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ECOSYSTEM MANAGEMENT: A CASE STUDY OF THE SHAWNEE
NATIONAL FOREST IN SOUTHERN ILLINOIS, USA**

Nicole Mooar

Southern Illinois University Carbondale, nicolemooar@gmail.com

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UNDERSTANDING NATURAL RESOURCE CONFLICTS AS CAUSES AND
CONSEQUENCES OF THE TRANSITION TOWARDS ECOSYSTEM MANAGEMENT: A
CASE STUDY OF THE SHAWNEE NATIONAL FOREST IN SOUTHERN ILLINOIS, USA

by

Nicole Mooar

B.S., Southern Illinois University, 2019

A Thesis

Submitted in Partial Fulfillment of the Requirements for the
Master of Science Degree

School of Forestry and Horticulture
in the Graduate School
Southern Illinois University Carbondale
August 2023

THESIS APPROVAL

UNDERSTANDING NATURAL RESOURCE CONFLICTS AS CAUSES AND
CONSEQUENCES OF THE TRANSITION TOWARDS ECOSYSTEM MANAGEMENT: A
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A Thesis Submitted in Partial
Fulfillment of the Requirements
for the Degree of
Master of Science
in the field of Forestry

Approved by:

Dr. Kofi Akamani, Chair

Dr. Kristin Floress

Dr. John Groninger

Graduate School
Southern Illinois University Carbondale
June 21, 2023

AN ABSTRACT OF THE THESIS OF

Nicole Mooar, for the Master of Science degree in Forestry, presented on June 21, 2023, at Southern Illinois University Carbondale.

TITLE: UNDERSTANDING NATURAL RESOURCE CONFLICTS AS CAUSES AND CONSEQUENCES OF THE TRANSITION TOWARDS ECOSYSTEM MANAGEMENT: A CASE STUDY OF THE SHAWNEE NATIONAL FOREST IN SOUTHERN ILLINOIS, USA

MAJOR PROFESSOR: Dr. Kofi Akamani

Since the 1980s, approaches to managing forest resources in the US and around the world have been shifting from the conventional sustained yield approach towards ecosystem management. Ecosystem management is a resource management paradigm that seeks to employ a collaborative and multidisciplinary approach to landscape scale conservation, as well as the integration of socio-economic and biophysical considerations with the overall goal of enhancing the health and resilience of coupled social-ecological systems. While the role of natural resource conflicts as drivers of the transition towards ecosystem management has received some research attention, the potential roles of ecosystem management in emerging natural resource conflicts have not been adequately explored. The effective implementation of ecosystem management requires adaptive governance mechanisms capable of integrating diverse stakeholder values and knowledge systems across scales. The absence of such institutional mechanisms could contribute to the emergence of wicked problems – a class of problems that defy clear definitions and definitive solutions. Using the Shawnee National Forest as a case study, the purpose of this qualitative study was to understand the role of natural resource conflicts in the transition towards ecosystem management, as well as the consequences of ecosystem management on emerging resource conflicts. The study also aimed to assess the extent to which the approaches and strategies used in managing natural resource conflicts meet the institutional requirements for

managing wicked problems. In this regard, semi-structured interviews were conducted in 2021 among 24 key informants representing the US Forest Service and relevant stakeholder groups, such as environmental groups, recreationists, and local businesses. The interviews were preceded by a review of documents to understand the context of changing forest policies and evolving conflicts in the Shawnee National Forest since the 1980s. The data were analyzed with the NVivo software using a deductive coding approach. The results showed that the transition towards ecosystem-based forest management in the Shawnee National Forest was primarily triggered by conflicts between environmental groups and the US Forest Service over timber harvesting. Although the institutional framework for alternative dispute resolution existed at the time, these conflicts were largely managed through the national legal system. Since the transition to ecosystem management with the adoption of the 2006 Forest Plan, new conflicts have emerged, this time, mostly among various recreational groups. The lifting of the injunction on timber harvesting and the increased focus of the US Forest Service on active forest management as part of forest restoration efforts appear to have set the stage for the potential re-emergence of conflicts over timber harvesting. Regarding conflict management, the use of alternative conflict management techniques, such as negotiation and mediation have received increased attention since the adoption of the 2006 Forest Plan, although the effectiveness of these processes has been hampered by various institutional and attitudinal constraints, including conflicting procedural requirements, limited capacity, and lack of agency commitment towards meaningful stakeholder engagement. Meanwhile, the fear of lawsuits continues to shape forest management decisions on the Shawnee National Forest. These findings highlight the inadequacy of the national legal system in managing wicked problems and they highlight the need for investments in effective institutional mechanisms for conflict management, such as adaptive governance.

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CHAPTER 1

INTRODUCTION

National Forests in the United States have traditionally been managed with a sustained yield approach that focused on maximizing the output of valuable commodities such as timber. Under the Multiple Use Sustained Yield Act of 1960, forest management goals broadened to encompass the equal consideration of timber output, recreation, fish and wildlife habitat, rangeland, and watershed management (Cubbage et al., 2017; Winkel, 2014). In spite of the change in policy, the continued implementation of the sustained yield approach on public lands faced criticisms as stakeholder values and preferences further shifted to include the need for public education and outreach, restoration, land protection, biological diversity, and stakeholder involvement in decision-making (Behnken et al., 2016; Winkel, 2014; Yaffee, 1996). In view of the changing societal values, lessons from failures in past management practices, and insights from emerging scientific disciplines, the need for a holistic, landscape level approach to forest management emerged as a means of balancing a variety of social, ecological, and economic demands (Behnken et al., 2016; Winkel, 2014; Wondolleck & Yaffee, 2000).

Ecosystem management is a land management approach that encourages resource managers and stakeholders to manage natural resources at the landscape level to achieve integrated goals using collaborative institutional mechanisms and diverse sources of knowledge while maintaining the flexibility to address the complexity and uncertainty embedded within social-ecological systems (Behnken et al., 2016; Chapin et al., 2010; Endter-Wada et al., 1998; Yaffee, 1996). Defining features of ecosystem management include the integration of social concerns into decision-making processes and management goals, as well as the consideration of social systems as integral components of ecosystems (Akamani, 2021; Chapin et al., 2010;

Endter-Wada et al., 1998; Loomis, 2002). However, just like other emerging resource management regimes, the mechanisms by which the successful transition towards ecosystem management could be navigated requires further research attention (Akamani, 2021; Chapin et al., 2010).

The role of natural resource conflicts as drivers of the transition from the sustained yield approach towards ecosystem management has received attention from a number of researchers (Nie, 2003; Winkel, 2014). In furtherance of this line of research, an opportunity exists for exploring the role of natural resource conflicts as causes and consequences of the transition towards ecosystem management. While existing research highlights the role of natural resource conflicts in the transition towards ecosystem management, the potential roles of ecosystem management policies in emerging conflicts require further exploration. For example, the lack of effective institutional mechanisms for the integration of diverse stakeholder values and knowledge systems across multiple scales during the implementation of ecosystem management policies could contribute to the emergence of wicked problems (Akamani et al., 2016; Behnken et al., 2016; Ritchey, 2013). This highlights the need for on-going conflict management processes that address social considerations as an integral part of the implementation of ecosystem management policies (Daniels & Walker, 1996).

National legal systems, customary systems, and alternative conflict management approaches represent three broad approaches to natural resource conflict management and each has its own relative strengths and shortfalls (Matiru, 2000). National legal systems are based on well-defined procedures that are legally binding and capable of managing conflicts at larger scales. However, they tend to involve expensive court procedures, may not be accessible to marginalized groups, and are likely to generate adversarial winner-loser relationships among

conflict parties (Engel & Korf, 2005; Matiru, 2000). Customary systems are more accessible to marginalized groups and offer effective mechanisms for recognizing local customs and values but are subject to influences from powerful external actors and are not always legally recognized (Skutsch, 2000). Alternative conflict management approaches employ negotiation and mediation strategies through multi-stakeholder collaborative processes to manage conflicts outside the national legal system. Although this approach may enhance stakeholder capacity-building and the promotion of consensus around shared interests, the agreements reached may not always be legally binding, and strategies employed may not always be adapted to suit the local context (Matiru, 2000; Skutsch, 2000).

The literature on wicked problems offers additional insights into the complexity of natural resource conflict management in the forestry sector. Forest management entails both biological and social complexity (Allen & Gould Jr, 1986). The uncertainties and conflicts entailed in managing this complexity gives rise to wicked problems (Akamani et al., 2016; Ritchey, 2013). Wicked problems have several defining characteristics, including difficulty of arriving at a definitive formulation of the problem, lack of agreement on preferred solutions, and lack of objective measures of implementation success (Ritchey, 2013; Rittel & Webber, 1973). In the field of recreation management, for instance, wicked problems, such as unmanaged recreation, stem from multiple causes, including increasing populations, amenity migration, urbanization, increased interest in outdoor recreation, and limited financial resources for land management agencies and stakeholders often disagree on the causes and solutions to these problems (Brooks & Champ, 2006). The conventional technical approach to forest management, that often focuses on collecting more data, producing better economic and ecological models for the purpose of maximizing output and solving problems based on assumptions of rationality, is

ill-suited for managing wicked problems (Allen & Gould Jr, 1986). The difficulty with managing wicked problems is that there is no established framework for analysis that addresses multiple sources of complexity (Peters, 2017). Although innovative governance mechanisms, such as adaptive governance, have been argued to have theoretical relevance in the management of wicked problems (Akamani et al., 2016), these relationships have not received enough empirical research exploration. Using the Shawnee National Forest as a case study, this study seeks to address some of these knowledge gaps by exploring the potential role of adaptive governance as an institutional mechanism for managing the wicked problems entailed in forest ecosystem management.

EVOLVING FOREST POLICIES FOR CONFLICT MANAGEMENT

The United States Forest Service (Forest Service) is subject to several lengthy and expensive lawsuits every year as a result of public dissatisfaction with forest management and planning approaches (Wells, 2014). Although the Forest Service implements forest management based on several laws, this section discusses the evolving approaches to the management of forest conflicts by focusing on four laws and directives: Multiple Use Sustained-Yield Act of 1960, National Environmental Policy Act of 1969, National Forest Management Act of 1976, and the recent 2012 Planning Rule. The discussion highlights the shortfalls in approaches to conflict management under these legislations and the need for an alternative approach to managing wicked problems.

Multiple Use Sustained-Yield act of 1960

The Multiple Use Sustained-Yield Act of 1960 (MUSYA) provided the legal mandate for national forests to be managed for the joint provision of outdoor recreation, rangeland, timber supply, watershed resources, and fish and wildlife habitat (Ruhl & Salzman, 2020). The concept

of managing for multiple uses served as a means of balancing a broad range of public interests and values. Managing for multiple uses requires the Forest Service to give equal consideration to each of the major resource use categories without giving priority to any particular use (Cubbage et al., 2017; Loomis, 2002). Through this legislation, the provision of recreational opportunities on national forest lands became recognized as a legitimate land use that is just as important as timber harvesting and other forms of extractive uses (Bates, 1993; Cubbage et al., 1993). While MUSYA appeared to represent a shift in the focus of forest policy, the guiding principles behind this legislation included the conventional belief that the efficient and sustainable management of forest resources required the sole discretion of technical experts (Bates, 1993). As such, no explicit mechanisms for reconciling conflicts in diverse stakeholder values were provided in the legislation (Cubbage et al., 1993). Instead, the implementation of MUSYA may have re-enforced the dominance of the national legal system as an approach to managing conflicts stemming from the continued emphasis of the Forest Service on timber production in spite of increasing public demands for recreational opportunities and other non-extractive uses (Bates, 1993; Cubbage et al., 1993)

National Environmental Policy Act of 1969

The National Environmental Policy Act of 1969 (NEPA) requires all federal agencies, including the Forest Service, to analyze the environmental impacts that could result from a proposed management action on federal land prior to making a decision (Steelman & Ascher, 1997). During the decision-making process, the procedural framework established by NEPA requires the Forest Service to communicate the purpose for a proposed management action, provide alternatives to the proposed management action, include interdisciplinary analysis of the effects of management in the form of a draft environmental impact statement (EIS), and provide

an opportunity for public comments before carrying out an action (Stern et al., 2010). However, this detailed analysis and extensive public involvement associated with the preparation of EIS is only required where a proposed management action is likely to have significant environmental impacts. In situations where the agency is not sure whether a proposed action will have significant environmental impacts, an Environmental Assessment (EA) is required, and this entails limited analysis and stakeholder involvement. Moreover, proposed actions that are considered not to have significant environmental impacts are placed under Categorical Exclusion and the NEPA process does not apply in those instances (Benson & Garmestani, 2011)

The effective implementation of the NEPA process may help tailor forest management decisions to specific local contexts, thereby addressing local needs and concerns (Wells, 2014). Also, when implemented in an effective manner, the opportunities for information sharing and stakeholder involvement in NEPA processes could potentially reduce the incidence of conflicts in the management of national forests. However, a key shortfall of NEPA as a conflict management mechanism is the lack of procedural guidelines that guarantee meaningful public involvement. There are discrepancies in how much influence the public holds over a final decision and it is up to the decision-makers of individual national forests to decide the level of public input and technical analysis required in each situation (Wells, 2014). Moreover, the implementation of the NEPA legislation largely focuses on the procedural aspects of the original legislation, as decision-makers are not required to choose the most suitable management option (Benson & Garmestani, 2011). In all, the national-legal systems has continued to serve as an avenue for managing conflicts stemming from the NEPA implementation process, particularly those between environmental nongovernmental organizations (NGO) that are dissatisfied with the process and outcomes of the NEPA process and the Forest Service that is seeking to limit the

need for detailed analysis and extensive stakeholder involvement in some of its management efforts (Wells, 2014).

National Forest Management Act of 1976

The National Forest Management Act of 1976 (NFMA) requires each national forest unit to prepare a long-term forest management plan using decision-making processes that meet the NEPA requirements for public involvement (Cubbage et al., 1993). As part of the NEPA requirements, the process for preparing the forest management plans must also include the preparation of EIS for proposed management actions whenever necessary (Loomis 2002). As part of this process, NFMA requires public participation in developing, reviewing, and revising the national forest management plans (Steelman & Ascher, 1997). Adopted in response to the continuous litigation against timber harvesting, NFMA re-affirmed the need for a multiple use approach to managing national forest lands (Cubbage et al., 2017). In this regard, the legislation placed limitations on timber harvesting practices by limiting where clear-cut harvesting could be undertaken, requiring forest regeneration as a component of harvesting, requiring that harvesting areas maintain biological diversity, and limiting the use of even-aged management on national forests (Tuholske & Brennan, 1994). Although NFMA mandates the use of public input in the decision-making process of national forests, the process for plan preparation follows a rational-comprehensive planning approach and this limits opportunities for stakeholder involvement and fails to address the wicked problems entailed in forest management (Allen & Gould Jr, 1986). As such, dissatisfaction with the planning and management process continues to lead to litigation and judicial review (Steelman & Ascher, 1997). Without clear guidance on conflict management under NFMA, environmental NGOs and the Forest Service continue to rely on the national legal system to resolve conflicts.

2012 Planning Rule

NFMA requires the Secretary of Agriculture to establish a planning rule to regulate the planning process for the development and revision of national forest management plans. The first planning rule was completed in 1982 with updates occurring in 1990, 2000, 2005, and 2008. These updates resulted in litigation and were eventually abandoned, leaving the 1982 planning rule in effect until a new planning rule was adopted in 2012 (Haber, 2015). The 2012 planning rule describes a cyclical approach to forest management that incorporates monitoring and plan revision based on new information to allow for the flexibility to adapt to change (Ryan et al., 2018). Besides monitoring the ecological effects of forest management plans, continuous monitoring and flexibility allows for amending and revising forest plans in response to changing societal values and preferences. The planning rule also requires that forest planners consider “opportunities to resolve or reduce conflicts, within the context of developing the plan’s desired conditions or objectives” (36 CFR Part 219). Moreover, the 2012 also requires public participation at various stages of the planning process, ranging from the period before, during and after plan preparation, as well as during the stages of monitoring and evaluation (McKinney & Johnson, 2015). The expectation is that the numerous opportunities for public comment and involvement before a plan is approved will provide avenues for resolving emerging conflicts before the management actions are implemented (36 CFR Part 219).

There have been few studies conducted on the efficacy of the 2012 planning rule, as a majority of management plans using the 2012 guidelines are being developed or are in the early stages of implementation (Ryan et al., 2018). Although the 2012 planning rule incorporates useful tools for conflict management in forest planning processes, there are still issues of unclear management approaches and ambiguous definitions. For example, as with the previous

legislation for national forest management, subjectivity and discrepancies in interpretation and implementation of the 2012 planning rule may limit its utility as a tool for alternative conflict management, thereby perpetuating the use of litigation and judicial review through the national legal system as mechanisms for managing forest conflicts (Haber, 2015).

DESCRIPTION OF STUDY AREA

The study took place in the Shawnee National Forest in southern Illinois, the largest publicly owned forested area in Illinois. The Shawnee National Forest was established in the 1930s from reclaimed farms and deforested lands and currently encompasses about 284,000 acres of primarily mixed hardwood forest between the Ohio River and the Mississippi River. There are over 2,755 identified heritage-sites as well as diverse, high quality wildlife habitat for over 500 vertebrate species. Visitors have access to scenic areas, diverse ecosystems, a variety of recreation opportunities, and education and research opportunities. In managing multiple uses, the Shawnee also serves as a source of timber for the local and national economy (*Final Environmental Impact Statement and the Land and Resource Management Plan: Shawnee National Forest*, 2006)

The Shawnee National Forest, under the jurisdiction of the Forest Service, was the setting of timber harvesting conflicts during the early 1990s. The Land and Resource Management plan that was adopted in 1992 prioritized commercial timber harvesting as a management goal (*Final Environmental Impact Statement and the Land and Resource Management Plan: Shawnee National Forest*, 2006). This was a period when timber harvesting practices were heavily scrutinized nation-wide and often resulted in escalated levels of conflict including protests and obstruction (Allen & Gould Jr, 1986; Winkel, 2014). The ongoing conflict led to a judicial intervention with an injunction being placed against timber harvesting in the Shawnee National

Forest in 1996. Subsequently, the focus on timber harvesting in the previous plan shifted to the maintenance of forest health and sustainability with the adoption of the 2006 Land and Resource Management plan (*Final Environmental Impact Statement and the Land and Resource Management Plan: Shawnee National Forest*, 2006). Thus, the conflicts that occurred in the 1990s could be considered as catalysts for the shift in forest management approach from a sustained yield approach to the ecosystem management approach that was embraced in the 2006 Land and Resource Management plan (Floress & Akamani, 2017).

