

Conservation Plan for Hydraulic Dredging to Restore Deep-Water Habitat in Buttonland Swamp

An Application for Incidental Take Authorization

Applicant: Illinois Department of Natural Resources

Project Location: Johnson and Pulaski Counties, approximately 2.6km (1.6 miles) southeast of Perks, Section 14, Range 1E, Township 14S

Project Coordinates: N37.2924 W-89.0607

Property Owner: Illinois Department of Natural Resources

Area of Impact: 27 acres maximum

Species Potentially Impacted: *Lepomis symmetricus* (Bantam Sunfish), state-threatened, and *Notropis maculatus* (Taillight Shiner), state-endangered.

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Preparation Date: 8/3/2019 (revised 8/14/2019, revised 4/1/2021)



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Executive summary

The Illinois Department of Natural Resources proposes hydraulic dredging to restore deep-water habitat in Buttonland Swamp. Buttonland Swamp is a forested and open water wetland within the Cache River Land and Water Reserve and is included in the Lower Cache River Swamp Illinois Natural Areas Inventory site. A century of landscape alteration and channelization projects in the Cache River watershed has resulted in excessive sedimentation of Buttonland Swamp and degraded the quantity and quality of deep-water habitats important to sustaining the extant aquatic community. Dredging will deepen a maximum of 27 acres in the open water areas of Buttonland Swamp. Sediments will be removed using a barge-mounted hydraulic dredge and dredge material will be pumped to a nearby containment basin. Incidental to the proposed activities is the potential for take of Bantam Sunfish (*Lepomis symmetricus*), a state-threatened species, and Taillight Shiner (*Notropis maculatus*), a state-endangered species. Bantam Sunfish has not been recorded in Buttonland Swamp for more than 20 years, but standard surveys may be inefficient at detecting the species and it has been recorded during a more recent survey upstream of the proposed impact area. The estimated take of Bantam Sunfish is 6-27 individuals over the three-year project period. Taillight Shiner was first recorded in Buttonland Swamp in late 2020 and on multiple occasions through early 2021. The estimated take of Taillight Shiner is 3-30 individuals over the three-year project period.

Section 1. Description of Impact

1.A. Project Setting

Buttonland Swamp is an approximately 565-acre (2.3 km²) wetland in the Lower Cache River Land and Water Reserve owned by the Illinois Department of Natural Resources (IDNR; Figure 1). It is the northern-most Bald Cypress-Tupelo swamp in the United States and contains forested wetland, emergent woody wetland, open water, and river channel habitats. Buttonland Swamp is within the Lower Cache River Illinois Natural Areas Inventory site (Appendix A) and is recognized for its high-quality swamp, pond, and wet floodplain forest communities. Twelve state-threatened or endangered species (four plants, two birds, two herptiles and four fish) have been recorded within the swamp.

