Neighborhood Perceptions of the Fourche Creek Bottoms

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Executive Summary

The Fourche Creek Watershed, "arguably the most important urban watershed in the state of Arkansas," is in trouble (Audubon Arkansas, 2015a). For decades the watershed has been plagued by pollution, and the water quality will not improve without intervention. Audubon Arkansas, a state office of the National Audubon Society, is working to restore and protect the watershed, as well as develop recreational opportunities on Fourche Creek. To assist with this process, Audubon Arkansas has partnered with the University of Arkansas Clinton School of Public Service to conduct research on local residents' views of Fourche Creek, and the types of recreational opportunities they would like to have available within the watershed.

The project was developed in collaboration with the Clinton School of Public Service, and Brett Kincaid and Dan Scheiman of Audubon Arkansas, and received research design assistance from Cindy Bennett and Dr. Michael Craw of the University of Arkansas at Little Rock. Dr. Warigia Bowman supervised students from Class 11 of the University of Arkansas Clinton School of Public Service, who conducted interviews, focus groups, and administered surveys to local residents living in neighborhoods adjacent to the Fourche Creek Bottoms. The purpose of this data collection was to gather information regarding residents' perception and use of parks and creeks in their area, and the types of outdoor activities and amenities they would like to have available for use. This report provides an analysis of the data obtained from three key informant interviews, 10 focus groups, and 416 surveys with community members.

We found that most of the participants were familiar with the Fourche Creek Watershed and were interested in the prospect of having more outdoor recreational opportunities in this area. Participants were particularly interested in the possibility of having more options for hiking, biking, and fishing in an area close to home. A number of participants expressed concern over trash and maintenance issues affecting the watershed. Nonetheless, a majority of the participants indicated that they would be willing to participate in cleanup efforts. The report provides more detailed information on the process of data collection and the findings associated with that data.

This paper makes five recommendations. First, Audubon Arkansas should continue to reach out to the community to increase awareness of their work as a conservation organization, as well as the importance of the Fourche Creek. Second, in developing a plan to enhance Fourche Bottoms, Audubon should emphasize multi-use trails for walking, hiking, and biking, and consider amenities. Future efforts at development of the Fourche Creek Bottoms should also include plans to address trash, maintenance, safety and security. Third, Audubon Arkansas should continue reach out to the neighborhood associations within the Fourche Creek Watershed to request assistance with the cleanup effort in areas near those neighborhoods. Fourth, improve signage indicating access to Fourche Creek in the city parks surrounding the Bottoms. Finally, given that Fourche Creek is one of the largest urban wetlands within city limits in the United States, there are likely opportunities for grants to improve the watershed.

Neighborhood Perceptions of the Fourche Creek Bottoms

The University of Arkansas Clinton School of Public Service partnered with Audubon Arkansas, a non-profit environmental conservation organization, to gather community perceptions, opinions and visions on the development and enhancement of Fourche Creek. Founded in 2000, Audubon Arkansas aims to restore and protect watersheds that are important ecological habitats for birds, and to educate and engage citizens on environmental conservation and policy initiatives (Audubon Arkansas, 2015). Their conservation efforts include the protection of the Fourche Creek Watershed, which is a 108,800-acre urban watershed that contains much of the city of Little Rock, Arkansas (Audubon Arkansas, 2015a).

The Fourche Creek Watershed acts as a conduit for runoff from eastern Saline and central Pulaski counties, and drains approximately 73% of the surface and storm water from Little Rock, before emptying into the Arkansas River (Audubon Arkansas, 2015a). The creek is also a dynamic, rich, ecological habitat and home to over 50 species of fish, diverse populations of migratory birds, and acres of hardwood forest (Audubon Arkansas, 2015a). However, over the last few decades the creek and its natural beauty have become polluted and unsafe, leading to a significant decline in its use for recreational purposes by the city's residents.

Audubon Arkansas has been spearheading efforts to conserve and clean up Fourche Creek. Out of the 108,800 acres, approximately 1,800 acres are comprised of intact wetlands. Audubon Arkansas established a partnership with the University of Arkansas Clinton School of Public Service to obtain the opinions of residents living in neighborhoods along or near Fourche Creek. The research aimed to collect data on local residents' views of Fourche Creek and the types of recreational opportunities they would like to have available within the watershed. The data collected from the research is especially valuable to Audubon Arkansas as it wishes to involve the community in the ongoing restoration and revitalization of Fourche Creek, and ultimately the development of a Fourche Creek Preserve for the benefit of the community.

