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# Natural Resource Management Knows No Bounds: A Case Study of the Cache River Joint Venture Partnership

Jennifer Ann Behnken
*Southern Illinois University Carbondale*, jenniferbehnken@gmail.com

# NATURAL RESOURCE MANAGEMENT KNOWS NO BOUNDS:

# A CASE STUDY OF THE CACHE RIVER JOINT VENTURE PARTNERSHIP

by

Jennifer Ann Behnken

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Approved by:

John W. Groninger, Chair

James J. Zaczek

Erin L. Seekamp

Graduate School
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In southern Illinois, multiple state, federal, and private ownerships are implementing various management tactics in the Cache River watershed. Although some aspects are coordinated under the Cache River Joint Venture Partnership (CRJVP), individual agencies and entities retain specific ownership priorities and approaches to management. This case study explores how agency/organizational characteristics and interrelations affect land management decision-making among land managers employed by federal agencies, state agencies, and non-governmental organizations. Semi-structured interviews were conducted with twenty-five participants, including land managers, staff members who maintain active participation with on-the-ground activities, and individuals who have worked closely with CRJVP. Triangulation of interview transcriptions, meeting observations, management plans, and other relevant agency/organization documents revealed emerging themes and patterns within the data. Grounded theory was applied to better understand how differences in institutional cultures, missions, and resources impact management practices across the landscape.

Results suggest that administrative processes, funding sources, policy and regulations, mission statements, specified objectives, and management goals within and between agencies/organizations determine how institutional priorities and capacity impact management

decisions and on-the-ground activities. Institutional structures influence decision-making power and field-level capabilities. Management decisions follow mandates and internal orders within their respective institutions. While overarching goals remain compatible, each institution exhibits their own perspective of managing resources. Combined with unclear management criteria, these discrepancies create a shift in institutional interests. Current economic conditions influence institutions to work internally and re-assess values, shifting focus from partnership actions to individual institutional goals. Despite diminishing budgets and lessening capacity, partnerships are able to pool resources and encourage collaborative on-the-ground actions. More resources indicate greater management capabilities, collective thinking to solve problems, and bridging resource gaps. Partners stand together in a unifying force, bringing strength to each institution and backing up decisions with collective efforts. For successful collaborative management, partners must focus on fundamental common goals as well as respect differences in institutional cultures. Partnership flaws must be acknowledged and accepted for constituents to continue to move forward in collaborative natural resource management. While addressing individual site needs, large scale management is still an effective management unit for natural resource institutions. Additionally, adaptive management is the key to addressing ecosystem dynamics. Natural resources are dynamic and resource managers must adjust management tactics to suit environmental changes over spatial and temporal scales.

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# CHAPTER 1

# INTRODUCTION

The term “management” involves a broad scope of actions, including performing tasks and actions in order to accomplish a collection of designated goals and objectives. Management on public lands can be a complex process in itself, beginning with brainstorming sessions, creative planning, organization, leading to delegation and implementation of plans with leadership and direction to achieve the goals and objectives set in place. This process requires a variety of resources, including people, finances, time, and equipment, to carry out the decisions made in the management process. In the Cache River Joint Venture Partnership, where agencies both cooperate and maintain autonomy in land management missions and practices, the process for any given tract of land may be impacted from both within and outside the land-holding management organizations and involved in the progression of initial development and planning to the final stages of implementation. Even then, the end product of decision-making and management implementation is not concrete and may require additional modifications and adjustment to address emergent needs and conditions, also referred to as adaptive management.

Land management is the integration and competition of an assortment of purposes and the methods of management for utilization and progress (Webster's Online Dictionary, 2013). The implications behind land management are to reach a desired effect, set in place at the onset of the goals specified. It is a delicate, yet highly sophisticated process. The larger the scale of land management, such as increasing tract size or numbers of stakeholders, the more complex the process becomes. Instead of addressing site specific concerns, management covers greater expanses of land, encompassing possibly several natural community types and potentially even more landowners. While it is rare for one entity to possess ownership at a landscape or a

watershed scale (Adams et al., 2005), it does not mean that landscape scale management is impossible. It simply means that the scope of management must change in order to address the larger scale issues.

Land management covers a variety of land uses. There are many studies researching abiotic and biotic factors of the environment, including flora and fauna and their habitats, food source, shelter, breeding grounds, niche overlap, and other driving environmental factors to construct their range, population numbers, and habitat requirements. It takes an extensive amount of research and time to develop management strategies for habitat, resources, and species continuation and sustainable practices for key species, as well as addressing the various complexities within these natural systems, which in turn, affect focal species.

Currently, there are several ongoing studies in the Cache River watershed over a variety of subjects and topics, such as wood ducks, macroinvertebrates (Stone et al., 2005), prothonotary warblers (Hoover, 2003), native cane (Schoonover et al., 2006), swamp rabbits (Scharine et al., 2009), riparian buffers (Schoonover et al., 2005), bottomland forest restoration (Kruse & Groninger, 2003), and deer browsing (Ruzicka et al., 2010). While not an exhaustive list, it further demonstrates the variety of potential environmental interactions across spatial and temporal scales. This scientific research is ostensibly intended to inform management practices on the Cache River watershed and similar ecosystems; however, sometimes study results and land management lack linkage, which may influence management strategies of land managers.

Management is not only influenced by natural processes and species composition, but human land use as well. Anthropogenic practices, including past and present land use practices influence organizational strategies of natural resource management. This idea alludes to the question of who owns and manages the land and monitors its natural processes. Management

itself implies that a person makes a decision that may impact biotic or abiotic processes. Regardless of the decision, whether it results in active management or passive management, an outcome will occur either intentioned or accidental. In the case of natural resource agencies, these actions can influence their very vision and goals, giving reason for institutional involvement and motivations to conduct management a certain way.

Over the past several years, managing environmental problems has expanded the development of institutional networks worldwide, statewide, and within local communities (Imperial, 1999). For an agency or organization owning public lands, it is the role of the site manager and personnel to decide how to best manage the environment to meet the needs of the public, satisfy their associated agency/organization's mission statement and objectives, advocate for environmental health, maintain effective public relations, and delegate individuals (staff, volunteers, etc.) to carry out these actions with productivity and efficiency. A land manager is placed into various roles, including educator, technician, mediator, conflict manager, public relations specialist, scientist, or a combination of these characteristics (Cortner et al., 1998). They must be prepared to engage in a variety of situations based on the needs of their site, their staff, and others who depend on their expertise.

Managers serve the public according to criteria established through policies of their respective agencies (Davenport et al., 2010). They must fulfill the mandates of their institution and specific criteria in their management plans. This action, plus a hierarchical decision-making chain, can sometimes hinder adaptive measures and professional discretion of field-level personnel. In many cases, management expands beyond the land boundaries from a specific site to a larger ecological setting. Coordinated management of an entire ecosystem, natural community, or watershed within the confines of specific land boundaries is rare in the central

United States and other predominantly agriculture-dominated landscapes. The lack of a central governing unit over larger scales of land creates managerial concerns and political challenges on how to control usage (Adams et al., 2005). As a result, there are special considerations when working with adjacent public and private landowners.

Here, partnerships are useful mechanisms to help achieve restoration goals on a landscape level. Agencies and organizations create partnerships in efforts to join forces with the overall goals of environmental sustainability and protecting land and water resources for their continuing viability. In natural resource management, partnerships may advance the likelihood of conservation and restoration practices beyond the capabilities of individual parties by collectively bringing to bear a variety of critical resources, including land, funding, personnel, facilities, or programming (Burde et al., 1998). They are effective in combining these assets to create powerful forces in environmental protection, conservation, and restoration. It is important to examine interactions between partners in order to understand dynamic levels of participation and how they relate to natural resource management.

## Cache River Joint Venture Partnership

Watersheds are typically in multiple ownerships. Resource planning institutions face the challenge of acquiring legitimacy and legal authority when implementing management decisions (Adams et al., 2005). Such is the case for the Cache River watershed. Over the course of two hundred years, landowners drained wetlands for agricultural production and to alleviate health concerns from viruses carried by mosquitoes. These practices, combined with land clearing for residential purposes and several hydrological alterations to the Cache River watershed and its associated wetlands led to awareness and concern for continuation of water quality, wildlife

sustainability, and recovering the loss of wetlands, which were and continue to be vulnerable to physical degradation.

A grassroots effort was started with the Citizen Committee to Save the Cache River, a group of local citizens who came together in the 1970s in response to the dramatic increase in drainage practices and destruction of waterfowl habitat. Public land acquisition also began in the 1970s with the Illinois Department of Conservation (now known as Illinois Department of Natural Resources). The Nature Conservancy, a non-profit organization, assisted with purchasing land within the Cache River watershed, selling much of it to the state and maintaining others areas of land within its own jurisdiction. Awareness of environmental degradation and the need for action increased as the loss of wetlands and drainage continued for involved entities. In 1990, the Fish and Wildlife Service, a federal agency, formed the Cypress Creek National Wildlife Refuge, acquiring a land corridor along the Lower Cache River.

The Cache River Joint Venture Partnership (CRJVP) formed in 1991 with constituents including the Illinois Department of Natural Resources (IDNR), Fish and Wildlife Service (FWS), The Nature Conservancy (TNC), and Ducks Unlimited (DU). The USDA Natural Resource Conservation Service (NRCS) became a member of the Joint Venture Partnership in 2008 in efforts to expand resource initiatives and goals with conservation programs for private landowners. The formation of the CRVJP was instrumental to addressing the scale and complexity of the efforts needed to protect and restore the Cache River watershed (IDNR website, 2006).

The first and foremost goal of the JVP is to protect and restore a 60,000-acre forest and wetland corridor along the Cache River.

> "The vision of the Joint Venture Partnership is to restore habitats and processes necessary to sustain the plants, animals, and natural communities of the watershed - habitats and processes that are also important to the people who depend on the health of the Cache River basin for their livelihoods and quality of life...the Joint Venture Partnership has broken the task of restoring the system into three components: forest and wetland habitat restoration, reduction of sedimentation and streambank/bed erosion, and a managed reconnection of the Upper and Lower segments of the Cache River" (IDNR website, 2006).

The CRJVP has maintained collaborative efforts with the U.S. Army Corps of Engineers, who has characterized the area's biological, geological, and hydrological characteristics. The CRJVP has also coordinated with private landowners holding property within the watershed's boundaries; also combining collaboration with researchers and scientists from numerous locations leads towards the assessment, restoration, and benefit of the Cache River wetlands. Their long-term vision:

> "…includes a functional, healthy wetland ecosystem that supports plants, animals, and natural communities similar to those which historically occurred in the wetlands. It is also a vision of a future where residents live, work and play, and where a healthy landscape sustains thriving communities" (IDNR website, 2006).

This vision involves ecological, economical, and social benefits to its partnerships, the surrounding communities, and other visitors who travel to view the Cache River watershed.

It is important to identify these goals and the ideology of the CRJVP. Goal setting encourages collaborative efforts and targets a range of social, economical, and environmental factors (Conley & Moote, 2003). Achieving collective goals can exceed individual agency achievements and provide partnership purpose. Additionally, it is necessary to revisit ideas and generate feedback for collective management decisions and actions. Evaluation encourages reviews and revisions in the application of adaptive management (Conley & Moote, 2003).

## Institutional Involvement and Strategic Planning

For this study, an institution refers to a formal administrative structure, specifically natural resource agencies or non-profit organizations managing public lands. The need for partnering involves various reasons to collaborate. Components to profitable relationships, such as support, mutual benefits, common goals, shared understanding, respect, synergy (Lasker et al., 2001), and adeptness determine level of contributions and overall commitment to the partnership (Seekamp & Cerveny, 2010). Mutual agreement and joint goals must lead to mutual benefits, with an understanding of the different purpose/missions of each organization. With these ideas in mind, it is in an institution's interest to form alliances with other institutions with related and potentially complementary foci in areas important to their agency or organization's goals (Hill & Hellriegel, 1994). Effective leadership, willingness to compromise and negotiate, and broad representation of stakeholders are prominent key aspects of successful collaboration (Selin et al., 2002). Compatible interests allow partners to diversify, yet retain common ground and in some cases, become an advantage in creating imaginative solutions (Wondolleck & Yaffee, 2000).

Relationships between agencies and organizations help create and implement plans and activities for large scale management. There has been movement toward broader scale, system-wide management and collaborative decision-making to address various contingencies in natural resource management. The Forest Service, for example, participates in collaborative actions with various stakeholders in the interest of addressing recreational opportunities and resource management during periods of rising demands and financial constraints (Seekamp & Cerveny, 2010). Joint ventures form as a means to handle limited resource capacity and hesitations as how to progress towards management decisions on these larger scales. They couple skills and resources as well as influence each other to implement particular services, ensure operational and technical effectiveness, and maintain successful partner relations (Hill & Hellriegel, 1994).

Relationships between agencies and organizations themselves have not been fully explored. At this time, studies tend to focus on planning processes instead of on-the-ground implementation. Consequently, it is unknown if institutions have gained the knowledge and experience from evaluation methods and feedback from strategic planning to make improvements to natural resource management. This concept is a further example of potential challenges for collaborative natural resource management. There are a variety of institutional and administrative issues within the realm of management coordination across multiple ownerships that may affect management decisions (Imperial, 1999).

Nevertheless, partnerships provide many benefits and instigate effective collaborative efforts, such as coordinating across governmental jurisdictions. Additional benefits may include marshalling of limited resources, coordinate information, facilitating conflict resolution, and create joint assumption of responsibility (Davenport et al., 2010). Partnerships also set the stage for checks and balances over one's actions, communicating wants and needs, obliging those needs, and assessing performances of partnering organizations for the collective goals of the group.

## Differing Ideas of Land Management

Biological and ecological processes do not abide by the rules of people. Actions with system-wide management do not always correlate with political boundaries since these types of functions are physiological, not sociological (Cortner et al., 1998). Additionally, broad-based management programs possess the potential for coordination concerns and conflicting interests (Imperial, 1999). This predicament is expanded further when managing for specific criteria or a particular resource, such as timber or endangered species protection (Cortner et al., 1998).

Benefits of sustainable partnerships outweigh negative aspects that may arise in long-term interactions and commitments. However, each agency and organization has their own mission to follow, which can lead to competing agendas and result in tension among partners. This tension may be unintentional; nonetheless, the effects can ripple throughout the partnership and create an imbalance of power in their collaborative efforts. Individual partners may choose certain areas that focus their management decisions for what they deem are higher priorities that may not coincide with others, especially when power imbalances in expertise or resources exist (Hill & Hellriegel, 1994). For example, one agency may be able to provide funding as their main resource contribution while another has greater staff capabilities to contribute personnel to a collaborative on-the-ground project. As a result, the power in the partnership shifts as each agency and organization decides the best way to utilize their contributed resources, not only for the partnership, but also for their individual institutional needs. The partnership may become a source of conflict, imperiling intended synergies (Lasker et al, 2001).

Another potential conflict threatening partnerships is the use of broad, unclear concepts, which remain poorly defined and spoken in general terms (Hull et al., 2003). Using terms such as restoration, conservation, ecosystem management, or sustainability remain vague since perceptions of terminology are subject to interpretation (Cortner et al., 1998). Meanings may also remain poorly defined not only between institutions, but also within institutions and vary per person or per site unless given measurable dimensions and comprehensible explanations.

The internal structure of each individual agency or organization is also a driving force that associated institutions must follow. Institutions have differing viewpoints on certain issues, projects, or concepts, and are not only subjected to scrutiny from their site users and personnel, but also their institutional superiors. Laws among branches and levels of government create

barriers in resource management and scientific methods. Institutions must therefore follow these laws, policies, and regulations defined in the agency or organization's mission statement, goals, and objectives based on an institution's traditions, values, and management structure (Cortner et al., 1998). Further, they must remain generalized to fit all institutional needs and may not always be completely applicable to on-the-ground management decisions.