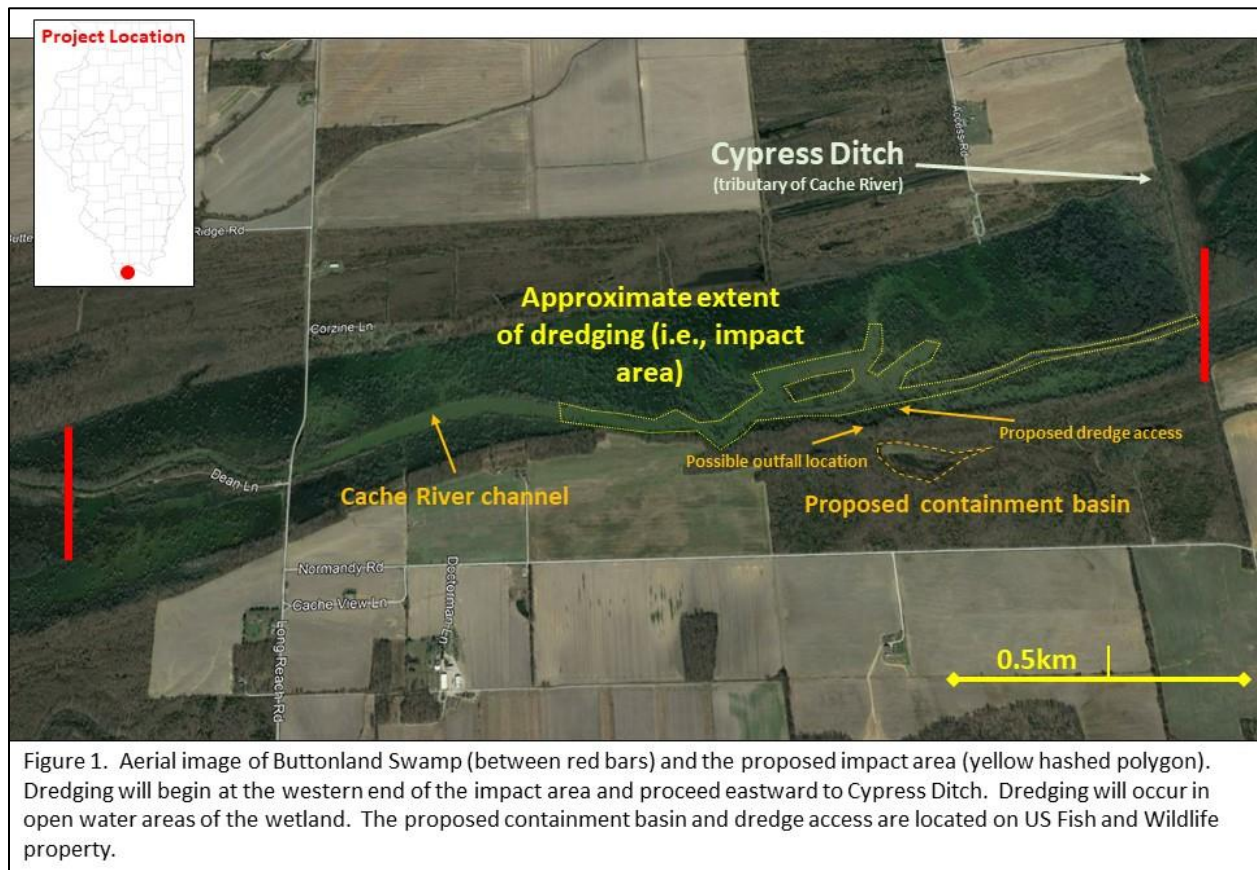


Figure 1. Aerial image of Buttonland Swamp (between red bars) and the proposed impact area (yellow hashed polygon). Dredging will begin at the western end of the impact area and proceed eastward to Cypress Ditch. Dredging will occur in open water areas of the wetland. The proposed containment basin and dredge access are located on US Fish and Wildlife property.

The primary management goal of the Lower Cache River Land and Water Reserve, as listed in the site's registration document, is to preserve and enhance existing natural communities and the IDNR engages in water level management, prescribed burns, targeted exotic and invasive species control, wetland restoration, reforestation, dredging, and monitoring to fulfill this goal. Before European settlement of the area in the early 1800s, much of what is now the Buttonland Swamp was permanently or periodically inundated open water wetland surrounded by forest, but a century of landscape modification and drainage projects altered the hydrology of the region. Conversion of forest and wetland to agricultural lands increased erosion and carried soils to the Cache River and Buttonland

Swamp. Soil-laden waters from the Cache River slow as they enter Buttonland Swamp and suspended sediments are deposited in Buttonland Swamp decreasing water-storing capacity and depth heterogeneity. Channelization projects throughout the Cache River basin, including in the main channel river, were completed to drain wetlands and quickly move water from agricultural areas. Buttonland



Representative photo of Cache River channel in Buttonland Swamp. Buttonbush thicket edge shown on left of photo.



