EXECUTIVE SUMMARY

Purpose of the Report:

The primary purpose of this study is to facilitate the development of a Lower Cache River Comprehensive Ecosystem Restoration Plan (Plan), addressing the complex hydraulic conditions that have prevented the Cache River Joint Venture Partnership (JVP) from acting on previously proposed hydrologic restoration alternatives. Recognizing the essential role of improved hydrologic function in the restoration of the Lower Cache River ecosystem, the study aims to leverage the U.S. Army Corps of Engineers' (USACE) comprehensive planning and engineering expertise to evaluate a broad range of ecosystem restoration measures and design options across a 30-mile focal area.

Ultimately, this study seeks to provide the JVP with the necessary data and analysis to advance their fundamental goal of preserving, restoring, and supporting the ecological communities of the Lower Cache River Area.

Study Area Description:

The Cache River study area from the Post Creek Cutoff to its confluence with the Mississippi River represents an approximately 35-mile stretch known as the Middle and Lower Cache (for purposes of this report we will refer to it as the Lower Cache). This dynamic and ecologically significant stretch is characterized by a complex interplay of bottomland hardwood forests, cypress-tupelo swamps, and agricultural lands. This section of the Cache is typified by its sluggish, meandering flow, reflecting its historical function as a vital floodplain. Hydrologically, the area is influenced by both backwater flooding from the Mississippi and Ohio Rivers and local precipitation, creating a mosaic of permanently and seasonally inundated habitats.

Problem Identification:

Human-induced physical modifications over the past two centuries within the Cache River floodplain have altered hydrology, topography, and biotic communities historically present within the study area. These alterations have degraded aquatic resources (i.e. side channel, fisheries, and wetland habitat), reduced forest community diversity (i.e. age, structure, and species composition), impaired ecosystem functions, and threatened the future sustainability of the river-floodplain ecosystem. The primary problems identified are described below:

- Hydraulic alteration within the Lower Cache River channel has caused disconnect from its floodplain on lower frequency events, altering natural

hydrologic inundation regimes which has altered natural biological and ecological processes;

- Water is unable to access floodplain areas effectively due to channelization and stream incision, resulting in the degradation of floodplain forests and wetlands, as well as overall quality of aquatic habitats;

- The degraded hydrology at various locations of the river and associated floodplain wetlands is reducing desired vegetative community composition and wildlife resources (e.g., forage, invertebrate production, nesting habitat, and resting sites); and

- Increased sedimentation inputs and the buildup of woody debris from ongoing bankline erosion and historic land use changes within the watershed has led to shallower depths, loss of interior connectivity, lack of substrate and bathymetric diversity, with subsequent decreases in habitat function and availability for aquatic species. This is most obvious in the crested portion of the system, where upland sediment inputs get trapped within Buttonland Swamp rather than being flushed downstream.

Objectives:

The Cache River Wetlands JVP strives to leads the effort to restore the Cache River Watershed by focusing on habitat restoration. The USACE Project Delivery Team (PDT), in collaboration with the JVP, identified the following restoration objectives for the study area:

- Enhance water management capability, improve biological diversity of native vegetation species composition and structural complexity throughout study area (wetlands, forests, etc.). Accomplishment of this objective should consider an overarching desire to keep O&M low, with localized areas of more intensive management capability;

- Improve bed and bank stability and restore aquatic connectivity throughout the study area;

- Improve bathymetric and substrate diversity; and

- Optimize hydraulics to reduce or prevent continued degradation of this complex and dynamic system during prolonged inundation and drought conditions.

Plan Formulation, Evaluation, and Comparison:

The interagency planning team, which includes biologists, engineers, and planners from the USACE, IDNR, NRCS, USFWS, TNC, and DU developed a series of measures for consideration to address the identified objectives. Measures were then assessed for ability to address study area problems and objectives. The final list of measures included:

- Dredging/Excavation
- Channel/Bed/Bank Stabilization
- Reconnection
- Water Control Structures
- Levee/Berm Modifications
- Vegetative Management
- Conservation Protection
- Sediment Management
- Stream Gage
- Pumps/Wells

Summary:

The Cache River PAS study evaluated numerous measures and alternative configurations with the primary focus on restoring the Lower Cache River system, with a particular emphasis on maximizing habitat benefits.

The study highlights specific combinations of key measures implemented within the study area which will have the greatest hydrologic impact and consequently, the most substantial positive effect on the area's habitat.

These efforts are crucial for the restoration of the Cache River, which is recognized as a "Wetland of International Importance" and is a unique ecosystem in southern Illinois.

It is important to understand that some of the restoration measures outlined in the study are interdependent and must be implemented together to be fully effective and minimize risk of unintended negative impacts.

While many individual measures can still provide some habitat gain, the key configurations identified for the Forman Floodway are designed to work in synergy to produce the maximum possible benefits for the watershed.

Alternative 4- Maximum Habitat Benefit is identified as the approach that will provide the most significant habitat uplift. Alternative 4 stands out as the most promising for ecological revitalization due to its combined approach, with projects that can lead to greater success and sustainability in the long term. This has the most positive impacts on the habitats involved and provides the most resiliency for the ecosystem.