Public Perception Of A High-Quality River: Mixed Messages

By: **Kristan Cockerill**

Abstract

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Cockerill, K. (2016). ENVIRONMENTAL REVIEWS AND CASE STUDIES: Public Perception of a High-Quality River: Mixed Messages. Environmental Practice, 18(1), 44-52. doi:10.1017/S146604661500040X. Publisher version of record available at: https://www.cambridge.org/core/journals/environmental-practice/article/environmental-reviews-and-case-studies-public-perception-of-a-highquality-river-mixed-messages/CEF1FFBDABDC3AE6C19BA1E1DD567667

Public Perception of a High-Quality River: Mixed Messages

Kristan Cockerill

Existing studies have demonstrated a lack of consensus on the relationships between what the public sees when viewing a river, the actual ecological quality of that river, and a perceived need for management measures for that river. More specifically, there is insufficient information available about public perceptions of high-quality rivers. Therefore, this study, conducted in North Carolina, assessed public perceptions of a high-quality river, including links between perceptions of how attractive or how natural the river appeared and perceptions of specific ecological conditions on the river. The study also assessed the public's perceived need for flood protection or river rehabilitation. The study's results show that public perception of the river studied is complex and, in some ways, aligns well with available monitoring data collected from that river, but simultaneously reflects the public's lack of knowledge about what constitutes a high-quality river, which influenced a perceived need for flood control and rehabilitation.

Many variables influence public perceptions of waterways, including cultural expectations and ideas about what is "natural." As Nassauer (1992) recognized many years ago, "We confuse our perceptions of natural beauty with ecological function" (p. 240). Findings from numerous studies comparing aesthetic values and ecological values have shown that sometimes these perceptions align in the public mind and sometimes they do not (Gobster et al., 2007; Larned et al., 2006; Lewis and Popp, 2013; Nassauer et al., 2004; Petursdottir, Aradottir, and Benedictsson, 2012; Westling, Lerner, and Sharp, 2009). Some studies have found that the public's perception of an area as "natural" positively affects their opinion of how aesthetically pleasing an area is (Junker and Buchecker, 2008). The presence of vegetation and wildlife can make river corridors seem more "natural" and, hence, more appealing to the public (Gobster and Westphal, 2004). More natural (i.e., less uniform) vegetation can be a desirable ecological trait for river corridors, but Suren (2009) discovered that the public sometimes perceived excessive plant growth, both in the river channel and in riparian areas, to be "untidy" and to reflect a lack of management. Several other studies have focused on public perceptions of woody debris in rivers. These studies tended to find that the presence of limbs or fallen trees in the river channel are not considered to be attractive, although their presence can positively impact ecosystem quality (Chin et al., 2008; Gregory and Davis, 1993; Piégay et al., 2005; Wyzga, Zawiejska, and Le Lay, 2009). These mixed findings highlight the need for continued exploration of what influences the public's perceptions of waterways and efforts to manage those waterways.

Given the potential for misaligned perceptions of what is natural versus what is aesthetically pleasing, the United States Environmental Protection Agency's (USEPA) recent emphasis on protecting high-quality river systems over trying to "fix" degraded river systems (USEPA, 2011, 2012) requires better understanding of what the public sees when they view a high-quality river. Among the many variables that influence how the public perceives a waterway, proximity to and having a personal connection with a waterway are highly relevant (Brody, Highfield, and Alston, 2004; Lewis and Popp, 2013; Silvano et al., 2005). Therefore, assessing perceptions of a river among people who are familiar with that river is warranted. Additionally, existing studies that assessed public attitudes about river conditions often rely on conducting surveys and showing survey respondents static images of rivers. This approach can introduce bias into study results (Lewis and Popp, 2013) and may reduce the influence of a personal connection to a waterway on study participants' perceptions. For these reasons, the study reported herein conducted public perception surveys on-site, near a high-quality mountain river.