However, there appears to be continued disagreements among stakeholders over the implementation of the ecosystem approach in the Shawnee National Forest. There are groups that oppose the use of timber harvesting and vegetation management as tools to promote forest health and ecological restoration as part of the ecosystem management approach. Stakeholders continue to express concerns regarding water quality, migratory bird habitat, and decreased recreation opportunities and wish to “let nature take its course” (*Final Environmental Impact Statement and the Land and Resource Management Plan: Shawnee National Forest*, 2006). In accordance with NFMA legislation that requires the Forest Service to update forest management plans every 10-15 years, the injunction on timber harvesting was lifted in 2013 following a review of the 2006 Land and Resource Management plan. Thus, the stage appears to be set for the further escalation of ongoing conflicts on the Shawnee National Forest (Floress & Akamani, 2017).

RESEARCH QUESTIONS

1. What types of conflicts occurred on the Shawnee National Forest prior to the implementation of ecosystem management, and in what ways did these conflicts play a role in the transition process toward ecosystem management?

2. Who were the participants involved in the forest conflicts on the Shawnee National Forest during the transition toward ecosystem management, and what were their motivations for involvement?
3. What conflict management approaches were employed, and what outcomes have resulted from the forest conflicts that occurred in the 1990s?
4. How have conflict management approaches changed since the conflicts in the 1990s?
5. To what extent do current mechanisms for managing conflicts on the Shawnee National Forest meet the requirements for an adaptive governance approach to managing wicked problems?

OVERVIEW OF RESEARCH METHODS

This study sought to understand the relationship between ecosystem management and natural resource conflicts on the Shawnee National Forest by using a qualitative research approach. In this regard, the constructivist research paradigm (Guba & Lincoln, 1994; Ponterotto, 2005) served as the foundational assumption for designing the study to capture the diverse meanings participants associate with ecosystem management and its relationship with the incidence of forest conflicts. A case study methodology was used to allow for the generation of multiple sources of data to understand the phenomenon of interest within a bounded context (Creswell et al., 2016). Data were collected through semi-structured interviews, and observations, as well as the review of documents. The data were analyzed using a deductive coding approach (Leech and Onwuegbuzie 2008).

THESIS OUTLINE

In the next chapter of the thesis, a review of the current literature on natural resource conflicts, wicked problems, and natural resource conflict management approaches shall be

presented. The chapter also outlines the analytical framework for the thesis by exploring the potential roles of adaptive governance in managing wicked problems. Next, chapter three will provide further details on the methods for data collection and analysis. Following that, chapter four will present the results of the study. And in chapter five, key findings from the study shall be discussed within the context of the broader literature. Potential areas of future research and the policy implications of the study shall also be discussed in this chapter.

CHAPTER 2

LITERATURE REVIEW

Natural resource management involves multiple groups with different values, goals, and perspectives. These differences often result in the escalation of conflicts where effective mechanisms for conflict management are not available. This chapter will review the relationships between natural resource conflicts, wicked problems, and conflict management approaches. The chapter will begin with a discussion on natural resource conflicts and their causes, as well as strategies and approaches for managing them. Next, the concept of wicked environmental problems will be presented as a more appropriate descriptor of natural resource conflicts. Following this, the latter part of the chapter will draw from the literature on resilience and adaptive governance to discuss mechanisms for managing wicked environmental problems. Concluding remarks will then be provided at the end of the chapter.

NATURAL RESOURCE CONFLICTS

Definitions

Natural resource conflicts are disagreements over the access, control, and use of natural resources (Matiru, 2000). These conflicts often involve two or more parties that attempt to achieve their own goals at the expense of others (Adams et al., 2003). Stakeholders have different perspectives, experiences, and understandings that can lead to incompatible goals (Yasmi et al., 2012). Increasing populations, urbanization, and expansion of agricultural lands are some of the factors that can also trigger conflicts in forest management, resulting in hostility, distrust, and violence among stakeholders (Yasmi et al., 2009). Because conflict is unavoidable, there is the need for mechanisms for anticipating potential conflicts, proactively addressing underlying causes, and working towards a wise, amicable, and efficient conflict resolution. This

will require collaboration, negotiation, and transparency among groups before the conflicts escalate and result in potentially undesirable outcomes (Yasmi et al., 2009).

Causes

As has been noted in the introductory chapter of this thesis, changing resource management paradigms constitute some of the fundamental sources of natural resource conflicts. Since the 1990s, there has been a shift in resource management approaches away from the sustained yield forest management paradigm towards ecosystem management that prioritizes the health and resilience of ecosystems (Behnken et al., 2016; Winkel, 2014). Changes in societal values in favor of ecological concerns, new insights from scientific disciplines, and experience from failures in past resource management approaches all account for this shift (Floress & Akamani, 2017). This change in ideals could lead to conflicts between communities and government agencies about how to manage public lands. For instance, under the ecosystem management paradigm, the increased support for policies aimed at reducing timber harvesting practices on public land often leads to conflicts with historically timber-dependent communities surrounding public lands in the western part of the United States (Winkel, 2014).

Institutional constraints, the factors that impede the effective and efficient performance of institutions, can constitute sources of natural resource conflicts. For instance, centralized institutions employ a top-down approach to decision-making that often provide limited opportunities for stakeholder involvement and coordination across sectors. Centralized institutions are also likely to ignore issues of local property rights and indigenous land management practices, and they may also lack the resources and expertise for effective conflict management. All of these constraints are likely to increase the tendency for conflict escalation in the resource management process (Matiru, 2000; Yasmi et al., 2012).

Closely related to the previous point, conflicts can also arise from the dominance of formal institutional mechanisms that fail to recognize informal institutional arrangements for resource management (Matiru, 2000). For instance, government policies may fail to recognize informal agreements regarding boundaries and access, and this can further intensify conflict between local users and government agencies. The enforcement of policies that prioritize resource extraction by outside commercial interests while excluding local communities frequently leads to conflicts that could have been avoided through participatory planning and communication with local users (Yasmi et al., 2013).

Differences in the attributes of stakeholders and resource management agencies, particularly differences in knowledge systems can also lead to misunderstandings about the key issues involved in the resource management process (Adams et al., 2003). Stakeholders come from diverse backgrounds, with different perspectives, values, and goals, and hold diverse systems of knowledge, ranging from scientific knowledge to local and indigenous knowledge systems that are rooted in firmly held beliefs (Adams et al., 2003). These cognitive differences may provide a deeper understanding about the remote causes of disagreements among stakeholders (Adams et al., 2003; Derkyi et al., 2014; Yasmi et al., 2012).

Natural resource conflicts may also occur due to policies that are based on a poor understanding of community complexity (Agrawal & Gibson, 1999). Decision-makers may fall into the trap of assuming all members of a community hold the same values, which can lead to the misidentification of key stakeholders, leaving underlying issues unaddressed, or assuming a single solution can apply to different communities (Skutsch, 2000). The socio-cultural context of communities shapes not only the interpretation of conflicts but also the choice of conflict management strategies (Yasmi et al., 2009). Failure to recognize the context-dependent nature of

what constitutes a preferred conflict management approach or strategy could potentially lead to failed interventions.

Another important driver of conflicts is the lack of trust among stakeholders in the resource management process. Past forest management policies have resulted in distrust between stakeholders and management agencies in many instances. This distrust acts as both a byproduct of past conflict as well as a driver of continuing and future conflicts. Distrust functions as an obstacle in finding common ground and consensus and undermines potentially constructive policy debates. When distrust drives conflict, there is often little interest in collaborative management, and this limits opportunities for innovative policies and experimental problem solving. One example of distrust working as a product and a driver of conflicts comes from the Forest Service's use of forest health, stewardship, and restoration to promote harvesting in National Forests. Regardless of what the science says, these terms are perceived by the public as a cover to re-enact commercial logging and are often the source of escalated conflict (Nie, 2003).

Finally, natural resource conflicts are often the outcome of broader political processes. Environmental problems are often used as a placeholder for wider political issues. Politicians co-opt environmental issues to drive larger, more controversial cultural conflicts. For instance, the debate of preservation versus resource conservation, recreation versus extraction, urban versus rural issues, and states' rights versus federalism all come into play when approaching natural resource management. Knowledge on these surrogate issues is useful when trying to understand the underlying issues behind natural resource conflict (Nie, 2003).

MANAGING NATURAL RESOURCE CONFLICTS

Not all conflicts are bad, and the way conflicts are managed determines whether the outcomes are positive or negative (Nie, 2003). In situations where effective conflict management

mechanisms are employed, the process can lead to various positive outcomes, including improved relationships and trust among conflict parties (Yasmi et al., 2009). Conflicts can also be harnessed as catalysts for promoting positive change, such as designing more inclusive policies (Yasmi et al., 2013). Alternatively, failure to address conflict during the decision-making process can lead to escalation, disruption, and violence (Winkel, 2014; Yasmi et al., 2009). Dealing with the fallout of unaddressed conflict will likely be more expensive than adjusting decision-making processes to work through anticipated conflicts before they escalate (Yasmi et al., 2013). This section discusses the range of conflict management strategies and approaches as well as their relative strengths and weaknesses.

Conflict Management Strategies

Stakeholders and decision-makers often manage natural resource conflicts using a variety of strategies: avoidance, coercion, arbitration, adjudication, mediation, and negotiation. The choice of strategy is based on the perceived likelihood of success, available options, and the relationship between parties (Matiru, 2000).

With avoidance, conflicting parties act in a manner that keeps conflicts from becoming publicly acknowledged (Matiru, 2000). In their analysis of forest conflicts in Asia, Yasmi et al. (2012) found the longstanding use of avoidance as a conflict management strategy in the East Kalimantan province of Indonesia. The authors attributed this to the power imbalance during Soeharto's authoritarian regime in which dissenting views from communities were repressed. Derkyi et al. (2014) also found in their analysis of forest conflicts in Ghana that avoidance was part of the strategies communities employed in most conflicts between the communities and the Forest Services Division, a government agency. While these findings suggest that avoidance may be more commonly used by less powerful actors, Sanginga et al. (2007) also found in their

analysis of resource conflicts in Uganda that avoidance tends to be used in conflicts on issues that are considered trivial and not worth the cost of public acknowledgment.

Coercion as a conflict management strategy entails the use of threats or force to pursue one's goals (Matiru, 2000). In their analysis of the forest conflicts in Asia, Yasmi et al. (2012) found the widespread use of coercion, with at least one conflicting party in five out of the seven cases that were studied employing this strategy. In Derkyi et al's (2014) study of forest conflicts in Ghana, both violent and non-violent forms of coercive strategies were recorded, and these strategies were used in conflicts among community members, as well as those between communities and external actors, such as the Forest Services Division.

Negotiation is a voluntary process where parties reach an agreement through consensus (Matiru, 2000). Negotiation processes are widely used due to their potential to resolve conflicts in an efficient, effective and amicable manner (Fisher et al., 2011). In their analysis of forest conflicts in Asia, Yasmin et al. (2012) found that in all the cases that were studied, conflicting parties attempted negotiation as a conflict management strategy. However, the authors also found that negotiation processes were more successful in cases where co-management arrangements already existed. This suggests that the success of negotiation processes depends on the availability of institutional structures that ensure the sharing of power among actors.

Closely related to negotiation, mediation as a conflict management strategy involves the use of a third party to facilitate agreements through negotiation processes, although the mediator lacks the authority to impose a solution on the conflicting parties (Matiru, 2000). In the analysis of the forest conflicts in Asia, Yasmi et al. (2012) found that mediation was often used in cases where attempts at negotiation had failed. The authors also found that in cases where government officials served as mediators, community members perceived a bias in favor of commercial

interests (resource extraction companies), and hence, sought the use of alternatives, such as non-governmental organizations. Like negotiation processes, the authors found that cases that pursued negotiation in a co-management context were more successful. Similarly, Derkyi et al. (2014) found that mediation was employed as a strategy for managing forest conflicts in Ghana in situations where negotiation processes had failed. Mediators included resource managers, traditional leaders, and local government officials.

In arbitration, conflicting parties submit the conflict issues to an agreed upon neutral party who reviews the issues and makes the final decision (Matiru, 2000). In Ghana for instance, Derkyi et al. (2014) found that arbitration is often used as a conflict management strategy after mediation processes have failed. In such situations, the third party could be a government agency with political mandate over the conflict issue or an arbitration team composed of representatives of each of the conflict parties.

Adjudication as a conflict management strategy involves situations where conflicting parties rely on a judge or an administrator who makes a legally binding decision (Matiru, 2000). In their analysis of forest conflicts in Ghana, Derkyi et al. (2014) found that adjudication was usually used as the last resort after arbitration and other strategies had failed. Even then, the use of adjudication (such as the arrest, prosecution, and fining of offenders) was limited to conflicts involving the illegal harvesting of timber rather than being used to address all types of conflicts. The authors noted that most conflicts involving local communities and external actors often do not end up in court due to limited funding and other community capacity constraints, elite interference in court decisions that favor communities, favoritism towards commercial timber interests, and the frequent adjournment of court cases among other challenges.

Conflict Management Approaches

The previous section of this chapter discussed various strategies used in natural resource conflict management. These strategies can further be categorized under three broad institutional mechanisms for managing conflicts, i.e., conflict management approaches: national legal systems; customary systems; and alternative conflict resolution methods (Engel & Korf, 2005; Matiru, 2000; Skutsch, 2000). This section elaborates on these conflict management approaches.

National Legal Systems

National legal systems comprise the use of legislation and policies that are administered through regulatory and judicial mechanisms (Engel & Korf, 2005). Adjudication and arbitration are the conflict management mechanisms that are employed under the national legal system (Matiru, 2000). The use of national legal systems in conflict management offers several advantages, including arriving at decisions that are legally binding, accounting for national and international concerns in the decision-making process, using judicial and technical specialists in decision-making, relying on formal, well-defined procedures for conflict management, and providing institutional safeguards for less powerful conflict parties (Engel & Korf, 2005; Matiru, 2000). However, national legal systems have also been associated with a number of shortfalls, such as limited access by marginalized groups, neglect of indigenous knowledge and local institutions, lack of capacity for participatory decision-making, and potential escalation of conflicts due to adversarial winner-loser outcomes that may fail to address community goals (Engel & Korf, 2005; Matiru, 2000; Skutsch, 2000). National legal systems are also prone to corruption, and the elitist nature of the process tends to favor businesses and governments over local communities (Engel & Korf, 2005). Local communities frequently feel as if legal procedures fail to support their goals and may turn to other informal methods such as coercion or

violence (Skutsch, 2000). Court proceedings can become lengthy and expensive; they can also cause more hostility and conflict by suppressing open communication and collaboration.

National policies also run the risk of being subjective and vague with different interpretations depending on the decision-maker (Broussard & Whitaker, 2009).

Customary Systems

Customary systems refer to informal processes for conflict management that have evolved within and across communities over time, some of which may be rooted in pre-colonial systems (Matiru, 2000; Skutsch, 2000). These systems usually rely on the moral authority of traditional institutions for their enforcement (Skutsch, 2000). A variety of conflict management strategies are employed under customary systems, ranging from mediation, negotiation, and arbitration, to the use of peer pressure, ostracism, supernatural sanctions, and violence (Engel & Korf, 2005; Matiru, 2000). Customary systems of conflict management offer a number of benefits, including recognition of local values and customs, promotion of collaboration among community groups, enhancement of community empowerment, and facilitation of access to, and ownership of the decision-making process and its decision outcomes (Engel & Korf, 2005; Matiru, 2000). However, the effectiveness of customary systems of conflict management may be threatened in the face of declining traditional institutions, increasing community heterogeneity, and growing influences from powerful external actors (Sanginga et al., 2007; Skutsch, 2000). The legitimacy of customary systems may also be threatened by the lack of legal recognition, as well as the pursuit of self-interest by traditional leaders (Engel & Korf, 2005; Matiru, 2000). Moreover, customary systems may not always be equitable as they can be inaccessible to marginalized groups on the basis of gender, caste and other factors (Engel & Korf, 2005; Skutsch, 2000).

Alternative Conflict Management

Alternative conflict management is a voluntary approach to managing conflicts that relies on negotiation and mediation strategies to promote joint decision making (Matiru, 2000; Skutsch, 2000). As a response to the adversarial nature of the national legal system, decisions in alternative conflict management processes are made based on consensus with the aim of advancing the shared interests of the conflict parties (Engel & Korf, 2005; Matiru, 2000). The process also builds on existing customary conflict management strategies to promote a flexible and cost-effective approach to managing conflicts (Engel & Korf, 2005). Ideal forms of alternative conflict management occur within collaborative processes and these provide opportunities for capacity building and the promotion of a sense of ownership among conflict parties (Engel & Korf, 2005; Matiru, 2000).

In spite of its benefits, alternative conflict management is subject to the influence of deep-rooted power imbalances and this limits its potential to address structural inequalities (Engel & Korf, 2005; Skutsch, 2000). There may also be difficulties in reaching all key stakeholders due to misidentification of conflict parties or lack of interest in participation (Engel & Korf, 2005; Matiru, 2000). The informal and voluntary procedures employed under alternative conflict management also raise concerns regarding the unclear legal status of agreements and difficulties in applying decisions at larger scales (Matiru, 2000; Skutsch, 2000).

WICKED PROBLEMS

The reason natural resource management repeatedly results in conflict is because of the ambiguity, uncertainty, and complexity associated with environmental problems. The management of natural resources is marked by wicked problems because it involves multiple actors at multiple scales who hold potentially conflicting values and utilize diverse sources of

knowledge (Allen & Gould Jr, 1986; Rittel & Webber, 1973). When dealing with wicked problems, there is no way to fully evaluate a potential solution before implementation, and every attempt at solving the problem will leave lasting impacts that can develop into their own, separate wicked problems (Rittel & Webber, 1973). It is often difficult to reach an agreement on the definition of wicked problems, as the framing of the problem is tied to the moral, political, and professional perspectives of the policy participants (Brooks & Champ, 2006; Ritchey, 2013; Rittel & Webber, 1973).