Literature Review

The Fourche Creek Watershed is the primary watershed for the City of Little Rock (Audubon Arkansas, 2015a). It includes six third-order streams and nine primary tributaries. Fourche Creek itself starts in Saline County, flows through Little Rock, and empties into the Arkansas River just past the airport. The 1,800-acre wetland known as Fourche Bottoms lies between the I-30/I-440/I-530 interchange and Baseline Road. It is aptly called the "bottoms" as it is 30 feet lower in elevation than the Arkansas River and 110 feet lower than the surrounding area (USGS, 1994). Conveniently located in the heart of the capital city, Fourche Bottoms is possibly the most significant urban wetland in Arkansas, and the largest natural urban filtration system in Central Arkansas (Audubon Arkansas, 2015). Fourche Bottoms filters 73 percent of the storm water that flows through the Little Rock Metropolitan Area (Fisher, 2003).

Figure 1: Boundaries of Fourche Bottoms



Source: Audubon Arkansas

There are more than ten city parks bordering Fourche Creek and its feeder streams.¹ While the core wetland area of Fourche Bottoms contains very little development, the surrounding area is crowded with commercial and industrial sites (Audubon Arkansas, 2015).

¹These parks include Rock Creek, War Memorial, Interstate Park, Gillam Park, Benny Craig Park, Western Hills Park, Otter Creek Park, Kanis Park, and Hindman Park.



Figure 2: Parks adjacent to Fourche Creek and its tributaries

Source: Audubon Arkansas

The study found that Fourche Creek was overloaded with pollutants from surface runoff, construction activity, illegal dumping, and industrial wastewater discharges (U.S. Army Corps of Engineers, n.d.). Unfortunately, the Bottoms have continued to be contaminated with pollution carried by rain and runoff from the city. This is particularly dangerous since, according to the Environmental Protection Agency, the contamination has destroyed much of the wildlife that once lived there and could potentially be harmful to a larger environmental habitat as Fourche Creek flows into the Arkansas River ("Fourche Creek Watershed", 2002).

Watersheds provide hydrological services that fall into four broad categories; water filtration and purification, seasonal flow regulation, erosion and sediment control, and habitat preservation (Postel & Thompson, Jr., 2005). Watersheds with a high proportion of land covered by dense forest and wetlands are particularly valuable for controlling runoff because the vegetation and soils are effective at filtering out contaminants and trapping sediments that would otherwise pollute waterbodies downstream (Postel & Thompson, 2005). Fourche Creek's wetlands can store up to 1 billion gallons of water (Audubon Arkansas, 2015a). If the watershed is not allowed to drain naturally, flooding is likely to occur, which poses a threat to wildlife as well as human life in the surrounding areas.

There are numerous environmental and economic reasons to maintain the health of the Fourche Creek Watershed and its wetlands . A healthy watershed can preserve biodiversity and stabilize the climate (Postel & Thompson, Jr., 2005). Urban wetlands such as Fourche Bottoms are greenspaces that can also double as parks, providing aesthetic enjoyment, enhancing recreation and tourism, and having a positive impact on the local housing market (Crompton, 2001). Research suggests that people frequently pay more money for homes closer to parks.

Furthermore, Crompton (2001) claims that the positive impact on the housing market will also create revenue for the city, further justifying a decision to protect greenspaces in a city. Another study performed by Crompton, Love, and Moore (1997) states that parks make areas more attractive to businesses and potential investors, which can have a direct positive impact on the local economy. Parks are smart investments for cities as, according to Burt and Brewer (1971), parks have a long sustainability horizon and may generate up to a 10% return on investment per year in social capital.