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A pragmatic rationale for understanding the public's perception of an environmental feature is a two-pronged risk inherent in *not* understanding that feature. First, if the public does not acknowledge degraded conditions or understand what actions might lead to degradation, support for conservation and/or rehabilitation measures could be weakened. Conversely, misconceptions that degradation exists when, in fact, the environmental feature is in good condition may lead to public demands for rehabilitation or other management measures that are not warranted, thereby wasting resources and potentially causing degradation with the implementation of such measures (Nassauer, 1992; Tullos et al., 2009). The latter scenario was the focus of the project reported herein. Misaligned perceptions about a river's condition and a subsequent intervention can create "false images" of an outcome, if, for instance, a project's goal claims to be addressing ecological concerns but does not actually improve ecological conditions (Cockerill and Anderson, 2014).

Nassauer, Kosek, and Corry (2001) noted that, "Part of the way to advance the ecological health of rivers is to get people to notice what has been undermined about their ecological health or what needs to be protected to maintain ecological health." The project described herein was designed to better understand how individuals who are familiar with a high-quality river perceive its subjective attributes (e.g., attractiveness, naturalness), general conditions (e.g., riparian vegetation, habitat quality) and specific water quality issues (e.g., chemical contamination, runoff). Additionally, the project assessed the study respondents' perceived need for increased flood protection and/or rehabilitation for the river.

Study Area

The study area is in Watauga County, located in the Blue Ridge Provinces of North Carolina, along a greenway trail adjacent to the South Fork of the New River (Figure 1). This headwaters mountain river is in a temperate rainforest region. The elevation at the study site is about 1,000 m, and the area averages 125 cm of rain and 100 cm of snow each year (State Climate Office of North Carolina, Undated). Watauga County is rural, with a total population of 52,000 and 64 people/km^2 (US Census, 2010). The largest city in the county, Boone, has a permanent population of about 17,000 and is home to Appalachian State University, which has a student population of about 18,000 (ASU, 2015). The South Fork of the New River flows through Boone, and, at the specific study site, the river is bordered by athletic fields and a greenway trail (Figure 1). In 2013 and 2014, this section of the river experienced several high water events.

All available data indicate that, at the study location, the New River is a high-quality river. A thorough summary of diverse data from the South Fork of the New River can be found in Swinson (2014). The median water temperature of the river is 10°C, which is well below the temperature required to support native trout. In addition, the river's pH is consistently within the 6–9 range, and turbidity averages 2 ntu, well below regulatory limits. At the study site, although there are conductivity spikes in the winter of more than 2500 µS/cm, from road salt in runoff, the general water quality of the New River remains high year-round. Benthic macroinvertebrate assemblages sampled from the river are rated "excellent" and fish populations are rated "good" on

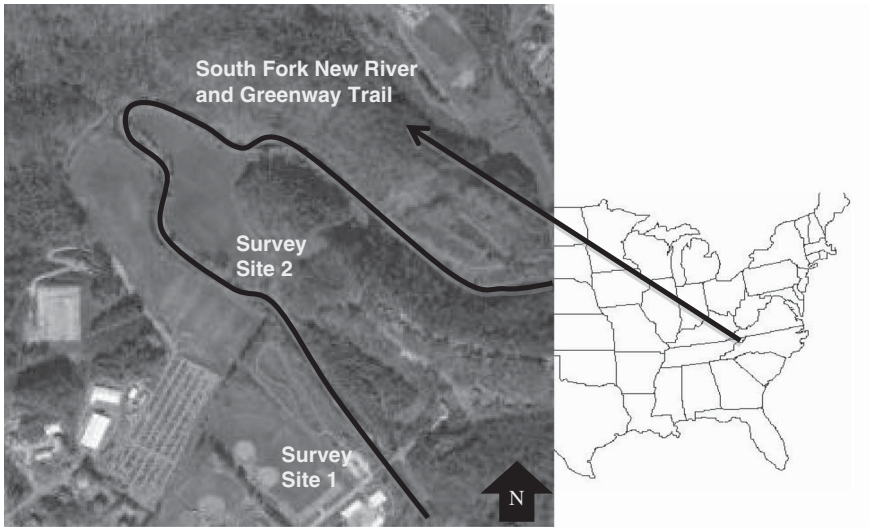

Figure 1. Study area, South Fork of the New River, Watauga County, North Carolina

the North Carolina Biological Indicator Index (NCDENR, 2012, 2013), and there are native trout present in the river.