These discrepancies can offset the balance of power within the partnership. Centralized administrative governments denote power and authority (Adams et al., 2005), but may lack the ability to operate outside their confines and standards and create difficulty in collaborative efforts with each institution possessing their individual centralized governmental procedures. Federal and state agencies have their own established rules and operating procedures and tend to function as individual entities, due to their internal agendas and cultures (Adams et al., 2005). It could pose a challenge to step out of the bounds of their institutional functionality and proceed in a completely democratic fashion with other partners.

Institutions have been characterized as narrow-minded, hierarchical, rigid, output oriented, and protective of turf (Cortner, et all, 1998), which is the space, area, or land to which an individual agency or organization obtains authority and domain over activities and resources. These concepts can lead to power imbalances in the partnership, especially if there are concerns to job security, expertise, policy, direction, traditional priorities, and accountability (Imperial, 1999). These types of asymmetries are further explained for discrepancies in available or accessible information and materials and thus, creates potential problems for partner equality.

Conflicts of interest can come from types of adaptive management. Complexities within watershed planning imply the need for flexibility within the planning process. Partnership members may lack elasticity in agency operations necessary to execute agreements or alterations

in resource allocation. Partners maybe even view negotiations as a disadvantage to their associated institution and decrease the importance of an agency's or organization's primary mission (Imperial, 1999). Nevertheless, partners strive to maintain effective communications in order to relay changes, modifications, updates, and other information that will affect management decisions, activities, and functionality of the partnership itself.

## Purpose Statement and Research Questions

There are a number of benefits to partnerships, but also a number of challenges for partnership interactions, collaborative management decisions, and addressing large scale concerns. The purpose of this research is to document how land management entities within the Cache River Joint Venture Partnership address resource management within the context of their individual institutional cultures. It is important to provide perspective for viewing the pressures of management decisions influencing areas within and outside of an institution's jurisdictions.

This research explores how management decisions affect public land use and long-term large scale management in an interagency relationship setting in the Cache River Joint Venture Partnership. This exploratory approach analyzes institutional structure, administrative procedures, institutional goals and objectives, rules and policy, personnel, funding and resource allocations, motivations, and cultural inferences to understand how these factors drive natural resource management decisions for members of the CRJVP.

Specific questions include the following: (1) How agencies/organizations differ or are similar in their management priorities and the types of preferred actions; (2) How policies, regulations, and mission statements influence decision-making; (3) How agencies/organizations

work collaboratively verses separate entities; (4) In what ways do agencies/organizations mutually influence partner decision-making?

# CHAPTER 2

# METHODS

Partnership dynamics can be explored by a number of means and from various perspectives. This chapter will further outline the parameters of this research, including the study objectives, study area, partners involved, methods for data collection and generation, analysis, and data quality assurance techniques.

The objective of this study is to explore how agency/organizational characteristics and interrelations affect land management decision-making within the Cache River Joint Venture Partnership.

Sub-objectives

- Determine how agency/organizational management decisions directly and indirectly affect natural resource management.
- Discover similarities and differences in management choices within and between institutions.
- Identify causes and institutional responses to changes in administrative structure.
- Examine how institutions influence one another and how associated partners affect various factors of their interactions and on-the-ground management decisions.

## Study Area

Public and private conservation efforts have focused on the Cache River watershed, a unique area with biological and cultural significance. Four physiographic regions converge here, one of only six places this phenomenon occurs within the nation. There are a total of eleven state champion trees identified in the Cache River watershed. One of them is a bald cypress

(*Taxodium distichum*) tree over a thousand years old and one of the oldest trees east of the Mississippi River. Ninety percent of existing wetlands (including high quality wetlands) in Illinois reside in the Cache. The National Park Service designated Buttonland Swamp and Heron Pond as two National Natural Landmarks. In the 1990s, the wetlands achieved international recognition by being dedicated a RAMSAR site. The Cache River watershed is home to over 100 threatened and endangered species (state and federally listed). It exhibits over 20 unique community types, including wetlands, such as cypress and tupelo swamps, and other communities such as bottomland hardwood forests, native cane breaks, uplands forests, glades, and barrens. There are several dedicated nature preserves, including Section 8 Woods, Little Black Slough, Heron Pond and, the Lower Cache Nature Preserve. The Cache River watershed represents valuable habitat for a variety of species, such as migratory birds, amphibians, mammals, reptiles, and fish populations. It also provides several recreational opportunities, including hunting, fishing, hiking, canoeing, wildlife viewing, nature photography, and general enjoyment of the scenic beauty (IDNR website, 2010).

The concentration of high value habitat types, unique landscape features, and the role of hydrologic properties in mediating restoration, conservation, and preservation within the Cache River watershed suggests that conjoined management efforts may further strengthen these values within this region. Understanding the origins, functionality, operations, opportunities, and barriers to partnerships may help clarify priorities, successes, and potential conflicts from which agencies and organizations can work around, build, and improve management tactics.

Agencies/organizations who maintain public land in the Cache River watershed in southern Illinois include the Illinois Department of Natural Resources (IDNR) who owns Cache River State Natural Area, The Fish and Wildlife Service (FWS) who owns Cypress Creek

National Wildlife Refuge, and The Nature Conservancy (TNC) who owns Grassy Slough. Natural Resource Conservation Service (NRCS) works with private landowners with land in the Cache River watershed, developing management plans following guidelines from conservation programs such as the Wetland Reserve Program (WRP) and the Environmental Quality Incentive Program (EQIP). By engaging landowners in these programs, private lands are treated in the same realm as public lands since they are being supervised by a federal agency. IDNR is an agency within the state of Illinois, the FWS and NRCS are federal agencies, and TNC is a non-profit organization. Ducks Unlimited is an additional non-profit organization and another CRJVP member. However, this member, although a stakeholder, does not currently own or provide direct management input to lands within the Cache River and therefore, is not considered further for this study.

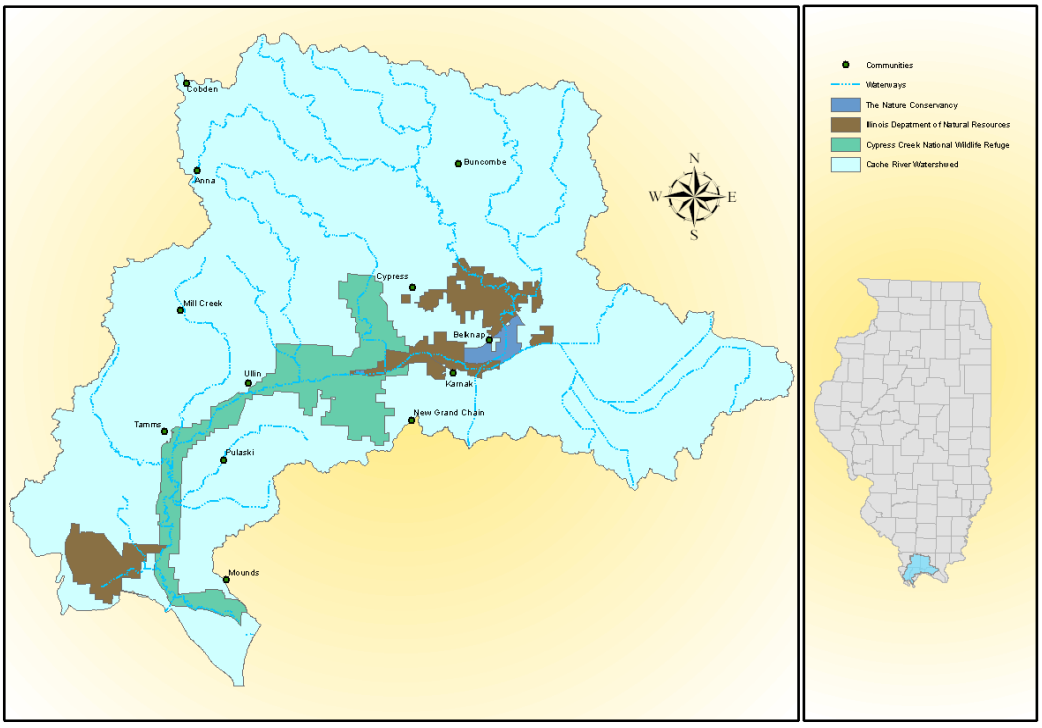


*Figure 1.* Study Area: Public Lands in the Cache River Watershed in Southern Illinois (Source: Cache River Joint Venture Partnership)

Land and water resources are the key identifiers for on-the-ground management for all agencies and organizations in the CRJVP. In the Cache River watershed, the resources of importance are: (1) water levels, (2) hydrologic connectivity of the Cache River (reconnection), (3) land restoration and, (4) priority species.

Water levels dictate habitat suitability and management priorities as well as flow continuity. There are several issues of management associated with water levels, such as fish migration, dissolved oxygen levels, species composition, and health.

Water levels are also a determining factor for flow in the Cache, which leads to connectivity and restoring the Cache River as a single hydrologic entity. Creation of the Post Creek Cutoff in the early twentieth century split the Cache River into two separate hydrologic systems, the Upper Cache River and the Lower Cache River. The negative consequences of this action include downcutting, channel widening and incision, and steambank instability (e.g. gullies) in the Upper Cache River. These actions have resulted in high water volume and velocity through the channel. In contrast, flow in the Lower Cache River has slowed to such a degree that sediment is filling the channel and dissolved oxygen has decreased, altering aquatic communities.

Bypassing the Post Creek Cutoff in high flow seasons and reconnecting the two river systems into one operational hydrologic unit would restore pre-20$^{th}$ century hydrology, but would increase vulnerability to potential flooding on non-partnership private land.

Management activities to support land restoration practices include thinning, burning, chemical and mechanical herbicide application, planting vegetation, invasive species reduction and eradication, and monitoring biological and ecological components to fit management criteria.

## Individual Institutions and Operations

### Illinois Department of Natural Resources (IDNR)

IDNR is a state agency whose mission is "to manage, conserve and protect Illinois' natural, recreational and cultural resources, further the public's understanding and appreciation of those resources, and promote the education, science and public safety of Illinois' natural resources for present and future generations" (IDNR website, 2012). They maintain Cache River State Natural Area, a combination of Little Black Slough Natural Area and Lower Cache River State Natural Area. The primary objective of Cache River State Natural Area is to "preserve, protect, and enhance the natural resources while providing the opportunity for quality outdoor recreation [and manage for] critical habitat, restored to preserve and protect endangered, threatened, and rare plants and animals" (Cache River State Natural Area fact sheet, 2010, p.1).

> "Primary objectives are to protect the site's significant terrestrial and aquatic natural communities and critical habitats for species of concern, dedicate and manage portions of the site as an Illinois Nature Preserve, and maintain an adequate land and water based and provide sufficient staffing and funding to accomplish goals and objectives" (West & Hutchison, 1988, p. ii).

Further detailed management objectives can be found in the Little Black Slough Natural Area and Lower Cache River State Natural Area Master Management Plans. Within the Cache River JVP, IDNR possesses approximately fifteen thousand acres of land with ownership in the Upper Cache River and the Lower Cache River. Segments of their property in their geographical location provide a potential location for reconnection of the river segments, stated as one of the primary goals of the CRJVP.

Additionally, IDNR is in charge of maintaining the Cache River Wetlands Center, a state run visitor center which serves as a hub for outreach and education.

> "The Wetlands Center will inform, interpret, and educate all visitors about the value, importance, and the bio-diversity of the Cache River wetlands, while promoting the Cache River Joint Venture Partnership... The Wetlands Center will foster natural resource appreciation and education, while interpreting the unique cultural history of the Cache River watershed [and] further the public's understanding and appreciation of all natural resources, and will promote the education, science, and public safety of these resources for present and future generations" (Waycuilis, n.d.).

U.S. Fish and Wildlife Service (FWS)

FWS is a federal agency and a branch of the Department of Interior, whose mission "is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people" (FWS website, 2012). They maintain the Cypress Creek National Wildlife Refuge located mainly in the Lower Cache River.

> "In an effort to protect what is left of the Cache River wetlands, the refuge was established to restore and manage bottomland hardwood forests and wetland habitat and provide opportunities for wildlife-dependent recreation and education. In coordination with partners, refuge staff strive to restore habitat as soon as land is acquired from willing sellers. This effort includes reforestation and restoring wetland functions and productivity" (FWS website, 2012).

Creation of the refuge was endorsed under the Emergency Wetlands Resources Act of 1986 and in support of the North American Waterfowl Management Plan (Cypress Creek NWF, Comprehensive Management Plan, 1997).

Along the Cache River JVP's goal, the Cypress Creek Refuge is situated in the southern part of the Cache River, completing the lower half connection of the river corridor. Similar to the IDNR's holdings, the refuge's land boundaries encompass approximately fifteen thousand acres. Other goals listed in their Comprehensive Management Plan (1997) include: (1) resource protection, (2) habitat restoration, (3) resource management, (4) dynamic partnering, (5) environmental education program, and (6) wildlife-dependent recreation and interpretation. Funds to achieve these goals originate from yearly operational budgets, similar to IDNR's

operational funds structure. Federal grants also supplement project activities, such as bat surveys.

## The Nature Conservancy (TNC)

TNC is a non-governmental agency funded through private donations. Originated in the 1950s, the mission of The Nature Conservancy is "...to conserve the lands and waters on which all life depends" (TNC website, 2012). In addition, "The Nature Conservancy is to preserve the plants, animals, and natural communities that represent the diversity of life on earth by protecting the lands and waters they need to survive" as well as land restoration (Fact sheet, TNC Illinois Chapter, 2011, p. 1).

TNC manages and operates Grassy Slough, a five-thousand acre tract of land located in the Cache River watershed. They also possess an additional four acres of land in Buttonland Swamp in the Lower Cache River.

> "While habitat restoration is very important, much of the success of restoration efforts in the Cache depend on restoring hydrologic connectivity between the Upper and Lower Cache River. Grassy Slough Preserve is an integral component in the attempt to restore these flows because it is located adjacent to the diversion between the Upper and Lower Cache River. The preserve also provides an important connection between protected lands up and down river" (TNC website, 2012).

TNC's focus involves land acquisition. Because funding is derived from private sources, TNC is able to obtain funding more quickly than governmental agencies and is also eligible for tax exemption. This organization is able to buy land from willing land sellers in a more timely manner and work with governmental agencies to transfer land ownership to their jurisdiction. TNC is also able to support agency projects by providing matching funds in many cases. Lastly,

and unlike public agency partners, TNC participates in lobbying at the state and federal level in support of agency projects due to their status as a non-profit organization.

## Natural Resource Conservation Service (NRCS)

NRCS is a federal agency that works with private landowners, but does not manage lands directly. Through programs, such as the Wetlands Reserve Program (WRP), Environmental Quality Incentive Program (EQIP), and the Wildlife Habitat Incentive Program (WHIP), they provide technical assistance and coordinate cost share programs, providing tax incentives in efforts to encourage landowners to manage their land with environmentally friendly methods, such as no till farming, riparian buffers, and streambank stabilization structures, to promote conservation and sustainability. Additionally, NRCS works with the Farm Service Agency to facilitate the Conservation Reserve Program (CRP), which further improves environmental health and quality through conservation practices, such as filter strips or grass waterways. According to NRCS's National Planning Procedures Handbook,

> "The planning process used by NRCS is based on the premise that clients will make and implement sound decisions if they understand their resources, natural resource problems and opportunities, and the effects of their decisions. Conservation planning helps clients, conservationists, and others view the environment as a living system of which humans are an integral part. Conservation planning enables clients and planners to analyze and work with complex natural processes in definable and measurable terms" (NRCS website, 2012).

According to TNC's website, "local landowners have protected 13,500 acres of restored wetlands through NRCS' Wetland Reserve Program. Also through NRCS, landowners are using a variety of conservation practices, such as no-till conservation tillage, grass waterways and reforestation; many of these practices are through NRCS' Environmental Quality Incentives and Wildlife Habitat Programs" (2012).

