolgrip, Wavy-rayed Lampmussel, Sensitive Benthic Insect (EPT) diversity
- **Large Stream.** River Redhorse, Gravel Chub, Purple Wartyback, Fat Pocketbook, Flatheaded Mayfly (*Macdunnoa persimplex*), Sand Minnow Mayfly (*Siphloplecton interlineatum*), Brachycentrid Caddisfly (*Micrasema rusticum*)
- **Major River.** Trout-perch, Lake Sturgeon, Black Sandshell
- **Cave.** Aquatic invertebrate diversity
- **Lake Michigan.** Longnose Sucker, Lake Chub, Cisco, Great Lakes Amphipod (*Diporeia* spp.)
- **Artificial Impoundment.** Aquatic invertebrate diversity

STRESSORS TO HABITATS AND SPECIES

Many stressors to streams and open waters are widespread among landscape types. The connectedness of waters (e.g., surface flow from up- to downstream, groundwater recharge and discharge, withdrawal and discharge) means sources of stressors may be separated, in both time and space, from the SGCN and the habitats that are impacted. Not all stressors may be present in all waters at all times, but at a statewide resolution they limit distribution and abundance of SGCN. The stressors listed below occur at the Campaign-scale, while stressors impacting a particular landscape type are addressed in their associated sections. Stressors identified for individual Species of Greatest Conservation Need can be found in the Native Species Section (Table IIId).

- **Extent.** Disturbances occurring at multiple spatial scales create a habitat matrix that varies in suitability for SGCN. Suitable habitat may be inaccessible to SGCN, further limiting the available extent of habitat. Limited extent of suitable habitat reduces distribution and abundance of SGCN.
- **Fragmentation**. Physical structures (e.g. dams, culverts, levees and other water control structures) prevent or reduce dispersal of aquatic life or alter physicochemical processes. Reaches with poor physicochemical conditions (e.g., dry or drying reaches, chemical concentrations with acute toxicity) also may reduce or prevent dispersal. Fragmentation may result in reduced distribution and abundance, altered metapopulation or population genetic structure, and reduced physical condition of SGCN.
- **Composition-Structure**. Biological, chemical, and physical characteristics of waters may be degraded by disturbances originating from within and outside focal waters. Pollutants are carried from waters upstream or upgradient and from the local watershed. Degraded physical characteristics result from current and historic physical alterations and from altered hydrologic processes. Some invasive species degrade habitat by creating monocultures or impacting physical characteristics of waters.
- **Hydrology**. Timing, frequency, and intensity of hydrologic patterns have been altered by climate change, physical structures, channel alteration, surface water and groundwater withdrawals and discharges, and landcover changes. Causes of this stressor originate from outside and within focal waters. Altered hydrology may be expressed as extreme low or high

flow velocity or volume, altered groundwater elevation and flows, and physicochemical homogenization or increased variability in conditions.

- **Pollution-Sediment.** Fine sediments from anthropogenic sources, nutrients, metals, chlorides, heat, and other pollutants originate from within a beyond focal waters. Sources include point discharges, stormwater runoff, tiling of agricultural lands, groundwater, and non-point surface flow. Pollutants may alter physical and chemical characteristics of waters in a way that changes behaviors or diminishes fitness or survival of aquatic life.
- **Hosts**. Freshwater mussels require a fish or amphibian host to complete their lifecycle. Limited host occurrence or density may lower recruitment.
- **Invasives/exotics.** Invasive fishes (e.g., Black Carp, Bighead and Silver Carp), mollusks (e.g., Zebra Mussels), and crayfish (e.g., Rusty Crayfish) harm native aquatic life through predation, competition, habitat modification, and alteration of trophic energy transfer. In many waters, invasives are present at densities high enough to cause reduced abundance and distribution of SGCN.
- **Dispersal.** Physical barriers (e.g., dams, culverts) and reaches of unsuitable habitat (e.g., poor water quality, dry channel) prevent or inhibit dispersal. Some taxa are poor dispersers (e.g., mussels, benthic fishes) and barriers exacerbate dispersal-related stressors. Insufficient rates of dispersal may degrade metapopulation organization, limit access to suitable habitat, lead to genetic isolation, and reduce adaptation to climate change.
- **Recruitment**. Low density of individuals, absence or low density of hosts, and high mortality of young from predation and competition reduce recruitment. Low recruitment may reduce population viability.