Methods

The author drafted a 25-item survey (including demographic questions) in the spring of 2013. The length of the survey was determined by a desire to keep it to one page and to keep the required time investment for survey respondents to under 10 minutes. Three water management specialists familiar with the study area provided input to drafts of the survey. Survey questions included how often and for what activities respondents used the greenway trail in the area where the survey was being administered. The survey asked about the respondents' perspectives on the aesthetic and environmental conditions of the New River and its riparian area. Because previous work has suggested a relationship between perceptions of what is considered to be natural and what is actually ecologically healthy, this survey explicitly asked how natural the river appeared to the respondents. Likewise, based on existing evidence that aesthetics matter in public perceptions of a river's condition, this survey explicitly asked how attractive the river appeared to the respondents. Additionally, to further delineate potential nuances in public perceptions, this survey asked respondents to compare the river they could see to an imagined ideal river. Asking about these three broad concepts of "naturalness," "attractiveness," and "idealness" was intended to allow the author to assess whether and how these concepts are distinct to the public.

The survey continued with questions about whether specific water quality issues (e.g., chemical contamination, erosion, runoff) or more general characteristics (e.g., quantity of riparian vegetation) were influencing the respondents' perceptions of the river's naturalness, attractiveness, and/or idealness. Finally, the survey asked the reader to respond to statements about the need for flood protection or rehabilitation for the river, to assess whether the respondents' perceptions of the river's conditions influenced their perceived need for management intervention for the river. Survey statements were structured in two formats: a five-point Likert-type scale (ranging from Strongly Agree to Strongly Disagree) and a numeric 1–10 rating scale. The Likert-type scale was used to assess respondents' knowledge about specific, quantifiable water quality issues and to assess their attitudes about flood control and rehabilitation as management options for the river. The numeric rating scale was used to elicit respondents' perceptions of the more subjective attributes of the river's naturalness, attractiveness, and idealness as well as their perceptions of its more qualitative general conditions. The survey and survey collection methods received Institutional Review Board approval (#13-0226) through Appalachian State University.

As noted in the introduction of this article, public perceptions about waterways are influenced by individuals' proximity to and familiarity with the waterway. Therefore, this project used purposive sampling focused on individuals who had likely observed the river on multiple occasions and under various conditions. The underlying assumption was that familiarity with the river would contribute to greater knowledge and understanding of the conditions on this waterway. Between July 13, 2013 and August 26, 2013, the author and student volunteers approached individuals observed to be using the greenway trail and asked them to take the survey. To avoid influencing the study participants' responses, the volunteers were trained to not engage in discussion with respondents about the survey or the river. If respondents had questions about the survey or the river, they were given the author's contact information and asked to follow-up with the author. Surveys were collected over a two-hour period at different times on each of four days. Additionally, surveys were collected at two sites: (a) a parking lot at one entrance to the greenway trail (Site 1), and (b) at a point where the trail runs between the athletic fields and the river (Site 2) (Figure 1). Using the parking lot location as well as the site more centrally located on the greenway trail allowed us to recruit participants who were biking or running before they began their recreational activity at the athletic fields. Both sites feature elements of the built environment as well as views of the river corridor.

In total, 122 completed surveys were collected. Unfortunately, reliable counts of the total number of potential survey participants at each survey collection event were not gathered, so it is not possible to calculate a precise survey response rate. Although anecdotal, the surveyors estimated that, at the end of each collection period, more than half of all the people approached about the survey completed it.

The survey results were entered into SPSS for statistical analysis, which included calculating response frequencies, computing a bivariate Pearson correlation for all variables, and running independent *t* tests to compare the responses collected from the two survey collection sites.

Results

As a group, the survey respondents can be categorized as predominantly highly educated women of all ages, from

Watauga County, who use the greenway trail frequently (Table 1). Because this study population was targeted, it was not anticipated that the survey respondents would represent the broader population.