Wicked problems cannot be adequately managed with the traditional rational-comprehensive planning process that emphasizes the rigorous application of the scientific method in identifying and solving societal problems (Akamani et al., 2016; Allen & Gould Jr, 1986). The conventional technical approach to forest management typically seeks to collect more data, produce better models, emphasize optimization, and solve problems based on rationality. As Allen and Gould (1986) have argued, simply gathering and analyzing more data does not lead to better management when dealing with the wicked problems that stem from the social and ecological complexity of forest management. Forest management problems, such as unmanaged recreation stem from multiple causal factors, including increasing populations, amenity migration, urbanization, increased interest in outdoor recreation, and dwindling resources of land management agencies, all of which contribute to creating wicked problems (Brooks & Champ, 2006). Leaving wicked problems unaddressed has consequences that may include conflict escalation with potentially negative implications for the attainment of sustainable resource management goals. The challenge with wicked problems is that there is no established framework for analyzing and effectively managing them (Peters, 2017). Inspired by views expressed in Akamani et al. (2016) among others, the remaining sections of this chapter draw

from the literature on resilience and adaptive governance to provide new insights for understanding and managing wicked problems.

RESILIENCY

Social Ecological Systems

National Forests across the US have traditionally been managed from a utilitarian perspective to ensure a consistent supply of economically valuable forest products (Winkel, 2014). However, changing societal values in recent decades have triggered a shift toward ecosystem management to promote healthy and resilient ecosystems (Broussard & Whitaker, 2009). A useful way to enhance the successful implementation of ecosystem management is to conceptualize National Forests as social-ecological systems in which human and natural components interact as inter-dependent systems across multiple spatial and temporal scales (Liu et al., 2007). Social-ecological systems are systems in which human constructs, such as community, economy, and society, are embedded within ecological processes (Folke, 2016). Social-ecological systems behave as complex adaptive systems, and are characterized by uncertainty, heterogeneity, surprises, and reciprocal feedback loops (Liu et al., 2007). Policies based on the separation of the social components from environmental processes are unlikely to be successful due to failure to account for the interconnectedness of social-ecological systems (Folke, 2016).

Resilience

The sustainable governance of social-ecological systems can be approached through a resiliency perspective that focuses on understanding and enhancing the capacity of social-ecological systems to respond to drivers of change, such as social conflicts (Akamani et al., 2016; Folke, 2016). Resilient systems can absorb changes through adaptation and transformation

without destabilizing their structures and functions (Folke, 2016). Adaptability refers to the capacity of systems to proceed on the current pathway by learning, innovating, and adjusting as a response to drivers of change (Akamani, 2020; Folke et al., 2010). Transformability is the capacity of a system to shift toward emerging pathways or create new ones when the existing system becomes undesirable (Folke, 2016; Folke et al., 2010; Olsson et al., 2014). If conflicts are addressed in a positive manner as an opportunity to learn, it can serve as a catalyst for adapting or transforming to new social-ecological processes (Dietz et al., 2003).

Adaptive Governance

Adaptive governance is one of the innovative governance mechanisms that embraces uncertainty and complexity in social-ecological systems (Akamani, 2020; Dietz et al., 2003; Folke et al., 2005). It is appropriate for managing social-ecological systems because it relies on multiple-level institutions that connect actors across scales to enable collaborative, flexible, and learning-based approaches to managing complex ecosystems (Akamani, 2016; Olsson et al., 2006). Adaptive governance is a continuous decision-making process that promotes resilience in social-ecological systems, and its key features include adaptive management, analytic deliberation, polycentric governments, and institutional variety (Akamani et al., 2016; Akamani & Wilson, 2011; Dietz et al., 2003).

Adaptive management is a systematic approach to natural resource management that aims at addressing uncertainty and building resilience through learning (Akamani, 2016; Allen et al., 2011). Learning in adaptive management occurs in multiple ways but can be enhanced through active adaptive management that involves experimentation and monitoring (Akamani, 2016; Allen et al., 2011; Holling & Meffe, 1996). The adaptive management process operates in a cyclical manner and includes decision-making and implementation based on the best available

information, monitoring to generate data, and integration of new knowledge into subsequent management practices (Allen et al., 2011; McLain & Lee, 1996). Adaptive management represents a shift away from the traditional command-and-control approach to natural resource management that aims at maintaining stability and predictability rather than embracing uncertainty and change (Akamani, 2016; McLain & Lee, 1996).

Besides adaptive management, another important feature of adaptive governance is analytic deliberation, a process that combines scientific analysis with public deliberation to ensure that good decisions are made based on the best available science and informed by diverse values (Akamani, 2016; Dietz, 2013). Given the ineffectiveness of conventional technical analysis in the resolution of wicked problems, analytic deliberation provides a more promising alternative to managing wicked problems through the explicit recognition of the diversity of knowledge systems and values held by policy participants (Akamani et al., 2016). Analytic deliberation also enhances social learning and trust by bringing stakeholders with different knowledge backgrounds and values together to discuss management priorities and strategies (Dietz, 2013; Dietz & Stern, 1998).

Polycentric governance systems are composed of multiple governing authorities across multiple scales with some degree of autonomy and diversity at each level (Ostrom, 2010). Such governance systems promote a nested institutional structure that works across scales from local agencies to national governments, and, ideally, to global agreements (Dietz et al., 2003; Ostrom, 2010). Polycentricity creates a diverse set of options for decision-making within social-ecological systems, and the nested institutional structure ensures that decisions made at the local level are appropriate for the social context (Akamani et al., 2016; Folke et al., 2005). Insights from Panarchy Theory suggest that nested institutions enable localized governments and

agencies to innovate and experiment while the larger institutional structure provides the stabilization that can absorb potential risk (Holling, 2001). As experimentation occurs, successful outcomes are communicated across scales that become a component of the larger institutional structure (Holling, 2001). Polycentricity faces drawbacks due to increased costs and difficulties of coordinating between multiple jurisdictions, as well as the fragmented authority in such systems that creates challenges when dealing with issues at larger scales (Akamani, 2016; Akamani, 2021; Koontz et al., 2015).

Institutional variety is another important feature of adaptive governance. Adaptive governance entails the coordination of the roles of a variety of institutions, including states, markets, and communities (Akamani & Wilson, 2011). This diversity of institutions provides an assortment of mechanism for incentivizing rule compliance, mobilizing and sharing information, as well as implementing decisions and monitoring outcomes (Akamani et al., 2016; Dietz et al., 2003). The use of a variety of institutional mechanisms addresses the challenges associated with the over-reliance on conventional top-down, centralized institutional structures that lack the flexibility and capacity to address uncertainties in social-ecological systems (Akamani, 2016). The use of a diversity of institutional mechanisms in adaptive governance systems also builds insurance against failures associated with any single type of institutional mechanism (Akamani & Wilson, 2011).

MANAGING NATURAL RESOURCE CONFLICTS AS WICKED PROBLEMS USING RESILIENCY AND ADAPTIVE GOVERNANCE

The conflicts that emerge in natural resource management qualify as wicked problems due to the complexity resulting from the knowledge uncertainties and diversity of values that characterize them (Akamani et al., 2016; Allen & Gould Jr, 1986; Ritchey, 2013). There are

similarities between the characteristics of wicked problems and social-ecological systems, which suggests that the best way to manage the wicked problems and conflicts that arise in natural resource management is to treat them as a component of social-ecological systems (Akamani et al., 2016). Like social-ecological systems (Folke, 2016; Olsson et al., 2014), wicked problems are unique to the local context (Brooks & Champ, 2006; Rittel & Webber, 1973). Wicked problems also exhibit other attributes of social-ecological systems, including cross-scale interactions, non-linear interactions among system components, surprise and uncertainty, and path-dependency (Akamani et al., 2016).

Several recommendations have been proposed in the literature for the management of wicked problems, and they include acknowledging complexity, enabling stakeholder involvement to accommodate multiple perspectives, providing transparent information, building trust and consensus, and utilizing a continuous decision-making and implementation process (Akamani et al., 2016; Peters, 2017; Ritchey, 2013). Thus, it appears that the adaptive governance approach that has been effective in managing social-ecological systems (Dietz et al., 2003; Folke, 2016), could readily be used to manage wicked problems (Akamani et al., 2016). The key features of adaptive governance, such as analytic deliberation, polycentric institutional structures, and adaptive management seem sufficient in meeting the requirements for managing wicked problems (Akamani et al., 2016; Dietz et al., 2003).

The social component of natural resource management makes these problems wicked, and better decisions are made when stakeholder concerns are considered through analytic deliberation (Akamani et al., 2016; Dietz, 2013). The traditional approach of rational-comprehensive planning does not integrate human values and goals. Under an adaptive governance approach, the process of analytic deliberation would allow stakeholders to integrate

their perspectives into the decision-making process (Akamani et al., 2016). This process would satisfy the need to accommodate multiple perspectives, promote group interaction, and consensus building as required for managing wicked problems (Ritchey, 2013).

Wicked problems require adaptation, as there is no stopping rule or criteria for success, and adaptation is enabled through nested, polycentric institutions where actors at lower scales have the opportunity to experiment and innovate (Dietz, 2013; Folke, 2016; Holling, 2001; Peters, 2017). Wicked problems are specific to the given context, but the effects can be felt across multiple scales (Rittel & Webber, 1973). By using a polycentric system, decisions can be made at the smallest scale while the larger institutions can absorb unforeseen crisis that may result. Polycentricity helps address the uncertainty, unique contexts, and need for flexibility that characterize wicked problems (Akamani et al., 2016).

Finally, within an adaptive governance framework, the use of adaptive management would allow for more flexibility in managing wicked problems by incorporating a continuous process of experimentation and monitoring. Wicked problems are non-linear, cannot be clearly defined, and it is impossible to establish all possible solutions (Rittel & Webber, 1973). The flexibility of adaptive management incorporates continuous monitoring and implementation and would allow for adjustments as new problems arise. The adaptive management cycle would be more appropriate for managing the complexity and uncertainty of wicked problems (Akamani et al., 2016; Allen et al., 2011; Chaffin et al., 2014; Holling, 2001).

CONCLUSION

In this chapter, the causes and consequences of natural resource conflicts and the strategies and approaches for managing them have been reviewed. The analysis revealed that although a range of conflict management strategies and approaches exist, alternative conflict

management mechanisms that emphasize the use of joint decision-making processes, such as negotiation and mediation, have been receiving significant attention among researchers and policy makers. However, these alternative conflict management strategies do not appear well-suited for managing wicked problems – a class of resource conflicts that are characterized by value differences and knowledge uncertainties. Following views expressed in Akamani et al. (2016), this chapter has argued for a rethinking of wicked problems as complex social-ecological systems and the potential to manage these complex problems using adaptive governance. While conflicts are context-specific and would require individual analysis, the adaptive governance approach has the capability to be tailored toward specific situations. In the United States, there are mechanisms in place that mirror the characteristics of adaptive governance, such as nested institutions, e.g. the Forest Service delegating some forest management functions, such as the preparation of community wildfire preparation plans to local communities; analytic deliberation, e.g., procedural requirements for stakeholder involvement in resource decision-making under the NEPA legislation; and the implementation of adaptive management on National Forest lands. However, a more systematic analysis is needed to understand the barriers and opportunities presented by these existing institutional mechanisms for the utilization of adaptive governance as a mechanism for managing wicked environmental problems in specific contexts, as this study seeks to do in the case of the Shawnee National Forest.

CHAPTER 3

METHODS

This chapter provides an overview of the methodological choices that were made during the design and execution of the study. The first section discusses constructivism as the overarching paradigm that informed the study. The next section focuses on the use of a qualitative approach in the study. This is followed by a discussion on case study as the research methodology. Subsequent sections of the chapter also cover sampling techniques, as well as other procedures for data collection and analysis.

RESEARCH PARADIGM

The constructivist research paradigm was used in this study due to its assumption of the existence of multiple socially constructed realities as opposed to the existence of a universal objective reality (Guba & Lincoln, 1994; Ponterotto, 2005). Constructivism as a research paradigm assumes that there are multiple, valid perspectives stemming from the lived experiences of groups of people in a given context (Ponterotto, 2005). This is a shift away from the postpositivist paradigm that focuses on the search for universal truths (Guba & Lincoln, 1994). A deeper understanding of the reality of research participants is attained through interactions between the researcher and the participants (Ponterotto, 2005). The use of the constructivist paradigm in this study was to allow for an exploration of the multiple perspectives of stakeholders on the implementation of ecosystem management on the Shawnee National Forest and its implications for forest conflicts.

RESEARCH APPROACH

The study employed a qualitative research approach. Quantitative research entails the collection of data from large samples on well-defined variables for testing hypotheses generated

from theory. The goal is usually to offer generalizable explanations beyond the sample and to predict relationships (Creswell & Creswell, 2017). Contrary to this research tradition, qualitative studies tend to collect data on small samples with the aim of gaining an in-depth understanding of the meanings research participants associate with the phenomenon of interest in particular contexts (Rust et al., 2017). In qualitative studies, the researcher retains the flexibility to adapt the role of theory and choice of methods in an ongoing process of data collection and analysis (Creswell & Creswell, 2017). The use of a qualitative research approach in this study is appropriate for understanding the diverse perspectives (e.g., human values, beliefs, and social norms) from which research participants approach forest management and conflicts on the Shawnee National Forest.

RESEARCH METHODOLOGY

Case study research methodology was used in this study to gain an in-depth understanding of how conflicts and conflict management approaches function as drivers and consequences of natural resource management regime shifts towards ecosystem management by using the Shawnee National Forest as a case. Case study methodology involves the use of multiple sources of data to generate information on one or more cases within a bounded context with the aim of gaining an in-depth understanding on the phenomenon of interest (Creswell et al., 2007). This methodology is appropriate for this research because the focus is on gaining a deeper understanding of context-specific issues (Flyvbjerg, 2006). While case study methodology may involve the study of a single case or multiple cases (Creswell et al., 2007), a single case study approach was employed in this study due to its economy and sufficiency in the analysis of the phenomenon of interest.

SAMPLING

Interview participants were chosen to represent a variety of stakeholder perspectives pertaining to ecosystem management and forest conflicts on the Shawnee National Forest. In this regard, a purposeful sampling approach was used to select research participants. Purposeful sampling involves the selection of research participants with the desired attributes for addressing questions on the phenomenon of interest (Koerber & McMichael, 2008). The purpose of sampling in qualitative studies is not to ensure representativeness or statistical generalizability but rather comprehensiveness in the representation of perspectives and experiences on the phenomenon of interest (Barbour, 2001). Hence the desired sample size is the point at which no new insights are emerging from additional interviews, i.e., the point of theoretical saturation (Guest et al., 2006).

The selection of research participants for this study was informed by a number of sampling criteria, including residence in the rural communities surrounding the Shawnee National Forest, membership in an environmental NGO with interest in the management of the forest, official affiliation with the Shawnee National Forest as an employee, and membership in the various user groups of the Shawnee National Forest, such as recreation, timber management, and environmental interests. According to Guest et al. (2006), data saturation is likely to occur after 12 interviews within a homogenous group. Given the diversity of user experiences and variety of uses available on the Shawnee National Forest, 24 interviews were conducted in this study. The interviews started with an initial list of five research participants selected through a review of documents (including local newspapers) on forest conflicts on the Shawnee National Forest as well as through personal correspondence with Forest Service personnel. Using the snowball sampling approach (Koerber & McMichael, 2008), additional research participants

were then recruited by relying on the knowledge and networks of the initial list of research participants.

DATA COLLECTION

Data for the study were generated through interviews and the review of documents. The fieldwork began with a review of publicly accessible documents, including Shawnee National Forest Land and Resource Management Plans, local newspapers, and relevant court records. These documents provided insights into the management of the Shawnee National Forest and the forest conflicts that have occurred, starting from the early 1990s. The review also shed light on the participants in the forest conflicts, as well the conflict management approaches that were employed and their resulting outcomes. These insights served as a context for the design of the interview guide as well as the selection of research participants for the interviews.

Semi-structured interviews are usually informed by an interview guide that contains a list of open-ended questions on various topics of interest, although the interviewee retains some flexibility regarding the order in which the questions are asked. This flexibility provides an opportunity for a conversational approach to the interview, as the participants' responses to a given interview question determines the next set of questions to be asked (Stuckey, 2013). The use of open-ended interview questions also allows for an in-depth exploration of research participants' perspectives on the phenomenon of interest (Boyce & Neale, 2006).

During the interviewing stage of this study, topics covered in the interview guide included the background of the research participants, the history of conflicts on the Shawnee National Forest, the dynamics of conflicts over time, and the implementation of ecosystem management and its roles in conflict management processes (Appendix A). The interviews were conducted between February 2021 and June 2021. Although face-to-face interviews would have

been desirable, the interviews were conducted virtually using the Microsoft Teams platform due to the restrictions imposed on social interactions during the outbreak of the COVID-19 pandemic. The length of the interviews ranged from 28 minutes to 158 minutes (about 2 and a half hours) long. All interviews were recorded and transcribed for subsequent analysis. Although the original proposal included data collection through observation, this aspect of the study could not be executed as the Forest Service COVID-19 mitigation protocol included the temporary suspension of stakeholder meetings, field trips, and open-house events.

DATA ANALYSIS

Data collected from the interviews and review of documents were coded using a deductive coding approach (Armat et al., 2018; Fereday & Muir-Cochrane, 2006; Leech & Onwuegbuzie, 2008). In the deductive coding approach, the researcher begins data analysis with some pre-determined analytical categories generated from theory or findings from the existing literature. This approach also has room for the generation of new categories from the data where segments of the data do not fit the existing categories (Armat et al., 2018). Using the deductive coding approach, a coding manual was designed containing categories and sub-categories generated from the broader literature that address the key topics covered in the interview (Appendix B). The coding manual was tested on four interview transcripts with a coding partner to ensure coding consistency. The use of multiple coders is a recognized criterion for enhancing the rigor of qualitative studies (Barbour, 2001). Moreover, the use of multiple sources of data, appropriate sampling techniques, clear procedures for data analysis, and the presentation of direct quotes from research participants in the results section add to the rigor of the study (Barbour, 2001; Baxter & Eyles, 1997).