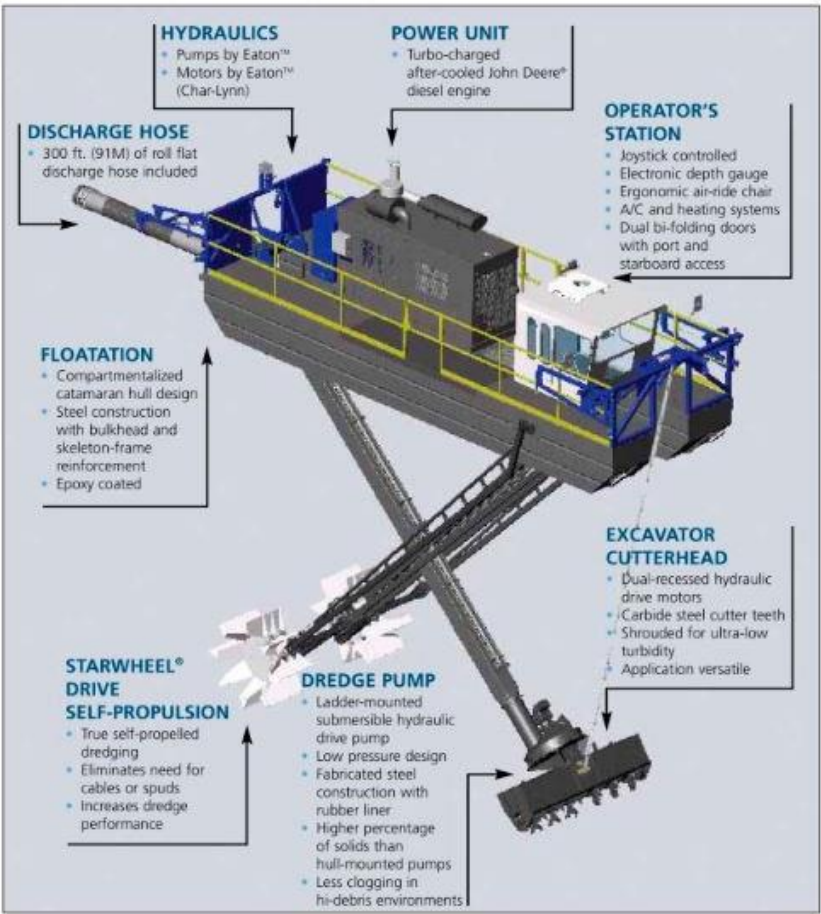
Representative photo of open water area in Buttonland Swamp. Buttonbush thicket edge shown in background.

Swamp, which was once permanently inundated, frequently and extensively dried. For more than 40 years the IDNR has attempted to slow or reverse degradation caused by altered drainage and sediment dynamics by installing and operating water control structures to maintain a more natural hydrologic regime and remove sediment deposits in aquatic habitats through dredging.

IDNR Office of Architecture and Engineering will conduct all dredging activities (e.g., dredge operation, monitoring containment basins). The Illinois Nature Preserves Commission maintains a conservation easement for the Lower Cache River Land and Water Reserve and has authority to evaluate and approve proposed dredging activities under the Illinois Natural Areas Act (525 ILCS 30). The proposed dredging has been approved by the Illinois Nature Preserve Commission as part of the Management Schedule for impacted property. Buttonland Swamp lies within the Big Creek #2 Drainage District (BCDD). BCDD has consented to dredging activities in the 2016 Declaration of Duties with IDNR.

1.B. Description of Project Activities

IDNR proposes hydraulic dredging to ameliorate sedimentation of Buttonland Swamp and restore deep-water habitat. The expected ecological benefits are increased water depth in the dredged area providing year-round suitable habitat for some fish species (e.g., large-bodied fish), extreme temperature refugia, and increased habitat availability during low water periods. Sediment will be removed using a boat-mounted pump with excavating head (Figure 2) and pumped to nearby containment basins. Excavation will begin at the western extent of the project area and proceed eastward to Cypress Ditch. The excavating head may be operated within 1m of woody vegetation to



maximize the dredged area, but direct contact with this vegetation will be avoided. The maximum area disturbed by dredging activities will be 27 acres (Figure 1), but the final area will depend upon the ability of the dredge to navigate to and through the wetland, the capacity of containment basins, and availability of personnel and equipment. Equipment will be staged at in an upland area owned by the US Fish and Wildlife Service and the dredge will enter Buttonland Swamp from an earthen ramp constructed from the staging area to the Swamp (Figure 1). Vegetation clearing for staging and ramp construction will be limited to removal of saplings. Dredged sediment will be pumped to an existing

containment basin south of Buttonland Swamp on US Fish and Wildlife property (Figure 1, Appendix A). This basin has been used to contain dredge material from previous dredging events and will be emptied for use during this project. Periodic cessation of dredging will occur to allow sediment particles to settle in containment basins and to adhere to Illinois Environmental Protection Agency (IEPA) regulations regarding turbidity limits for discharges. Over time dredged sediments will consolidate in the containment basins and be colonized by vegetation. Dredging will occur over a single one- or two-week period per year for two or three years. Dredging will occur only in open water areas as the excavation head cannot remove woody vegetation. Dredging will occur in winter and spring (roughly November – March) to ensure water depth adequate for the dredge’s draft.

1.C. Biological Data

1.C.1. Databases and Surveys

Much of the biological information for Buttonland Swamp comes from opportunistic observations or occasional reconnaissance. The IDNR Natural Heritage Database indicates eight state-listed animals are in or adjacent to Buttonland Swamp (Table 1).