Respondents claimed that they do stop to look at the river while using the greenway trail, and do perceive the river to be "natural" (Table 2). At the same time, a majority of respondents stated that more should be done to prevent the river from flooding and that the river needs to be rehabilitated. The survey asked about specific water quality issues (i.e., thermal pollution, pet waste, chemical contamination, runoff, and erosion), because these specific issues can be documented and act as indicators of a respondent's knowledge about river conditions. Given that monitoring data show that the New River is a high-quality waterway, the Strongly Disagree and Disagree responses to the questions about whether the water quality issues noted are impacting this section of the New River can be interpreted as "correct," while the Strongly Agree and Agree responses to these questions can be considered "incorrect." As Table 2 shows, only 2%–7% of respondents selected the correct responses to these questions. A third or more said that they "do not know" if these issues were impacting the river's water quality, and the remainder perceived there to be problems that are not reflected in the monitoring data collected from the river.

Table 1. Survey respondent characteristics among 122 total respondents

Characteristic	Percentage (%)
Gender (n = 117)	
Female	71
Age (n = 116), range: 19–85	
19–24	21
25–39	19
40–54	28
55–64	20
65 +	12
Education (n = 118)	
Less than college	17
College degree or higher	67
Current college student	16
Residence	
Watauga County	69
North Carolina	93
Greenway use frequency (n = 120)	
Less than once/week	23
Average once/week	19
Multiple times/week	58
Primary greenway activity (n = 120)[a]	
Walking	64
Running	27
Dog walking	15
Biking	10

[a] Totals more than 100% because many respondents selected more than one activity.

Despite survey respondents' perceptions that there may be water quality issues in this section of the New River, when they were subsequently asked to rate the various attributes of the New River, their responses were quite positive (Table 3). Most respondents rated the river's overall attractiveness, naturalness, and idealness as an 8 (mode value) on a 10-point scale. Survey responses to the statement about the river's attractiveness reflect the highest mean and the lowest range in responses among the subjective statements. The quantity of riparian vegetation around the river was rated quite highly. Water and habitat quality were rated lower, but were still on the positive side of the scale.

Where respondents took the survey did affect their ratings for riparian vegetation quantity and their perceptions of how natural the river appeared to be. Respondents who took the survey in the parking lot (Figure 1, Site 1) before entering the greenway trail had a mean rating for vegetation quantity of 6.63 on the 1–10 scale, compared with respondents who were already on the greenway trail (Figure 1, Site 2) when they took the survey, whose mean rating was 7.35 (t test comparing responses from the two locations, $p = 0.038$). When rating how natural the river appeared, the mean for respondents who were administered the survey at Site 1 was 6.31, compared to a 7.11 mean for respondents who were administered the survey at Site 2 (t test, $p = 0.032$). There were no other significant differences between the two survey sites.

Perceived River Condition

Correlations among survey variables show positive relationships between the respondents' perceptions of the river's attractiveness, naturalness, and idealness (Table 4). To assess what might influence these perceptions, the survey asked respondents to rate riparian vegetation quantity, water quality, habitat quality, and the general environmental condition of the river and its riparian area. Respondents' ratings for these characteristics are all positively correlated with their perceptions of the attractiveness, naturalness, and the idealness of the New River. The strongest relationships were between the respondents' ratings of habitat quality and overall

Table 2. Responses to statements about river condition

Survey statement	SA/A (%)	N (%)	D/SD (%)	DK (%)
When using the Greenway, I typically stop at least once to look at the river. (n = 120; mean:[a] 5.25; SD: 0.839)	88	4	5	3
At this location, the New River looks like what I expect a natural river to look like. (n = 121; mean: 4.69; SD: 0.932)	65	16	12	8
More should be done to prevent flooding at this location. (n = 120; mean: 4.71; SD: 0.989)	53	24	8	15
This section of the New River needs to be rehabilitated to improve its overall environmental condition. (n = 121; mean: 4.72; SD: 0.866)	51	26	6	17
Thermal pollution (hot water) is a water quality issue here. (n = 120; mean: 4.16; SD: 0.895)	12	35	7	47
Pet waste is a water quality issue here. (n = 120; mean: 4.51; SD: 0.914)	31	29	7	33
Chemical contamination (e.g., pesticides, fertilizer) is a water quality issue here. (n = 119; mean: 4.70; SD: 0.811)	35	24	2	39
Runoff from streets, sidewalks, and buildings is a water quality issue here. (n = 120; mean: 4.75; SD: 0.916)	43	21	4	33
River bank erosion is a water quality issue here. (n = 120; mean: 4.73; SD: 0.822)	43	23	4	29

Scale: Strongly Agree (SA), Agree (A), Neither Agree nor Disagree (N), Disagree (D), Strongly Disagree (SD), Do Not Know (DK).
[a] Mean/Standard deviation (SD) calculated on a scale between 2 (Strongly Disagree) and 6 (Strongly Agree) (excludes "do not know" responses, coded as "1" in the dataset).