CHAPTER 4

RESULTS

This chapter presents the results from interview data collected on conflicts, conflict management, and ecosystem management on the Shawnee National Forest (Table 1). During the fieldwork, research participants were questioned about the history of conflicts on the Shawnee National Forest, the use of ecosystem management principles in the management of the forest, current conflicts, as well as challenges and opportunities for conflict management. The chapter begins with a summary of participants' perspectives of the history and current context of the Shawnee National Forest. The next section describes the history of conflicts prior to the adoption of the 2006 Land and Resource Management plan, dating from the 1980s until the early 2000s. Following this, the application of ecosystem management principles in the implementation of the 2006 Land and Resource Management plan is analyzed. The next section focuses on the conflicts that have occurred since the adoption of the 2006 Land and Resource Management plan, as well as current mechanisms for managing them. The latter parts of the chapter present results on the challenges and opportunities for conflict management, as well as participants' perceptions of the future direction for conflict management and ecosystem management on the Shawnee National Forest.

Table 1. Summary of Results

Coding Category	Sub-Category	Participant Descriptions
Context and Perspectives	Social	<ul style="list-style-type: none">• Emotional connection to the forest• Desire to protect the forest• Concern for ethical principles of other forest users

	Biophysical	<ul style="list-style-type: none"> • Physical beauty • Topographic and biological diversity • Resource degradation • Fear of loss of biodiversity • Management concerns
	Economic	<ul style="list-style-type: none"> • Economic driver • Tourism destination • Below-cost timber
Conflict History	Stakeholder Groups Involved	<ul style="list-style-type: none"> • EarthFirst! • Regional Association of Concerned Environmentalists • Sierra Club • Audubon Society • Logging companies • Mining contractors • Forest Service • Illinois Department of Conservation • Fish and Wildlife Service
	Management Goals	<ul style="list-style-type: none"> • Timber harvesting • Wilderness designation • Balancing recreation uses with environmental impact
	Participation	<ul style="list-style-type: none"> • Use of NEPA process • Public comment period • Appeals process
	Sources of Conflict	<ul style="list-style-type: none"> • Timber harvesting • Below-cost timber sales • Poor management • Wilderness designation • Recreation impact • Recreation access
	Conflict Management Approaches and Strategies	<ul style="list-style-type: none"> • Adjudication (national legal system) • Negotiation (alternative dispute resolution) • Mediation (alternative dispute resolution) • Coercion • Limits of acceptable change (alternative dispute resolution)

	Outcomes	<ul style="list-style-type: none"> • Timber harvesting injunction • Seven wilderness areas designated • All-Terrain Vehicle (ATV) ban • Designated equestrian trails
Ecosystem Management	Landscape Scale Management	<ul style="list-style-type: none"> • Managing for health and biodiversity • Oak-hickory restoration • Ecological restoration • Vegetation management
	Decision-Making Process	<ul style="list-style-type: none"> • Follows procedural requirements • Participation changes under 2012 Planning Rule • Legislative constraints (Federal Advisory Committee Act)
	Adaptive Management	<ul style="list-style-type: none"> • Implementation of passive adaptive management • Attempts to address uncertainties • Minimal monitoring and evaluation
	Knowledge	<ul style="list-style-type: none"> • Interdisciplinary within Forest Service • Knowledge sharing at open-houses, field trips • Limited use of local/traditional knowledge
	Collaboration	<ul style="list-style-type: none"> • Formalized partnerships • Partnerships provide volunteer services, funding, outreach, and education
Current Conflicts	Conflict Dynamics	<ul style="list-style-type: none"> • Increased recreation conflicts • Decreased timber conflicts • Shift in public attention toward broader social justice issues
	Stakeholder Groups Involved	<ul style="list-style-type: none"> • Sierra Club • Audubon Society • Illinois Native Plant Society • The Nature Conservancy • Wild Turkey Federation • Forest Service • Shawnee Forest Defense • Heartwood • Shawnee Trail Conservancy • Shawnee Mountain Bike Association

	Sources of Conflict	<ul style="list-style-type: none"> • Illinois Climbers Association • Active forest management • Recreation access • Trails Designation Project • Unease about response to resumption of timber harvesting
	Conflict Management Approaches and Strategies	<ul style="list-style-type: none"> • Avoidance • Coercion • Adjudication (national legal system) • Mediation (alternative dispute resolution) • Negotiation (alternative dispute resolution) • • Limits of acceptable change (alternative dispute resolution)
Challenges	Social	<ul style="list-style-type: none"> • Distrust • Differing values • Us versus them mentality • Winner-loser dynamic
	Resources	<ul style="list-style-type: none"> • Inadequate funding • Reduced staff • Limited time
	Institutional	<ul style="list-style-type: none"> • Top-down bureaucracy • Reactionary • Slow to change • Frequent personnel changes • Departmental jurisdiction
Opportunities	Social	<ul style="list-style-type: none"> • Improving relationships • Incorporating analytic deliberation
	Resources	<ul style="list-style-type: none"> • Partnership organizations providing funding, volunteer labor, outreach, and education • Incorporating citizen science
	Institutional	<ul style="list-style-type: none"> • Leadership changes • Upcoming generations of Forest Service personnel

CONTEXT AND PERSPECTIVES

Natural resource conflicts are often characterized as wicked problems which are rooted in differences in personal values, goals, and beliefs. Continuous conflict management encourages the identification of individual concerns as well as shared and differing values. This section identifies and describes the differing and shared values of the interview participants and their respective stakeholder groups. The section is subcategorized into social, biophysical, and economic dimensions. The social category describes participants' assessments of the forest in relation to human dimensions, the biophysical assessment describes the biological and physical characteristics of the forest, and the economic assessment describes the relationship between the Shawnee National Forest and local tourism and other businesses, as well as the resulting economic impacts.

Social

Research participants frequently described an emotional connection to the Shawnee National Forest, a place where some participants spent their childhood pursuing various recreational activities through which they developed special bonds with other people and with the natural environment. Research participants talked about being drawn back to the areas surrounding the Shawnee National Forest after moving away and a hesitance to leave the area because of their love for the forest. The interviews revealed a shared desire among respondents to protect the Shawnee National Forest and to ensure that it is managed sustainably to generate long term benefits for people and nature.

“I’m just drawn back here all the time. I just loved coming here and I loved spending time out in the woods of southern Illinois. The more time I spent, the more I wanted to learn about it.” (Environmental NGO Representative)

Unfortunately, a majority of participants described a lack of ethical principles among some users of the forest. Vandalism, littering, and disturbance of wildlife were reported to have occurred at popular recreational sites such as Garden of the Gods and Bell Smith Springs, as well as remote wilderness areas that are less accessible.

“And I know the locals try to blame the tourists for all this stuff, but at wintertime [during winter] when there’s less tourists, there’s still just as much trash along the road. Maybe not as much along the trails, but there’s just as much along the roads, and nobody’s coming from Chicago and dumping their washer and dryer in the forest.” (Private Business Representative)

Biophysical

During the interviews, research participants described the physical beauty and diverse plants and wildlife as major factors influencing their love for the Shawnee National Forest. The convergence of four major biomes in Southern Illinois creates a topographically unique and biologically diverse area for the Shawnee National Forest. Users can experience a variety of ecosystems with an abundance of plant and wildlife diversity within a small geographic location. High quality wilderness areas, migratory birds, rare plants, and beautiful landscapes with waterfalls, bluffs, and ravines were highlighted in participants' responses.

“I think the landscape is particularly unique for this state. That’s primarily because of the way our states are carved up, I suppose. If we had an east-west state, it wouldn’t be that unique. But we have a north-south state and most of the state is prairie. So, we have this unglaciated little jewel down here at the south end, which is pretty cool. I’ve hiked over a whole lot of it and there’s some really gorgeous places out there.” (U.S. Forest Service Employee)

In spite of the perceived natural beauty and biodiversity of the Shawnee National Forest, research participants expressed concern about the declining state of the forest. Between the preservationists' fear of resource extraction and unwise management and the conservationists' fear of losing oak-hickory forest to ecological succession, there lies a shared fear of loss of biodiversity and uniqueness found on the Shawnee National Forest due to high levels of recreational use, lack of resources for management, and encroachment by invasive species.

“Because of the lack of management and the lack of funding for management, I would say that the Shawnee National Forest is in, every year, a net state of decline of the quality of the resources. As far as trails, as far as general maintenance, backlog maintenance. I don't see that changing anytime soon. From what I've seen over the last 20 years I would stand by that statement.” (Recreation User)

Economic

Regarding the economic contributions of the Shawnee National Forest, key informants highlighted recreation and tourism activities generated by the forest as having an overall positive influence on the local economy. There are many popular recreation opportunities found in the forest, including an abundance of trails for hiking and horseback riding along with a newly designated 14-mile mountain biking trail. Horseback riding is a major recreational activity on the Shawnee National Forest, with designated horse camps and organized rides available throughout the year. Mountain biking is also a growing recreational pursuit with enthusiasts working toward increasing mountain bike use. Although only one trail has been designated for mountain biking, the interviews revealed that mountain bikers are not explicitly discouraged from riding on trails outside of designated trails.

Research participants also described these recreation opportunities as important drivers of local economic development. Key informants from the equestrian group noted that many horseback riders travel from out of state to ride in the Shawnee National Forest. When people travel to the Shawnee National Forest for recreation opportunities, the money that they spend to pay for lodging, food, gas, and souvenirs benefits the local economy. Increasing recreation opportunities and promoting the forest as a tourism destination were consistent management preferences for the interview participants.

“It’s a hidden gem that hardly anybody knows about. I have conversations with people where they say, “Oh yeah, I’ve seen the Shawnee National Forest when I drove through it on my way to somewhere else.” Just the other day I was talking to a friend of mine, and I said “You really need to come visit here in Southern Illinois. It’s amazing!” and he said “Yeah, maybe on my way to the Smokies sometime. I’ll stop through it.” I’m like, “No! This is the destination!”” (Environmental NGO Representative)

While recreation and tourism emerged as the main economic contributions of the Shawnee National Forest, the role of the forest in timber extraction was also mentioned by some respondents. Timber extracted from the Shawnee National Forest is largely processed and distributed through mills located in Kentucky and Missouri. While some interview participants viewed timber as a valuable resource, there were also expressions of concern about the potential adverse economic impact of timber supply from federal forests on the local economy.

“When the Shawnee is selling timber with these contracts that can be modified and extended year after year, where they can hold onto them until the timber markets are good, they control the market, and they influence the market. The timber market is national, but local too. A private landowner’s timber is not going to be as valuable when

there's this supply of public timber that's really good quality that's out there being sold on the cheap." (Environmental NGO Representative)

CONFLICT HISTORY

This section encompasses the conflicts that occurred on the Shawnee National Forest prior to the adoption of the 2006 Land and Resource Management plan. Research participants' depictions of conflicts in the management of the forest date back to the 1970s, with the majority of conflicts occurring during the late 1980s and the 1990s. The Shawnee National Forest's first forest plan, as required by the National Forest Management Act of 1976 (NFMA), was released in 1986 and was significantly modified in 1992. The conflicts described in this section are primarily in response to the 1992 Land and Resource Management plan. This period was known across the US for being prominent for conflicts surrounding timber harvesting. Additional conflicts that occurred in the Shawnee National Forest were in response to recreation management and the designation of wilderness areas. These conflicts led to a reputation of the Shawnee National Forest being conflict ridden, with one participant stating that the Shawnee National Forest was known as "Little Vietnam" within the Forest Service. The first subcategory of findings describes the stakeholder groups involved in these conflicts, followed by presentation of results on the management goals of the Shawnee National Forest, the level of stakeholder participation, the sources of conflict, conflict management approaches and strategies, and the outcomes of the conflicts.

Stakeholder Groups Involved

During the early 1990s timber harvesting conflicts, there were two primary grassroots activist organizations who held similar views for forest management on the Shawnee National Forest. The first group is EarthFirst!, a recognized national environmental organization which

was described by a research participant as “the alarm clock of the environmental movement.” The second group is the Regional Association of Concerned Environmentalists (RACE), which was a subgroup of the Association of Concerned Environmentalists. RACE members wanted a localized organization and structured the name to express the notion that they were in “a race against time” to protect the Shawnee National Forest. Although these grassroots activist organizations were primarily engaged in protests, they were also active in appeals and litigations. The more formalized national environmental groups, which relied on diplomatic means to achieve their goals, include the local chapters of the Sierra Club and the Audubon Society. These groups had more resources and partnerships and were the primary appellants and litigants against management proposals on the Shawnee National Forest. Resource extraction interests, such as logging companies and mining contractors, as well as other government agencies including the Illinois Department of Conservation (currently Illinois Department of Natural Resources) and the U.S. Fish and Wildlife Service were also involved in negotiation efforts during the conflicts.

Management Goals

The 1986 and 1992 Land and Resource Management plans followed the mandates established by the Multiple-Use Sustained Yield Act (MUSYA). As such, there was an emphasis on timber harvesting, with consideration for recreation, water, and wildlife. Rangeland resources were not considered as a multiple use as there is a lack of suitable rangelands on the Shawnee National Forest. Silvicultural practices for timber harvesting included clear-cutting, group selection cuts, and shelterwood harvest. The primary goals of the Shawnee National Forest at this time were rooted in the traditional forestry practices of utilitarian, timber management for sustained yield harvesting.

“I mean we are the Forest Service and forest means timber. So, I think it would be hard to separate from that. To say you have a multiple use forest, and then you’re not cutting timber, it just didn’t work. And there were targets from the Chief’s Office, there were hard timber targets and if you didn’t make those timber targets, you were in a lot of trouble.” (Forest Service Employee)

Wilderness designation was another major management goal for the Shawnee National Forest. In 1975, President Gerald Ford signed The Eastern Wilderness Areas Act into law, which allowed areas that do not qualify under the Wilderness Act of 1964, primarily due to history of human impact, to be included in wilderness protection. In the 1970s, the Shawnee National Forest, in partnership with Southern Illinois University, surveyed land to be designated as wilderness.

“The Shawnee Wilderness Evaluation Project was looking at nine areas in southern Illinois to be rated and judged and decided if they could be included in the wilderness system. It was a yearlong project; it was the most extensive survey done on foot by naturalists ever.” (Environmental NGO Representative)

Providing recreation opportunities for a variety of activities was the final primary management goal described by participants. During the 1970s, 80s, and 90s, there was unrestricted equestrian and ATV use with primarily user-made trails throughout the forest. During this time, recreation goals were focused on balancing recreation use with concerns for erosion and degradation caused by unrestricted use on undesignated trails.

Participation

NEPA requires public involvement through a formalized process of notifying the public of a management decision followed by a public comment period. The public comment period

allows stakeholders to present concerns for management decisions and receive a response from the agency. Prior to NEPA, informal meetings between concerned stakeholders and agency personnel were the primary source of public involvement.

“Actually, up until the National Forest Management Act and National Environmental Policy Act were passed, any kind of involvement would have been totally informal. Like I said, meeting at a coffee shop or calling on the phone. Maybe there would be a meeting, maybe the Ranger would go to the local fishing group or horseback group, and they would be having a meeting. They'd invite the Ranger to come over and talk about their plans.” (Forest Service Employee)

Under NEPA, the general public does not participate in generating proposed management actions or alternatives. Rather, the agency establishes proposed actions and alternatives, then notifies the public, receives input through public meetings and comment submissions, responds to concerns, and makes a final decision on actions and alternatives based on public input. If there are stakeholders who still disagree with the management decision, there is an appeal process through the Forest Service where additional meetings take place.

“Now whenever you appeal, the appeal regulations required that you'd have a meeting with the person who made the decision to try to work out an agreement. sometimes you'd get them to agree to withdraw.” (Environmental NGO Representative)

Sources of Conflict

During the interviews, key informants mentioned a number of factors that constitute the sources of the conflicts that occurred during the 1980s and 1990s: timber harvesting and below-cost timber sales; poor management decisions; wilderness designation; and the impact and access recreation opportunities. Based on the research participants' description of these sources, they

seem to be rooted in distrust of the Forest Service, as well as differing personal values among the conflict parties.

An increase in environmental awareness led to concerns about the appropriateness of horseback riding and ATV use in the forest. The Shawnee National Forest has a loess soil composition, which is prone to erosion from increased recreation activities. This is especially the case under wet conditions, as these activities compact the soil, thus resulting in reduction in water absorption and hence, increased run-off and erosion. ATVs and horses have also been found to increase the seed dispersion of invasive species. Environmental groups proposed that these activities should not be allowed on the forest, while the recreation groups felt they provide suitable remediation and volunteer labor to mitigate these environmental impacts.

The designation of wilderness areas on the Shawnee National Forest required protective measures that excluded extractive uses, as well as motorized recreational activities. During the wilderness designation process, the conflict was primarily driven by opposition from resource extraction interest groups who asserted their access rights to the forest under the multiple use mandate of the Forest Service. Similarly, ATV user groups opposed wilderness designation due to the strict prohibition of this recreational activity in wilderness settings. Key informants noted that although the wilderness areas were designated in remote areas that were not readily accessible to commercial interests or ATV users, the conflicts ensued, nonetheless.

The history of recreation conflicts and wilderness designation was mild in comparison to the volatility surrounding timber harvesting on the Shawnee National Forest. According to some key informants, timber harvesting conflicts were driven by a history of poor management decisions that led to a deep distrust of the Forest Service. Perceptions of unsound management decisions of the past included the planting of invasive species such as pine and autumn olive,

conversion of native hardwood stands to pine plantations, poor erosion control, and the overuse of herbicides. This distrust was compounded when environmental groups learned that the Forest Service sells timber at below-cost.

“The term below-cost timber sales, that’s what it is. And they were all below-cost timber sales. But the thing is the money, the receipts they get, don’t go back into the Treasury to pay for the costs of the timber sales. They go to increase the Forest Service budget. So, the Forest Service can increase their budget by losing money on timber sales, so they have a very perverse incentive to log. That’s why we always said we’re against commercial logging. End commercial logging.” (Environmental NGO Representative)

Aside from distrust, the conflict-ridden timber sales were rooted in differing values. All of the environmental groups were in opposition to clear-cut harvesting practices. The Sierra Club and Audubon Society were in support of ending commercial harvesting, but they did not pursue this goal to the extent that RACE and EarthFirst! did. These environmental organizations differed from the values of other stakeholders who saw the need for timber harvesting and active management of the national forests.