NATURAL LANDS AND WATERS

Waters functioning as Natural Lands include those protected to preserve their biological character, those within protected lands, and those in areas that cannot be or have not been developed. Examples of these waters include offshore areas of Lake Michigan, waters of the Cache River State Natural Area, Sanganois State Fish and Wildlife Area, Emiquon Preserve, Embarras River Bottoms State Habitat Area, some backwater ponds and lakes of major rivers, most aquatic caves, and waters occurring on protected lands (e.g., Nature Preserves, Land and Water Reserves).

Stressors to Habitats and Species for Natural Waters

Many stressors originate from working or developed lands and are transported to natural lands through surface or groundwater flow. Stressor pathways or expressions unique to natural landscapes are identified in this section. Stressors identified for individual Species of Greatest Conservation Need can be found in the Native Species Section (Table IIId).

- **Composition-Structure**. Even on Natural Lands, riparian vegetation and channel structure may be degraded or managed for outcomes beyond ecological benefits for associated waters. Resulting impacts may include habitat homogenization and degradation of ecological processes important to maintaining viable populations of Native Species.

- **Pollution-Sediment**. Waters of aquatic caves and springs are frequently polluted with nutrients, chlorides, and other anthropogenic chemicals. Pollutants may originate from agricultural production, septic systems, wastewater, and paved areas outside of the immediate vicinity of the cave or spring. Many impacts of these pollutants are unknown, but are expected to reduce the distribution and/or abundance of sensitive Native Species.

Conservation Action Strategies to Address Stressors for Natural Waters

The overall approach for conserving Native Species in Natural Lands and Waters is to eliminate or minimize stressors originating within Focal Areas and mitigate those stressors originating from other landscapes. The Conservation Action Strategies identified below address both campaign-level stressors and those uniquely found in focal areas of Natural Waters.

Land and Water Protection Strategy

1. Delineate and protect groundwater contribution areas for Natural Communities and Native Species dependent upon groundwater.
2. Identify waters of high biological intactness, importance for maintaining Native Species, or essential habitat for threatened and endangered species and implement protection mechanisms (e.g., Nature Preserve dedication, fish and mussel preserves, Category I or II INAI feature designation).

Land and Water Stewardship Strategy

1. Enhance resiliency of waters to increasing temperature and flow variability by restoring forested riparian areas on public lands, especially in cool or transitional waters and ponds.
2. Construct side-channel wetlands and remove drainage tiles to promote sustained groundwater discharge to streams where possible.

Natural Community Connectivity Strategy

1. Remove or replace instream structures, like dams, culverts, and weirs in state-owned properties to enhance dispersal potential of Native Species and enhance habitat and flow characteristics.
2. Reconnect waters to floodplains by removing levees or regrading banks of incised channels to allow periodic flooding in public lands and access to those seasonal habitats.
3. Create dispersal corridors between waters separated by distances greater than the dispersal potential of Native Species or in waters fragmented by degraded reaches.

Invasive Species Strategy

1. Employ education and outreach efforts along waters on public lands to engage community members with invasive species management.

2. Conduct sentinel monitoring along waters on public lands to implement early detection and rapid response measure to prevent spread of invasive species.

Pollution Reduction Strategy

1. Remove anthropogenic sediments through dredging to enhance water depth and habitat heterogeneity and to expose coarse substrates in waters of the Cache River basin and backwaters of major rivers. Stressors addressed: Composition-structure, pollutants.
2. Use alternatives to chloride-based deicers on roadways in public lands. Stressors addressed: Pollutants.
3. Minimize non-point pollution inputs to streams, lakes, and ponds in public lands by planting 30 feet of riparian area in non-mowed native vegetation. Stressors addressed: Pollutants.
4. Construct and maintain sediment traps or plugs in accessible locales to reduce costs of removing anthropogenic sediments from public lands. Stressors addressed: Pollutants.