Fourche Creek has been identified by the Environmental Protection Agency (EPA) as a source for enhancing the quality of life for Central Arkansas residents (Fisher, 2003)². Audubon Arkansas has been at the helm of efforts to conserve Fourche Creek in order to restore its quality and beauty (Audubon Arkansas, 2015). The organization is growing a multi-stakeholder coalition called the Friends of Fourche Creek to restore and revitalize Fourche Creek for the benefit of the environment and a wide variety of public uses. Partners include the City of Little Rock, Arkansas Game and Fish Commission, Arkansas Department of Environmental Quality, University of Arkansas at Little Rock, Arkansas Canoe Club, and others. Through hands-on volunteer opportunities and developing recreational access, Audubon hopes to renew the community's interest in Fourche Creek and engage more people in protecting the watershed. (Audubon Arkansas 2015).

Because watersheds and parks provide positive environmental, economic, social, and health effects for their local communities, citizens of Little Rock should support the Audubon Society and Friends of Fourche Creek in their efforts to protect and conserve the Fourche Creek watershed, as well as their plans to develop a natural resource for everyone to enjoy. Public spaces, especially parks and recreation areas, have long served as invaluable resources in facilitating an engaged and active community. The services offered through these public spaces can be an effective tool to promote physical health (Bjork, et al, 2008; Sallis et al, 2012) and increase community cohesion, as well as protect the environment for future generations (Harnik & Crompton, 2014; Maas et al, 2009).

Methodology

We used a mixed-method approach to collect both qualitative and quantitative data to gauge the experiences of the community members living in the vicinity of Fourche Creek and Fourche Bottoms, specifically in neighborhoods south of I-630.

² The Mayor's Sustainability Commission has also identified Fourche in this way. "Fourche Creek Recreation" is part of the 2020 Roadmap to Sustainability under the "Quality of Life" tenant. <u>http://www.littlerock.org/citydepartments/publicworks/solidwaste/recycle.aspx</u>

Sampling

We used purposeful and convenience sampling methods.³ The survey sampling frame was generated by randomly selecting from a database of grocery stores and churches in the project area zip codes—72204, 72206, and 72209. These served as the interview locations. At each location we interviewed willing participants.

In addition, we used purposeful sampling of five neighborhood associations through focus groups. The respondents were therefore persons living in neighborhoods in close proximity to Fourche Bottoms. These neighborhoods included Granite Mountain, Upper Baseline, South West Little Rock, University District (including Broadmoor and Fair Park), and South End. Two focus groups were held in each neighborhood.

Recruitment

Recruitment for participation in focus groups commenced soon after approval was granted by the Institutional Review Board (IRB) at the University of Arkansas at Little Rock. Audubon Arkansas, the Arkansas Community Organization, and Little Rock neighborhood associations helped with recruitment. In addition student researchers made announcements at neighborhood meetings, and community celebration events such as "National Night Out."⁴ Others participants were recruited via phone calls and emails. Key informants were selected based on their leadership role within the community as well their professional expertise. In line with the requirements of the IRB, informed consent was sought from respondents either verbally or in writing. Surveys were administered in the same locations where the focus groups took place. Convenience sampling was used to identify willing respondents. Surveys were conducted with a data collection tool that contained both open and closed ended questions. In total, 416 surveys were administered.

Data Limitations

Focus groups are an effective means for gathering perceptions as they allow participants to provide detailed answers in their own words (Krueger & Casey, 2009). Though the focus groups were successful, not all participants participated equally. A few outspoken participants caused others to withdraw or answer less frequently. Our facilitators worked to mitigate this by addressing questions to specific participants to obtain their answers. The limitations of focus

³The authors of this study would like to thank Cindy Bennett, the Director of the Survey Research Center, and Dr. Michael Craw of the Institute of Government, both at the University of Arkansas at Little Rock, for their assistance in designing this project.

⁴The authors would like to thank Pat Gee, Kathy Wells, Warrine Robinson, Joan Adcock, Ron Copeland, Karen Walls, and many other community members for their support in assembling the focus groups.

groups may be mitigated by combining this methodology with a quantitative method such as surveys (Krueger & Casey, 2009).

Our most significant survey data limitation was our population sample. A probability sample, a method of selection that gives everyone in a selected area the same chance to participate, was not used to conduct our surveys (Fowler, 2009). Due to concerns about student safety, student researchers employed a convenience sample. This method has a higher rate of bias due to the selection of participants based on their availability rather than a random selection, and thus limits the generalizability of the data (Fowler, 2009). Only those individuals that were present at a location on the day we conducted a survey had an opportunity to be selected for participation. To lessen some of the selection bias in the convenience sample, the student researchers attempted to conduct our surveys at randomly selected locations. Unfortunately, not all locations that were randomly selected were willing to let us conduct surveys on their property. Due to thisThus, we selected alternate locations (grocery stores, gyms, health centers, etc.) that were willing to allow us to conduct surveys, rather than using a random selection process. The alternate locations selected still fell within the requirements of being south of Interstate 630. Surveys were completed with the utmost care, and the data analysis was reviewed extensively for potential mistakes.