Conflict Management Approaches and Strategies

The interviews revealed that a number of conflict management strategies were used by the Forest Service and other conflict parties in managing conflicts on the Shawnee National Forest during the 1980s and 1990s. Of these, adjudication seemed to be the most frequently used. Negotiation and mediation were attempted but were only effective in managing minor conflicts. Coercion in the form of protests, threats, defamation, and alleged acts of violence took place prior to and alongside adjudication strategies. These strategies indicate that although mechanisms

for alternative conflict management existed, it was the national legal system that was widely used during the era prior to the adoption of the 2006 Land and Resource Management plan.

One mechanism for alternative conflict management that was available to the Forest Service during the 1980s and 1990s is the NEPA legislation that requires that the Forest Service solicits public comments on proposed management actions and that the agency considers those comments in making a final decision. While the NEPA legislation could serve as a guiding framework for negotiation and mediation processes, the interviews revealed that this legislation did not seem to have been effectively implemented in managing conflicts on the Shawnee National Forest at that time.

The Forest Service also has an administrative appeal process for situations where conflicts are not contained through the NEPA process. Reflecting an arbitration strategy, the appeals process allows stakeholders to file a direct complaint through the forest supervisor and the regional forester to the Chief of the Forest Service in Washington DC. After an appeal is filed, the appellants meet with the appropriate Forest Service personnel to discuss their concerns. At this point, the supervisory personnel overseeing the appeals process can choose to reverse or uphold the decision in question.

“We were kind of going by the book on that. We would propose a timber sale, we would do the minimum requirements of getting public input before the decision was made and write up the environmental assessment. They had environmental assessments and then made a decision and we all just expected there would be appeals.” (Forest Service Employee)

Outside of this formalized NEPA and administrative appeals procedures, each National Forest also had the discretion to implement additional conflict management strategies prior to the

appeals process. Depending on the leadership present at the time, these additional procedures can be effective or ineffective in avoiding appeals or conflict escalation. The interviews revealed that during the management of the Shawnee National Forest in the 1980s and 90s, there was an approach used during the wilderness, recreation, and timber conflicts called “limits of acceptable change.” This approach sought to identify what the stakeholder groups were willing to compromise on to reach a decision. A Forest Service employee who was instructed to use this approach found it ineffective in addressing the mutual interests of conflict parties.

“Basically, you set up a meeting. you define what you're not willing to accept, right? That's your limit of acceptable change. And it can be a whole raft of categories. And getting to that is cumbersome. If you read about LAC as it's called, you start to understand how that works. But it was just a planning process. There are lots and lots of planning processes, but this one was particularly cumbersome I thought, and I resisted doing it for a long time. I had a friend that kept pushing it and we said OK, we'll try that ... It's like any typical recreation user conflict... those people would come to these meetings and they would just glare at each other. But as they engaged in this process, it is so cumbersome. Pretty soon the process was the thing they were starting to hate.” (Forest Service Employee)

Similarly, key informants representing groups that were opposed to the Forest Service management actions also felt that the focus of this conflict management strategy on what they were willing to compromise on, or “give up,” created a winner-loser relationship among conflict parties.

“It was a long process, but I found that a very successful tactic that I used was: if you just refuse to accept what they want long enough, they will finally give in. I just wouldn't

compromise with them. I'd make them compromise. I was representing the public interest, so I felt it was my job to get as much as I possibly could. You don't win by compromising. We used to compromise, and we got nothing. I didn't compromise and we won." (Environmental NGO Representative)

Given the failures in the application of mechanisms for alternative conflict management, the use of the national legal system seemed to be the most prominent in the management of conflicts on the Shawnee National Forest. The Forest Service and environmental groups used the national legal system whenever they felt they had the advantage. The interviews revealed that during the conflicts, whenever the Forest Service could prove that their management decisions were supported by legal procedures and policy mandates, the courts would rule in their favor. On the other hand, when environmental groups could prove that legal procedures and policy mandates were not being followed, they could halt a management decision.

"I always argued we knew their processes better than they did. Unfortunately, the only way you could win the legal points on legal issues is following the right procedures. It didn't matter if you were right on the merits. Whether it was a bad thing or a good thing, that didn't matter. The only thing that mattered is if you could show that they did not follow the proper legal procedures. Which they usually did, but I was really good at figuring out what they did illegally." (Environmental NGO Representative)

It was also learned during the interviews that when adjudication procedures failed, environmental groups turned to coercive strategies. Threats of litigation and defamation surrounded the conflicts with wilderness, and recreation, but timber harvesting conflicts escalated to multiple protests, with the most contentious one involving the Fairview Timber Harvest in 1990. Protesters camped along the logging road for 77 days (about 2 and a half

months), blocked the entrance with a buried vehicle, chained themselves to logging equipment, and involved news stations and local government officials in an attempt to “buy time” for other environmental groups to find a way to prove in court that the Forest Service did not follow legal procedures before approving the sale of timber. The protests and legal efforts by environmental activists failed, and in 1991 the judge who oversaw this court case ruled in favor of the Forest Service, stating that the timber sale was legal and met the requirements established by NEPA.

“Fairview is the most controversial timber sale in the history of the Shawnee. I think there was somewhere in the neighborhood of 40 arrests by the time that timber sale was cut, it was phenomenal. I believe they sold the wood for less than \$55,000. The Forest Service spent \$43,000 building a road into the timber sale [site] and had to rebuild the road twice before they ever did log. These [plaintiffs] were doing their legal work process, so that means they were researching it, filing all of the court documents themselves. They were doing it all themselves and making mistakes, but just plugging away over and over and over again.” (Environmental NGO Representative)

Outcomes

In 1990, after protests and mediation, the wilderness designation conflicts resulted in seven areas of the Shawnee National Forest being designated as part of the national wilderness system under the Eastern Wilderness Areas Act. These wilderness areas exclude ATV use, timber harvesting and mineral extraction, motorized vehicles, and mechanized equipment. Conflicts surrounding the wilderness designation continue today in the form of excluding mountain biking, which has been interpreted as mechanized equipment.

Through the use of adjudication and mediation, recreation conflicts on horseback riding and ATV use resulted in a forest-wide ban of ATVs, although participants have described a lack

of enforcement. The effects of unrestricted horseback riding were ameliorated by designating specific trails for equestrian use, rather than allowing unrestricted access throughout the forest. During the public input process, participants were able to identify popular equestrian trails and assisted in consolidating user-made trails in areas where multiple trails were located.

Although Fairview was logged, timber harvesting conflicts continued through 1996 with more protests, appeals, and several litigations that ultimately resulted in a court-ordered injunction against timber harvesting in 1996 that lasted for 17-years. The reliance on national legal systems to settle timber harvesting conflicts failed to address the root causes of agency distrust and differing values and established an adversarial relationship among conflict parties that remains today.

ECOSYSTEM MANAGEMENT

This section presents results on the application of ecosystem management principles in the management of the Shawnee National Forest following the adoption of the 2006 Land and Resource Management plan. The first category focuses on the pursuit of landscape scale management goals aimed at improving ecological resilience and increasing biodiversity. This is in contrast with the traditional emphasis on timber management for maximum output that resulted in the forest conflicts of the 80s and 90s. The second category outlines the decision-making process used on the Shawnee National Forest, followed by descriptions of the use of adaptive management principles in the next category. The subsequent categories describe the sources of knowledge and mechanisms for knowledge sharing. The final category describes the Shawnee National Forest's collaborative efforts with stakeholder organizations.

Landscape Scale Management Goals

The Shawnee National Forest's 2006 Forest Plan proposed management actions that emphasized improved forest health and increased biodiversity through oak-hickory forest management. The plan's prioritization of ecological restoration over timber harvesting was a shift away from the traditional, utilitarian goals of the 1992 Land and Resource Management Plan. Timber harvesting has resumed since the injunction was lifted in 2013. However, unlike the past, current timber harvesting efforts are targeted at shelterwood harvesting as a form of vegetation management to provide the ecological disturbance that oak-hickory forests need for regeneration. The production of lumber products is now a secondary benefit.

The intention behind vegetation management and shelterwood harvesting is to increase the amount of sunlight that reaches the forest floor to provide optimal conditions for oak-hickory saplings to mature, while simultaneously providing the conditions needed for native grasses and forbs to germinate. The priority concern for the Shawnee National Forest is to reduce the amount of mesic understory species through vegetation management and prescribed burning. This management approach is supported by multiple natural resource agencies and private businesses as well as environmental groups such as the Audubon Society and Sierra Club, who were opposed to timber harvesting on the Shawnee National Forest during the 80s and 90s. Management actions aimed at providing sunlight and other enabling conditions for restoration of oak-hickory forests are considered by these groups to be integral to maintaining wildlife populations and rare plant communities, and also controlling erosion on the Shawnee National Forest.

“I think that it's all about preserving and improving our forest. I'm afraid that a totally hands-off approach to our forest would be highly detrimental if you understand what's

going on with the forests and with mesophication. As far as tree species, if you go hiking in the wintertime and get into some of the forest areas that need management, you can tell by looking down through the forest canopy into the midstory, the beech trees hold their leaves throughout the winter, the desiccated leaves. Some areas you go into, it's all you can see. Just a kind of sea of tan leaves. It's not necessarily a good thing to see that.”

(Environmental NGO Representative)

Decision-Making Process

Research participants who were not employed by the Forest Service were largely unaware of the decision-making process on the Shawnee National Forest. Although key informants representing the Forest Service also did not feel confident that they had knowledge on planning procedures, it emerged during the interviews that the process is guided by laws and directives, such as NEPA, NFMA, and the 2012 Planning Rule. Based on the interviews, it appears that whenever a project or program is being considered for implementation, the planning process is usually initiated by a planning team, comprised of technical specialists and led by the forest planner, who meets with stakeholders to present information about proposed management actions and alternatives while identifying stakeholder issues and concerns. Forest Service specialists, such as biologists, soil and water specialists, heritage resource specialists, and recreation programmers, provide input on the management actions and perform the Environmental Assessments and Environmental Impact Statements as required by NEPA where necessary. The information from the planning team and Forest Service specialists is subsequently compiled into a report and sent to a leadership team, which includes the forest supervisor, staff officers, and district rangers. The leadership team is responsible for integrating this information into the preparation of a management plan. The final decision is made by the forest supervisor

and the regional forester for approval by the Chief of the Forest Service, although decisions typically do not require approval from the Chief. Each forest has the flexibility to design their own decision-making process as long as it meets the procedural requirements.

“It’s pretty well lined-out because of the National Environmental Policy Act and the National Forest Management Act. There’s requirements in the law, and then there’s regulations that were written to implement those laws. So, there are some specific requirements in the implementing regulations that have to be done. Then, it’s up to the forest, in consultation with the forest supervisor and regional forester, to kind of set a process that would go over and above that requirement. Or, they might say “Hey, it’s not worth it. Let’s just do the minimum that’s required.” And I think some people now have that attitude. Basically, “Let’s do the minimum that’s required by the regulations and put it in writing. We know we’re going to get appeals, we know we’re going to get lawsuits, so why do any more than absolutely required?”” (Forest Service Employee)

Besides the NEPA legislation, the 2012 Planning Rule also calls for increased opportunities for public input. Some key informants described improved participatory management on the Shawnee National Forest based on this directive. In this regard, key informants mentioned the use of field trips, open houses, and public meetings as mechanisms for stakeholder engagement. For example, one research participant representing the Forest Service explained:

“So more recently, as opposed to sharing [information] with the public through media, we have gone towards more meetings with stakeholders and determining who stakeholders are and then meeting with them. Not necessarily to create compromises, but

at least to listen and to determine when we can incorporate their concerns into our own management plans.” (Forest Service Employee)

On the other hand, other key informants noted that it is more difficult for stakeholders to be involved in public input meetings, with many meetings taking place during workdays or with little public notice. Key informants talked about instances where stakeholders were unable to participate in public meetings because they did not comment on scoping notices or file an appeal within a designated period. Thus, some key informants were of the view that the Shawnee National Forest only conducts public meetings in order to meet regulation requirements rather than providing an opportunity for meaningful stakeholder input.

“They see the public as a potential conflict, and so the way to minimize that is to minimize your interaction with the public and meeting the minimum requirements of the law, so that if you file a lawsuit and say, “they didn’t do enough public participation,” they can say, “Yea, we did this. We sent out a scoping notice and we held the public information meeting in Harrisburg and that’s all we’re required to do.” And that’s probably enough for them to check off that checkbox. But as far as really wanting to find out what people think about what they’re doing or what the people that will be directly impacted and how it affects their day-to-day life? No.” (Environmental NGO Representative)

It also emerged during the interviews that some of the existing federal legislation tend to impede efforts aimed at promoting meaningful stakeholder engagement in the management of the Shawnee National Forest, with specific reference to the Federal Advisory Committee Act (FACA).

“Well, you have to be careful as a federal manager. FACA, the Federal Advisory Committee Act, plays in a lot of these kinds of discussions. We are actually prohibited from forming advisory committees to make decisions. FACA allows for some set number of advisory committees nationwide, and it’s a small number. I think maybe the Secretary of Agriculture has to approve them and there’s only so many that can be going on at any one time. So, if you do something like these stakeholder things that I did, you’re really walking on a razor blade. We were always careful to follow up whatever recommendations, not decisions, and make it clear that “they” were making recommendations and “we” were making decisions. FACA makes it hard for federal agencies to do stakeholder involvement in a significant way. Because that’s our job. It’s the feds job to make those decisions. It’s us and Congress, those are the ones who make the decisions, not the public that comes to a meeting.” (Forest Service Employee)

Adaptive Management

Results from the interview data also showed that the majority of key informants perceived that the Forest Service is implementing adaptive management principles to the best of its ability. For instance, it was mentioned that the Shawnee National Forest attempts to address uncertainties by utilizing models to predict future climate conditions and creating management proposals that could successfully deal with these future management challenges. However, key informants also expressed the desire to see improvements in monitoring, evaluation, and anticipation of climate change impacts. The views of the environmental activists who were affiliated with RACE during the protests in the 1980s and 1990s were less favorable, as they perceived that the Forest Service is failing to address climate change, does not implement suitable monitoring or evaluation, and is inflexible and unwilling to adapt to new information.

Based on the interpretation of adaptive management as monitoring (which is an essential part of passive adaptive management), key informants noted that there are legislative provisions for adaptive management in NEPA and NFMA. However, it also emerged during the interviews that although resource managers have the discretion to do more than the minimum legislative requirements for the implementation of adaptive management on specific national forests, monitoring and adaptive management do not seem to be management priorities on the Shawnee National Forest, neither does there appear to be the required capacity for implementation.

“The forest plans always have a monitoring plan that specifies the kind of monitoring that’s going to occur. Some forests are better at monitoring than others. If you don’t have somebody pushing that, that’s one of those things that tends to fall off the table. The forest level monitoring, in my experience, has been a little bit laxed. So much of this is personnel based. If you have somebody who’s really good and really on top of that, then it’ll happen. They’ll just keep the pressure on to make sure it happens.” (Forest Service Employee)

Key informants noted that monitoring and evaluation of management actions are lower priorities in the face of lack of funding, changes in staff and leadership, and the urgency to pursue other management goals. Key informants also noted that even when the Forest Service does have the capacity to respond to emergency situations that require an immediate response, the flexibility of the agency is constrained by the procedural requirements of NEPA and NFMA that tend to lengthen the time it takes to adapt to new information. It also emerged during the interviews that the focus of management on the Shawnee National Forest appears to be on correcting problems created by past management decisions rather than experimentation and

learning for improved future decisions. As such, there is a lack of research dedicated to answering questions that arise from management actions.

Knowledge

Sources of knowledge used to manage the Shawnee National Forest were described as being interdisciplinary, as resource managers rely on Forest Service specialists to provide data on soil ecology, silviculture, botany, wildlife biology, fire ecology, water resources, and heritage resources. The Shawnee National Forest shares knowledge with the public during public meetings, field trips, open houses, and also through the use of social media, whereas the primary method for the public to share information with the Forest Service is through the public comment period of the NEPA process. Knowledge shared from the Shawnee National Forest to stakeholders is primarily based on current research and best available science, although it was also learned that there were a few instances where local knowledge was used to inform management decisions.

“One of the processes we did was to try and map all the traditional trails that folks use; an awful lot of the trails were user constructed. We would use that knowledge a lot, we spent many days with maps trying to define where people traditionally used the forest and we’d run that through a process to make sure the trails make sense and work with [threatened and endangered] species and soils and all of that.” (Forest Service Employee)

Collaboration

The Shawnee National Forest works in collaboration with several government agencies, NGOs, and local organizations with the goal of conserving natural resources across southern Illinois. Sharing resources, information, and management goals across multiple organizations with differing goals ensures that the management goals of the Shawnee National Forest meet the

needs of its diverse stakeholders. Research participants from the Forest Service noted that partnership organizations, which require formalized agreements with the Forest Service, are integral to stakeholder outreach and education efforts. It was learned that due to a history of public distrust for government agencies, stakeholders are more receptive to information disseminated by NGOs and other non-state actors. It was also learned that collaborating organizations provide substantial volunteer service for resource maintenance and data collection. They also constitute a considerable source of funding for the management on the Shawnee National Forest. However, some key informants also expressed concern over the overreliance of the Forest Service on partner organizations and the potential for marginalizing stakeholders that are not affiliated with the formal organizations involved in these collaborative efforts.

“I see it as a positive and negative step. It’s a positive step because they’re actually willing to listen to the needs of the users. It’s not a positive step because I think they view that as a replacement for actually funding the work that needs to be done. I think it’s good that it’s a top-down push, but it’s a top-down push because they don’t have any funding. I think the result is positive for relationships and for everybody getting on the same page, but at the end of the day, volunteers cannot maintain the backlog of maintenance in the Shawnee National Forest and I don’t think it’s appropriate to rely on them to.”

(Recreation User)

“They really have spent a great deal of time courting the partners. I’m not a partner, apparently. I feel like I contribute a lot. Let’s make sure that the public is not cut out of this, and I think that’s what’s happening.” (Environmental NGO Representative)

CURRENT CONFLICTS

This section focuses on the analysis of conflicts that have occurred on the Shawnee National Forest following the adoption of the 2006 Forest Plan. Although the Shawnee National Forest continued to operate under the 2006 plan at the time of the fieldwork, the original plan had been amended in accordance with the 2012 Planning Rule that calls for an increased focus on monitoring and evaluation, as well as improved mechanisms for public involvement and conflict management in the forest management process. Themes covered in this section include an analysis of the evolving nature of conflicts and conflict participants as well as the approaches and strategies for managing these conflicts.