Table 1. State Threatened and Endangered Animals Recorded in Buttonland Swamp.

<u>Taxon</u>	<u>Common Name</u>	<u>Most Recent Observation</u>	<u>Status</u>
Amphibians			
<i>Hyla avivoca</i>	Bird-Voiced Treefrog	1995	Threatened
Reptiles			
<i>Thamnophis sauritus</i>	Eastern Ribbon Snake	1989	Threatened
Fish			
<i>Lepomis miniatus</i>	Redspotted Sunfish	1979	Endangered
<i>Hybognathus hayi</i>	Cypress Minnow	1996	Endangered
<i>Lepomis symmetricus</i>	Bantam Sunfish	1996	Threatened
<i>Notropis maculatus</i>	Taillight Shiner	2021	Endangered
Birds			
<i>Dendroica cerulea</i>	Cerulean Warbler	1993	Threatened
<i>Ixobrychus exilis</i>	Least Bittern	1998	Threatened

Multiple nighttime frog call surveys have been completed over twenty years in the project area. Call surveys conducted in 2007 and 2008 recorded the Bird-Voiced Treefrog at two of four listening stations and reported calls achieved the highest call index ranking of “full chorus, constant and overlapping calls”, indicating multiple individuals (Berkey and Phillips 2010). Most source features for the species in the Natural Heritage Database record only presence, but those quantifying abundance based on call surveys estimate between 1-50 individuals per record.

The IDNR Division of Fisheries conducts periodic fish community surveys in and near Buttonland Swamp. Between 1992 and 2015, 50 surveys at 14 relevant locations yielded records for 56 species. These surveys resulted in one Cypress Minnow recorded in 1992 in Cypress Ditch near Buttonland Swamp and three Bantam Sunfish from the vicinity of the Lower Cache River access (downstream of impact area) in 1995. A survey conducted in 2004 by the Illinois Natural History Survey failed to document Redspotted Sunfish near the project area. Bantam Sunfish was recorded approximately 8km upstream of Buttonland Swamp in 2004 in a wetland with hydrologic connectivity to the Swamp. Vandermyde and Shults (2015) surveyed fish in the wetlands and low gradient streams of the Cache River basin, but no state-listed species were recorded in or near Buttonland Swamp during their efforts. Southern Illinois University – Carbondale began conducting frequent electrofishing surveys of Buttonland Swamp in mid-2020. Taillight Shiner was first recorded in Buttonland Swamp in September 2020 and has been recorded from a total of eleven sampling events between September 2020 and March 2021.

No surveys targeting reptiles or birds were identified, although incidental observations have occurred (Table 1).

1.C.2. Species at Risk for Impacts

A conservative estimate of species presence was used given biological surveys conducted in Buttonland Swamp are infrequent and often limited in scope: Species recorded during the past 20 years, within or adjacent to Buttonland Swamp and with at least one life history stage which may be impacted directly or indirectly by the proposed project (i.e., overlap in time and space).

Call evidence of Bird-Voiced Treefrog has been recorded as recently as 2008; however, adults do not utilize the impact area and larvae are not present during the impact period. Eastern Ribbon Snake, Redspotted Sunfish, Cypress Minnow, Cerulean Warbler and Least Bittern have not been recorded within the 20-year period. Although Bantam Sunfish has not been recorded in Buttonland Swamp for more than 20 years, it was recorded upstream of the Swamp in 2004. Furthermore, fish community surveys are unlikely to detect Bantam Sunfish given its propensity to inhabit the densely vegetation areas of Buttonland Swamp where surveys are difficult to complete. Therefore, there is a reasonable likelihood that Bantam Sunfish is present in Buttonland Swamp and take may occur during dredging activities. Taillight Shiner recently has been recorded in Buttonland Swamp and survey data suggest the presence of a viable population. There is a reasonable likelihood that take of Taillight Shiner may occur during dredging activities.