Focal Monitoring Species for Natural Waters

Focal monitoring species and taxa for Natural Waters are those whose distribution, abundance, or population viability may be enhanced by conservation actions strategies.

- **Bantam Sunfish.** Bantam Sunfish inhabits open waters and streams of the LaRue Pine Hills area and Cache River. Actions that enhance native vegetation composition and extent and depth heterogeneity will benefit this species.
- **Brown Bullhead.** Brown Bullhead is found in open water areas along major rivers and lakes. Actions that enhance native vegetation composition and extent and depth heterogeneity will benefit this species.
- **Native aquatic plant diversity.** Aquatic plant diversity is an indicator of less-disturbed waters. Actions that enhance hydrologic patterns and water quality or remove invasive species will improve aquatic plant diversity.
- **Illinois Cave Amphipod**. Illinois Cave Amphipod inhabits aquatic caves of the southwestern Illinois karst region. Actions that protect or enhance groundwater quality and flow will benefit this species.

Focus Areas for Natural Waters

- The main channel Cache River and adjacent flooded areas within the Cache River State Natural Area,
- Embarras River Bottoms State Habitat Area,
- Sanganois State Fish and Wildlife Area
- Rice Lake,
- Banner Marsh,
- Pekin Lake,

- Marshall State Fish and Wildlife Area
- Hennepin-Hopper Lake
- Horseshoe Lake Conservation Area (Alexander Co.)
- LaRue Pine Hills
- Waters of State-owned Nature Preserves and Land and Water Reserves.

WORKING LANDS AND WATERS

Waters that function within the Working Lands Sector are often modified to serve human needs, including commerce, food, energy, and industrial production, drinking water supply, and wastewater conveyance, yet they retain some ecological importance by harboring SGCN and contributing to ecological processes essential to continued persistence of SGCN. Because they are widespread and include some suitable habitat, they harbor the majority of SGCN occurrences. Examples of waters in this landscape type include nearshore Lake Michigan, glacial lakes, Illinois Public Waters.

Stressors to Habitats and Species for Working Waters

Waters of working landscapes are impacted by local and upstream stressors. Multiple stressors often are present in these waters, but stressor intensity can vary greatly across time and space. Stressors common to working landscapes are inventoried in this section. Stressors identified for individual Species of Greatest Conservation Need can be found in the Native Species Section (Table IIId).

- **Fragmentation.** Dams and lock structures reduce dispersal of SGCN and disrupt ecological processes. Fragmented waters limit SGCN access to habitat, disrupts SGCN behavior, and degrades habitat.
- **Composition-structure.** Dredging for navigation, excessive erosion and sediment deposition, and bank or shore armoring may reduce suitability of habitat for SGCN and limited species' distribution and abundance.
- **Hydrology.** Waters of working landscapes are sources for municipal, industrial, and energy production water withdraw, and sometimes that water is not returned to the same waterbody or is lost to the atmosphere. Navigation, hydroelectric, and water source dams create pooled reaches and can reduce downstream flow.
- **Pollution-sediment**. Frequent barge traffic and recreational boating increases turbidity of some waters in working landscapes. Reduced distribution and abundance may result for those SGCN intolerant of turbid waters. Thermal discharges created during power generation may result in mortality or reduced habitat suitability for SGCN.
- **Killing**. Although not the target, SGCN may be incidentally taken during commercial or recreational harvest. Barge propwash and barge settling dislodge and crush benthic SGCN. Dredging to maintain navigation channels eliminates benthic SGCN and rooted vegetation.
- **Structures-infrastructure**. Impingement and entrainment at industrial and energy generation facilities results in direct mortality of SGCN.