Conflict Dynamics

The interviews revealed a number of trends that have been occurring on the Shawnee National Forest since the adoption of the 2006 Land and Resource Management Plan, including an increase in conflicts among recreationists and a decline in the membership and activism of environmental groups following restrictions on timber harvesting that started with the court injunction in 1996 and continued with the implementation of the 2006 Land and Resource Management Plan. The decline in environmental activism was thought to be partly due to the reduction in clear-cut harvesting, but also due to an increased focus of the public on issues relating to social justice.

“There are so many issues happening right now, so many other social justice issues, that are not environmental, so the response is really fragmented. Like what should we be spending time on? The social justice issues having to do with race and gender and sexuality and everything that’s happening now is so critical. Even basic: how are people going to survive through this pandemic? All of these things are critical issues and that

means the environment takes a little bit of a backseat and people aren't seeing the intersections of those issues. I think activism happens in a very specific and compartmentalized way." (Environmental NGO Representative)

Stakeholder Groups Involved

Stakeholders involved in conflicts on the Shawnee National Forest have changed over the years and now include various recreation user groups, although environmental groups are still involved in conflicts. The Sierra Club and Audubon Society remain involved, although they are primarily in support of the current management approach of the Shawnee National Forest, just as the Illinois Native Plant Society, The Nature Conservancy, and Wild Turkey Federation. Previous members of the grassroots groups RACE and the local chapter of EarthFirst! are now members of newer environmental activist groups which include Shawnee Forest Defense and Heartwood. These two groups continue to oppose active forest management practices, such as timber harvesting, although they currently have lower membership and less public support than they had in the past.

"We were almost like a victim of our own success. Because during that 17 years, everybody who was concerned in southern Illinois about what was going on with the clear cutting had gotten used to nothing going on. So, there was really no controversy for which to organize. Now the Forest Service has started up doing things that are sort of contrary to what people had wanted and were hoping for. I see some of this controversy starting to brew up again, but it hasn't gotten anywhere near to the point that it was around the 1990s or the early 90s leading up to the injunction." (Environmental NGO Representative)

Notable among the recreation user groups that are currently involved in conflicts on the Shawnee National Forest are the Shawnee Trail Conservancy, a group that seeks to promote equestrian use, and the Shawnee Mountain Bike Association that seeks to increase mountain biking opportunities in the forest. Other recreation groups involved in current conflicts include hikers and the Illinois Climbers Association that aims at improving facilities for rock climbing on the Shawnee National Forest.

Sources of Conflict

Current conflicts on the Shawnee National Forest revolve around active forest management and recreational issues, such as conflicts between equestrians and mountain bikers. Recreation conflicts involve access to trails, trail maintenance, and shared use. The Trails Designation Project, implemented in 2006 on the Shawnee National Forest, was a result of environmental groups suing the Forest Service for not appropriately managing trails. Prior to the project, majority of trails on the forest were user-made and mostly degraded from heavy equestrian use. The Forest Service had to decide which user-made trails to designate and which trails to decommission. Equestrian users felt that they were being negatively affected by the trail designation process because they lost access to trails that were previously unrestricted access. With the increasing interest in mountain bike riding, equestrian groups are concerned about having to share equestrian trails with mountain bikers, which will make those trails less accessible for horseback riding due to safety concerns.

“The Forest Service regulations do not allow the Forest Service to do any maintenance on a trail that’s not designated. Most National Forests in the United States were told to go out and designate trails. The people that were in the Shawnee Forest at that time did not

go out and designate anything. So, all the trails that horse people were riding were user-created trails and they never had any maintenance.” (Recreation User)

“We’re the biggest user group on the Shawnee and we were the ones faced with losing trails during the designation. Now we have mountain bikes, and unfortunately, they don’t mix with either hikers or equestrians because of their speed and just the nature of a bike as opposed to a horse or an equine. And it’s a danger to us more than it is the bikes, horses are flight animals. If something scares them, they’re going to turn and run. People have ended up in the hospital because they saw a bike and the horse got scared.”

(Recreation User)

On the other hand, mountain bikes have one designated trail and unofficial unrestricted access to the rest of the trails on the Shawnee National Forest. Some mountain bike users believe that designating mountain bike trails will reduce their access across the forest, while others believe that having designated trails will increase their influence as a recognized user-group. As it stands, mountain bikers tend to avoid popular equestrian trails because the degradation renders them unsafe.

Although majority of conflicts that have occurred on the Shawnee National Forest since 2006 have been recreation-based, there was a sense of increasing unease among research participants about the resumption of timber harvesting on the forest. The court injunction that was placed against timber harvesting was lifted in 2013, and the first timber harvest since 1996 took place in 2014. Since then, an increase in harvesting targets has created anxiety among those stakeholders who remain in opposition to harvesting, as well as a sense of fear among staff of the Shawnee National Forest of the potential for conflict.

“Within the last four or so years, the Washington Office gave the forests bigger targets for timber and fire, so there has been a push to burn and to harvest more. I think it’s just shocking to some people to see us switch. Maybe we were focusing more on watershed health at one point and then all of a sudden we’re focusing more on timber harvesting. I think that can be shocking.” (Forest Service Employee)

Conflict Management Approaches and Strategies

Results on the analysis of mechanisms for managing recent and ongoing conflicts on the Shawnee National Forest revealed that there have not been substantial changes in conflict management strategies and approaches since the adoption of the 2006 Land and Resource Management plan. The conflict management strategies used by the Forest Service and stakeholders reflect the strategies used in the past. These strategies range from avoidance and coercion to the use of adjudication, mediation, and negotiation processes, reflecting the use of the national legal system and alternative conflict management approaches.

The results showed that negotiation and mediation processes as part of the requirements of the NEPA legislation continue to be important conflict management strategies on the Shawnee National Forest. As part of the preparation of Environmental Impact Statements under the NEPA process, resource managers on the Shawnee National Forest are required to release a scoping letter where they announce the intent of a proposed management action and invite public comments. These comments are used to prepare a Draft Environmental Impact Statement, and then released for public input again before the Final Environmental Impact Statement is prepared. During this process, aggrieved stakeholders can file appeals with the Forest Service, which will prompt a resolution meeting. During the interviews research participants described their experience at these resolution meetings as reminiscent of the “limits of acceptable change”

approach that was used in resolving the forest conflicts that occurred in the 1980s and 1990s. Based on the experience of key informants in these processes, it appears that although processes for negotiation exist, current processes are not effective in promoting meaningful stakeholder engagement and consensus building.

“The whole resolution meeting ended up being us presenting our case, and then them telling us “What is it that you would be willing to compromise out of your objection?” In the end they didn’t propose possible mitigation from their standpoint, they just wanted to hear what we’re willing to compromise. They made it clear that there’s no resolution intention there from the start, so there was no true settlement.” (Environmental NGO Representative)

On the other hand, the interviews also revealed that some stakeholders, such as those opposed to active forest management, have found ways of using the NEPA process to advance their interests rather than protesting it.

“They’ve been around the Shawnee for decades, and so I think they understand that they can slow down things by doing the NEPA. They just put everything they possibly can for us to address to slow it down and tie up weeks of time just responding to their comments. That is the point of what they’re doing, it’s just slowing us down.” (Forest Service Employee)

While shortfalls exist in current mechanisms for alternative conflict management, research participants described improvements in the process in recent years, such as an increased use of listening sessions, field trips, and outreach prior to the scoping and public comment periods of the NEPA process. Key informants representing the Forest Service mentioned that the use of listening sessions, field trips and so forth beyond the minimum requirements of the NEPA

process has contributed to better decisions, more trust, and more support from stakeholders during the NEPA process.

“We’re trying to do more meetings in the field. Well, COVID really slowed that down. But just trying to set up these public events and really get people engaged, we found that to be important in conflict management because when people read the projects without that engagement, some of the things can sound terrible to them. It’s so much better to take them out and show them the current conditions of the area, show them what we see, ask what they see, try to talk and present ideas in that setting. Whereas I think in the past, it’s just been throwing the project out to the public and then they can respond. We’re really trying to get them there in the beginning before we even start NEPA, just to hear their ideas and maybe consider changing some proposed actions.” (Forest Service Employee)

Besides the use of negotiation, research participants also described the use of coercive strategies by conflict parties. For instance, it was learned during the interviews that during one of the resolution meetings, there was an armed Forest Service employee who escorted some of the attendees out of the meeting. The Forest Service employee also prevented a local journalist from attending the meeting. This was interpreted as a “show of force” and research participants felt that their opinions and concerns were suppressed at these meetings.

Conflict avoidance is another strategy that emerged during the interviews among the strategies employed by resource managers on the Shawnee National Forest. Examples of this strategy were described in reference to both recreation conflicts with equestrians and the opponents of active forest management. Research participants who oppose vegetation management, herbicide use, and prescribed fire perceived that the personnel of the Shawnee

National Forest ignoring their concerns with recreation conflicts. Some research participants also perceived that the Forest Service altered management proposals to avoid excluding equestrian access in an effort to avoid conflicts with that user group.

Finally, the interviews revealed that adjudication remains a major strategy for addressing conflicts in the Shawnee National Forest, and the threat of lawsuits is often used by conflict parties to influence forest management decisions. During the interview, it was learned that the threat of lawsuits is so prevalent that it has led to a reduction in the number of management proposals and actions put forward by resource managers on the Shawnee National Forest as they try to avoid the time and financial commitments associated with the use of the national legal system. However, it was also revealed that some unintended benefits sometime result from lawsuits. For example, the trails designation project, which was implemented in 2006, was the result of a lawsuit against the Shawnee National Forest in which the judge determined that trails had to be officially designated in the forest and repaired. This ruling led to the Forest Service receiving federal funding for trail infrastructure development.

“They would much rather avoid conflict at all costs than appropriately manage their resources. I think that the scene is ripe for another lawsuit and I’ve even heard people within the Forest Service say that they wish they got sued again because maybe they would have funding to take care of their resource.” (Recreation User)

CHALLENGES

This section outlines participant descriptions of the challenges stakeholders and the agency face when managing conflicts on the Shawnee National Forest. The challenges and barriers described by participants could be grouped into three subcategories: The first section

describes social challenges, the second describes challenges in obtaining resources, and the third challenge is based on the institutional structure of the Forest Service.

Social

Social barriers that reduce the capacity for conflict management and resolution stem from distrust, differing values, and the winner-loser dynamic perpetuated by the reliance on the national legal system for managing conflicts. The Forest Service is a federal agency, and there is a deeply entrenched us-versus-them mentality between stakeholders and the federal government that can be seen across federal agencies and departments. The people who work for a federal agency are not seen as members of the community while representing the agency, even if they have lived in the community for an extended period of time.

“There’s a young guy that’s worked his way up in the Forest Service, a local, and somebody made the comment, “Well for a local boy, he’s still federal.” They have a job to do, even though they may disagree with what they're doing, they’re not going to risk getting fired. They’re not going to risk their retirement; they’re just doing their job.”

(Recreation User)

The Forest Service relies on the best available science and current research to justify their management decisions, but that does not address the opposition group's beliefs that it is better to let nature take care of itself. Values-based differences will not be resolved through scientific expertise, and conflicts are compounded by the opposition groups' belief that they are being ignored and dismissed. The conflict management approaches used by the Forest Service in the Shawnee National Forest thus far have reinforced an us-versus-them, winner-loser dynamic where neither party is interested in finding common ground or building a relationship.

“This history of contention with the Forest Service, those legacies, it’s going to be hard for some people to see anything that the Forest Service does as authentic. That they authentically care or like you’re authentically listening to me. I think a lot of people don’t believe that government agencies are responding to them. It’s going to be really difficult to deal with that sense of betrayal that is inherent.” (Environmental NGO Representative)

Resources

A lack of resources was repeatedly mentioned as a barrier to effective conflict management. The Forest Service in the Shawnee National Forest cannot adequately address conflicts in a proactive manner with insufficient resources that are already stretched thin across an overwhelming backlog of maintenance, repairs, and management. Inadequate funding, reduced staff, and limited time has led to a reactionary approach to conflicts that rarely exceeds the minimum required standards established by NEPA. The strain on resources leaves continuous conflict management at a lower priority, resulting in an approach that involves reacting to conflicts after it has escalated to a level that requires attention rather than anticipating and addressing conflicts.

“There are whole books written about conflict resolution and the results of movements that happen in conservations, why they worked or why they didn’t. But the thing is, you got to keep up with these things. They need to be funded because they need to be kept going for years.” (Private Business Representative)

Institutional

As a federal institution, the Shawnee National Forest and the Forest Service reflect the United States governance structures, which are top-down bureaucracies that are slow to change.. These institutions typically address conflicts as problems that need to be solved, rather than a

component of natural resource management that can be mitigated. Although the Shawnee National Forest has made incremental improvements to conflict management, they continue to largely depend on court rulings as a definitive solution. In the face of limited opportunities for public involvement, slow-moving bureaucratic procedures, and limited resources, participants believe that legally binding court rulings are the only way to create significant changes.

“I’m not going to sue the Forest Service, but if I really wanted things to change, I think that lawsuits are some of the only ways that sweeping changes might actually happen.”

(Recreation User)

Additionally, employees of the Forest Service are faced with frequent reassignments and are unlikely to receive promotions without moving to a new forest, and high employee turnover makes it difficult to build the community relationships that are needed to alleviate long-term conflicts. Frequent personnel changes coupled with a lack of funding results in positions being left vacant or partially filled by existing staff. For example, the current acting forest supervisor on the Shawnee National Forest is the forest supervisor from another forest. Personnel changes strains relationships with partners, contributes to the perception that federal employees are “outsiders,” and can delay management actions in an already slow-moving process. The procedural requirements and regulations that govern federal forest management along with the social-ecological context of an individual forest can take several years for incoming staff members to learn, at which point they may be moving on to a new position at a different forest. Considering the Shawnee National Forest is one of the smallest forests within the National Forest system, the goals and personalities of individual staff members have a larger impact on the overall management of the Shawnee compared to larger forests.

“I think because it’s such a tiny forest, other forests that are much, much larger, the staff is much larger, and so you have a greater depth in every program area. But then you get on a little forest like the Shawnee, you might have one person in a program area, and if they’re not stellar, you’re going to suffer because of that.” (Forest Service Employee)

A subset of the interview participants, those who opposed to past and current timber harvesting and extraction, argue that a major contributing factor to conflicts on the Shawnee National Forest can be attributed to the fact that National Forests are under the jurisdiction of the U.S. Department of Agriculture (USDA). This group believes that the goals of extraction, harvesting, and optimizing output are inherent in the USDA, and argue that National Forests should be managed under the Department of Interior, alongside National Parks and Bureau of Land Management.

“I really believe that I won’t feel like there’s much hope until the Forest Service is taken out of the Department of [Agriculture]. To me, it’s such a misfit. I don’t see the Department of Ag could ever be an entity that would actually have the health of the forest as a priority. I would love to see legislation enacted that would create a Forest Service department, not the Department of Agriculture making the decisions.” (Environmental NGO Representative)

OPPORTUNITIES

This section outlines opportunities for improving conflict management on the Shawnee National Forest as depicted by research participants. These views were in response to questions on what research participants would like to see changed on the Shawnee National Forest and what would make them feel as if their values and concerns were being considered in the forest management process. Similar to the previous section on challenges, the results, begin with social

opportunities, followed by resources, and conclude with opportunities within the institutional structure.

Social

Responses from key informants indicated that one of way managing conflicts rooted in differing values among stakeholders is by improving relationships with stakeholders who are typically opposed to forest management on the Shawnee National Forest. The interviews revealed that stakeholder meetings aimed at managing conflicts are currently structured as presentations rather than organized in a manner that provide opportunities for stakeholders and agency personnel to discuss management options.

“One thing I would say [is that] public meetings [are] the worst setting to do anything. Public meetings are a good place to start out, if people have questions, they can ask questions, but it is not the place to sit down and have arguments. I think it’s better to tease out the people with conflicts and get them together and work through the process patiently and slowly. Have them lay out what the issues are, where they think a problem is, and figure out what we can do to help as an agency. Sometimes it works, sometimes it doesn't, but the reason it doesn’t work is when there’s no continuity.” (Private Business Representative)

Similar to the analytic deliberation, an attribute of adaptive governance that involves scientists, resource managers and decision-makers engaged in deliberation processes that are informed by science, key informants noted that issues of distrust could be addressed in a situation where stakeholders and the agency introduce their own experts to discuss concerns.

“We can’t get any information from them. If there is a plan that is about ecological balance, then I’m not understanding it. When we talk about the use of herbicides, we

show the science that questions the use of herbicides and we get dismissive answers. If there is a new way of thinking about the forests, then why not look to this research that we've produced and say, "here's why that won't work here." (Environmental NGO Representative)

Resources

During the interview, it was revealed that the biggest opportunity for addressing the Shawnee National Forest's lack of resources comes from their partnership organizations. These organizations often secure grant funding, provide in-kind donations, and match funds to see that the Forest Service is able to implement management decisions. Along with funding, partnership organizations provide volunteer labor for maintenance and management, including litter and vandalism clean up, invasive species removal, and educational outreach. NGO partnerships, such as the Sierra Club, have the capacity to lobby at the congressional level to increase funding for National Forests in general, or make appeals directly to the office of the Chief of the U.S. Forest Service for increased funding to the Shawnee National Forest.

"As I said, they're woefully understaffed. And one of the things I'm trying to influence the Sierra Club to do is to get more money coming towards the Forest Service in general and Shawnee in particular at the Washington level. The nice thing about organizations like Sierra Club is that we can go right to the top." (Environmental NGO Representative)

Citizen science was frequently described as an opportunity for increasing stakeholder involvement along with addressing the lack of staff and funding available for monitoring and evaluation. Involving volunteer members with monitoring and evaluation and creating a database of citizen observations could help determine if benchmarks are being met and inform management decisions. Volunteer monitoring and evaluation through citizen science could also

contribute to generating shared knowledge and providing an opportunity for experimentation as part of adaptive management processes.