Bantam Sunfish, *Lepomis symmetricus*

- Conservation Status: State-Threatened
- Range: The lower Ohio and Mississippi River basins from southern Indiana and Illinois through Missouri, Kentucky, Tennessee, Arkansas, Mississippi and Louisiana, and into eastern Texas.
- Distribution in Illinois: Twelve Element Occurrences (EOs) from four southern counties are recorded in the Natural Heritage Database.
- Species Appearance: Relatively small and stout sunfish with alternating vertical bands of tan and olive. Up to 9cm.
- Habitat and Diet: Swamps, shallow backwater lakes and margins of low gradient rivers with herbaceous or woody vegetation. Consumes small mollusks, crustaceans and insects.
- Breeding and Life History: Spawns in May. Larvae leave the nest approximately 7-10 days following hatch and reach 2cm in length after approximately two months. Reaches sexual maturity in less than one year.
- Status in Impact Area: Four surveys conducted in the 1990s recorded between 2 and 9 individuals. The species was last recorded in Buttonland Swamp in 1996, however it was recorded upstream of the impact area in 2004.



Taillight Shiner, *Notropis maculatus*

- Conservation Status: State-endangered
- Range: The eastern seaboard from North Carolina to Florida and the Mississippi River valley from Louisiana to southern Illinois.
- Distribution in Illinois: Two EOs are recorded in the Natural Heritage Database. The first is in Mud Creek, Massac County, but no Taillight Shiner have been recorded within this EO since 1988. The 2020-2021 Buttonland Swamp records populate the second EO.
- Species Appearance: A slender minnow with a large black spot at the base of the caudal fin, dusky stripe along the side, and rosy coloration during breeding season. Up to 8cm.
- Habitat and Diet: Swamps and backwaters of rivers usually associated with vegetation or woody debris. Consumes detritus, zooplankton, and small aquatic insects.
- Breeding and Life History: Spawns March through May in southern part of range, but likely April and May in Illinois. This species is a broadcast spawner and reaches maturity in less than one year. Maximum life expectancy is approximately 2 years.
- Status in Impact Area: Recent surveys in Buttonland Swamp have collected between 1 and 10 individuals. The species had not been recorded in the impact area prior to September 2020.



1.D. Anticipated Impacts to Listed Species

1.D.1 Characteristics of Impacts

Take may occur as individuals enter the excavating head of the dredge. Contained within the head are rotating teeth designed to dislodge and break up sediments (Figure 2), and it is expected that animals entering the head will be destroyed. This form of take is most likely to occur near the transition between open water areas (where dredging will occur) and the dense areas of woody emergent vegetation where Bantam Sunfish and Taillight Shiner may be present. It is also possible these species may utilize the deepest parts of the open water areas as thermal refugia during the winter dredging period and come into contact with the dredge.

Take may also occur as individuals are displaced or change their behaviors as a result of dredge operation. The propulsion and hydraulic systems create vibration and flow as they operate. Bantam Sunfish and Taillight Shiner are likely to avoid the dredge and in doing so may be more vulnerable to predation or may be temporarily displaced to less suitable habitat. Dredging will also increase turbidity during operation, although these impacts are temporary and localized. Discharges from the containment basin may also increase turbidity near its outfall. Discharges must not exceed IEPA NPDES turbidity standards. It is unlikely increased turbidity will greatly impact Bantam Sunfish or Taillight Shiner as they are accustomed to the high ambient turbidity of Buttonland Swamp.

1.D.2. Estimate of Take

Take of Bantam Sunfish and Taillight Shiner may occur if individuals enter the excavating head or as a result of temporary displacement. Both species are most likely to occupy vegetated areas of Buttonland

Swamp where the dredge cannot operate. Still, feebly swimming individuals, like juveniles, may be sucked into the head as the dredge operates nearby. The species may also inhabit open water areas during the dredging period. Individuals of all life stages may also be displaced as they avoid vibrations created by the dredge. It is unlikely turbidity increases will impact Bantam Sunfish or Taillight Shiner as Buttonland Swamp is a relatively turbid system and the species appear tolerant of silt. Take of Bantam Sunfish and Taillight Shiner may be estimated using abundance records from community surveys. Bantam Sunfish take associated with this project is estimated at 2-9 individuals for each of three years (6-27 individuals, total). Taillight Shiner take is estimated at 1-10 individuals for each of three years (3-30 individuals, total).

Section 2. Avoidance, Minimization and Mitigation

2.A. Minimization of Impact Area

A maximum of 27 acres of Buttonland Swamp will be dredged over a three-year period. Dredging will occur in open water areas of the Swamp, which is marginal habitat for Bantam Sunfish and Taillight Shiner during most periods. No efforts will be made to minimize the area impacted as the goal of this project is to restore deep-water habitat and provide refugia for the benefit of Buttonland Swamp's aquatic community.