Data analysis

Qualitative approaches were used to analyse the focus groups. First to analyze the focus group data, first, all theeach audio- recorded interviews were was transcribed. Each focus group was transcribed separately by the team that conducted it. This was then followed by the process Transcripts were coded, codes were grouped into categories, and categories grouped into themes. of coding each of the transcribed interviews for the purposes of making of the verbatim and identifying similarities. The next step involved grouping common codes into categories and then into themes. After all the surveys were returned, the team of student researchers embarked on the process of going through each For questionnaires, a code book and a code sheet were developed, and data were analyzed and used to enter the data using the Statistical Package for Social Programs (SPSS).

Research Results

Surveys

Survey participants were asked a series of questions pertaining to outdoor activities, neighborhood parks, desired resources, and time spent in the outdoors. Popular outdoor activities (Table 1) ranged from leisure activities such as walking/walking one's dog (22.7% of participants) and fishing (7.2%) to more intensive activities including sports such as football, basketball or golf (21.5%); biking (10.6%); and hiking (17.8%). When asked about activities

they like to do in neighborhood parks, participants identified walking (25.2%), playing games such as hide and seek (16.0%), and sitting and relaxing (10.7%) as popular choices (Table 2). Picnicking was the fourth most popular response (9.0%).



Source: Surveys conducted by Clinton School Class 11



Source: Surveys conducted by Clinton School Class 11

Interestingly, desired amenities for parks did not align completely with participant activities/interests. Over 34% of participants did not respond to questions about desired amenities for parks (Table 3). Only 14.7% of participants expressed a desire for additional sidewalks and trails, but about one third of those surveyed mentioned walking or biking as an outdoor activity. In addition, participants asked for outdoor playsets and playgrounds, as well as better bathrooms and water fountains.



Source: Surveys conducted by Clinton School Class 11

A majority of participants have spent some time around creeks, heard of Fourche Creek, or are interested in cleanup activities at Fourche Creek. Of the participants who have spent time around creeks (72.4%), 54% of these participants about half have visited creeks either monthly, weekly, or daily (Table 4).



Source: Surveys conducted by Clinton School Class 11

More than 25% of participants surveyed have never spent any time around creeks. However, it is important to note that even though a significant percentage of participants have not spent time around creeks, 58% of all participants surveyed have either heard of Fourche Creek (Graph 1) or are interested in helping clean the creek (Graph 2).



Source: Surveys conducted by Clinton School Class 11





Source: Surveys conducted by Clinton School Class 11

Frequencies of fishing and boating in creeks were significantly lower than picnicking. Over two-thirds of participants have never gone fishing (69.6%; Graph 3) or boating (71.5%; Graph 4) in creeks, while nearly two-thirds of participants have gone picnicking (62.7%; Graph 5).



Source: Surveys conducted by Clinton School Class 11



Source: Surveys conducted by Clinton School Class 11



Source: Surveys conducted by Clinton School Class 11

Of the participants who have fished, the highest individual percentage of participants fished weekly (8.7%), however, a majority (23.1%) of participants fished less than twice a year (Table 5). It is worth noting that 18.1% of participants fished once a month or more (Table 5).



Source: Surveys conducted by Clinton School Class 11

Boating was mentioned less frequently than fishing. This also aligns with data gathered on popular outdoor activities in Little Rock (Table 1). A little over 21% of participants went boating, kayaking, or canoeing less than twice a year while only 10% of participants were active more than once a month (Table 6). The highest percentage of participants participated either twice a year (7.5%) or once a year (8.4%).



Source: Surveys conducted by Clinton School Class 11

Survey respondents picnicked more regularly than they fished or floated. Thirty-six percent of participants who have picnicked or walked did so either monthly, weekly or daily (Table 7). This increases to 52.4% when including participants who picnicked or walked at least twice a year. Most participants either picnicked or walked monthly (18.6%) or twice a year (16.4%).