“What harm could it do to actually have several tracts of land where you tested these results over a long time and actually see what happens? That would be pretty productive, I think. When you’re talking about follow up, there doesn’t seem to be any, and that probably has to do with labor, I’m sure. But how do you know what the results are if you never go back to these sites? Or if you only go back to the ones that are sort of for show and tell? There needs to be more dedication to that kind of follow up and observation and that could be done by citizen scientists.” (Environmental NGO Representative)

Institutional

Institutional opportunities for improving conflict management in ecosystem management processes come from leadership changes along with new and incoming staff members who have received education in natural resources management that emphasizes broader ecological sciences. Leadership changes at the national, regional, and local level were expressed to have a major impact on prioritizing and allocating funding to continuous conflict management in order to avoid lengthy and expensive lawsuits.

Traditionally, the training of professionals employed in the U.S. Forest Service has focused on the biophysical sciences. Nowadays, forestry education encompasses backgrounds knowledge in zoology, botany, water and soil conservation, recreation, and human dimensions along with silviculture. Research participants were hopeful that the current and upcoming generations of Forest Service personnel on the Shawnee National Forest have the capacity to manage for forest health and restoration at multiple scales.

“It’s a whole new group of people on the staff that have nothing to do with the work in the past. And foresters these days, the young ones I’ve met that are newly out of school or in graduate school, seem to have a much better ecological background. They’re a little bit more cautious about what they plan to do, and they take other considerations into account.” (Environmental NGO Representative)

FUTURE DIRECTIONS

Barring mandated institutional changes within the Forest Service, participants were wary that any meaningful improvements would occur. There was a common theme of the Shawnee National Forest Service “doing the best they can with what they’ve got,” and suggesting that without appropriate funding and enabling legislation, conflicts on the Shawnee National Forest will continue to escalate until they are settled with lawsuits and judicial rulings. The interview participants from the Forest Service had no insight into the preparation of an updated Forest Plan or how conflict management approaches would look in the future. Participants in the opposition groups were looking toward taking legal action against the Forest Service for their use of vegetation management, prescribed burning, and herbicide use. Participants in equestrian and mountain biking groups were prepared to defend their right to access trails for recreation under the multiple-use mandate, arguing that the presence of the opposite recreation group reduces access to their own use.

Participants had a generally positive response to field trips and open houses that the Shawnee National Forest was presenting prior to the COVID-19 pandemic, but there have not been opportunities to continue with that path since 2020. Participants from the agency, partnership organizations, and opposition groups felt that this was an improvement over previous presentation-style public meetings and would like to see that continued in the future.

CHAPTER 5

DISCUSSION AND CONCLUSION

Natural resource management in National Forests has shifted from the sustained yield management approach with the goal of maximizing timber output toward an ecosystem management approach that emphasizes resilient ecosystems, participatory decision-making, and integrating social-ecological systems perspectives (Akamani et al., 2016; Winkel, 2014; Yaffee, 1996). Within this changing context, the combination of uncertainties stemming from the complexity of ecosystems and differences in stakeholder values, goals, and beliefs gives rise to wicked problems (Brooks & Champ, 2006; Folke, 2016; Ritchey, 2013). It can be argued that while conflicts have served as catalysts in the shift towards ecosystem management in recent decades, the implementation of ecosystem management also serves as a driver for emerging conflicts. As such, these conflicts could best be characterized as wicked problems. However, empirical studies on natural resources conflicts as causes and consequences of the transition towards ecosystem management are limited. Importantly, studies on mechanisms for managing wicked problems in ecosystem management processes are rare.

To address some of these knowledge gaps, a qualitative research approach was used to research the occurrence of conflicts on the Shawnee National Forest before and after the transition towards ecosystem management, as reflected in the adoption of the 2006 Land and Resource Management Plan. Data for the study were generated through the review documents, as well as from semi-structured interviews that were conducted with representatives of key stakeholder groups in the management of the Shawnee National Forest to understand the evolving conflicts and conflict management approaches over the years. This chapter summarizes

the results of the data within the context of the current literature and offers suggestions on future pathways for research and policy.

SUMMARY OF FINDINGS

Context and Perspectives

Research participants' descriptions of the Shawnee National Forest supported the argument that National Forests qualify as social-ecological systems. Social-ecological systems are environments where human constructs, such as community, economy, and society, are embedded within environmental processes across multiple spatial and temporal scales (Folke, 2016; Liu et al., 2007). Research participants described strong bonds and emotional connections with the Shawnee National Forest as a result of their historical relationships with the forest as users. These bonds often resulted in expressions of desires to ensure the protection of the forest, as well as concern over user behaviors that were considered detrimental to forest health. Biophysical attributes of the forest, including its topography, biodiversity, and beauty often constituted sources of appreciation for the forest among respondents. This appreciation also informed the choice of management options preferred by respondents. The forest was also seen as an integral part of the local and regional economy through its role as a destination for recreation and tourism. Thus, the Shawnee National Forest can be conceptualized as a social-ecological system that is composed of the interconnections among the personal values and preferences of diverse user groups, the biophysical characteristics of the forest, interventions of resource managers, and the dynamics of the local and regional economy.

Conflict History

Natural resource conflicts occur when two or more parties disagree over the access, control, and use of natural resources with an attempt to disrupt another party's goals to achieve

their own (Adams et al., 2003; Matiru, 2000). In the case of the Shawnee National Forest, the underlying causes of conflicts are primarily tied to values-based disagreements on how to best manage the forest. Prior to the Shawnee National Forest's 2006 Land and Resource Management Plan, conflicts rooted in distrust and differing values were met with approaches that perpetuated a winner-loser dynamic while failing to identify the root causes. A reliance on the national legal system as an approach to conflict management ultimately led to judicial rulings serving as the final decision-maker in contentious management decisions, while the attempted "limits of acceptable change" approach sought only to identify what stakeholders were willing to concede, rather than identifying commonalities with a desire to reach shared consensus and understanding. National legal systems establish legally binding policies and directives, but vague language is often left to interpretation by decision-makers within the agency, creating the opportunity for opposing stakeholders to sue the Shawnee Forest Service based on policy compliance. Adjudication became the primary strategy for opposing stakeholder groups due to the perception that lawsuits were the only way to "win" against the Shawnee Forest Service, whom they felt were ignoring and dismissing their perspectives. Adjudication was so successful that coercive approaches of threatening lawsuits became prevalent and effective enough to influence management decisions.

The use of conflict management strategies such as coercion and adjudication implies an undesirable state of governance (Chaffin et al., 2014). The lack of capacity to address fundamental differences in values between stakeholders and the agency resulted in coercive responses, including defamation, threats, and protests. Continued failure to address conflicts and overreliance on the national legal system resulted in several years of lawsuits from opposing stakeholder groups which culminated in an injunction against timber harvesting in 1996. The

injunction prevented the Shawnee National Forest Service from harvesting timber and forced a shift in resource management priorities towards ecosystem management.

Ecosystem Management

Ecosystem management is a set of principles that are intended to encourage natural resource management beyond political boundaries with collaborative decision-making, stakeholder involvement, and adaptability (Endter-Wada et al., 1998; Yaffee, 1996). Although ecosystem management is described in the 2006 Land and Resource Management Plan, the collaborative decision-making, adaptability, and stakeholder involvement components are lacking. Therefore, it would be more accurate to consider the Shawnee National Forest to be in a transition period toward ecosystem management, rather than fully embracing ecosystem management principles. As established by the previous chapter, the categories used to determine the use of ecosystem management are as follows: landscape-scale management, decision-making process, adaptive management, public participation, and collaboration.

The Shawnee National Forest meets the criteria for landscape scale management, as managing for the purpose of optimizing timber is no longer the priority. The Shawnee National Forest works in collaboration with multiple agencies in southern Illinois to retain oak-hickory dominance as the historic native ecosystem. Management goals prioritize the removal of invasive species, reinstating a historically documented burn cycle, regenerating oak-hickory, and establishing higher light conditions with the removal of overabundant beech-maple species to encourage the growth of forest understory species. This approach is rooted in best available science, works in conjunction with multiple natural resource agencies, and is broadly accepted by stakeholders, with a few exceptions. The Shawnee National Forest is also working toward

building resilience towards natural disturbances but faces challenges with absorbing the effects and outcomes of conflicts driven by human values.

As described in the results chapter, the interview participants were not fully informed on the decision-making process in the Shawnee National Forest. According to the respondents, there remains a hierarchical and centralized process to decision-making with degrees of separation between the final decision-maker, the specialists, and the relevant stakeholders. This is antithetical to the ecosystem management approach of collaborative decision-making with stakeholder involvement, but speaks to the larger issue of bureaucratic government structures being ineffective for managing wicked conflicts in natural resource management (Matiru, 2000). Besides the hierarchical approach to decision making employed by the Shawnee National Forest is the Federal Advisory Committee Act (FACA), which directly impedes the ability to perform collaborative decision-making (Koontz & Bodine, 2008). With NEPA regulations requiring public input, and FACA regulations hindering collaborative decision-making, the role of the stakeholder within the National Forest management paradigm is limited to commenting on proposals, whereas ecosystem management stresses the need for shared decision-making (Endter-Wada et al., 1998).

The capacity to perform adaptive management is another key concept of ecosystem management that is limited by overarching federal regulations. NEPA processes require an Environmental Impact Statement or Environmental Assessment, depending on the scope of the project, which is then subject to public notice, public input, agency response, and appeals and resolutions as needed (Steelman & Ascher, 1997). This burdensome, time-consuming process puts the Shawnee National Forest at a disadvantage to adapt or transform management in response to new information. There are exceptions for management needs that are deemed

urgent, in which case the Shawnee National Forest Service personnel can file a categorical exclusion, but these are limited in scope. The National Forest Management Act (NFMA) attempts to incorporate flexibility by establishing management goals across a 10 to 15-year period, but this approach is limited by the lengthy requirements needed to amend an approved forest management plan (Steelman & Ascher, 1997).

As stated previously, stakeholder involvement is limited to public comment periods and appeal processes. Ecosystem management principles encourage stakeholder involvement prior to and throughout the decision-making process, with an emphasis on continuous conflict management (Daniels & Walker, 1996; Endter-Wada et al., 1998). The 2012 Planning Rule establishes a mandate for increased stakeholder involvement and consideration toward potential conflicts, but the language remains vague and is left to interpretation by individual forests (Ryan et al., 2018). The Shawnee National Forest has attempted to increase stakeholder involvement in recent years through field trips, open houses, and information sessions; While this approach serves to reduce conflicts that are rooted in misunderstandings of current science and lack of information and context, it does little to address conflicts rooted in differing values and does not foster a sense of agency or increased social capacity among stakeholders. In the end, if stakeholder groups do not feel their concerns are being addressed, the general consensus among interview participants is that the only avenue available to them is to resort to the use of coercion or adjudication against the Shawnee National Forest Service.

While collaborative agreements and partnerships have greatly increased under the 2006 Land and Resource Management plan, interview participants stated that these collaborative initiatives are driven by a lack of resources. Reliance on partnership organizations for funding, labor, and outreach has the potential to create an imbalance of power between the agency,

partnerships, and general stakeholders. A federal agency's dependence on partnership organizations can lead to formalized partnership organizations having a greater influence on decision-making and management outcomes. If a partnership organization feels that their needs for the Shawnee National Forest are not being met, they can rescind their partnership agreement and cease to provide volunteer labor and resources. This represents a source of institutional vulnerability in the management of the forest, as well as a potential source of marginalization of stakeholders who are not affiliated with any of the formal collaborative partner organizations. For instance, a recent study found that although collaborations through stewardship agreements have the positive effects of assisting with defining management problems and formulating solutions with the added benefit of having the capacity to work beyond agency constraints, such collaborative partnerships also have an outsized influence on management directives and that management results may be biased toward partnership goals (Cowan et al., 2022).

Current Conflicts

Current conflicts on the Shawnee National Forest reflect the timber harvesting and recreation conflicts of the past, suggesting that conflict management approaches and strategies have been ineffective at addressing the underlying cause of conflicts. The resource extraction conflicts remained latent during the timber harvesting injunction, but because the underlying issues were not resolved during this time, they have resurfaced as timber harvesting resumed. A group of stakeholders involved during the 1990s protests continue to oppose timber harvesting and vegetation management and are considering bringing forth litigations once again. The difference lies in the level of support this group had during the 1990s compared to now. In the past, the grassroots organizations of RACE and Earth First! were aligned with prominent nongovernmental organizations (NGOs), such as The Sierra Club and Audubon Society, who

have access to more resources and were able to share the burden of litigating against a federal agency. Today, the members of Heartwood and Shawnee Forest Defense (formerly members of RACE and Earth First!) are in opposition to the larger NGOs, who have since sided with the management decisions made by the Shawnee National Forest. The grassroots organizations, while still engaged in activism locally, are constrained by their decreased resources and connections as well as the decrease in their membership. This leaves their particular perspectives and values at risk of being ignored, perpetuating a conflict avoidance strategy along with unresolved issues of distrust.

As described in the literature, the national legal systems approach assumes that a rational approach with increased resources and scientific analysis is sufficient for resolving conflicts (Nie, 2003). The use of open-houses and field trips are used as a tool to disseminate scientific information regarding management decisions rather than addressing the underlying causes of conflict. This approach has alleviated conflicts among environmental NGOs, who were in conflict with the Shawnee National Forest prior to the 2006 Land and Resource Management Plan, but it has had little effect amongst the stakeholders who identify with the local grassroots activism organization such as RACE, Heartwood, and Shawnee Forest Defense. Additionally, this approach has failed to resolve conflicts between recreation user groups, whose conflicts are rooted in shared use of limited space rather than disagreements over resource management. Interview participants who were primarily interested in recreation use are anticipating the need to resort to lawsuits and litigations to resolve their ongoing conflicts.

Challenges

The challenges presented throughout the study are not unique to the Shawnee National Forest and are described throughout the literature on natural resources conflict management.

Challenges cited by the literature include centralized decision-making, reliance on national legal systems, lack of resources, and policies with vague language. Instances of conflict that are dependent on context are not compatible with the bureaucratic policies and governance typically found in national forest management (Broussard & Whitaker, 2009; Engel & Korf, 2005; Matiru, 2000; Skutsch, 2000). Despite the need for broadscale institutional changes, lack of resources, and decreased capacity for continuous conflict management, decisions still need to be made and forest management still needs to occur.

Although the interview participants did not have a clear understanding of the decision-making process, the descriptions fall in line with a centralized decision-making hierarchy. Participants described the Forest Service as militaristic in structure, meaning there is a “chain of command” beginning with the program area specialists and ascending to the Chief of the Forest Service. Aside from that, Forest Service staff members described a lack of interdisciplinary decision-making in the recent past. The lack of interdisciplinary work, lack of knowledge sharing, and lack of clarity in the decision-making process suggests a habit of working in silos that is typically found in centralized governments (Meredith et al., 2021). Despite these shortcomings, participants within the Forest Service expressed noticeable improvements in interdisciplinary collaboration.

National legal systems are incapable of addressing the underlying issues of natural resource conflict. Issues of distrust and incompatible values will not be resolved within a court room, and only leads to a negative, win-lose dynamic between the agency and oppositional stakeholders. Additionally, this approach relies on adhering to procedural requirements rather than collaboration and public engagement. That is, the national legal system bases their rulings, ergo the “winner,” on whether or not procedure was followed as written (Broussard & Whitaker,

2009; Matiru, 2000). Interview participants agreed on the inefficacy of relying on national legal systems but were overall unsure of the possibility of implementing a new process, primarily due to an increasingly shrinking budget and lack of personnel.

It is important to note that the Shawnee National Forest, being the second smallest National Forest and not a major source of timber, is faced with additional challenges related to lack of financial resources. Budget cuts and an extensive backlog of necessary infrastructural repairs and management leaves them at a disadvantage when it comes to appropriately staffing the forest as well as instituting conflict management that goes above mandated requirements. When adding the restrictions to collaborative decision-making and stakeholder involvement as a result of FACA, the Shawnee National Forest faces major challenges with allocating resources toward continuous conflict management.

Policies with vague language allows for flexibility within individual forests to enact conflict management approaches that go beyond mandated requirements, meaning change in conflict management approaches could be dependent on leadership within the Shawnee National Forest. That being said, under current conditions there is little incentive to allocated limited funding towards ecosystem management, adaptive management, or continuous conflict management initiatives (Koontz & Bodine, 2008).

Opportunities

Interview participants from all represented groups expressed a desire to improve conflict management on the Shawnee National Forest. Opportunities for improving conflicts on the Shawnee National Forest include rethinking the stakeholder involvement process, incorporating analytic deliberation, citizen science, and experimental management plots.

Stakeholder involvement meets the minimum requirements under NEPA directives but are typically framed as a presentation of management decisions and the corresponding data to support the need for management. Based on interview responses, presenting information and answering questions is the primary approach to enabling stakeholder involvement, but this approach does not address the need to repair damaged relationships and distrust between stakeholders and the agency. The literature explains that while some stakeholders respond to presented facts and empirical data, others will respond to an approach that appeals to their personal values (Adams et al., 2003). The Shawnee National Forest has been successful with stakeholders that respond to scientific analysis but has failed to engage with those who are driven by fundamental beliefs. With this in mind, it is recommended that the Shawnee National Forest engage in more discussion-focused stakeholder meetings rather than relying on presentation-style meetings.

While the Shawnee National Forest has begun implementing “listening sessions,” they appear to be a similar one-way flow of communication as presentation-style meetings. Listening sessions were described as the Shawnee National Forest Service personnel asking questions of the stakeholders, taking notes, and compiling a report for the forest supervisor’s consideration. Redesigning stakeholder meetings, field trips, and open houses as a discussion between agency personnel, stakeholders, and experts would meet the criteria for analytic deliberation, a component of adaptive management that appears to be missing from the decision-making process. Incorporating analytic deliberation into stakeholder meetings could serve to build trust, present new ideas, and potentially result in management decisions that represent a diversity of values (Folke, 2016).

A report written in 1993 outlines the correlated effects of conflict management strategies that are used in the Shawnee National Forest today. Interview participants described presentation-style engagement meetings, an appeals process, and field trips to management sites, which Cheng et al. (1993) found had no correlation with decreased instances of conflict. In fact, the use of an appeals process correlated with increased conflicts. On the other hand, the report found that integrating stakeholders into the process of formulating management alternatives did not correlate with instances of conflict, suggesting that stakeholder participation beyond NEPA requirements is necessary to ameliorate conflicts (Cheng et al., 1993). A separate study on forestry conflicts in Sweden presents a desire for increased dialogue between stakeholders and natural resource management agencies. This study came to a similar conclusion that favors open discussion with stakeholders in place of presentation-style informational meetings (Jakobsson et al., 2021).