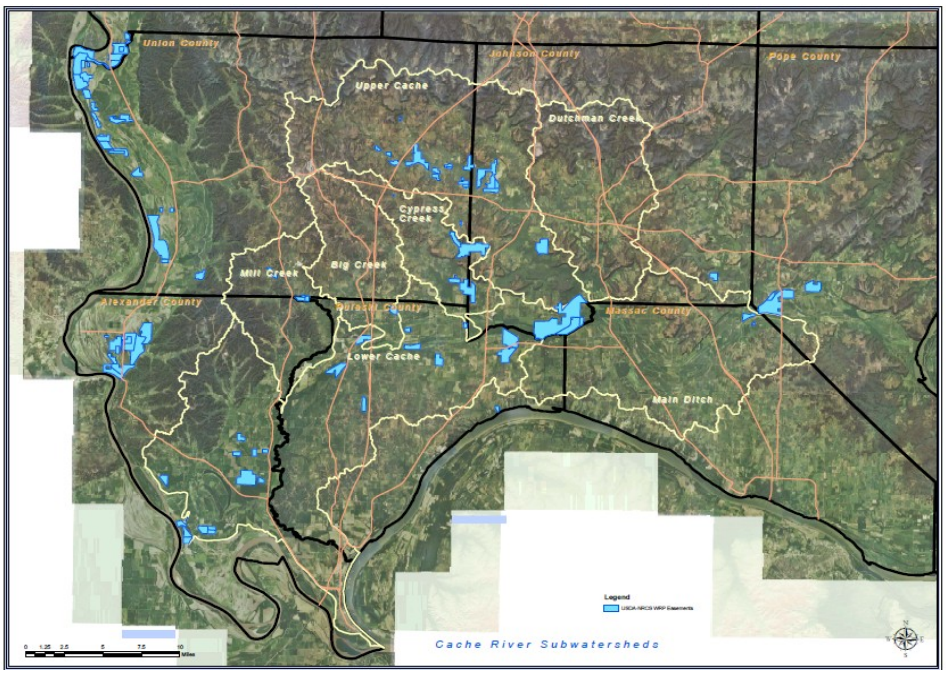


*Figure 2.* Lands Enrolled in the Wetland Reserve Program in the Cache River Watershed (Source: Natural Resource Conservation Service)

These practices are implemented in support of other restoration efforts on the Cache River watershed and supplement the mission statements and objectives of other CRJVP partners. NRCS builds the local connection between District Conservationist offices, local landowners in the Cache River watershed, and governmental agencies (NRCS website, 2012). It is through their federal programs that they are able to treat private lands with similar goals and objectives set on public lands to create a greater contiguous block of protected lands within the Cache River watershed.

## Data Collection Methods

The fundamental core this research lies in qualitative research methodology. Qualitative research design demonstrates the need for connectivity and communication amid different planning mechanisms (Maxwell, 1999). This project is also an exploratory case study, which

further targets the real-life context of the research design and explores situations where the outcome is not controlled by the researcher (Yin, 1984). Data analysis should maintain these principles and allow the conclusive evidence to possess the ability to stand alone.

Grounded theory was applied to determine conclusions, allowing the data to reveal meanings instead of making preliminary assumptions (Charmaz, 2006). Strategy of inquiry included interviews, observations, & document review. Initial contacts were established with the site managers from previous working relationships and personal former employment at the Cache River Wetlands Center. Their identities and contact information could also have been found on their associated websites (Cypress Creek National Wildlife Refuge (FWS), Cache River State Natural Area (IDNR), and Little Grassy Slough (TNC)).

## Participant Approval

Participants were informed of the study's parameters (Appendix A) and asked to sign consent forms, giving them the ability to allow or deny permission to audio-record their interview, observe their actions, and quote their responses. Prior to contact, the SIUC Human Subjects Committee viewed and approved all content, including consent forms, initial phone contact dialogue, interview guidelines, and methods of data storage of the study (Appendix B, C, & D). Each interview participant also completed a facesheet to record demographic information, job title, and work history.

## Pilot Study

A pilot study was conducted with a small number of participants, focusing on site managers representing three public agencies/organizations within the Cache River Joint Venture Partnership. The participants were engaged in a one-on-one, face-to-face interviews, which were

audio-recorded for quality assurance purposes. Questioning included three categories: (1) working experiences/managing your site, (2) working as an individual agency/organization, and (3) involvement as (or working with) a Cache River Joint Venture Partnership member. The response content for the majority of the interviews revolved around the first two categories. Understanding the background and experiences of each agency/organization was essential to understanding how each group functioned within the Partnership. Notes were recorded on salient points, statements, responsibilities, and other dialogue, which uncovered underlying themes and eventually revealed patterns and relationships. Direct observations of work environments within the Cypress Creek National Wildlife Refuge office and the Cache River Wetlands Center were utilized by the researcher to correlate interview statements with active projects, issues, and concerns as well as to observe direct interaction among individuals involved in the CRJVP.

## Data Collection & Data Generation

The timeframe of data collection, including the pilot study, was from March 2012 to October 2012. After gaining entry and establishing rapport with preliminary participants, the sample population was expanded through inquiries to other staff members working on-site through the chain referral method, or snowball method (Patton, 1990). Key informants were asked to identify other individuals who may provide a unique perspective of the CRJVP (or as an active part of the CRJVP). Participants included active CRJVP members, previous staff members with extensive knowledge and experience of the CRJVP, and others who work closely with the partners, but do not maintain an official membership in the CRJVP. Purposive sampling was utilized in participant selection since the research involves seeking specific criteria and develop intrinsic meaning to the researcher (Baxter and Eyles, 1997). Participants are chosen

based on their status and position (in relation to the CRJVP) and their knowledge and experiences in the benefit of ensuring the quality of the data generation. Additionally, they provided pertinent information to supplement the research objectives, involving the experiences necessary to build a conceptual framework instead of random chance inquiry (Baxter and Eyles, 1997).

Sources of documentation, including management plans, environmental studies, proposals, progress reports, articles, maps, organizational records, memoranda, meeting minutes, and other types of documentation were analyzed to become fully versed in past history, goals and objectives, current practices, concerns and issues, and future outlooks on the public lands within their jurisdiction.

The primary source of data collection was in the form of in-depth interviews. A total sample of twenty-five (n=25) individuals were consulted. Five of the original interviewees were engaged in follow-up interviewing sessions for a total of thirty interviews. Twenty-eight interviews were conducted in a one-on-one, face-to-face setting. Two interviews were conducted via phone for due to long distance locations. The same interview guide from the pilot study was applied, utilizing all three categories of questioning. Interviews lasted approximately one hour in length on average, ranging from thirty minutes to over two hours. Interviews were recorded using a digital voice recorder and transcribed post interview. Meeting locations were based on convenience and preference of the participant.

Table 2. Interview Participant Demographics

| **Institution Affiliation** | **Age** | **Gender** |
|---|---|---|
| FWS | 40-49 | Female |
| FWS | 50-59 | Male |
| FWS | 40-49 | Female |
| FWS | 50-59 | Male |
| TNC | 40-49 | Female |
| TNC | 70-79 | Male |
| TNC | 50-59 | Male |
| IDNR | 40-49 | Male |
| IDNR | 50-59 | Male |
| IDNR | 50-59 | Female |
| IDNR | 60-69 | Male |
| IDNR | 50-59 | Male |
| IDNR | 40-49 | Male |
| IDNR | 60-69 | Male |
| NRCS | 50-59 | Male |
| NRCS | 40-49 | Male |
| NRCS | 40-49 | Female |
| NRCS | 30-39 | Female |
| Other | 60-69 | Male |
| Other | 40-49 | Female |
| AmeriCorps | 20-29 | Female |
| AmeriCorps | 30-39 | Female |
| AmeriCorps | 20-29 | Female |
| Friends of the Cache River | 70-79 | Female |
| Friends of the Cache River | 60-69 | Male |

***Note: all participants were of Caucasian ethnicity**

Interviews were the most appropriate method for retrieving research data since selected individuals had unique and otherwise unavailable data critical to study objectives. Therefore, the interviews followed a semi-structured format. While inquiries were formulated prior to the interview to provide structure, a semi-structured format allowed for the creation supplementary questions prompted from participant responses, which in turn, allowed for question flexibility and further probing in response development. A list of questions (as defined in the categories stated in the pilot study) served as guideline to ensure that all participants were interviewed in the same format for a level of consistency within the context of the study (Appendix E). After

each interview, a reflexive report was composed in order to track salient topics, possible emergent or reoccurring themes, record specific quotes of particular interest, and document observations of behaviors and attitudes perceived from the interviewee.

Direct observations at monthly CRJVP meetings continued within the timeframe of the study. Notes and observations were recorded at additional meetings where the partners were involved, such as restoration committee meetings, NRCS annual planning meeting, and the Friends of the Cache River Watershed monthly meetings. Observations were focused on discussion points of the meetings, current events, activities, concepts brought to the table for JVP discussion, and other information presented requiring CRJVP attention. All observations and recordings remained confidential to maintain discretion and security of study participants. Ambiguity of identification protected the views and identity of the individuals involved since they were occupied in a potential divisive situation (Yin, 1984). Accordingly, names were not used in the final report, unless given permission by the participant.

## Data Analysis

Direct observations were recorded electronically to assist future coding and analysis. Audio recordings were transcribed utilizing Olympus DSS Player pedal. Memoing was applied during the interview to supplement interview response knowledge, aid reflection, and to promote analytic insight (Maxwell, 1996). Memoing during the interview provided clarity of interview responses and identified salient points to reference further analysis. Reflexive reports were developed after each interview to document initial reflection and impressions and to further identify thematic categories preceding coding (Shenton, 2004). The combination of these techniques aided in visualization of themes from statements, interpretations, and individual accounts.

A coding key was created based on knowledge acquired from initial documentation review (e.g. reading management plans and materials) and pilot study transcriptions. The coding key evolved during the interview transcription and memoing process as new themes and patterns emerged. Coding patterns emerged from the combination of acquired knowledge from the literature review, information pertinent to the research objectives, and suppositions formulated throughout the interview process. The creation of thematic material developed through concepts throughout repetition in the data, indicating a level of importance to address them. Transcription documents and meeting minutes were analyzed using NVivo 9 software. Codes, or nodes, were implemented in the program for data organization and categorization through open coding procedures (Strauss and Corbin, 1998). The software helped expose and form emergent themes and patterns, revealing relationships between interviews, and aided the development of conclusive statements based on pattern results. These themes became the foundation of the research, formed by relevancy in relation to the project and characterizing the institutions represented (Charmaz, 2006). Additionally, the themes were refined during data analysis as new information was integrated into existing coding patterns, finalizing after theoretical saturation.

## Data Quality Assurance Techniques

Instead of relying on equipment, the source of measurement during qualitative research is the researcher himself/herself (Patton, 1990). Measurements derived from human cognitive faculties could indicate a greater chance for biased results and errors in the data. The act of sorting out relevant verses extraneous information is shouldered squarely on the researcher.

There are several methods to counter these potential flaws. Triangulation is one solution by combining a variety of data sources and providing validation from several sources to strengthen credibility, reduce bias, and emphasize certain concepts (Patton, 1990). In the case of

this study, documentation, meeting minutes, and interview transcriptions were combined to reduce potential bias to the study (Shenton 2004). If, for example, reforestation efforts are discussed in meetings, explained in interview responses, and noted in management plans as being a priority, reforestation is being revealed as an important aspect for the partners from combining these various sources and therefore, its applications of management should be examined.

Thick, rich descriptions supplement context, enabling a truer representation of real-life occurrences, and developing an understanding of the data. They provide insight into information that was collected during data generation by adding substance and background to the data and constructing reality while interpreting these experiences (Shenton, 2004). While recording meeting minutes, transcribing interviews, and memoing, additional information was recorded about the environment during data collection, including participant's appearance, social interaction with others, or noting vocal inflections or behaviors, such as when a participant laughed. Interpreting body and vocal language enhanced the quality of the data and assisted in revealing thematic patterns.

Data saturation is the re-iteration of similar data content throughout data collection, indicating a plateau in new material and finality of study conclusion (Baxter and Eyles, 1997). Theoretical saturation is reaching the point of not acquiring new material from research participants, which was met when the same conceptual insights were being re-iterated by several informants. Saturation occurs not only during data generation, but also through data analysis as coding reveals themes and patterns. Concepts solidify and are verified by comparing sources of data and between the same source, such as analyzing interview responses. The combination of

all methods of data collection promotes rigor and legitimacy in the research (Baxter and Eyles, 1997) while promoting an inclusive and complete view of the data construct (Tobin, 2004).

Baxter and Eyles (1997) and Shenton (2004) discuss evaluating qualitative research through these four components: credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985). The use of these techniques gives room for "…questioning how things are done… [and] allows qualitative research to demonstrate the relevance of the single case (credibility) and to move beyond it (transferability), with a degree of certainty dependability and confirmability" (Baxter and Eyles, 1997, p. 521). Additionally, Baxter and Eyles (1997) and Shenton (2004) discuss various analytical techniques, including peer debriefing and member checking to test for accuracy and credibility of the data. Peer debriefing includes gathering perspectives of individuals outside of the study, such as faculty advisors or committee members, to gain an outside perspective on interpretations of the data, revealing patterns, and analyze the coding theme application for consistency. In this case, the researcher's advisor was the main channel for assuring stability with the textual data.

Member checking was completed during the interview process. Participants responded to questions posed during the interview. If the response was vague, the researcher clarified their response and confirmed that the summary was accurate with the participant's intentions. Follow-up questions were posed to the research participants after data analysis with additional phone calls to participants in order to clarify statements that were unclear or incomplete during the analysis process. Responses to follow-up questions either confirmed or dissolved claims to prove or disprove statements, which were then modified to maintain the correct representation of the data.

# CHAPTER 3

# RESULTS AND DISCUSSION

## Results

Data generation and analysis results in institutions discussing management in terms of resources in compliance with their goals, objectives, mission statements, policies, and funding principles. Results will explain these resources in detail and how each CRJVP partner operates within their management tactics to address and pursue resource management. Discussion will further explore and interpret these concepts and include specific quotes from interview responses and meeting minutes to support thematic patterns and ideas.

It is important to analyze institutional characteristics in order to understand partner interactions and capabilities. Table 1 is a breakdown of institutional components to show their organizational status, management structure, and primary activities completed on-the-ground.

Table 1. Institutional Mechanics of the CRJVP Partners and Their Operations

| Institution | Partner Type | Personnel Decision Structure | Selected On-the-Ground Activities |
|---|---|---|---|
| Illinois Department of Natural Resources (IDNR) | State | Multiple divisions<br>Site staff | Land acquisition, hydrologic structures, dredging, stream stabilization, riffle weirs, riparian buffers, sedimentation control, erosion control, water level monitoring, thinning, prescribed burning, reforestation, wetland restoration, invasive species management, monitor threatened and endangered species |
| U.S. Fish and Wildlife Service (FWS) | Federal | Manager<br>Assistant manager<br>Site staff | Land acquisition, moist soil management, wetland restoration, reforestation, sedimentation control, erosion control, native cane restoration, wildlife surveys, invasive species management, monitor threatened and endangered species |
| The Nature Conservancy (TNC) | Non-profit | Coordinator<br>Off-site resource experts | Land acquisition and transfer, native seed collection, bottomland reforestation, wetland restoration |
| Natural Resource Conservation Service (NRCS) | Federal | District and area staff | Resource assessment and enhancements through conservation programs, such as riparian buffers, conservation tillage, reforestation, streambank stabilization, wetland restoration, erosion control, soil analysis, wildlife food plots, filter strips, invasive species management, monitor threatened and endangered species, animal waste control (*Note: supply expertise and resources, but not actual implementation) |

## Illinois Department of Natural Resources (IDNR)

IDNR's management goals and practices support the idea of preserving intact communities and habitats and promoting restoration measures to manage for species that were historically located in the watershed. Management actions steer ecological processes that drive the composition of various natural communities and the natural processes that occur (or should occur in the absence of humans) within these systems. At Cache River State Natural Area, the

focus is management of high quality natural communities and appropriate stewardship of natural areas and nature preserves.