Source: Surveys conducted by Clinton School Class 11

An important point to note is that all activity participation percentages fell at or below the overall frequency of time spent around creeks. This shows that the data gathered from participants is consistent across questions. Overall, our results show that individuals are most likely to be monthly or bi-annual visitors to Fourche Creek and are willing to participate in clean-up events.

Focus Groups

The majority of the information provided could be sorted into three primary themes:1) recreational use of parks, 2) the issue of trash and maintenance, and 3) the need for safety and security. The responses were varied with regard to the recreational use of parks, but there was a consensus among participants about the importance of maintenance and cleanliness as well as safety and security.

Focus group participants mentioned using the city's parks fairly frequently. Fishing was mentioned by a number of participants as being an activity they or their family members enjoyed in the creeks around Little Rock. "My son," said one participant, "used to catch fish in the stream in Boyle Park. We never encouraged him to eat the fish, but we saw a few little guys that were sizable fish." A few participants said they enjoyed playing with their children on playgrounds and playing with their dogs in parks around the city. Nearly all of the participants mentioned walking and biking on the paths and trails of different parks as activities they enjoyed regularly. Some participants talked about how much they enjoyed the wildlife they encountered on these trails. They talked about the diversity of snakes and birds they saw along these trails, and mentioned the high-quality bird watching in the area.

Participants agreed that proper trail maintenance is essential to their enjoyment of the trails. When we asked what amenities they would want if the city were to establish a Fourche Creek Park, the first thing mentioned was trails. They followed this with requests for canoeing, fishing, and a pavilion. Although participants used the parks for different recreational activities, they did come to a consensus on the importance of trail maintenance, especially with regard to flooding concerns. When discussing trails in Boyle Park one participant said, "well the problem is it needs constant maintenance, because every time it rains Boyle Park floods no matter what. And it leaves a lot of debris, especially on the bridge."

The issue of trash was brought up after we asked the participants about Fourche Creek and Fourche Bottoms. Some participants thought this referred to "the bottoms near the airport" until they were shown where Fourche Bottoms was on a map. There was much concern among the participants about the cleanliness of Fourche Creek and Fourche Bottoms. The only participant who recognized the area asked if that was where the landfill was placed. "It's a pile of trash," she said. "I mean they kind of destroyed that. All of the trash in Little Rock went there." The participants did go on to say that they have covered the landfill with grass. However, once they discussed the creek itself one participant claimed, "Oh, the creek is a mess." Another participant said, "Well the creek has a lot of litter. I saw it a long time ago and it was really littered." One participant understood that the watershed collected water from throughout Little Rock and pointed out that "[trash] gets washed off the street, and it comes from everywhere North and West of here." This participant also recognized the efforts of Audubon Arkansas and Friends of Fourche Creek in helping to clean up the area.

Participants agreed on the need to make sure that parks were safe and secure. They were concerned about crime when using parks at night and were worried about flood safety. Even in parks with lights, participants were concerned with crime. "It's a real improvement," a participant said, "to have...the nice walking trail with lights, though no one I know walks there at night. Unless there was crime patrol, I don't think anyone would do it." When asked about a park in Fourche Bottoms, participants cited security as a major concern. Flood control was the other big issue that the participants had with a possible park in Fourche Bottoms. One participant recalled one flood in 1979 that tragically resulted in some people losing their lives. She said, "I think it is a beautiful idea, but boy are you going where flooding has been a real issue. You would need cement ramps to withstand the floods for canoes." Despite these concerns, the focus groups seemed to show support for the idea of creating a Fourche Creek Park.

Interviews

We also conducted interviews with three key community members whom we felt were key informants. From these interviews, we distilled two common concerns.

First, the interviewees emphasized the importance of preserving the natural habitat of Fourche Creek. The interviewees were excited about the potential development of the park and recreational amenities for the community's pleasure. They noted however, that Audubon Arkansas should not overlook the significant opportunity for ecological restoration and preservation of Fourche Creek. One of the interviewees mentioned that Audubon Arkansas could refer to successful nature restoration precedents, such as Schuylkill River and Chesapeake Bay. They were in consensus that the park could and should be developed in a way that was least intrusive on the natural habitat. These concerns were echoed by focus group participants who mentioned how much they enjoyed the wildlife they encountered while at the parks. They would likely agree that minimal intrusion should be a top priority for any park established in the area.