2.B. Management of the Impact Area

Dredging will remove accumulated sediment in the Cache River channel and other open water areas of Buttonland Swamp. Increasing water depth will improve utility of these areas as winter or low-water refugia for Bantam Sunfish and Taillight Shiner. Water level management (i.e., impounding water in Buttonland Swamp during low-water periods) will continue during and after dredging.

2.C. Avoidance, Minimization and Mitigation Measures

Dredging will occur during high water periods between November and March. Bantam Sunfish reproduce beginning in May, so dredging will not impede reproductive efforts nor will vulnerable larvae be present during dredging. Taillight Shiner reproduce between March and May, and mature within nine months, so dredging will conclude before peak spawning period. The most vulnerable periods in the two species' life history (i.e., spawning and larval periods) will be avoided.

Turbidity impacts will be minimized by pumping dredged sediment to containment basins located in upland areas adjacent to Buttonland Swamp. These basins will be constructed with dams that will allow supernatant (i.e., the liquid located above a sediment that has fallen out of solution) to reenter the Swamp once turbidity has decreased to IEPA-approved levels. All turbidity impacts are expected to be temporary and localized to the site active dredging or near the outfall of the proposed containment basin (Figure 1).

The purpose of the dredging project is to ameliorate the impacts of sedimentation in Buttonland Swamp and create deep-water habitat for the benefit of the natural community. Bantam Sunfish and Taillight Shiner may use deep-water areas as refugia in winter or during periods of low water when the most suitable habitat (i.e., vegetated area) is inaccessible or intolerable. The proposed project will benefit the

aquatic community of Buttonland Swamp, including Bantam Sunfish and Taillight Shiner, so no further mitigation activities are proposed.

2.D. Monitoring

IDNR Division of Fisheries surveys the Cache River basin once every five years, and one survey location is in the main channel Cache River within Buttonland Swamp and in the dredging footprint. This survey is scheduled to occur in 2024. IDNR boat electrofishing protocols are used. These surveys provide information regarding long-term trends of fish assemblages, but do not target the most suitable habitat for Bantam Sunfish and Taillight Shiner.

IDNR shall conduct or facilitate a survey for Bantam Sunfish and Taillight Shiner in year one and three following cessation of dredging activities (likely 2022 and 2025). Surveys will use IDNR standardized boat electrofishing procedures and will occur in dredged and vegetated areas of Buttonland Swamp, areas not typically targeted by Division of Fisheries surveys. Proposed surveys will evaluate fish assemblage composition in restored deep-water habitat and improve likelihood of detecting presence of Bantam Sunfish and Taillight Shiner relative to existing survey programs. Survey methods, a map of survey reaches, characteristics of surveyed reaches and species abundance will be recorded for each electrofishing run. Length and weight of individuals from threatened or endangered species, including Bantam Sunfish and Taillight Shiner, and representative photos of these species will be recorded. Threatened or endangered species records will be provided to the IDNR Natural Heritage Database.

2.E. Adaptive Management Practices

Hydraulic dredging requires water elevation sufficient for floating the dredging equipment and providing an adequate volume of water for pumping dredged material to the containment basins. These conditions most frequently occur during winter and spring when high precipitation and low evapotranspiration result in high and sustained water elevation. If high water conditions in Buttonland do not occur during the proposed November – March dredging period, dredging will be delayed until the following November – March period. Adherence to the November – March dredging period ensures avoidance of vulnerable life stages of the focal species.

Species occurrence data are incomplete and unexpected presence of threatened or endangered species may occur during dredging activities. To avoid take of these species dredge operators will be provided educational materials that will include species identification and avoidance information. Contact information for the local District Heritage Biologist will be provided.

Spills and leaks from dredge equipment may occur. Dredge machinery carries diesel fuel, oil, grease and other substances with potential for environmental contamination. Dredge operators and supervisors will develop an anti-contamination procedure to prevent spills or contain spills should they occur. This procedure must include contact information for local emergency response agencies.

2.F. Verification of Funding

All dredging activities will be funded through Park and Conservation Fund (0962). Monitoring will be performed using IDNR Office of Resource Conservation funds for use in natural areas or for conservation of species and communities, Natural Areas Acquisition Fund (0298) or Illinois Wildlife Preservation Fund (0909).

Section 3. Alternatives

The goal of dredging activities is to remove accumulated sediment and restore deep-water habitat in Buttonland Swamp. Alternatives to this action are presented below.