Determining the species that reside in the natural communities and managing for sustainable populations are the primary foci of the Division of Natural Heritage. This division within IDNR has the most active involvement in management of the Cache River State Natural Area. The overall objective of this site is to manage for biological and ecological integrity and encouraging natural processes that would occur without human involvement, historically prior to European settlement. IDNR owns much of land critical to reconnection as well. Divisions have different priorities and levels of involvement. Participation is dependent on the aspects of the project and resources impacted (i.e. a land or water issue (Land Management Division), a tree issue (Forestry Division), a wildlife issue (Wildlife Division), etc.).

IDNR retains active management interest in water levels since management of this resource has the greatest effect on sensitive habitats on Cache River State Natural Area. On-the-ground management includes water level management structures located at various points on the Cache River. Other water management activities include dredging for deep water habitat and additional bank stability structures. IDNR maintains stream gauges strategically placed along the Cache River to record water levels at various times during the year. In support of full or partial reconnection and effective water management, IDNR strives to reduce sedimentation, install buffers along the stream banks for stability, and strengthen the river bed from further channel downcutting. Lastly, IDNR confers with the Illinois Nature Preserves Commission and Illinois State Water Survey to monitor, research, and document terrestrial and aquatic ecological processes.

## U.S. Fish and Wildlife Service (FWS)

The Cypress Creek National Wildlife Refuge plan establishes the need to restore bottomland and upland forests, wetlands, and river hydrology. There is an emphasis on migratory birds since the refuge was authorized under the Emergency Wetlands Act. Secondly, the refuge specifies and encourages six priority public uses; hunting, fishing, environmental education, natural history interpretation, and wildlife viewing, and photography.

The wildlife biologist monitors and makes recommendations based on observations and the rules put in place upon refuge establishment. The refuge manager collaborates with the assistant manager and wildlife biologist to direct site management. Additional modifications to the management plans are revisited by the field staff on a cyclic basis to provide additional guidance to priority species and habitat management. The Comprehensive Management Plan, for example, is updated every fifteen years. They also rely on research to supplement management decisions to better understand biological and ecological processes occurring in the watershed.

Water levels are imperative to aquatic populations and food sources for wildlife, which influence FWS's management decisions. However, as for reconnection efforts, FWS are not heavily engaged in this process.

The refuge implements an assortment of habitat and land management projects, including tree planting, moist soil management, monitoring programs, wildlife surveys, and plant and animal invasive species management to carry out the refuge's objectives. Land acquisition to fill the refuge's purchase boundary is another primary target.

## The Nature Conservancy (TNC)

TNC management is guided by historical context, ecological accuracy, and high quality systems to maintain an equilibrium that is practical in current water and land use. They perceive land and water resources as an inseparable functioning unit. TNC endorses naturalness and health in a system without identifying specifics of how to accomplish such measures until scientific assessments can be made on a site by site basis.

Consultation for water levels is provided by a TNC river specialist, who works with large river systems throughout the state. TNC seeks other sources of expertise for additional resource concerns and land management decisions. In the case of reconnection, TNC purchased Grassy Slough and enrolled it in the Wetlands Reserve Program (WRP), a conservation easement with the Natural Resource Conservation Service (NRCS).

Additionally, TNC supports on-the-ground projects and restorations measures that relate to their mission (conserving land and water), such as installing wetlands or planting trees. They also opened Grassy Slough to hunting for wildlife management purposes, specifically to control deer populations.

## Natural Resource Conservation Service (NRCS)

NRCS's mission statement is "helping people help the land," meaning they provide assistance through programs to private landowners for best management practices and appropriate conservation methods while promoting co-existence between biological processes and human manipulation.

Area level staff members address water level management and reconnection efforts while district level personnel work with individual landowners to address their specific needs. NRCS

has a passive role in reconnection, with exception of WRP management on Grassy Slough, since Grassy Slough is a potential focal point for reconnection. However, NRCS participates in survey and design work to model reconnection efforts.

Staff members provide advice and recommendations to address land issues for private landowners and public natural resource agencies alike. These proposals include habitat management, resource assessment, forestry or grassland enhancements, wetland restoration, eradicate invasive species, installing food plots, and attract and retain key wildlife species to client properties. NRCS addresses other resource concerns, such as erosion control, water quality, water quantity, streambank erosion, loss of wetland habitat, loss of riparian corridors, stream bank stabilization, and other related water management issues. NRCS also collects data through aerial observations and develops resource assessments to be utilized. This information presents the most recent research for large scale management as well as monitors landscape changes to address site specific management issues.

## Discussion

The Cache River Joint Venture Partnership is built from constituent agencies that have coalesced around common goals and missions. A memorandum of understanding was created to provide an agenda of cooperation for the parties involved and institute a collective written agreement. There are common themes among the agencies and organizations, which provide the foundation and reasoning behind collaborative decision-making processes as well as differences that allow agencies to retain unique identities, but present challenges to collaboration (Imperial, 1999).

The following questions were proposed in order to establish a research purpose and explore partnership dynamics in natural resource management: (1) How agencies/organizations differ or are similar in their management decisions and the outcomes of these decisions; (2) How policies, regulations, and mission statements influence decision-making; (3) How agencies/organizations work collaboratively verses separate entities; (4) In what ways agencies/organizations mutually influence partner decision-making? The answers to these questions will be discussed in detail throughout this chapter.

## Common Goals

Each institution within the Cache River Joint Venture Partnership shares the goal of protecting land and water resources (Conley & Moote, 2003). There is a concentration of efforts on several significant areas for the CRJVP, such as restoring forest and wetland habitats, reducing erosion and sedimentation, and investigating methods to restore water flows and hydrologic connectivity. Land acquisition and enrollment in conservation programs that encourage protective practices are primary goals for each agency/organization. These actions help protect CRJVP lands against environmental impacts and bridge the gap between fragmented sections to establish connections and corridors for plants and animals alike. Habitat restoration is another overarching goal for all institutions. There are several overlapping targets, including managing high quality systems, threatened and endangered species, and controlling exotic invasive species, which demonstrate management strategies to contribute towards the health and stability of the watershed and its associated natural communities. Additionally, there are shared aims for controlling water levels and water quality, such as sediment reduction, erosion control, streambank stability, and resisting entrenchment and channelization.

Managing for threatened and endangered species is another common goal. Agencies utilize a database called EcoCAT from IDNR's website to determine state threatened and endangered species that reside in their project area. The Fish and Wildlife Service uses a similar procedure to track federal threatened and endangered species. Other types of management plans also have common characteristics. NRCS and IDNR use the same forestry plan for private landowners, minimizing overlap of forest management strategies.

Reconnection is an overarching goal, but a full reconnection may never be feasible, due to the nature of the Post Creek Cutoff and ownership status of affected lands. Completely severing it from the Cache River means flooding private as well as public land and is socially infeasible. What remains is the need to balance proper drainage that will not impact private lands while a naturally flowing river system that sustains a broader range of conservation practices than does the status quo. All agencies and organizations involved strive for a healthy and fully functional watershed. While reconnection is a CRJVP goal, each institution has various priorities and advisements of how this process should occur and different levels of involvement and contributions to implementation (Hill & Hellriegel, 1994). Additionally, the CRJVP partners possess different viewpoints of what reconnection entails, timeline of reconnection, and viability of its tangible accomplishment. The question remains; how to restore the natural hydrology while addressing the mechanics of the process throughout the Partnership.

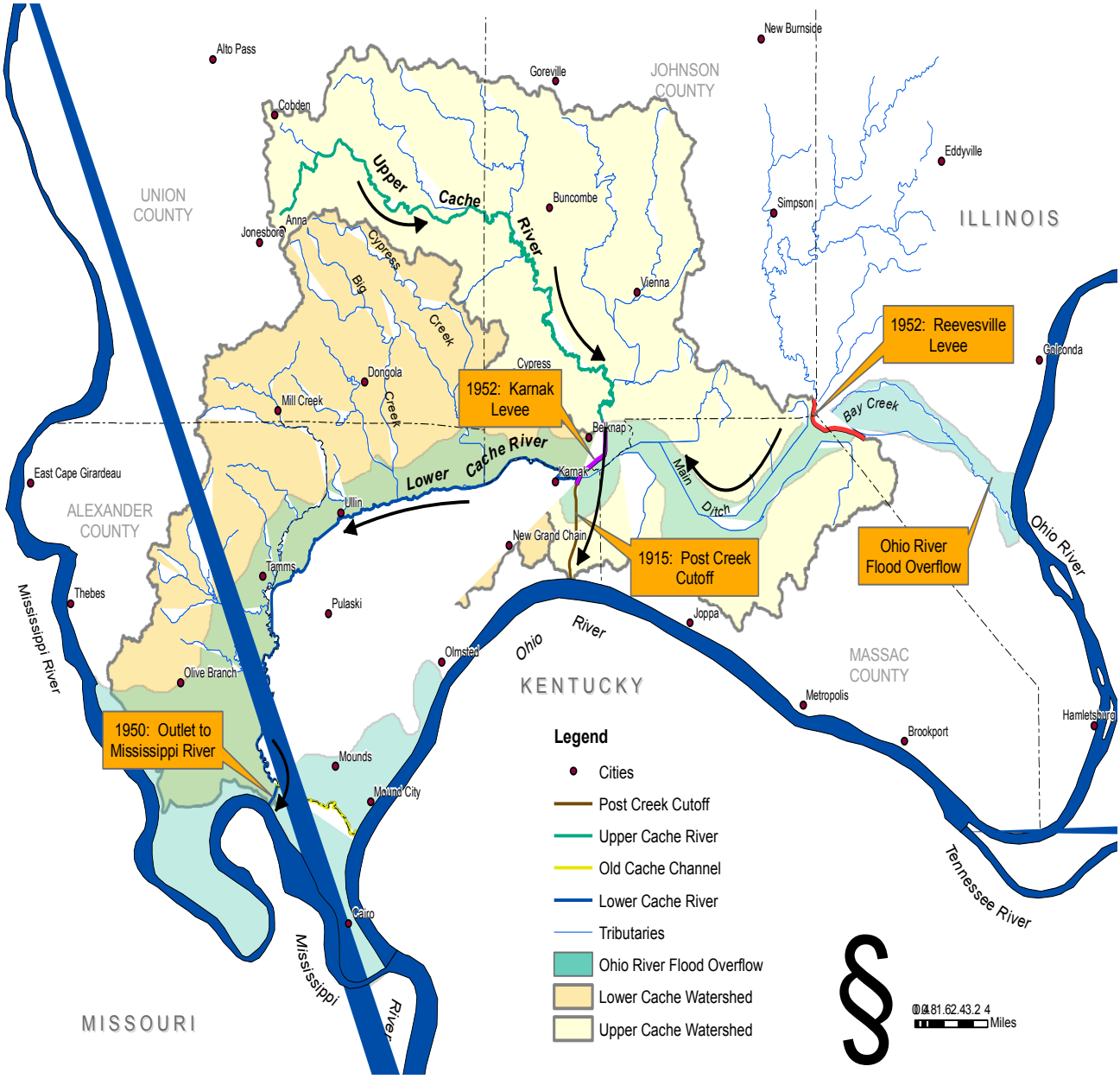


*Figure 3.* Hydrologic changes in the Cache River watershed (Source: ISWS)

Collaborative functions exhibit a balance between complementary and potentially problematic factors of the Partnership (Hill & Hellriegel, 1994). All partners want to implement on-the-ground management, but are constrained by the following five factors: (1) policy, protocol, and procedures (2) funding sources, (3) administrative structure, (4) institutional culture, and (5) incompletely defined management and decision-making criteria.

**1. Policies, protocols, and procedures dictate what management actions can or cannot be completed**

The foundation of a collective unit of individuals requires fundamentals of how to govern those individuals and their responsibilities. Rules are established to provide order and maintain supervision for decision-making boundaries (Adams et al., 2004); however, these rules are not always clear. Policy ambiguity does not always define clear parameters in land and water management. On the other hand, rules and regulations can present distinct constraints for an agency or organization. These rules may be specifically enforced for one entity while remaining imprecise for another (Cortner et al., 1998).

As for the case of federal agencies, there are several protocols and procedures that must be strictly followed in accordance to federal rules (Adams et al., 2004). As a result, they can be a hindrance to focusing progress on the land management. Time is spent writing reports and organizing reporting in order to adhere to the rules and policies that dictate management protocols. Writing reports in the office means less time for on-the-ground management.

The Illinois Department of Natural Resources has several policies in place to protect ecological processes and water quality. In the case of water levels, one particular policy that can create issues regarding hydrologic restoration is the fact that agencies are not allowed to impede drainage on private lands. However, adjacent landowners and the local Drainage District have obtained an injunction to halt IDNR management activities due to potential flooding impacts. As a result, IDNR cannot move forward with management until the lawsuits are resolved. Since it is an IDNR legal concern, the Fish and Wildlife Service must refrain from working with IDNR on this issue. FWS is unable to support IDNR's actions and incapable of collaborative participation.

The delay in action can create a ripple effect for other land management agencies that also depend on specific water levels. If water levels impact FWS or TNC, they are unable to complete actions or alter their management to offset impacts from water levels on IDNR property. All agencies must remain in a suspended state until the matter is resolved.

The Fish and Wildlife Service has similar policies regarding private land impacts and has remained a passive partner in the reconnection project. Additionally, IDNR is in a water structure agreement with an adjacent private landowner to control water levels. However, the structure is potentially negatively impacting other adjacent private lands. FWS is concerned that flooding private adjacent landowners constitutes affecting private property drainage, a position inconsistent with the agency mandate. As a result, FWS is unable to support current water level management and FWS must refrain from collaborative water level management choices on the lands they manage, resulting in shifts in the dynamics of the CRJVP.

> *"There's a personal private property rights issue Fish and Wildlife Service has with the way IDNR is handling this private property issue and they're not support the way that IDNR is handling it. FWS has already said that if it goes to court, that they're not going to be backing them and in many ways, they can't, because it does set a precedent that you're flooding somebody's land potentially that you know about and it's complicated and I don't see the partners coming together on these really big legal issues" (int. 22).*

Meeting minutes suggest that water level management and potential policy violations has also been brought up among the CRJVP members.

> *"Refuge [FWS] is not participating in statements about water management without the resolution to private property rights. FWS is concerned about the [328.4 water level]*

*document being misconstrued as supporting the taking of private property rights which does not support the FWS policy. [IDNR] stated that the goal is to support ecological services and that the agency policies should support agency goals, and that maybe policy should be reconsidered to reflect site specific needs. IDNR recognized the important of the partnership and the 328.4 document supports ecological services with the best science available...There is a concern that it may be too restrictive. If there is no way to address special circumstances and partnership priorities, and how policy affects these, the resource will suffer. Policy should be complimentary to the resources and ecosystem service provided by the JVP... [IDNR] hopes FWS will eventually revisit policy issues and how these impact their ability to provide the ecosystem services documented in their missions/goals" (JVP minutes, January, 2012).*

The Fish and Wildlife Service has specific goals and objectives driven by the ideals established when the refuge was created and specific policies the refuge must follow, such as the National Environmental Policy Act, Emergency Wetlands Resources Act, Migratory Bird Act, and the North American Waterfowl Management Plan. These policies dictate how and why the land should be managed and prioritizing particular species and associated habitat types for management. In the case of the Cypress Creek National Wildlife Refuge, the emphasis is migratory birds, especially waterfowl, and their habitats, which are primarily wetland areas and bottomland forest.

The Nature Conservancy exhibits flexible management priorities since the nature of a non-profit organization implies lesser political constraints. However, the organization incorporates planning processes, such as Conservation by Design (TNC staff, 2006), which are utilized for determining optimal habitats and targeting attributes for the flora and fauna that

occupy (or could potentially occupy) the Cache River watershed. They also experience management constraints preceding management strategies, including standard operating procedures and procedure manuals to address liability and legal issues.

The Nature Conservancy enrolled their land into the Wetlands Reserve Program to promote advancing steps in protecting the land. WRP focuses on wetland restoration, protection, and enhancement, which in turn, seeks to return hydrologic processes of the river system nearer to historic norms and supports TNC's mission of land and water system protection and sustainability. However, well-intentioned notions have resulted in unforeseen management consequences. Additional NRCS rules and regulations were enforced along with TNC's policies in the management of Grassy Slough. With WRP regulations, the rules for flooding and changing the hydrology could hinder flexibility for reconnection actions since they must obey the regulations of two institutions instead of one.