Due to the history of distrust and the anticipated litigations, the use of a third-party mediator could facilitate meaningful discussion, negotiations, and conflict resolution between stakeholders and the Shawnee National Forest that addresses underlying causes. As it stands, the interview participants have little faith in the conflict management approaches used by the Shawnee National Forest. Including a mediator in stakeholder meetings could help ease the concerns of opposing stakeholders and incorporate a new approach to conflict resolution that avoids the use of coercion and adjudication (Engel & Korf, 2005; Matiru, 2000).

Citizen science was recommended by interview participants as a way to increase stakeholder involvement and build social capacity and a sense of ownership over the Shawnee National Forest. The benefit of citizen science is that it would increase the Shawnee National Forest Service's capacity for monitoring and evaluation while promoting opportunities for

building relationships, increasing transparency, generating shared knowledge, and incorporating local knowledge. Using citizen science to inform management decisions could also serve to build trust among oppositional stakeholders, as it could increase awareness of the needs of the forest. Research on the use of multiparty monitoring approaches within the Collaborative Forest Landscape Restoration Program study areas included a site in the Uncompahgre National Forest where citizen science was employed for project-level monitoring. Through interview data, this study found that the use of citizen science contributed to increased trust and shared understanding among stakeholders and Forest Service staff (Schultz et al., 2014)

Interview participants also suggested the use of experimental management plots as a way to showcase the differing effects of management alternatives. Experimental management plots would satisfy the experimentation and learning component of adaptive management while. As suggested by Larson et al. 2013, all proposed management alternatives would be represented within a national forest, including “no action” alternatives. This would serve to accelerate learning and reduce uncertainties inherent to natural resource management. Additionally, it would satisfy a desire for oppositional stakeholder groups who wish to see a hands-off approach to forest management. In order to achieve this, it is important to identify learning as a management objective, in accordance with adaptive management, with equal consideration alongside the five multiple uses (Larson et al., 2013).

LIMITATIONS OF THE STUDY

The Shawnee National Forest has a diverse group of recreational users, business owners, NGOs, collaborative agencies, and personnel who could offer their own unique perspectives on the interview questions. The interview subject pool lacked representation from personnel in the “upper leadership team” who are directly involved with the decision-making processes, along

with a lack of representation from Indigenous communities, government officials, and judicial representatives. The interview data was driven by a particularly interested group of individuals and may not be representative of the general public.

The COVID-19 pandemic mitigation protocols forced the Shawnee National Forest to temporarily halt stakeholder meetings, open-house events, and field trips that would have provided a participant observation and field notes component typically required for qualitative research. Interview data was collected during the spring and summer of 2021 when social-distancing was recommended, and in-person meetings were discouraged. As a result, the interviews were conducted over video conferencing or telephone, rather than in-person, which reduces the capacity to incorporate non-verbal communication as a source of information.

FUTURE RESEARCH DIRECTIONS

Interview data uncovered the constraints to incorporating stakeholders into the decision-making process. The Federal Advisory Committee Act (FACA) limits the capacity for shared decision-making between federal agencies and stakeholders. The literature on ecosystem management expresses a need for shared decision-making, where stakeholders are involved in generating management goals alongside the agency, rather than simply providing comments and input on predetermined decisions and alternatives (Engel & Korf, 2005; Matiru, 2000; Yasmi et al., 2009). Future research could explore avenues to incorporate shared decision-making in the face of legislation that limits the capacity for shared decision-making.

Under current procedures within the Shawnee National Forest, the interview data did not describe an avenue for generating shared knowledge. Information and knowledge are generated by Shawnee Forest Service specialists and presented to the public in a question-and-answer style forum. This method does not provide an opportunity for stakeholders to share their knowledge

with the Forest Service, and interview participants expressed that they are limited to submitting academic research through the NEPA public comment process. Under this design, knowledge appears to flow from the agency to the stakeholder, but not conversely. Further research could be conducted on the capacity to incorporate citizen science as a means of generating shared knowledge, increasing monitoring and evaluation, as well as the effects these measures have on improving conflict management.

The literature states that financial costs of litigation in response to conflict outweigh the costs of continuous conflict management approaches that avoid lawsuits (Yasmi et al., 2013). Interview participants frequently cited lack of financial resources as a barrier to effective conflict management, and agency personnel expressed the financial strain that lawsuits have on management objectives. Financial statements on the costs of litigations within the Shawnee National Forest were unavailable, and research could be conducted on the costs of litigations compared to the costs of different conflict management approaches used throughout the years to determine which approaches were most effective at reducing lawsuits.

CONCLUSION AND POLICY IMPLICATIONS

Stakeholders of the Shawnee National Forest maintain a strong sense of place tied to their personal values about how public lands and National Forests should be managed. Their sense of place stems from individual experiences and perspectives that relate to their particular interests in the use of National Forests. Recreation users have a relationship with the Shawnee National Forest that is tied to their respective use, and management decisions that impede access to their preferred use will have a negative impact on their sense of place. Those who prioritize wilderness and a perception of intact ecosystems unspoiled by human intervention tend to lean towards less active management, holding the ideals that nature is capable of correcting itself and

adapting without intervention. On the other hand, the majority of interviewed participants believe that active management is necessary to correct past mistakes and restore the forest to a resilient ecosystem. These ideals are in a constant state of conflict with each other, and ineffective conflict management approaches have led to, and will continue to lead to escalated conflicts that result in lengthy and expensive litigation. This dynamic remains after 30 years, and it is assumed among interview participants that current and future conflicts will require litigation, thus highlighting a great need to adjust current conflict management approaches. Policies informed by an adaptive governance approach could help address some of these wicked problems through the pursuit of integrated management goals that accommodate the diversity of worldviews held by stakeholders.

National Forests across the United States, including the Shawnee National Forest, have shifted from utilitarian forestry towards an ecosystem management approach. Ecosystem management requires the integration of stakeholder values and concerns along with a shared decision-making approach (Akamani et al., 2016; Endter-Wada et al., 1998; Winkel, 2014; Yaffee, 1996). The prevalence of wicked problems increases with the diversity of human values and beliefs, and the literature asserts that wicked problems cannot be solved through a rational approach that focuses on providing more scientific information (Allen & Gould Jr, 1986; Rittel & Webber, 1973). In the Shawnee National Forest, the use of the national legal system to solve conflicts indirectly forced a shift in management toward ecosystem management through the timber harvesting injunction, but the adoption of ecosystem management appears to be a reactionary attempt at reducing excessive lawsuits. Aside from landscape scale management and increasing collaborative partnerships, interview participants described very few instances of incorporating local knowledge, generating shared knowledge, adaptive management, or shared

decision-making. Given this information, it can be argued that the Shawnee National Forest remains in a transitional state towards ecosystem management rather than fully embracing the key components of ecosystem management. The implementation of adaptive governance principles, such as analytic deliberation that entails structured decision-making processes among scientists, resource managers, and other stakeholders, coupled with the use of adaptive management processes, could provide an appropriate mechanism for eliciting diverse stakeholder values and facilitating learning among stakeholders. However, existing institutional constraints such as legislative constraints, lack of resources, and the centralized nature of decision-making seen among federal land management agencies throughout the United States will need to be recognized and addressed in order to make such processes meaningful.

Natural resource management of the Shawnee National Forest has been focused on correcting past management mistakes, but there is a need to correct past conflict management mistakes as well. The national legal systems approach along with limits of acceptable change has created a volatile win-lose dynamic that has persisted for decades. Formally addressing the shortfalls of conflict management approaches could serve as a way to symbolize the need for improvements, while validating the struggles that stakeholders have faced in having their values and perspectives considered. Considering the restrictions to collaborative decision-making, including mediation, negotiation, analytic deliberation, and appealing to personal values during stakeholder meetings appear to be the most viable options for increasing involvement. Furthermore, interview participants explained that forest supervisors, who are the final decision-makers, are not involved in stakeholder meetings unless appeals are filed. Involving the forest supervisor within the planning team that meets directly with stakeholders could increase the sense of stakeholder involvement, though this is likely to be a challenge due to lack of resources.

Nonetheless, the use of analytic deliberation processes with the help of conflict management professionals, such as facilitators and mediators, could help in providing a meaningful process for stakeholder engagement and the management of wicked problems.

Effective conflict management in social-ecological also requires institutional structures that connect actors with diverse knowledge, values, and experiences across scales (Akamani et al., 2016; Peters, 2017; Ritchey, 2013). As discussed in the literature review section of this thesis, the adaptive governance principles of diverse and nested institutions could provide an effective means of managing wicked problems across scales. Considering that the Shawnee National Forest already depends on collaborative partners to provide funding sources and volunteer labor, they can take this a step further by providing opportunities to partner organizations and the general public, including local communities that focuses on various stages of decision-making. Although, the design of such multi-level institutional mechanisms could be challenging without broader changes to the existing legislative and institutional mechanisms governing the management of national forests, the effective implementation of some of these recommendations could facilitate the transition towards ecosystem management and the effective management of wicked problems on the Shawnee National Forest and elsewhere.

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APPENDIX A

SHAWNEE NATIONAL FOREST STAKEHOLDER INTERVIEW GUIDE

Background Information

- What organization or stakeholder group are you affiliated with?
- What role do you and/or your organization play in the management of the Shawnee National Forest?
- What do you like about the Shawnee National Forest?
- What are your least favorite things about the forest?

Conflict History

- Please tell me about the history of the Shawnee National Forest
- Specifically, please tell me about the history of conflicts in the management of the forest.
- Prior to the adoption of the 2006 Land and Resource Management plan, how was the Shawnee National Forest Managed?
- Prior to the adoption of the 2006 Land and Resource Management plan, what mechanisms were available for stakeholder involvement in the management of the forest, and how effective were these mechanisms in promoting meaningful participation?
- Please describe the nature of the conflicts that occurred during the 1980s and 1990s.
- What were the causes of these conflicts, and who were the actors that were involved?
- Please tell me about the mechanisms that were used to manage these conflicts and the actors that were involved in the conflict management process.
- What were the outcomes of these conflicts and the conflict management process?
- How satisfied were participants in the conflicts with the outcomes of the conflict management process?

Conflict Dynamics

- Please tell me about recent/ongoing conflicts in the management of the Shawnee National Forest that you are familiar with, and the actors that are involved in them.
- How do these conflicts and their participants differ from the older conflicts that occurred in the 1980s and 1990s?
- Please tell me about the mechanisms that are being used in managing these recent conflicts.
- How do these recent conflict management mechanisms differ from those that were used in the 1980s and 1990s?
- Overall, how satisfied are you with the effectiveness of current mechanisms for managing conflicts on the Shawnee National Forest?
- What do you consider to be the barriers to the effective management of conflicts on the Shawnee National Forest?
- What opportunities are available for the effective management of conflicts on the Shawnee National Forest?

- What recommendations would you provide for enhancing the effective management of conflicts on the Shawnee National Forest

Ecosystem Management

- Please tell me what you know about the 2006 Land and Resource Management plan.
- What factors led to the adoption of the 2006 Land and Resource Management plan?
- Specifically, what role did forest conflicts play in the adoption of the 2006 Land and Resource Management plan?
- Please tell me about the process that was used in preparing the 2006 Land and Resource Management plan and the actors that were involved in the process?
- What are the current management goals of the Shawnee National Forest?
- To what extent do these forest management goals address the interests of all stakeholders in the management of the forest?
- Who are the stakeholders in the management of Shawnee National Forest?
- Please describe the roles played by each of these stakeholders/stakeholder groups in the management of the forest.
- Please describe the relationship among the stakeholders involved in the management of the forest.
- Please describe the procedure for decision-making in the management of the forest
- To what extent do these decision-making procedures involve the relevant stakeholders?
- What opportunities are available for local communities near the Shawnee National Forest to be involved in the management of the forest?
- How effective are these decision-making procedures in managing conflicts among stakeholders in the management of the forest?
- What mechanisms are available for dealing with uncertainties in the management of the forest, such as Climate Change impacts?
- What mechanisms are available for monitoring and evaluation in the management of the forest, and how effective are they?
- How flexible is the Shawnee National Forest and its stakeholders in adjusting management decisions and actions in response to new knowledge or changing stakeholder expectations?
- What are the main sources of knowledge that are used to inform decision-making on the Shawnee National Forest?
- What mechanisms are available for integrating knowledge from the social and ecological sciences in the management of the forest?
- What opportunities are available for utilizing local/traditional knowledge in the management of the forest?
- To what extent are stakeholders involved in generating and sharing the knowledge that informs decision-making on the Shawnee National Forest?
- In all, to what extent has the 2006 Land and Resource Management plan contributed to the resolution of conflicts on the Shawnee National Forest?

APPENDIX B

CODING MANUAL

- **Background Information:** Description of stakeholder groups, involvement with the Shawnee National Forest and personal assessments of the forest
 - Social: Participant assessment of the forest in relation to social norms, ethics, economics, philosophies, and other human dimensions
 - Biophysical: Participants assessment of the biological and physical characteristics of the forest
 - Economic: Participant assessment of the forest in relation to local economy, tourism, businesses, and other economic impacts

- **Conflict History:** Instances of conflicts and conflict management prior to 2006 Land and Resource Management plan
 - Stakeholder groups involved: Key individuals and/or organizations that supported or opposed management goals prior to 2006.
 - Management Goals: Descriptions of the intended purpose for management on the Shawnee National Forest prior to 2006
 - Participation: Level of involvement that stakeholder groups had in the decision-making process prior to 2006
 - Sources of Conflict: Participant descriptions of sources of conflicts based on differences in values, beliefs, interests, perspectives, goals, and interests.
 - Conflict management approaches: Mechanisms by which differences in values, beliefs, interests, perspectives, goals, and interests among Shawnee Forest Service and stakeholder groups are recognized and resolved.
 - Conflict management strategies: negotiation, mediation, arbitration, adjudication, avoidance, coercion, violence
 - Outcomes: How instances of conflict came to conclusion and what resulting decisions were made in response to conflict

- **Conflict Dynamics:** Instances of conflicts and conflict management approaches after 2006 Land and Resource Management plan
 - Stakeholder groups involved: Key individuals and/or organizations that supported or opposed management goals after 2006.
 - Management Goals: Descriptions of the intended purpose for management on the Shawnee National Forest after 2006
 - Participation: Level of involvement that stakeholder groups had in the decision-making process after 2006
 - Sources of Conflict: Participant descriptions of sources of conflicts based on differences in values, beliefs, interests, perspectives, goals, and interests.

- Conflict management approaches: Mechanisms by which differences in values, beliefs, interests, perspectives, goals, and interests among Shawnee Forest Service and stakeholder groups are recognized and resolved.
 - Conflict management strategies: negotiation, mediation, arbitration, adjudication, avoidance, coercion, violence
- Outcomes: How instances of conflict came to conclusion and what resulting decisions were made in response to conflict
- **Ecosystem Management:** Examples of how ecosystem management principles relate to policy enacted by the Shawnee National Forest
 - Landscape scale management: Descriptions of the intended purposes for management on the Shawnee National Forest
 - Decision-making process: Current mechanisms by which management decisions are made within the Shawnee National Forest
 - Adaptive management: The extent of use of flexible decision-making mechanisms for anticipation, preparation, and response to risk and uncertainty through experimentation, monitoring, and evaluation.
 - Public involvement: How accessible it is for stakeholder groups to access or share information, communicate support or concerns, or be involved with decision-making process.
 - Knowledge: Use of expert science and/or traditional/local knowledge to inform Shawnee National Forest management actions
 - Collaboration: Instances of Shawnee Forest Service working across jurisdictions with other governmental agencies, NGOs, private entities, and community groups
- **Challenges:** Mechanisms that inhibit effective conflict management and implementation
 - Resources: Constraints to conflict management as a result of lack of funding, staff, time, etc.
 - Social: Constraints to conflict management as a result of social dynamics between Forest Service staff, community members, NGOs, agencies
 - Institutional: Constraints to conflict management as a result of Forest Service policies, mandates, and institutional structure
- **Opportunities:** Mechanisms that encourage effective conflict management and implementation
 - Resources: Opportunities for effective conflict management as a result of lack of funding, staff, time, etc.
 - Social: Opportunities for effective conflict management as a result of social dynamics between Forest Service staff, community members, NGOs, agencies
 - Institutional: Opportunities for effective conflict management as a result of Forest Service policies, mandates, and institutional structure

- **Future directions:** Participant perception of the future direction of conflict management, participatory decision-making, outreach and education, forest management policies, adaptability, sustainability, public sentiment, and forest health in the Shawnee National Forest.
- **Other:** Categories that emerge from the data that is not captured by the coding manual

APPENDIX C

INSTITUTIONAL REVIEW BOARD APPROVAL



INSTITUTIONAL REVIEW BOARD
OFFICE OF RESEARCH COMPLIANCE
WOODY HALL - MAIL CODE 4344
900 SOUTH NORMAL AVENUE
CARBONDALE, ILLINOIS 62901

siuhsc@siu.edu
618/453-4533
FAX 618/453-4573

To: Nicole Mooar

From: M. Daniel Becque
Chair, Institutional Review Board

Date: November 23, 2020

Title: *Managing Wicked Conflicts on the Shawnee National Forest*

Protocol Number: 20252

The SIUC Institutional Review Board has approved the above referenced study. The study is determined to be exempt according to 45 CFR 46.101(b)2. This approval does not have an expiration date. However, any future modifications to your protocol must be submitted to the IRB for review and approval prior to their implementation.

Best wishes for a successful study.

This institution has an Assurance on file with the USDHHS Office of Human Research Protection. The Assurance number is FWA00005334.

MDB:jh

cc: Kofi Akamani

VITA

Graduate School
Southern Illinois University Carbondale

Nicole Mooar

nicolemooar@gmail.com

Southern Illinois University Carbondale
Bachelor of Science, Forestry, May 2019

Ozark Technical Community College
Associate of Arts, General Studies, May 2016

Ozark Technical Community College
Associate of Applied Science, Business and Marketing, December 2014

Thesis Paper Title:

Understanding Natural Resource Conflicts as Causes and Consequences of the Transition Towards Ecosystem Management: A Case Study of the Shawnee National Forest in Southern Illinois, USA

Major Professor: Dr. Kofi Akamani