

A Deeper Look at the Ouachita River



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ASSESSING ECOSYSTEM SERVICE BENEFITS

Background

Louisiana has experienced severe storms and historic flooding multiple times since 2015. While the social and economic consequences of flooding are clearly understood, it is important that communities better understand how flooding affects the benefits they receive from nature (ecosystem services). Ecosystem services are the positive aspects of our natural environment that improve our lives. The clean air we breathe, the water we drink, and the soil we use to grow our crops are all ecosystem services.

Ouachita River Study

Complex decisions require clear, measurable objectives, so proposed actions can be compared and evaluated fairly. For the Ouachita River Study, Structured Decision Making (SDM) was used to:

- identify community goals,
- transform those goals into measurable values, and
- use these measurable values to establish consensus about the best actions for achieving community goals.

This approach has been called “organized common sense” and serves to better engage stakeholders in the decision process and make complex decisions like implementing flood control strategies easier to understand.

Study Overview

For this study, U.S. EPA worked with 35 participants representing 14 community stakeholder groups and 18 representatives of federal agencies, including Federal Emergency Management Agency (FEMA), U.S. Department of Housing and Urban Development (HUD), U.S. Army Corps of Engineers (ACOE), and U.S. Department of Interior (DOI), as well as four state representatives, and 13 local officials, planners, engineers, researchers, and students from Louisiana State University (LSU). These participants met during



two in-person workshops held in West Monroe, Louisiana, in May and November 2018, and one online webinar in August 2019. Workshop discussions and analysis focused on linking proposed community action categories, or project types, to the Ouachita River’s ecosystem services and the Ouachita Parish community well-being.

Action Categories

This study focused on general types of mitigation actions, called action categories, rather than specific project plans. This allowed the workshop participants to have meaningful discussions about the benefits and impacts of projects without being overwhelmed by project details. Ouachita Parish leaders identified four important action categories that were presented at the first workshop. These categories were:

- Levee maintenance,
- River depth for navigation,
- Stormwater control, and
- Green infrastructure.

For each action category, workshop participants identified measurable river attributes, ecosystem services, and areas of human well-being likely to be impacted by projects within that category.

Ecosystem Services and Community Well-being

The Ouachita River Study evaluated the degree and type of impact that ecosystem services have on residents. Actions taken affect ecosystem services of the river, which in turn affect human well-being.

(Continued on page 2)

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Actions

- Stormwater Projects (Pumps, Drainage)
- Levee Maintenance
- River Pool/Navigation (Dredging, Locks/Dams)
- Greenspace



River Attributes

- Water Depth
- Water Flow
- Water Clarity
- Risk of Flooding
- Commercially Important Animals
- Other Attributes



Ecosystem Services

- Public Water Supply
- Stormwater Discharge
- Recreational Opportunities
- Education/Outreach
- Other Ecosystem Services



Human Well-being Domains

- Safety
- Health
- Education
- Connection to Nature
- Social Cohesion
- Other Domains

Workshop participants discussed the ways that the Ouachita River affects core community values. That list of the benefits, goods, and services provided to the community by the river was used during the second workshop to determine how ecosystem services impacted community and resident well-being.

What are River Attributes?

River attributes are measurable qualities of the river that were used during the study to help quantify specific ecosystem services. River attributes are things like depth, water quality, flow, and number of fish.

Resident Well-being

One measure of Ouachita Parish community and resident well-being is based on a national Human Well-Being Index (HWBI) that evaluates communities across eight separate domains, including safety/security, health, education, connection to nature, and others. Through the guided discussion during the first workshop, stakeholders ranked safety, health, and education among the top priorities for community well-being. By analyzing, ranking, and weighting the priorities discussed and documented during both in-person workshops, the study team was able to quantify the overall impacts of each potential action category on the overall resident well-being.

Recommendations for the Future

Impacts on well-being can be used to evaluate proposed plans for flood mitigation projects on the river. This study demonstrates how communities, working with state and federal partners, can identify

and prioritize projects and funding to directly improve resilience and recovery in the Parish, by considering the impacts those projects have on human well-being. Projects with the greatest benefit to ecosystem services and human well-being, such as levee maintenance and creation of greenspace, should be prioritized. Then, throughout implementation of the projects, the identified river ecosystem services can be used to measure success. The recommendations and outcomes of the study will significantly benefit these communities and the region, as well as serve as a model use of EPA’s SDM approach to community decision making. The study provides concrete guidance on the relative merit of proposed flood control strategies on the ecosystem services identified as most important to the community residents.

For Additional Information

U.S. EPA. 2017. *Practical Strategies for Integrating Final Ecosystem Goods and Services into Community Decision-Making*. EPA/600/R-17/266. August 2017.

Gregory, Robin. *Structured Decision Making: A Practical Guide to Environmental Management Choices*. Wiley-Blackwell Press, 2012.

To Learn More

Enhancing Flood Resilience along the Ouachita River
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