> *"...on the technical side of it, with the restoration and hydrology, we are working with them still pretty strongly, and we're going to have to because if for instance, the route is Grassy Slough, because it's in WRP, there's all kind of rules. We have to go through a pretty big process with NRCS if we want to make that the route" (int. 22).*

> *"Where we were purposing to divert the water was through a Wetland Reserve, WRP, and NRCS had some issues there with, can you really go into an easement and change the character of that easement, even if it's for reconnection" (int. 23)*

**2. Management actions are driven by pools of funding and funding climates**

All partners suffer the effects of a depressed economy when attempting to implement management decisions. Capacity levels diminish as staff and budgets are increasingly cut back.

As a result, individual institutions must also reassess and determine levels of priority and where to focus their resources, which in turn, can create shifts of interest that may or may not be compatible with partnering institutions. They must also address economical viability of management decisions verses ecological benefits (Davenport et al. 2010).

Some, if not all, management actions are influenced by funding availability (Adams et al., 2004). While some finances are cyclical, such as operation funds and earmarked taxes, others originating from soft money and grants are less predictable. Special funds command specific actions, as mandated by how the funding is intended to be utilized. Therefore, both implementation and maintenance activities are driven by the funding availability, which in turn, indirectly dictates how the land and its resources are managed.

Some funding sources are able to interchange between money pots while others remain fixed (Imperial, 1999). In the case of the Fish and Wildlife Service, the refuge manager has the ability to allocate budgets to specific on-site priorities. For example, the refuge manager has the power to say how much funding is dedicated towards specific projects, such as tree planting or bat surveys. He also has the ability to transfer funds as needed from one source to the other.

> *"It's kind of discretionary on part of the refuge manager how much money they want to put towards biological stuff, visitor services, that type of thing. They're given categories of money for each of those things, like maintenance money or a general fund of money, but then it's kind of up to them on where they want that money to go... We are given an allotment, some money for each category, like maintenance, visitor services, but we can shuffle that money around. Nobody is stopping us from doing that. If the refuge manager wanted to say, take all the maintenance money and give it to biology, he could do that.*

*He has the freedom and he's in charge of how we are going to spend our money basically" (int. 26).*

This funding structure differs from the Illinois Department of Natural Resources, which does not allow funding to be re-allocated elsewhere where gaps exist. For example, for the Land Management Division, funding for building operations cannot be transferred to equipment operations and vice versa. It is not known if funding isn't set up to cross divisional lines as well.

Methods of resource allocation are a determinate of where institutions center efforts (Imperial, 1999). NRCS demonstrates these constraints. The downside to receiving funding through programs is that NRCS has evolved into becoming a program driven agency instead of simply technical. This idea means that personnel concentrate their efforts on pieces of private land that are suitable within program guidelines, which in turn, motivates continued funding for the agency to administer these programs. The work is influenced by the ability to obtain funding for these conservation programs and results in where the staff members focus their efforts. In much the same vein as the state, funding influences where NRCS places their attention. As a result, their actions leave less time for NRCS staff to assist partners with problems on public lands since those actions do not create immediate revenue.

The Nature Conservancy acquires resources from private individuals and foundations and is not limited by certain conditions associated with public funds. They are unconstrained by government fiscal bureaucracy and can allocate acquired funding more quickly than public agencies. TNC also exercises its freedom to participate in political actions, such as lobbying, avenues closed to governmental agencies.

Besides managing their own tracts of land, TNC assists other partners by providing additional funding for other restoration projects, such as reforestation efforts. However, this idea of flexible funding is not applicable to all management decisions. Decisions, especially projects that require a substantial amount of money, require assistance from a national level. While most funding is generated from grants, fundraising efforts, and donors within the state, some actions, such as the purchase of Grassy Slough, required financial assistance from TNC's national organization. Seeking money at the national level is a lengthy process, requiring the approval from upper echelon authorities in the organization.

**3. Administrative structure delineates power and ability to make on-the-ground decisions**

The structure of authority and power of decision-makers differs per institution, including top-down versus grassroots power structures. Some orders are carried out immediately while others must await further instructions and approval from higher ranks. When decisions are ordered from upper levels of authority, they are subject to individuals who are not familiar with on-site needs and conditions since the orders usually originate off-site (Holling & Meffe, 1996). Field staff must first place their obligations to those orders, which may diverge from their own experience, preferences, and perspectives.

Different administration levels of personnel address certain resources. NRCS, for example, designates specific staff members to address diverse resource concerns. When it comes to landscape level management, it is the area (regional) staff instead of the district (by county) staff that address resource concerns. Issues such as water levels relate to both public and private landowner management practices on a larger scale. Area staff survey the river, develop, and design models to manage water levels to meet specific management objectives. Looking at these larger scales allows NRCS personnel to address specific landowner needs. Addressing

individual issues connects to the watershed level issues. Each parcel of land under NRCS's supervision individually contributes to connectivity across the larger landscape. As for the district staff working with private landowners, each management action with each landowner supplements larger scale resource concerns, such as water levels and water quality.

Communications within the institutions themselves are an important factor. There are two pathways of communication within IDNR. One pathway is communications between field staff of various divisions. The Illinois Department of Natural Resources consists of divisions, each having their own set of interests depending on the resource being managed (i.e. fisheries, forestry, wildlife, natural heritage, etc.). IDNR divisions are reliant on the Division of Land Management to conduct management actions on public lands. District personnel work with the site superintendents and seek approval from them in order to carry out on-the-ground functions. When it comes to on-the-ground management, the staff members communicate between divisions to address site specific needs.

The other pathway is communications between levels of hierarchy within individual divisions. Each division has its own command structure, reporting to their superiors in each individual partition. For example, forestry district staff report to regional forestry supervisors and fisheries district staff report to their regional fisheries supervisors, up the chain of command, reaching headquarters in Springfield to the head of each division and finally to the overall director of IDNR. Challenges in intra-agency correspondence can arise when those two pathways of communication clash with each other. These challenges are further enhanced when diminished staff capacity leaves gaps in the tiers of authority. This results in either field staff making autonomous decisions or awaiting longer approval processes.

If autonomy is the case, they may be a benefit by providing field staff with greater abilities to conduct on-the-ground management decisions. IDNR's wildlife biologist in the Cache River watershed, for example, has served as the district and regional wildlife biologist and essentially reports to himself in that specific tier of command; that independence has allowed him to make faster decisions for the resource management benefits and collaborative efforts with colleagues, such as waterfowl surveys or addressing nuisance species. However, if the opposite is true and work ethics are hypothetically compromised, field staff may also possess the power to not pursue beneficial management.

Other types of management outcomes may also be compromised if an approval process is required. Management actions such as prescribed burning consist of a seasonal window to implement and is a time sensitive decision. If district staff members do not receive supervisory approval in time, the amount of prescribed burning could diminish or not occur at all.

Field staff members make on-the-ground decisions, but must also await orders from higher administrative levels for approval of proposed actions, adding to potentially delayed actions. Interestingly, the administrative structure of the Fish and Wildlife Service differs from IDNR. While there are exceptions to the case when it comes to legal issues, the refuge manager possesses a greater ability to make changes on the ground as opposed to waiting for upper levels of administration to approve all management actions. In the words of one interviewee,

> *"Refuge managers are god. They are given the control to make a decision on the ground, so the refuge managers do not have to call the regional office for every decision" (int. 23).*

Specifically, refuge managers possess the power to direct funding for on-the-ground needs. They are also able to make quick decisions, such as addressing issues impacting adjacent lands where the problem is an immediate concern to the landowner.

> *"...let's say we've got a ditch that's plugged up somehow that's on us and a neighbor might feel it's a problem for them. The typical thing, we'd probably say yeah, we're gonna get to that. If [we] have neighbors that sometimes say, I'd like to go do that right now, we might give them a special use permit and say yeah, go ahead, you can do that" (int. 16).*

The last managerial challenge relates back to fulfilling mandates and reporting. Some institutions, especially federal agencies, are constructed on the backbone of policy and mandated processes, derived from their administrative structures. Consequently, at least one interviewee expressed concern that management actions revolve around these processes and generating reportable quantifiable results, taking focus away from on-the-ground management concerns.

One federal employee admitted to being heavily process driven and addressing administrative needs above natural resource needs, such as focusing on reporting verses conducting on-the-ground actions. While not specific, it would serve to speculate that addressing administrative needs first could impact resource concerns if the management purpose was a time sensitive issue, such as invasive species management or flood control.

> "*It'd be nice if we were spending more time looking and thinking about ... resource management documents instead of more time on administrative stuff" (int. 16).*

**4. Institutional culture provides level of focus on objectives and goals that drive land management practices**

Each institution has its own approach to land management, available resources, and methods to carry out management activities (Hill & Hellriegel, 1994). Their groundwork and evolution denotes customs and traditions in an institutional communal setting. Their distinctive characteristics distinguish partnership depth and capacity and define a diverse management culture of the CRJVP itself. Federal, state, and non-profit groups working together give the partnership uniqueness and individuality set apart from other collaborative agreements (Imperial, 1999).

Institutional culture influences approaches to management strategies. The Nature Conservancy defines their mission holistically. Their role is intent upon recreating a sustainable, naturally flowing system and their focus looks at system management, in this case, watershed management. As quoted from one individual, The Nature Conservancy aspires,

> *"...to actually protect, restore, and manage the significant natural character of the Cache River. So it involved more than just buying land..." (int. 18).*

Many of The Nature Conservancy's views on hydrological processes are also reflected in land, wildlife species, and habitat management. They support the science completed on-site to bring a better understanding of how ecological and biological aspects function in a connective and integrative manner. They continue to seek scientific research to identify key characteristics of the land in order to evaluate and adapt current management measures and to perpetuate effective management strategies. However, the stated mission lacks specific criteria or focus to define "natural systems," a problem identified as an inhibitor to collaborative planning processes in other contexts (Hull et al., 2003).

Each partner devotes their own set of unique resources. NRCS provides expertise and knowledge and assists with development and design for private and public parties. However, they are usually unable to provide funding sources to public land management agencies. NRCS's funding is designated mostly for private landowners through the form of conservation programs.

Culturally, NRCS's niche is working with private landowners (Burde et al., 1998). The two most prevalent programs implemented in the Cache River watershed are the Environmental Quality Incentive Program (EQIP) and the Wetlands Reserve Program (WRP). They both provide cost share money and financial assistance by supplying incentives for landowners to implement best management practices that will benefit the landowner's needs as well as support larger conservation principles important to landscape scale management (Adams et al., 2004). These programs, especially WRP, allow NRCS staff access to private landowners' properties through contractual conservation easements and manage it similarly to public natural resource land management. This method allows private landowners to retain ownership without relinquishing all land ownership rights.

> *"In watersheds like the Cache, where we've had landowners that would have never sold their ground to Fish and Wildlife Service for part of the refuge, but yet as long as they can maintain ownership, we're willing to put it in the Wetland Reserve Program, and they maintain the ownership, but it's permanently enrolled in wetlands now and managed as a wetland restoration... The Wetland Reserve Program is tied nicely in that it's targeting some of those lands that never would have made it into federal ownership" (int. 12.)*

The Wildlife Habitat Incentive Program (WHIP) is a conservation program that private and public landowners alike are able to utilize. IDNR was able to partner with NRCS through

this program, matching funds to address lateral gully concerns on Cache River State Natural Area. Rock structures plugged these gullies and enhanced erosion control and sediment reduction on the Cache River. While WHIP is a smaller program and currently not receiving funding from NRCS, it is still an example of partners being able to come together to address environmental concerns cooperatively.

NRCS provides consultation to private landowners for appropriate management activities attuned with NRCS missions and goals. Management actions that cross connect with natural resource management on public lands include practices, such as riparian buffers, wildlife food plots, streambank stabilization, erosion control, reforestation, and wetland restoration. The land then becomes a cooperative project between NRCS and the landowner; in a sense, the land is an extension of adjacent public lands, working in conjunction with natural resource management measures and providing connectivity to public lands and enhancing conservation benefits. The Wetland Reserve Program, for example, contributes thirteen to fourteen thousand acres in the Cache River watershed, supplementing the existing thirty-five thousand acres in Cache River Joint Venture Partnership ownership.

NRCS personnel provide the expertise, survey and design, and funding (or matching funds) to implement projects; in return, the landowners implements practices themselves. Additionally, NRCS is a resource for databases, such as soil maps and aerial photography, which are utilized to display broader scale analysis or for addressing site specific concerns. It is also NRCS's purview to monitor management actions and changes to the land and water to ensure that landowners remain in the guidelines specified in their contractual agreement.

The private lands focus of NRCS keeps this agency primarily in an advisory role. They have the resources to collect aerial data, create maps, and complete hydrologic models, but lack

equipment or personnel to administer management practices. However, they work in tandem with state Soil and Water Conservation Districts and the Farm Service Agency, tapping into their resources and placing these individuals in the role of serving as an extension of the CRJVP. The Farm Service Agency, for example, operates the Conservation Reserve Program (CRP), a program similar to NRCS's conservation programs by providing cost share funding and implementing conservation friendly practices, such as filter strip or grass waterways, to private landowners enrolled in CRP. There are different management levels of this program, specifically general assistance (addressing concerns on a need by need basis) verses continuous assistance (addressing more environmentally sensitive needs on a continual basis). Lands enrolled in continuous assistance CRP in Johnson and Massac counties (two counties within the Cache River watershed) contribute an additional three thousand acres to natural resource management in the Cache River watershed.

Unfortunately, this unique relationship with private landowners can also be challenging. Private landowners are concerned with agricultural practices and sustaining the land for the purpose of generating goods. NRCS strives to meet the private landowners' needs while balancing best practices for natural resource conservation benefits. These two philosophies are not always compatible with public natural resource agency goals. Additionally, private landowner constituents can perceive NRCS as "siding with the enemy" when private landowner and public agency needs clash. Landowners may then view all government entities in the same viewpoint and place NRCS in a predicament between their target audience (private landowners) and their role as a CRJVP partner.

*"Some of the conflicts the field office has are sometimes being pulled towards the interests of agriculture verses interests that the state and federal agencies have. So*

*there's a delicate balance that the field offices try to maintain, especially when it comes to things like agricultural drainage or policy of how lands will be procured that are going to be federal lands, but there's a delicate balance of trust that we have between groups like the Drainage Districts, let's say. Our agency verses the Fish and Wildlife Service or IDNR, who they see as maybe a primary enemy of them in terms of drainage and stuff. There's kind of delicate balance where we have to be careful in some of our partnership that we don't, or we're not seen as representing some of the interests that they have, but we're more or less there to represent our own interests, but that we're not necessarily totally buying in to all the interests of all the other partners that we work with... we have to be a little careful there, when you're working with people… to do that in a way where it doesn't look like we're trying to take what some other agency wants to do and cram it down their throat. That's the hardest part and probably the toughest challenge. It's caused friction in the past" (int. 12).*

*"Some of the landowners who don't agree with what the CRJVP's trying to do I actually saw it as a negative, because they didn't always want to work with us because we were in cahoots with the CRJVP. Down there, it was actually more of a disadvantage being a member of the [Cache River Joint Venture] Partnership" (int. 30).*

Institutional ideologies embrace protection, restoration, and conservation of natural resources. However, methods of protection and land management objectives vary among agencies. Each agency or organization has slightly different approaches and shifting interests for species and habitat focus. Additionally, they have obligations to meet, placed in priority of what their institution deems central to their mission.

The Fish and Wildlife Service focuses on addressing objectives based on the founding premise of the refuge. Further management strategies, such as tree planting, moist soil management, monitoring programs, and wildlife surveys, support the basis of the refuge's existence. Land acquisition from willing sellers within the refuge's purchase boundary is also a priority for the refuge, especially those considered prime for restoration measures; that is, property leading to the creation of contiguous tracts of restored lands adjacent to the Cache River. However, there are still questions addressing how to manage complexities of the system (Imperial, 1999).