Conservation Action Strategies to Address Stressors for Working Waters

Conservation of Native Species and their habitats in Working Waters focuses on minimizing impacts of local stressors and restoration to enhance the physicochemical characteristics of those waters.

Land and Water Stewardship Strategy

1. Develop and implement environmental flow standards in waters where flow is regulated (e.g., dams with controlled gates) and where significant water withdraws occur to maintain aquatic Natural Communities and the species they support.

Invasive Species Strategy

1. Monitor glacial lakes and connected waters for invasive aquatic plants. Support local partners through technical assistance in controlling these species.

Native Species Protection Strategy

1. Identify Native Species that may be unintentionally captured during commercial or recreational harvest and identify regulatory changes that prevent negative impacts to their populations. For example, Pallid Sturgeon may be taken during Shovelnose Sturgeon recreational angling and restricting angling for Shovelnose Sturgeon to river reaches where Pallid Sturgeon is absent may prevent negative impacts to Pallid Sturgeon populations.

Focal Monitoring Species for Working Waters

- **Butterfly.** The Butterfly mussel is found in the Mississippi River upstream of the Missouri River. Actions minimizing or mitigating impacts of local stressors, like point-source pollution and dredging, will enhance the species' status.
- **Spike**. This species is infrequently encountered in large and major river community types and is likely to suffer from multiple stressors, including hydrologic alteration, pollution, fragmentation, and structures. Actions addressing these stressors may enhance the number of viable populations in Illinois.
- **Western Banded Killifish.** This native subspecies has declined in distribution due to decreased extent of habitat and to competition and hybridization with the invasive Eastern Banded Killifish. Actions that prevent spread of Eastern Banded Killifish and restore or enhance native aquatic plant in waters where Western Banded Killifish occur will maintain or enhance population viability.
- **Ninespine Stickleback**. Occurring in nearshore Lake Michigan, this species is associated with aquatic vegetation. Stressors include limited extent of habitat and pollutants. Actions that restore or enhance habitat, including composition and extent of aquatic vegetation, and minimize pollution may enhance distribution and abundance of the species.
- **EPT Richness.** EPT (Ephemeroptera, Plecoptera, Trichoptera) larvae are relatively more sensitive to habitat composition, hydrologic alteration, and pollution-sediment.

Focus Areas for Working Waters

- Grass Lake
- Fox Lake
- Nippersink Lake of Chain ‘o Lakes
- nearshore Lake Michigan
- Kankakee River
- Rock River
- Fox River
- Mississippi River upstream of the Missouri River.

DEVELOPED LANDS and WATERS

Developed Waters are those which have been heavily modified for human use but still retain some ability to support Native Species including Species of Greatest Conservation Need. Because more than 85% of Illinois’ landscape is developed (e.g., agriculture, urban, mining) and more than 10,000 waters have been impounded, developed waters are widespread and numerous. Extensive landscape and hydrologic modifications that facilitate human uses are present in these waters. Developed Waters are used as conduits to quickly remove excess precipitation, to facilitate commerce and recreation, for water storage, and to dilute and transport effluents. Yet, SGCN and Campaign Focal Species persist in these waters, and more so, waters of natural and working landscapes are hydrologically connected to these Developed Waters. Examples of Developed Waters include artificial impoundments, detention and retention basins, harbors and marinas, channelized streams actively maintained for drainage or navigation, urban streams that function primarily to carry storm runoff.

Stressors to Habitats and Species for Developed Waters

Stressors to habitats and species of waters in developed landscapes are similar to campaign-level stressors, but impact intensity and sources of those stressors are unique to this landscape type. Stressors identified for individual Species of Greatest Conservation Need can be found in the Native Species Section (Table IIId).