Alternative 1. No Action. IDNR may choose not to engage in removing excess sediment from Buttonland Swamp. This alternative would result in no take of listed species; however, this proposed project is expected to provide a net benefit to all aquatic obligate species and so 'no action' would jeopardize the long-term status of Bantam Sunfish and Taillight Shiner in Buttonland Swamp.

Alternative 2. Reduce Extent of Dredging. IDNR may choose to restrict dredging activities to a portion of the proposed dredging extent. This alternative may reduce take of listed species but would provide limited ecological benefits to the natural community.

Alternative 3. Alternative Water Control Structure Operation or Design. The desired outcome of the proposed dredging is greater quality and quantity of deep-water habitat in Buttonland Swamp. IDNR may be able to achieve these outcomes by raising the water elevation in Buttonland Swamp through modification or addition of impoundment structures or diverting additional flow from elsewhere in the Cache River basin to Buttonland Swamp. This alternative would result in no take of the two focal species; however, the social and ecological costs of this alternative are unacceptable. Additional water in Buttonland Swamp could increase the frequency and intensity of flooding on public and private property, which may violate 17 Ill. Admin. Code 3700 (Construction in Floodways of Rivers, Lakes and Streams) prohibiting increased flood elevation on private property. The increased water elevation in Buttonland Swamp may imperil plants and animals of the adjacent terrestrial areas.

Section 4. Species' Likelihood of Survival

Twelve EOs for Bantam Sunfish are recorded in the Illinois Natural Heritage Database. The EO that includes records (i.e., observations) in Buttonland Swamp (EO #5) also includes seven additional records over a 15km extent, although all records are more than 15 years old (Table 2). Bantam Sunfish has not been observed in Buttonland Swamp since the 1990s, although the most suitable habitat for the species is difficult to access (dense thickets of Buttonbush) and is likely underrepresented in surveys. The remaining EOs in Illinois are represented by between one and 15 records with a mean number of observed individuals ranging from one to 13.2. The frequency of surveys at each EO and the effort expended during each survey is mostly unknown, so the status and viability of each EO is unclear. The IDNR Division of Fisheries database contains Bantam Sunfish records at just two locations (Illinois River [EO#13] and Running Lake Ditch [EO#12]). The lack of population data or even contemporary distribution information necessitates use of a coarse species viability assessment. Assuming Bantam Sunfish remains extant in Buttonland Swamp, it is unlikely take of 6-27 individuals over three years will jeopardize the species existence in the Middle Cache River EO (#5) or in the Swamp itself. Furthermore, the proposed project will not damage the species' most suitable habitat and provides a net benefit to

the species and its associated community by providing thermal and drought refugia. By extrapolation, then, the statewide status of Bantam Sunfish will not be jeopardized by the proposed take.

Table 2. Bantam Sunfish element occurrences (EO) from the Illinois Natural Heritage Database. The highlighted EO includes the proposed project area.

EO #	General Location	Number of Records	Most Recent Record	Range of Observed Abundance	Mean of Observed Abundance
1	Running Lake Ditch (Mississippi River tributary)	14	2000	1-10	3
2	Running Lake Ditch (Mississippi River tributary)	2	2001	na	1
3	Clear Creek (Mississippi River tributary)	2	1993	2-4	3
4	Horseshoe Lake	7	1996	1-4	2.3
5	Middle Cache River	8	2004	1-6	3.3
6	Clear Creek (Mississippi River tributary)	2	1993	1-2	1.5
7	Winters Pond	4	2004	1-8	5.7
8	Wolf Lake Swamp	15	1985	1-35	13.2
10	Clear Creek (Mississippi River tributary)	1	1993	1	na
11	Clear Creek (Mississippi River tributary)	1	1993	1	na
12	Running Lake Ditch (Mississippi River tributary)	1	2009	1	na
13	Illinois River	1	1998	1	na

The only extant EO for Taillight Shiner is in Buttonland Swamp. Between 1 and 10 individuals are associated with each record. There are no population abundance estimates for this species; however, length measurements of captured individuals indicate recruitment is occurring. The mean number of individuals collected during each electrofishing sample is 4.4, suggesting take of 1-10 individuals per year over the entire area of Buttonland Swamp will not jeopardize the species' continued persistence in Illinois.

Section 5. Implementing Agreement

5.A. Schedule

The existing containment basin adjacent to Buttonland Swamp will be rehabilitated in 2021. The first dredge-year will occur between November 2021 and March 2022. Additional dredging events may occur during the November-March period of 2021-2022 and 2022-2023.