> *"Habitat restoration, that's a huge one and that's probably the most difficult goal that we have" (int. 23).*

Consequently, species management clashes can occur when applying management methods from two different agencies. Wildlife priorities and land management specified in the refuge management plan may be different than wildlife priorities and land management in state management plans. Management choices are also dependent on land quality and institutional priorities.

> *"If [IDNR] buys a piece of land, [IDNR] looks at it, look at the public land survey notes, look at the adjacent habitat, [and] determine to the best of our ability what it would have looked like prior to human disturbance, and that's what we put back. Fish and Wildlife Service might look at the same piece of the land and if it's not high quality, they might say yeah, we want to put forest on here, but we have an opportunity to put three hundred acres of moist soil units, intensively managed unnatural system, that would provide benefits for waterfowl, which are, you know, part of their mandates, so they're going to do that" (int. 8).*

This example suggests that given the same piece of land, two partners may possess differing perspectives regarding the method of management and long-term outcome. While overall purposes are similar, there are intricacies influenced by institutional goals and objectives that determine management intentions.

The challenges become more prominent when natural communities cross over political boundaries (Cortner et al., 1998). Cypress-tupelo swamps at Buttonland Swamp, for example, are a natural community type that occur on both state and federal lands. The state and the refuge share commonalities for cypress-tupelo tree management and justification for their existence. Both objectives have similar overarching characteristics; however, intricacies of each objective create a divergence in the direction of how and what to accomplish. One issue is the desired future condition of cypress-tupelo tree appearance and health at Buttonland Swamp. Both IDNR and FWS recognize that current swamp water levels are producing stress on the trees. IDNR is managing the swamp for open, deep water habitat with the intent of imitating historical conditions (a mission for IDNR's Division of Natural Heritage and Cache River State Natural Area). For IDNR, a degree of tree stress is acceptable and a natural characteristic of pre-settlement conditions since in those circumstances, there would be less trees. FWS addresses tree stress as concern, recognizing that static water affects tree health, regeneration potential, and primary productivity. They propose management to mimic drier conditions; whereby, the swamp is subject to seasonal variation, allowing dry periods between flood pulses instead of permanent, deeper water levels. IDNR's land is positioned upstream of the refuge and higher in the watershed, meaning that IDNR management decisions, especially water management, influence practices on the refuge. That divergence can also hinder progress of either landowner's objectives since one decision affects the other's land.

*"There's stuff [water structures and manipulating water levels] on the IDNR side that impacts refuge land, so yeah, that gets a little more challenging because those things are under one partner's control and they affect more than that one partner, so I'd say that does make it a little more challenging" (int. 16)*

While fundamentals remain static, institutions are subject to change in response to priorities shifting to outfit new data, new authority figures, or modifying existing objectives. The Nature Conservancy demonstrates these types of changes. The idea of land management is more novel to TNC compared to other natural resource agencies. The Nature Conservancy's role has usually been to provide the scientific backing to support management practices and turning over purchased land (and associated water systems) to other natural resource institutions. Their long-term scenario for water levels strives to provide the scientific basis for management and possible funding for management actions without always completing the management action themselves. TNC takes an advisory role after turning it over if needed, but resigns actual ownership and active management. Cache River State Natural Area is an example of land transference. Parts of it were originally bought by TNC, but TNC is no longer actively managing the land.

In some instances, TNC does actively pursue management. Grassy Slough is a prime example of implementing and maintaining restoration measures, first through active management with reforestation and wetland restoration and currently through passive management. However, the combination of passive management, reprioritization of staff to areas of larger landholdings, and unclear prospects of reconnection have led to a decrease in TNC involvement and the diminishment of personnel.

"*We used to have a southern Illinois director and we used to have a full staff that worked on Grassy Slough, but since Grassy Slough is already in a restoration phase, really it's [now] more management of invasives. We're not going in and planting trees. Everything [management implementation] is done, and we're just waiting for things to grow and mature, but we do have to manage invasive species and do that through that with an agreement with the strike team, which is separate from the Cache, but it's something that we partner with IDNR. So the needs for managing Grassy Slough have lessened over time." (int. 22)*

The combination of culture, investment, and approach are displayed in hydrologic connectivity efforts of the Cache River. Reconnection efforts illustrate how institutional diversity is a benefit, but can also be a hindrance. IDNR is increasingly invested in the reconnection project because the point of connectivity is focused in and around state owned land. They will also be in charge of monitoring reconnection management and conducting the work to support its success.

TNC supports reconnection by sponsoring hydrologic modeling to optimize ideal reconnection locations since hydrology is a key driver in river systems and in support of their mission. The idea behind reconnection is establishing natural conditions, perpetual water flow, and creating pathways for aquatic communities to follow. Additionally, TNC purchased Grassy Slough with its role of being the optimal location for reconnection and a major driving factor for continued CRJVP involvement.

Historically, TNC has been engaged in the long-term commitment of supporting reconnection. Enrolling Grassy Slough in a WRP with NRCS was a step further to enhance land protection and to promote appropriate management actions. They have also contributed towards

reconnection by providing input from their river specialist and matching funds for a restoration coordinator position.

However, thirty years after the initial venture, reconnection still has not occurred. Expecting tangible results, TNC has been losing interest in supporting an action that "may" never happen. These concerns have become present in CRJVP interactions, as shown in the following meeting minutes and interview commentary.

> *"TNC, frustration, not making enough progress concerning restoration in the Cache, re-evaluate, what is the value of the contribution, full support vs. reduced support" (JVP meeting, June 2012).*

> *"We can't continue to pour resources and money into science when we're not implementing things and we're not using it and then actually doing stuff on the ground… Restoring the hydrology is huge and that is really one of the main reasons why The Nature Conservancy is here, so it's hard for us to really be involved when that is all at a standstill" (int. 22).*

Part of this decision is also influenced by donors to TNC, whose focus has shifted towards larger population centers and management actions showing evident and quantifiable outcomes as well as sources of memberships, fundraising, and donations. As a result, The Nature Conservancy has been backing away from active participation and taking a position as a silent partner.

**5. Unclear management and decision-making criteria create divergences of opinions**

Terminology usage in management plans is subject to an institution's interpretation (Cortner et al., 1998). Some institutions clearly define their objectives and pursue strict metrics

in search of these criteria. Other institutions are less organized and follow broader ideas, seeking a more abstract view of how to achieve their mission.

Water level management is a concept to further demonstrate this point. Every agency has a different standard to what they call acceptable water levels and their justification for active or passive management of water levels. Water levels affect all partners, but partners possess varying tactics to address water level management on their associated lands. While modeling for various water elevation levels and monitoring stream gauges during different flow periods has provided insight, it still remains a debatable issue of what is the "correct" elevation.

Changes in water levels delineate habitat types. Tree composition and health are affected by these levels, influencing the decision of what level to maintain. One management option is managing for deepwater habitat while the other management technique suggests ephemeral flooding periods. As an example, there are existing mature, aged oaks over a hundred years old that are being impacted by current IDNR water level management. The oak trees are in an area that is being subjected to a greater saturation level, mimicking pre-European disturbance levels, and in a sense, "shouldn't" be growing there, despite their age. However, the oak trees denote potential biological and cultural value and receive debate about their right to exist. This aspect is more of an issue between IDNR and an adjacent private landowner, but the concept transcends to the CRJVP and managing for the "correct" habitat.

> *"We're dealing with something like that in the Cache with the affects of water levels on cypress trees and what's the best way to maintain the cypress swamp and what state do we want to maintain a swamp in. Do you want to restore what was there historically or maybe there's a better use for that swamp now, something that's a little different than what was there a hundred or two hundred years ago, but because the landscape has*

*changed or because things have disappeared other places and maybe pushing that in a little different direction would make more sense, and their arguments often times are on several sides of that issue. It can be difficult" (int. 27).*

Forest health has been an emerging issue. It concerns tree composition, water levels, water flow, hydrologic connectivity, and acceptable levels of tree health factors, such as amount of woody debris and tree mortality. IDNR's forester and a hired consultant reviewed satellite imagery and instigated monitoring programs, such as plot surveys, to collect data and determine current tree health conditions. IDNR is also examining historical context supplemented through existing documentation to determine historical regimes. FWS is supplementing their efforts by updating current vegetation maps of the refuge and other adjacent areas. In these ways, the CRJVP is collectively contributing towards the solution to this dilemma. However, tree health and composition is an ongoing issue and remains questionable to a group consensus of appropriate tree health management.

Reconnection is another example of differing perceptions (Hill & Hellriegel, 1994). It remains an important goal to achieve for some partners, but is becoming difficult to maintain active involvement in the process. Reconnection is also an action that is not occurring on federal lands. The Fish and Wildlife Service lacks the ability to manage on-the-ground actions for reconnection and therefore, makes reconnection less emphasized by this agency. FWS questions if actual reconnection is a achievable goal or if it is unattainable in reality (similar to TNC's views). As a result, they reassess their focus on projects where they have management control and record evidence of active management efforts. IDNR possesses a different viewpoint, noting that while reconnection is a long-term and possibly infeasible goal, restoration projects, such as reforestations or restoring wetlands, are compatible with reconnection plans. Management

activities enhance the ecological value of reconnection and on-the-ground projects complement reconnection efforts while maintaining conservation values regardless of reconnection status.

Institutions also possess different views of research's role in guiding resource management planning (Holling & Meffe, 1996). For The Nature Conservancy, the emphasis on using scientific data to back up management choices can be challenging. Research tends to concentrate on specific factors and cannot always bring solutions to system-wide concerns. Lack of scientific input leads experts to choose opinions derived from past experience, educational knowledge, and primary resource interest rather than concrete evidence, creating a divergence in management decisions.

The question remains; what constitutes adequate scientific justification for implementation versus continuing the planning and data gathering phase. Agencies make the decision on the amount of justification needed to support management actions independent of one another. In some instances, agencies have differed in their interpretation of when baseline research should partially give way to actual implementation.

> *"We're kind of at the point where we're saturated with so much science on the ground that we really need to move with getting stuff done on the ground, ... I think there are things that I think we can move forward on now. We have these management plans and we have the science and we should be utilizing that to do more on the ground" (int. 22).*

> *"There's a lot of grey area out there, and even taking lessons learned in one spot or one site, and trying to transfer them to another site, all of a sudden, it's gray. It's not exactly the same situation, the critters are a little different, the landscape is a little different, the key players or the stakeholders are a little bit different, so there's a lot of grey out there*

*and everyone isn't entitled to their own science, but everyone is entitled to their own opinion, and a lot of these things, when decisions are being based, and when you don't have the best science to base stuff and a lot it is just professional opinion, then that can get kind of difficult, and it's just hard to get to an answer because you can't prove that one opinion is right or wrong or better than the other, so that can be difficult" (int. 27)*

*"Any good scientist knows nothing is one hundred percent so there is that point in which you have decided to have enough information to do this" (int. 5).*

Reconnection is an example of this research verses implementation conundrum. Over the past thirty years, CRJVP partners have contributed resources towards modeling reconnection locations, studied biological and ecological effects of reconnection, analyzed whose lands will be affected, addressed legal proceedings with adjacent private landowners, and examined flooding potential and long-term effects of hydrologic connectivity. IDNR and TNC matched funds to hire a restoration coordinator to oversee the process, facilitate, and gather information from various stakeholders, including agencies, local community members, and researchers conducting studies to map reconnection effects. The Illinois State Water Survey updates inventories and provides the latest on-the-ground observations. Overall, reconnection consists of a combination of physiological, social, and economical resources within the watershed. While research and planning processes are beneficial to the continual pursuit of reconnection, the question remains if and when reconnection will occur and when there is enough evidence to support scientific justification for its implementation.

Native cane restoration is another initiative under deliberation. There are currently several studies regarding native cane research to understand their habitat, rate of spread, reproduction, changes to soil, water, fertilizer, and disturbance response. The Fish and Wildlife

Service has several existing cane remnants on their land as well as experimental plots under analysis. Their Habitat Management Plan lists native cane as a "management priority." It has also been recognized as an important community type by all CRJVP partners through targets and attributes identification on the Cache River watershed. However, large scale restoration measures are currently lacking for this species. One reason for this deficiency is gaps in understanding native cane's growth rate and response to various environmental conditions. Native cane is also difficult to propagate in large scale proportions and costly to implement. However, there are several questions that remain speculative: when will there be enough data and justification for all the partners to invest in this practice? Additionally, is native cane an appropriate species for the land in a specific agency or organization's ownership? As a hypothetical example, is Grassy Slough (TNC land) suitable for native cane plantations? Or should TNC manage Grassy Slough by focusing on other species, such as bottomland forests? When is the optimal moment to adopt these practices and where is the data to justify that decision?

# CHAPTER 4

# MANAGEMENT IMPLICATIONS

Policies, funding, administrative structure, culture, and incompletely defined management criteria influence decision-making power and field-level capabilities. These factors challenge compatibility among partners and question resource management tactics. It is essential to define goals, clear plans, and participation levels for environmental outcome criteria, such as habitat, water quality, biological diversity, and resource conservation (Conley & Moote, 2003).

Research studies are continually beneficial in directing management clarity. They are able to expand on management principles and draw conclusions that may not be able to be viewed otherwise. For example, water level monitoring gauges are an example of research providing insight to management practices. Each station supplies a collection of water level data to researchers and field staff members who are able to construct hydrologic models and build a conceptual understanding of water flow to guide water level management.

However, individual research projects lack the breadth to address all ecological processes and ecosystem dynamics. Each study focuses on an explicit set of parameters and, as is the case of this study, reflects a snapshot in time. On-the-ground management is dynamic. Further speculation indicates that studies that are theory based do not necessarily replicate the same results when applied on-the-ground. There are confounding variables and study limitations that, in a realistic setting, must be considered if all possible.

Native cane research, for example, has provided a wealth of knowledge regarding how to propagate and create sustainable native cane breaks. However, on-the-ground implementation must take all environmental aspects from all angles into account, such as biotic and abiotic

factors, human land use practices, disturbance regimes, long term effects (e.g. native cane quality and health, effects on other adjacent natural communities, wildlife utilizing cane populations and ecological effects of wildlife vitality), implementation, and site appropriateness.

Resource managers must balance their budgets to address all land and water resource management operations. It is not feasible to dedicate a substantial amount of funding for one specific resource. Besides native cane, for example, the refuge must also allocate funding for bat surveys, moist soil management, and reforestation efforts. If too much funding focuses on one resource, other resources could suffer deficiencies.

Additionally, one cannot study a single particular resource to determine how to manage a complete system. However, managers sometimes use indicators for broader ecosystem health issues. Resource analysis has many applications for guiding management decisions. For example, tree health is monitored and can be used as an indicator for other factors, such as water levels appropriate for the tree vitality and other wildlife depending on sustainable tree populations for certain tree compositions.

Communication between researchers and land managers can also be lacking. Research and academia environments verses on-the-ground management on public lands does not always overlap communication pathways. Researchers utilize the public land for plots and study areas and make contacts to initiate research projects, but do not always relay study results during and after project completion. While not the focus of this thesis, this concept deserves acknowledgement to understand and bridge the gaps between research and on-the-ground implementation since it is an important component in guiding management.

Natural resource institutions face the challenge of addressing concerns within and beyond their political boundaries. One decision affects various resources interacting within management boundaries of that decision. In the words of one interviewee,

> *"You can't throw a rock in the Upper Cache [River] without something happening fifty miles downstream in the Lower Cache [River]" (int. 5).*

This example illustrates how management transcends the target area to potentially distant locations and with unknown impacts. In the case of the Cache River watershed, watershed management is in a state of constant flux, requiring flexible strategies for implementation, monitoring, and adaptive management techniques (Adams et al., 2004).

Managing natural resources across multiple land ownerships means differences in interest and opinion regarding how to manage those resources. However, this idea does not mean that management actions are non-negotiable. One interviewee suggests,

> *"...maybe what the goal is in terms of what you're trying to protect or maintain, and how much change you're willing to tolerate to achieve what you think is important" (int. 20).*

There needs to be a balance between understanding fixed needs and other management actions that can be flexible. Planting bottomland hardwood forests, for example, means that the refuge is able to plant selective oak trees that produce smaller acorns and those management actions are well-matched with constructing bottomland hardwood forest composition compatible with other agency/organizational bottomland reforestation efforts.