- **Structure-Composition**. Many streams in agricultural or urban areas are channelized, armored, cemented, or flow through culverts and underground pipes. These modifications homogenize physical characteristics of waters and reduce available suitable habitat and limit distribution and abundance or Native Species.
- **Hydrology**. Impervious surfaces on the developed landscapes, drainage tiling, and channelization alter timing and intensity of hydrologic patterns. These flow extremes limit distribution and abundance of Native Species.
- **Pollutants-Sediment.** Excess nutrients and fine sediments are lost from agricultural lands in surface runoff and through drainage tiles and cause eutrophication and sedimentation of

waters in developed landscapes. Municipal wastewater discharges release nutrients and endocrine and behavior disrupting pollutants. Use of deicing salts have permanently increased chloride concentration in surface and groundwater. These pollutants reduce suitable habitat or reduce survival and recruitment of Native Species.

Conservation Action Strategies for Developed Waters

Conservation Action Strategies to lessen the intensity of stressors on Developed Waters.

Pollution Reduction Strategy

1. Perform nutrient loss prevention measures (e.g., adaptive drainage tiling, cover crops) on all IDNR-owned lands leased for agriculture and encourage the use of those practices on private lands.
2. Identify the intensity and extent of emerging pollutants, like PFAS and microplastics, in waters of developed landscapes and measure their potential impacts on Native Species (e.g., body condition, mortality, behavior).

Population Connectivity Strategy

1. Use regulatory mechanisms (e.g., Incidental Take Authorizations) to compel replacement of infrastructure that limits habitat extent or creates barriers to dispersal with structures that enhance hydrology, habitat structure, and dispersal.

Focal Monitoring Species for Developed Waters

SGCN are infrequently encountered in Developed Waters because many are highly degraded. Presence or abundance of those selected as focal monitoring species or taxa may be used to assess intensity of stressors and evaluate effectiveness of conservation actions.

- **Iowa Darter.** This species inhabits small streams and lakes and predominantly occurs in moderately urbanized areas of northeastern Illinois. Actions that maintain or enhance water quality characteristics, hydrology, and native vegetation will enhance distribution and abundance of this species.
- **Ellipse**. Found primarily in medium and large streams, many occurrences of Ellipse occur in developed landscapes. Actions that reduce sedimentation and enhance hydrology, like creating and maintaining natural vegetated buffers along streams, may benefit this species.
- **EPT diversity.** EPT diversity (e.g., species count) is likely to be low in many Develop Waters, yet measures of EPT diversity may correlate well with intensity of stressors and may act as a surrogate for measures of SGCN status. Actions that minimize stressors acting to limit or degrade habitat may increase EPT diversity.

- **Amphibian diversity.** Many amphibians are sensitive to stressors present in developed landscapes. Amphibian diversity (e.g., number of species) may reflect stressor intensity and effectiveness of conservation actions.

Focus Areas for Developed Waters

- Waters on and adjacent to state-leased lands used for agriculture
- Publicly owned artificial impoundments

PERFORMANCE MEASURES FOR MONITORING THE EFFECTIVENESS OF LANDSCAPE STEWARDSHIP ACTIONS AND SPECIES MANAGEMENT ACTIONS

Campaign objectives identify targets for Conservation Action Strategies, but Campaign performance measures are quantifiable measures and metrics by which progress towards objectives may be assessed over the ten-year horizon associated with this Campaign.

- Number of IDNR SSAs developed for SGCN and Stewardship Species.
- Number of guidance documents developed for target species.
- Number of SGIN with updated S-ranks.
- Number of Focal Species and Illinois Stewardship Species with improved S-ranks.
- Increase in stream miles attaining a Biological Stream Characterization grad of A and B (Schartel 2025).
- Acres of native vegetation buffers created on public lands.
- Number of groundwater contribution zones mapped.
- Acres of IDNR agriculture lease lands with implemented conservation practices.
- Increase in acres of local watersheds of focal areas, and areas critical to SGCN persistence, enrolled in Land Protection Programs.

REFERENCES

NatureServe. 2015. NatureServe conservation status assessments: Rank calculator version 3.192, updated 2020. NatureServe Arlington, Va. Available: http://connect.natureserve.org/publications/StatusAssess_RankCalculator

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