A summary of dredging activities, including area dredged, dredging dates and operation of containment basins will be provided to IDNR within 90 days following each dredging event. Monitoring reports including information identified in Section 2.D will be provided to IDNR within 90 days following each monitoring event. Take of any threatened or endangered species other than Bantam Sunfish and Taillight Shiner will be reported to IDNR within 48 hours and all work will stop pending consultation with IDNR.

5.B. Legal Authorities

IDNR owns Buttonland Swamp. The containment basin south of Buttonland Swamp is owned by the US Fish and Wildlife Service, and IDNR is seeking an easement for its use. IDNR will complete all activities. Under the Illinois Natural Areas Preservation Act, 525 ILCS 30, the Illinois Nature Preserves Commission evaluates and approves or rejects management activities in Land and Water Reserves.

5.C. Compliance

Dredging in navigable waters requires U.S. Army Corps of Engineers 404 and Illinois Environmental Protection Agency 401 and ILR10 permits. The Corps 404 permit was received in 2014 and expires December 21, 2030. Environmental Protection Agency permits are pending. Work funded and performed by IDNR requires a Comprehensive Environmental Review Process (CERP). CERP for this project was completed in April 2019.

5.D. Signatures

Each participant listed below has the legal authority to carry out their respective obligations and responsibilities (in parentheses) under this conservation plan.



Colleen Callahan
Director, IDNR (landowner and applicant)

APPROVED FOR EXECUTION

Date: 5/29/2024

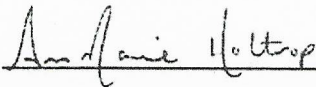
Legal Counsel: Nicole Thomas, R



George M. Covington
Chair, Illinois Nature Preserves Commission (easement holder, Lower Cache River Land and Water Reserve)



Dale W. Brockamp
Chief, Division of Architecture and Engineering, IDNR (dredging activities)



Ann Marie Holtrop
Chief, Division of Natural Heritage, IDNR (monitoring)

References

- Berkey, A.J.M. and C.A. Phillips. 2010. Utility of anuran call survey data for estimating occupancy, abundance and reproductive success in the Cache River basin. Illinois Natural History Report. Final Report for Illinois State Wildlife Grant #T-40-R-1.
- Burr, B.M. 1977. The Bantam Sunfish, *Lepomis symmetricus*: Systematics and distribution and life history in Wolf Lake, Illinois. Illinois Natural History Survey Bulletin, 31(10).
- Illinois Department of Natural Resources. 1998. Registration Agreement – Cache River Land and Water Reserve.
- Illinois Department of Natural Resources. 2017. Illinois Nature Preserves Commission Management Schedule, Cache River State Natural Area – Land and Water Reserve (1 January 2018 – 31 December 2021). Approved 2017.
- Joint Petition for the Renewal of Declaration of Duties between Illinois Department of Natural Resources and Big Creek Drainage District #2. Pulaski County Circuit Court. February 2016.
- NatureServe. 2018. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://explorer.natureserve.org>. (Accessed: March 7, 2019).
- Page, L.M. and B.M. Burr. 2011. Peterson Field Guide to Freshwater Fishes of North America North of Mexico, 2nd Edition. Houghton Mifflin Harcourt, New York, NY.
- Philips, C.A., R.A. Brandon and E.O. Moll. 1999. Field Guide to Amphibians and Reptiles of Illinois. Illinois Natural History Survey Manual 8. 296pp.
- Redmer, M. 2019. *Hyla avivoca*, Bird-Voiced Treefrog. Amphibiaweb. Accessible <https://amphibiaweb.org/species/728>. Accessed March 7, 2019.
- Robison, H.W. and T.M. Buchanan. 2020. Fishes of Arkansas, 2nd Edition. The University of Arkansas Press, Fayetteville, AK.
- Smith, P.W. 1979. Fishes of Illinois. University of Illinois Press, Urbana, IL.
- Vandermyde, J.M. and S. Shults. 2015. Survey of historic populations of slackwater fish species in greatest need of conservation in the Cache River watershed. Illinois Natural History Survey Technical Report 2014(44).
- Wetzel, J.E. 2007. Spawning and raising the Bantam Sunfish, *Lepomis symmetricus*. American Currents, 33(1):11-15.

Appendix A. Project setting, including locations and names of Nature Preserves, Land and Water Reserves, Illinois Natural Areas Inventory sites, other DNR properties and relevant project sites.