Environmental conditions change across spatial and temporal scales as resource needs fluctuate. Natural resource personnel must (and do) recognize resource variability and strive to

adapt management to balance resource needs. The challenge is, who makes the call and what is the criterion to define a mutual balance for multiple institutional perspectives?

Institutions encounter challenges of acclimating to abrupt on-the-ground needs. Institutional functions possess a degree of inflexibility; rigidity becomes more pronounced as governmental scales reach larger scales (i.e. federal agencies are more rigid compared to non-profit organizations). Grassroots efforts have the ability to continue partnership interactions due to field staff possessing an understanding of institutional structures and knowledge of on-the-ground resource conservation needs.

While solutions are not always clear, it is important to be aware of institutional mandates and capabilities. In any type of teamwork setting, one must accept the weak points of others in the group and build upon strengths. This concept is recognized among the partners. Interview commentary reflects acknowledgement of variability, but uncertainty remains regarding how to proceed with these differences.

Common goals for the CRJVP must exist in order to maintain partner motivations. Benefits from the partnership, such as combined resources, funding climates, skill, shared information, and manpower, serve as incentives for continued corroboration. Investment in collaborative actions implies an expectation in reciprocation of additional goods and services. Institutional internal support and willingness from other partners to collaborate are also important aspects for partnership continuity. It is necessary for institutions to understand operations and interactions of other partners for successful natural resource management (Imperial, 1999). Communication within and between institutions enhances that understanding and productivity.

Challenges do not necessarily possess a negative connotation. They can instigate conversation as partners express differences. Both resource concerns and institutional management initiatives can change and communications must stay current with events.

> *"There is disagreement about how to manage the water, but disagreement is okay as long as you can maintain the conversation" (int. 20).*

Additionally, disagreements can lead to management diversity and constant evaluation of resource management. While this idea does create divisions, it can also bring strengths in ensuring that there isn't a singular focus on a particular resource or reliance on a single management tactic.

> *"When your common goals aren't fully aligned, that can be an issue, but sometimes it can also be a positive thing too, depending on how you look at it. I always think it's good. I like to be not only questioned by partners, by constituents, and opponents[to] make sure we're always doing the right thing" (int. 17).*

Other comments suggest that management trial and error are natural and expected. Field personnel must take initiatives and risks in management strategies when scientific answers are not always available.

> *"In resource management, if you don't have screw ups, then you're not trying. And you shouldn't be afraid to try things. I think there are so many things that we argue about or debate about and they seem very important at the time, but in the long term, none of us are good at looking at this thousand year time frame, which, a lot of times, is the only thing that's important. One time down in the Cache, we were talking about wetland management and should it be developed this way or managed that way, or should the*

*levee be this tall or that tall, or all of these little things and people will really argue about it, really feel strongly about it and think about it in a hundred years. Is any of that really important? A lot of stuff I see in southern Illinois, the only thing that matters is how much ground can we get under easement or in public ownership, because it's going to be developed if it's not public" (int. 29).*

Resource concerns do not always require collective decision-making either. Some concerns are external and applicable to the CRJVP while others remain internal to the institution.

*"I think sometimes priorities aren't always agreed, what's a priority for the partnership at a certain time, which is okay. You have to understand when things are a partnership issue or an individual [issue]…what's a JVP issue and what's a department issue? Sometimes those things aren't always crystal clear" (int. 17).*

*"It's just kind of natural that there are specific site issues that maybe are a concern for us...but they're not on other lands, and they may not have [to be] a system wide issue" (int. 16).*

Crisis moments are an example when institutions collaborate and pool their resources. Resource concerns exemplify this idea when the health and sustainability of natural resources are in peril and immediate action is required. The CRJVP originated from individuals (public and private) concerned with alarming rates of sedimentation, loss of waterfowl and fishing areas, and excessive land clearing practices. The need to protect existing high quality wetland remnants and repair environmental degradation were catalysts for the origins and involvement of the current partners in the CRJVP.

*"Unfortunately, a lot of times, collaboration doesn't happen until [there is] some emergency. There's gotta be a real need, not just, well, someday we're going to do this, and then we keep doing what we do. A lot of times, real collaboration comes out of an immediate need, an emergency. It doesn't always have to be a natural disaster, but so many times, we rise to be our best after a natural disaster. That's when all the agency labels are put aside. Somebody sets up this command incident system ... and you are part of the team" (int. 13).*

Reconnection has been a continuing example of resource concern debate with the CRJVP. For several years, reconnection has been a driving force and push for management actions, implying that the resource remains in crisis mode until hydrologic connectivity occurs. Some partners are satisfied with the rate of progress towards reconnection while others exhibit dissatisfaction.

Reconnection is one goal in the CRJVP among other overarching goals. Should reconnection never happen, there are still other objectives of the partnership, such as sedimentation control and wetland restoration, to drive continued collaboration efforts. Broader resource management, such as conservation and restoration, remain universal themes and umbrella goals among all natural resource agencies and organizations will remain similar. However, partnership dynamics may change as partners with a greater investment in certain actions, such as reconnection, become less active in partnership interactions as momentum for reconnection diminishes.

*"We've been so focused on reconnection, even though we've been doing a lot of other things, it can kind of look like, well, you've just been focused on reconnection for twenty years and it hasn't happened. So it kind of looks like a failure in a way, or not much*

*success, whereas I would argue, well, we've still been planting trees, we've still been buying land, we've still been doing outreach, we've been doing other things. It's just that we really don't talk about them very much. And reconnection may never happen. That just might be the reality; if we can just decide that when we get the money, it's going to require approval of different agencies, etc. and we don't know if that's going to happen….I always think that there's a danger on, if you're focused just on this great big holy grail that could take a long time, it's not a way to really encourage people being involved, because a lot of people just won't have the patience or whatever. So I think you need to think about what are the other things we're also doing that will be successful to move us forward" (int. 16).*

The future of the CRJVP remains unclear. Financial constraints influence partnership interactions as individual institutions reassess management efforts for their individual sites. It also leaves partners less time to expand efforts beyond institutional immediate needs. However, resource management will never disappear. There will always remain commonalities, such hydrologic management, and thus, incentives to partner will also never completely dissipate.

## Participant Recommendations

Throughout the interview process, some participants expressed viewpoints and ideas on ways to address concerns or enhance partnership and/or institutional performance. Table 3 displays the results of their suggestions. It is important to note that these recommendations follow no specific order and remain general, interpreting the responses at face value. Perhaps they will provide insight into partnership feedback and future ventures.

Table 3. Participant Recommendations

| Institutional Affiliation | Recommendation |
|---|---|
| **NRCS** | Incorporate all stakeholder perceptions |
| **NRCS** | Increase partner involvement compared to current conditions |
| **NRCS** | Rank all private landowners equally for applying for conservation programs |
| **TNC** | Share research of affiliated institution with partners |
| **TNC** | Combine historians with scientists for research and planning |
| **TNC** | Good public relations |
| **TNC** | Use all facets of research into work and design |
| **TNC** | Political influence recognizing resource conservation for the next generation, not the next election |
| **TNC** | Create Southern Illinois volunteer network |
| **TNC** | More on-the-ground projects demonstrating effective resource strategies for the public |
| **TNC** | More community and public outreach |
| **IDNR** | Important to maintain partnership communication |
| **IDNR** | Continue on-the-ground projects to supplement overall goal of reconnection |
| **IDNR** | Find on-the-ground projects and maintain partner involvement in those projects, keep everyone working together |
| **IDNR** | Partners need to respect one another |
| **IDNR** | Earmark tax for generating IDNR dedicated funds (from license plates) |
| **IDNR** | Need a permanent southern Illinois project director |
| **IDNR** | Hire one person to write grants and seek other funding sources explicitly at the IDNR regional office for extra funding potential for all divisions |
| **IDNR** | Good public and private landowner relations |
| **Friends of the Cache River Watershed** | Political backing from the state and federal level |
| **Friends of the Cache River Watershed** | Influential political people need to visit the resource (the Cache River watershed) |
| **Other** | Respect each entity and how they function |
| **Other** | Integrate layered training (experience, interpersonal relationships, strategic planning) |
| **Other** | More outreach and education to private landowners and general public |
| **Other** | Quarterly breakfast meeting sessions for all partners to maintain communication |
| **Other** | Leadership in the partnership to continue driving interactions, collaborative management and communication |

# CHAPTER 5

# CONCLUSIONS

Management decisions and the methods to achieve goals, either set by an individual institution or as a partnership, are a complex process. There are several variables which have to be taken into consideration, as explained in the previous chapter. These aspects help define an institution's capabilities. Additionally, they provide an understanding as to how and why an institution functions a certain way and how natural resource agencies and organizations work together, taking these factors into consideration and either pursue collaboration or, in some cases, refrain from collaboration when necessary. Resource managers maintain their lands while striving for the larger scales, which in turn, motivates collaboration with partners around common goals.

## Future Research

Future research could investigate institutional factors identified in this study by comparing other organizational partnerships with the CRJVP. Partnerships are a growing trend due to financial and capacity constraints. This study is the exploration of one particular partnership. Comparing other partnerships to the CRJVP, either local or out of state, could express other commonalities and differences in partnership dynamics and reveal what types of challenges are universal to all natural resource partnerships and which challenges are unique to the CRJVP.

The study has the potential to expand beyond the circles of immediate CRJVP members. Researchers and scientists play an integral role in providing data to the CRJVP to help guide management decisions and may possess a unique perspective on governmental partnerships. Additionally, the general public, such as visitors, school groups, recreationists, or adjacent

private landowners would provide additional viewpoints since they are also affected by resource management decisions of individual institutions as well as by existence of the CRJVP.

The role of power in partnerships is another aspect within the realm of this research. There are power imbalances that exist (and noted in previous literature) as being a factor in partnership dynamics. Additionally, there may be unseen stereotypes and prejudices placed on certain institutions and can also expressed in interpersonal relations within the CRJVP. However, social interactions among members of the CRJVP were beyond the scope of the research objectives for this study and while still significant, will remain as potential material for future expansions of this project.

This study utilized qualitative methods. It may be insightful to approach natural resource management from a quantitative standpoint, such as surveys, to see if this type of research would capture other types of data useful for understanding collaborative management. One may also examine resource management by collecting data on the resource itself, such as water levels or tree health if one is interested in comparing measures of institutional capacity to measures of ecological change. This approach could evaluate on-the-ground data by taking measurements of a specific resource and see how it compares management actions of this specific resource across political boundaries on public lands (as is potentially the case for several biophysical studies).

Regardless of the method, whether it is a qualitative or quantitative approach, it is important to learn from this exploration and be able to expand on the possibilities of its implications. Natural resource management is an ever going process that depends on research to maintain current and future resource requirements and adapt management decisions to meet those needs. Resource managers and personnel administer on-the-ground actions on a daily basis. It is beneficial to learn from their insight and pass on their wisdom and knowledge to the

next generation of managers to continue building on those experiences for the benefit of staff members, interested general public, and resources quality.

## Reflexivity

Reflexivity is the act of self evaluation and personal involvement within the study. It provides an in-depth self analysis to critically reflect on the researcher's role in the project. It is a monitoring system to determine the researcher's values and cognitive process throughout the course of the research and bringing and understanding to why things happened they way they did and the reasons for the researcher's decisions (Hamdan, 2009).

Natural resource management is a practice that brings about familiarity and awareness. Its characteristics are deeply engrained in my education, knowledge, training, and skills. As such, I share similarities with my research participants' perspectives, including their principles, jargon, culture, and equivalent biases towards natural resource management (Groves, 2003). My familiarity with management practices and previous established relationships with several of the study participants allowed to me connect and understand institutional and social dynamics related to the CRJVP (Shenton, 2004).

Prolonged engagement with these individuals allowed me to build trust and establish rapport (Baxter & Eyles, 1997). I was able to immerse myself in the culture, not only for the individuals themselves, but also developing an appreciation for the environment that they must manage. I understood the fundamentals of their resource management goals and challenges they endured, even though I was not and continue to not be fully versed in their day-to-day responsibilities. This overall insight provided guidance for what answers to seek in the research and where to seek them.

Previous to this study, my role with the CRJVP was being an assistant to natural resource managers. During this time, I was an AmeriCorps member affiliated with IDNR. My job responsibilities reflected their expectations and their needs, mainly, visitor services and environmental education since my service site was the Cache River Wetlands Center. I also assisted in projects, such banding geese or conducting prescribed burns, to help meet land management objectives. I also worked with the refuge, in particular, with environmental education and outreach opportunities per status quo of my position. However, they also provided opportunities to implement field work, such as plant trees or conduct wildlife surveys, with approval from my IDNR superiors. To a lesser extent, I assisted The Nature Conservancy with projects on Grassy Slough, such as planting pickerel weed, an aquatic plant.

I interacted with CRJVP staff, other AmeriCorps working with the CRJVP, and Friends of the Cache River Watershed members. I was able to view these various interactions and become involved with them myself throughout the various facets of my job. In return, I perceived their working relationships, management practices, successful collaborative venues, and points of concern among the partners. These experiences provided me with a personal background of the partners, a deeper understanding of management decisions, and their reasons for making those choices. Additionally, I established a personal relationship with these individuals, which made the transition between the employee status to researcher status easier.

Groves (2003) acknowledges that field research, in this case, interviews and meeting observations, is more than the researcher investigating the researched. It is a culmination of the interdependence for both parties with each side feeding off one another during the entire data gathering process. While the objective was for me, the researcher, to acquire information, participants were also curious about my project and I obliged them with explanations of my work

(while protecting the confidentiality rights of individual participants). Additionally, certain data collection sessions, especially interviews, resulted in sensitive material, demonstrating conflicting viewpoints and potential tensions. Some individuals expressed sensitivity to certain questions due to their contentious nature (i.e. hot button issues for the partners). I treated everyone's responses with the same level of respect and confidentiality to relay security and a comfortable atmosphere to allow room for participants to express themselves openly.

My role in the data collection exhibited many facets (Baxter & Eyles, 1997). One perspective was my status as a previous employee who formerly worked with the CRJVP. From this viewpoint, I was perceived as a co-worker who shares an understanding of working relationships and interactions among the CRJVP partners and other constituents involved with the CRJVP. Previous direct interaction with these individuals over the course of two years instigated assumptions that no doubt transcended into the research objectives and hypotheses of this study. Another perspective was the development of personal relationships with these individuals through life experiences, social meetings, personal friendships, and getting to know their social circles. A third perspective was the formal relationship between a researcher and his/her subjects. Our interview and meeting arrangements were on professional basis and more of a reflection of the roles between academia and sources of data collection. This type of relationship put personal feelings aside and addressed associations in a professional setting.

These three types of identities were displayed in various combinations throughout my experiences in the study (Groves, 2003). Sometimes an interaction would instigate one of these viewpoints, such as formally requesting a consent form or setting an interview date, while other times, all three perspectives transitioned from one to another in the same setting. An interview session for example, would begin with friendly chatter, move to the business of the interview

itself, wrapping up with recent proceedings in the working world, and back to inquiring about personal life events.

There was a delicate balance between research participants and myself in context of the research project. Perspectives can even change depending the individual, subject of discussion, and level of involvement. Directly asking interview questions to a specific person was different than silently documenting meeting observations with no direct involvement in meeting dialogue. As a result, boundaries between each viewpoint were not always clearly defined (Groves, 2003).

There are two stances of a researcher's position in relation to the research subjects: the insider verses the outsider. In general, an insider denotes an understanding of institutional culture and societal norms, speaking the jargon, navigating well among interview participants, developing meanings, and promoting special privileges and power for extracting information (Groves, 2003). Participants were willing to provide information and exhibit a level of comfort that an outsider may not be able to achieve due to my authenticity (Hamdan, 2009). However, being an insider means being a part of their realm, indicating a potential lack of objectivity and promoting biased results in favor of the culture in question.