A second concern the interviewees emphasized that they would like to see an increased volume of publicity from Audubon Arkansas with regards to their achievements in the state. In general, the interviewees were highly complimentary of Audubon Arkansas' work. However they encouraged Audubon Arkansas to engage in more publicity to better showcase the positive

work that they have done over the years. The interviewees commented that they worry that people have only heard of the negative aspects of Fourche Creek, for example, the clean-up expeditions. The interviews corroborated with what we found in the focus group as well. For example, focus group participants generally knew of, and spoke highly of, Audubon Arkansas' cleanup efforts but could mention little else about the organization. It would therefore be beneficial to publicize the positive accomplishments of Audubon Arkansas, and the benefits of canoeing and kayaking Fourche Creek. Increasing the community's awareness of the progress that has been made in Fourche Creek may promote greater community participation in cleaning and maintaining the area.

Conclusion and Recommendations

The purpose of our research was to assess community perceptions of Fourche Creek and the types of recreational opportunities community members would like to have available within the watershed. Our findings showed that most participants were generally aware of Fourche Creek and over half expressed interest in assisting in cleanup activities. Through our interviews, focus groups, and surveys we learned that participants are excited about the possibility of having a park close to home that would allow them to have access to the outdoor activities they enjoy, such as walking, hiking, biking, and sports. In relation to the development of a park, participants expressed concerns over trash cleanup and park maintenance, as well as safety and security within the park.

Based on our research, our team has provided the following recommendations to assist Audubon Arkansas' effort to protect and preserve Fourche Creek and develop plans for a park in the area.

1) Audubon Arkansas should continue to reach out to the community to increase the community's awareness of their work as a conservation organization, the importance of the Fourche Creek Watershed and the need for its preservation, and how the community can contribute to the effort.

2) In developing a plan for the park, Audubon Arkansas should consider including multi-use trails for walking, hiking, and biking and should also consider park amenities such as restrooms, fountains, benches, dog play areas, and child play areas. All of these amenities were mentioned by a large portion of participants. The development of the Fourche Bottoms should also include plans to address trash and maintenance and safety and security.

3) Audubon Arkansas should reach out to the neighborhood associations as well as to branches of the Arkansas Community Organization within the Fourche Creek watershed area to request assistance with the cleanup effort in areas near those neighborhoods. We are aware that Audubon hosts major cleanups in the Bottoms, but perhaps some smaller cleanups involving both neighborhood associations and the Arkansas Community Organization could be explored.

Specifically, Audubon Arkansas should begin by strengthening ties with neighborhoods that were involved in our research, in part by taking neighbors on guided tours through parks neighboring the Fourche, and in part by organizing smaller, shorter clean ups. These neighborhoods have been introduced to Audubon Arkansas through the research process and, based on our research findings, we believe that there were a large number of community members who would be willing to assist with cleanup in the watershed area.

4) Our visits to the boat ramp at Interstate Park revealed that access to Fourche Creek is not well marked. We recommend that Audubon and the City of Little Rock work together to improve signage, and information so that city residents are aware of the numerous parks on the Fourche Creek Watershed, the recreational opportunities available in the Bottoms, and the chances to birdwatch and walk along trails that are already present in parks.

5) Given that Fourche Creek is one of the largest urban wetlands in the United States, there are likely opportunities for grants through the National Science Foundation, the Environmental Protection Agency, and other related entities that Audubon Arkansas could explore to protect the watershed. For example, the National Science Foundation has a grant on the Dynamics of Coupled Natural and Human Systems that could be applied Fourche Bottoms in partnership with UALR and the Clinton School.

Overall, Little Rock residents whom we spoke to were interested in the conservation efforts of Audubon Arkansas and the possibility of enhancing the accessibility of Fourche Creek. There is clear interest in restoring the area, and our research indicates that there would be support from the community in continuing Audubon Arkansas's conservation efforts if more community members were made aware of when the clean-ups take place. We believe that the community will respond favorably to an increase in awareness of Audubon Arkansas and the Fourche Creek Watershed, especially if they continue to be included in the process of park development.

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