The other perspective was the view of an outsider. It was difficult to take the stance as the unbiased researcher with these particular individuals. I questioned if I was placing a level of importance from specific individuals based on previous work experience and personnel interactions instead of seeking an unbiased representation of the CRJVP. The role of an outsider presented an air of objectivity to the study and provided an outside perspective with detached perceptions, influenced (personally) by my role in academia.

Although I view myself more in the insider position, I would speculate that my two-year absence of not working with this group on a day-to-day basis has created a separation from their lives. If participants viewed me in this role, they may have been more hesitant to be open with their responses and address my inquiries in a more formal manner. Additionally, there were certain individuals that I was introduced to throughout the research instead of having previous familiarity; in those cases, objectivity may have been more dominant. Thus, my view as an outsider reflects my role in academia instead of being a part of on-the-ground natural resource management.

Baxter & Eyles (1997) recognize that demographics can influence researcher and participant interactions. I approached this research from a stance of a younger, Caucasian female's perspective. There are stereotypes that come with this representation (conscious or sub-conscious) and how study participants view me. My role as a female might have denoted certain responses from both male and female participants, possibly as more nurturing and compassionate, or the opposite, such as physically and mentally weaker and less analytical. In return, all participants were Caucasian and in general, middle aged. My experiences compared to theirs exhibited a gap when comparing the introduction of my career in natural resources to their twenty plus years of experience. While their history exhibits variances, including work experience and previous geographical dispersion among the United States, experiences on the Cache River watershed link their life roles and create a diverse background, resulting in a unique collection of experiences.

Interviews were held on an individual basis instead of focus groups. The nature of the interview and transcription process was in a sense, an intimate setting. I was able to perceive inflections in responses, make notes and pick up on body language (or voice inflections if it was

a phone interview). Personal reflections after each interview provided me with an avenue to report my initial thoughts and finding as well as pick up on emerging themes and trends in the data. Reading back over my notations provided a holistic view throughout the data collection phase of this study.

The transcription process allowed me to review the data and make additional notes of concepts and inflections not captured during the initial interview (Note: I highly recommend all researchers to transcribe their own data. It is cumbersome, yet a critical experience in order to fully understand and analyze the data). I became intimately familiar with responses, participant personalities, and with the dialogue expressed throughout the interview. The entire process directed my analysis as my data transitioned from large blocks of raw data to concise and pertinent points. It was an evolutionary process from thought conception to qualitative research application, data development, and eventually, conclusive findings.

Qualitative research is an avenue to explore data through its complexities and distinctiveness. Instead of concrete numbers in quantitative analysis, I was able to create a narrative of CRJVP natural resource management by weaving in facts from documentation, observations from meetings, and dialogue from interviews to generate an effective tool for future partnerships to examine and potentially model. The entire process allowed me to develop a deeper appreciation and respect for partnership dynamics and the efforts that staff members dedicate into making the partnership work. Additionally, it provided a reverence for the countless complexities of management over spatial and temporal scales.

This research was a snapshot in time for this particular partnership. Even as I write this, the CRJVP has already changed. I captured this information at a pivotal time in the CRJVP when partners were (and still are) re-defining roles and leadership status, in particular, The

Nature Conservancy. Financial factors combined with changing decisions in managing natural resources results in individual institution reassessment and redefining institutional representation in the CRJVP. Individual institutions lessen partner involvement to address site needs first and thus, create confusion as partners try to understand new status roles for themselves and other partners. Financial status of all partners continues to decline; however, each for each institution, it seems to be occurring at various rates, with the state (during this study) exhibiting the greatest financial crisis.

## Limitations

This study was focused on issues specific to wetlands and hydrology of a watershed. Resource management may be different if the study was located in a different geographical region. Wetland management, for example, harbors specific challenges, such as drainage, that may not be applicable to other systems, such as barrens or natural communities found on rocky bluffs. Resource needs will change depending on the resource under scrutiny.

Findings were influenced by the governmental partners involved in this study. Results were limited to this particular case study. Partnerships with other participating institutions and other levels of government may yield different results. A different set of partners or different levels of government may demonstrate contrasting management strategies. The combination of institutions in partnerships is countless, ranging from other federal agencies, such as the Forest Service or National Park Service, to other state agencies, such as the Missouri Department of Conservation or Kentucky Department of Fish and Wildlife Resources, to other non-profit organizations, such as the National Wild Turkey Federation or Quail Forever. Each agency and organization has their own structure, resource allocations, goals, and missions, and would possibly exhibit challenges diverse from the CRJVP. Transferability of methods and findings to

other partnerships may not be feasible with different resource needs and other partner motivations.

Data generation created a wealth of information to analyze. However, there were large portions of data left fundamentally unexplored due to its inapplicability to the research objectives. For example, this study also did not explore community involvement and outreach. While both components are important for all partners, and stated abundantly by several interview participants, the direction of the research objectives did not allow for expansion and interpretation of these findings as part of this thesis.

There are several limitations by liability of the researcher. As stated earlier, the instrument of measure was completed by the researcher instead of a specific measurement tool. Since the interviews followed a semi-structured format, some questions were generated during the interview. Interview questions asked and responses received may not have always geared towards objectives specified in study, especially with interview participants questioned early in the study when the researcher was still attempting to grasp the project essentials. This uncertainty may have led to asking unneeded questions or not asking the "right" questions.

Reponses to interview questions also suggested that participants possessed various interpretations of the questions posed. While there was nothing wrong with their interpretations and in some cases, their responses led to insights not considered, it may have indicated an inconsistency in the data. Further questions may have been too selective or not selective enough in data collection. Inquiries were based on personal motivation and interests and possibly not acknowledging other information of potential importance (Shenton, 2004). Additionally, early analysis began before closing all avenues of data collection, especially noting the pilot study, leading to potential premature closure (Baxter & Eyles, 1997).

The sampling method could have slanted the data. Purposive sampling, the type used in this study, reflected a bias in participant choices. This selection may not have been a reflection of all pertinent perspectives and potentially created gaps in the data by excluding certain individuals thought to have had a lesser role with the CRJVP.

Other possible limitations related to the researcher's role in the study, as expressed in the reflexivity. The parameters of my research objectives yielded narrow interpretations and focused views of the data instead of displaying the overall picture (Groves, 2003). Researcher bias was inescapable due to the nature of asking specific questions and unaccountable interactions among research participants. Interactions, either personal or professional, were inevitable and influenced the data retrieved (Baxter & Eyles, 1997). Professional judgment was impaired by institutional and cultural immersion, especially for interviews and meeting observations (Shenton, 2004). Lastly, reactivity, or the influence of the researcher on the setting or individuals studied, was an unavoidable factor in qualitative methods and noted as possibly skewing results (Maxwell, 1996).

There are several challenges ahead for natural resource managers as economics change and personnel are forced to do more with less. Exploring this process through the eyes of the research subjects has provided insight into institutional characteristics, natural resource management intricacies, and mechanics of how partnerships play a role in implementing natural resource management.

## Conclusion and Recommendations

With diminishing financial budgets and lessening personnel and resources capacity becoming the norm, partnerships pool together resources as partners work collectively in pursuit

of common goals. Combined resources yield greater abilities to complete on-the-ground actions, with the idea that working together is better than working alone. More resources indicate more management capabilities, greater collective thinking to solve problems, and bridging resource gaps. Partners also stand together in a unifying force, bringing strength to each institution involved and backing up decisions with collective efforts. However, there are still challenges which can disrupt collaboration. Management decisions follow institutional mandates and internal orders within their respective institutions. While overarching goals remain compatible, each institution exhibits their own perspective of managing resources. Such discrepancies are not always compatible and can shift institutional interests. Management criteria subject to interpretation exacerbates this divergence, leading to unclear procedures and uncertainty of future management actions. In the current economic crisis, diminishing resources cause institutions to work internally and re-assess values, shifting focus from partnership actions to individual institutional goals, leaving little room for collaboration.

Partners must focus on common goals since they are fundamental principles and the driving force for cooperation. It is also necessary to respect institutional culture and differences. Like any teamwork effort, partnerships will exhibit flaws, but as long as they are acknowledged and accepted, partners can continue to move forward in collaborative efforts. Site management will exhibit variances from landowner to landowner. It is important to continue looking at large scale management as an effective management unit while addressing site by site requirements. Adaptive management is the key to addressing ecosystem dynamics. Natural resources are dynamic and resource managers must adjust management tactics to suit environmental changes over spatial and temporal scales.

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# APPENDICES

APPENDIX A

# Information Form

*Thesis Research Project: Interagency Relationships*

Jennifer Behnken
Southern Illinois University, Carbondale

Purpose

The purpose of this study is to (1) identify interagency relationships on public lands within the Cache River watershed, (2) determine how informal and formal partnership arrangements affect management decisions, and (3) determine agency/organizational characteristics and contributions to the partnership.

Participation

If you choose to take part in this study, you will be asked to participate in semi-structured interviews. These interviews will be audio-recorded and later transcribed so it may be referenced most accurately. Names will be coded to maintain confidentiality unless permission is given to do otherwise. Code listings and data sheets will be kept in separate and secure locations. The tapes and code list will be destroyed upon completion of the research project, approximately two years duration. Observations will also be included, including taking field notes in meetings, field work, and other work-related activities.

Your Rights

Your participation is **voluntary** and you may withdraw from the interviews and/or observations at any time. Please feel free to present any questions or concerns to the interviewer at any time before, during, or after the interview. You do not need to answer any question you do not want to for whatever reason.

Confidentiality

All information gathered from the interviews/observations will be kept in a filing cabinet in a locked office or a locked cabinet at the researcher's residence. Only the researcher or others involved in the research will have access to the records. Neither your name nor any identifying characteristics will be recorded without permission. If any report is publishing using data from this project, **no** information that may make it possible to identify you will be recorded.

Ethical Guidelines

I am committed to following the ethical guidelines for research. Southern Illinois University, Carbondale requires an application for approval for human research participation and approval by the university's Institutional Review Board.

Thank you for your help and support. If you have any questions regarding this study, please feel free to call or e-mail me, 618-453-3341, jenniferbehnken@gmail.com

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Research Development and Administration, SIUC, Carbondale, IL 62901-4709.
Phone (618) 453-4533. E-mail: siuhsc@siu.edu

APPENDIX B

# Personnel Permission Consent Form
# Audio-Taping and Observation

*Thesis Research Project: Interagency Relationships*

Jennifer Behnken
Southern Illinois University, Carbondale

I, _____, agree to participate in this research project conducted by Jennifer Behnken, graduate student in the Forestry Department, Southern Illinois University, Carbondale. I have read the information form and agree to the terms laid out. I understand that my participation is voluntary and that I may refuse to answer any question without penalty. I also understand that my responses to the questions will be audio-recorded, and that these tapes will be transcribed, stored in a locked location in the office or home of Ms. Behnken, and kept for the duration of her research project, approximately two years. Afterwards, these tapes will be destroyed. Interviews will last approximately an hour. All responses will be kept confidential and secured. Only those directly involved with this project will have access to the data. I understand that I may request future changes to the data collected (e.g. modifications, data deletion from project, etc.)

I will also allow Ms. Behnken to observe work-related activities, including meetings, field work, etc. I understand that participation is voluntary and have the right to restrict Ms. Behnken's research observations for the purpose of confidentiality as well as withdraw from the study at any time. I understand all information gathered from her research may be used in a written thesis for the completion of a master's degree in Forestry at Southern Illinois University, Carbondale. All transcriptions and field notes will be coded to maintain confidentiality unless permission to use names is given.

I understand questions or concerns about this study are to be directed to Jennifer Behnken, 618-453-3341, jenniferbehnken@gmail.com or her advisor, Dr. John Groninger, Department of Forestry, 618-453-7462, groninge@siu.edu.

I have read the information above and any questions I asked have been answered to my satisfaction. I agree to participate in this activity and know my responses will be audio-recorded, transcribed, or recorded as field notes. I understand a copy of this form will be made available to me for the relevant information and phone numbers.

"I ____ agree ____disagree to allow Ms. Behnken to conduct an interview."

"I ____agree ____disagree to have my responses recorded on audio tape."

"I ____agree ____disagree to allow Ms. Behnken to quote me in her paper anonymously."

"I ____agree ____disagree to allow Ms. Behnken to contact me for follow-up interviews. "

"I ____agree ____disagree to allow Ms. Behnken to observe me in work-related activities."

Name: (please print) _____ Signature: _____

Date: _____ Agency/organization affiliation:_____

APPENDIX C

# Site Permission Consent Form

*Thesis Research Project: Interagency Relationships*
Jennifer Behnken
Southern Illinois University, Carbondale

I give permission to Jennifer Behnken to conduct research at the establishment:_____ _____ for the purpose of a master's thesis research project. I understand that she will collect interviews from staff members, as well take notes based on her observations on site and associated facultative activities. The name of the establishment and all persons will not appear in my written work unless permission has been granted. I understand all information gathered from her research may be used in a written thesis for the completion of a Master's degree in Forestry at Southern Illinois University Carbondale. I also understand that this information may be later used in conjunction with the publication of academic journal articles or books.

Name: (please print) _____

Signature: _____

Location of establishment: _____

Date:_____

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Research Development and Administration, SIUC, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: siuhsc@siu.edu

APPENDIX D

# Face Sheet for Interagency Relationships Study

# Managers/Staff/Previous Personnel

Date: _____ Location:_____

Interview #: _____ (to be filled in by researcher)

Demographic Information:

Sex: _____

Age: _____

Race/Ethnicity:_____

Education:_____

Occupation/Job Title:_____

Current employer:_____

How long have you worked in your current position?_____

On average, how many hours do you work per week?_____

Where have your worked previously?_____

_____

What agencies/organizations have you worked and/or volunteered with prior to your current position? How long did you work for each agency/organization? _____

_____

_____

Please keep answers brief if possible. Interviews will include further detailed questioning.

Thank you for your participation!

*Please write **N/A** in the space provided if the question does not apply to your current situation.*

APPENDIX E

# Interview Guide: Managers/Staff/Previous Personnel

Work Experiences/Managing Your Site

- Can you walk me through your job responsibilities over the course of a year? What types of actions do you perform for your position?
- What are the specific goals of your site?
- How does your site function within the Cache River watershed?
- Does your site have particular needs for sustainability? Are you interested in the needs being met and those that aren't?
- Have expectations for your site changed over the years? If so, how?

Working as an Individual Agency/Organization

- What are the goals and points of focus for your agency/organization? (e.g. recreation, wildlife management, etc.)
- Are there actions you are required to complete for your agency/organization?
- How does your agency/organization carry out management decisions?
- What sorts of policies or regulations, if any, influence the management of your site?
- What are advantages and disadvantages regarding being a representative of your agency/organization? How is your agency/organization viewed by others?
- Based on your experiences, have you noticed any changes in your agency/organization?

Working as a Cache River Joint Venture Partnership Member

- What are the goals of the Joint Venture Partnership?
- How would you characterize your agency/organization's role and expectations in this partnership?
- Can you give examples of actions or projects you participate in collaboration with your partners?
- Based on your experiences, how has the nature of the partnership evolved?
- Have you noticed any changes in the JVP since you've started working here?

- Can you identify any conflicts that have arisen as a result of differences in management philosophies among the Joint Venture Partnership partners?

Wrap-Up

- What other factors influence your management decisions?
- Is there anything else that I didn't ask you that you think I should know about the JVP, your agency/organization, or your site?
- Can you place identify another individual who differs from your views concerning management of your site?
- Can you please identify another individual who shares your views concerning management of your site?

# VITA

Graduate School
Southern Illinois University

Jennifer A. Behnken

jenniferbehnken@gmail.com

Southern Illinois University Carbondale, Carbondale IL
Bachelor of Music, Performance, May 2007
Bachelor of Science, Forestry, May 2009

Special Awards and Honors:
Member, Xi Sigma Pi National Forestry Honorary Society
Member, Society of American Foresters

Thesis Title:
Natural Resource Management Knows No Bounds: A Case Study of the Cache River Joint Venture Partnership

Major Professor: John W. Groninger