Table 3. Responses to survey statements rating current conditions along the New River at the survey location

Survey statement	Mean	Mode	SD[a]
The overall attractiveness of this section of the New River. (n = 119)	7.31	8	1.774
Quantity of the vegetation along the banks of this section of the New River. (n = 119)	7.03	8	1.911
Quality of the water in this section of the New River. (n = 112)	6.30	7	2.066
Quality of the habitat for wildlife in this section of the New River. (n = 112)	6.48	6	2.096
General environmental condition of this section of the New River. (n = 115)	6.69	8	2.010
The "naturalness" of this section of the New River. (n = 115)	6.75	8	2.018
Think about what you would consider an "ideal" river in this region. Rate how this section of the New River compares to that image. (n = 118)	6.33	8	2.063

Scale: 1 = It is awful, to 10 = It is almost perfect.
[a] Standard deviation.

environmental condition and their perceptions about the river's idealness. However, the survey respondents' perceptions of specific water quality concerns (e.g., thermal pollution, erosion), were generally not correlated with how attractive, natural, or ideal the respondents perceived the river to be.

The study's results show that responses to the two groups of river condition statements were consistent among the survey respondents. That is, respondents who indicated that one specific water quality concern was an issue on the river were likely to state that all of the concerns were issues. Likewise, survey respondents who rated either vegetation quantity, water quality, habitat quality, or general environmental condition highly were likely to rate all of these characteristics highly. There are, however, a few connections between responses to these two groups of river condition statements. The survey respondents' perceptions of whether chemical contamination and runoff are water quality concerns for the river were negatively correlated with their perception of the general water quality of the river, and their perceptions of whether chemical contamination is a water quality concern for the river was negatively correlated with their estimation of the overall environmental condition of the river and its riparian area.

Although responses to the questions about the river's naturalness that used a Likert-type scale and the numeric rating scale were correlated, they differed in their relationships to other survey items. For example, responses to the question about the river's naturalness that utilized the Likert-type scale was not correlated with the survey respondents' perceptions of the river's general water quality, habitat quality, or overall environmental condition, while the responses to the question about the river's naturalness that employed a numeric

Table 4. Correlations among survey variables

Survey variable	SD[a]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. River looks natural	0.932															
2. Rate river naturalness	2.018	0.25[b]														
3. Rate river attractiveness	1.774	0.28[b]	0.56[b]													
4. Rater river "idealness"	2.063	0.11	0.69[b]	0.65[b]												
5. Thermal pollution is an issue	0.895	0.19[c]	− 0.01	0.04	0.06											
6. Pet waste is an issue	0.914	0.17	−0.01	−0.02	0.05	0.51[b]										
7. Chemical contamination is an issue	0.811	0.02	−0.04	−0.06	−0.06	0.66[b]	0.72[b]									
8. Runoff is an issue	0.916	0.05	−0.02	−0.04	−0.12	0.52[b]	0.60[b]	0.79[b]								
9. Erosion is an issue	0.822	0.05	0.01	−0.09	−0.01	0.45[b]	0.61[b]	0.61[b]	0.65[b]							
10. Rate vegetation quantity	1.911	0.22[c]	0.63[b]	0.70[b]	0.66[b]	−0.02	−0.06	−0.08	−0.08	−0.11						
11. Rate water quality	2.066	0.03	0.51[b]	0.60[b]	0.59[b]	−0.12	−0.10	−0.22[c]	−0.22[c]	−0.14	0.61[b]					
12. Rate habitat quality	2.096	0.04	0.68[b]	0.58[b]	0.74[b]	−0.10	−0.11	−0.18	−0.16	−0.15	0.62[b]	0.76[b]				
13. Rate environmental condition	2.010	0.04	0.68[b]	0.64[b]	0.73[b]	−0.15	−0.15	−0.22[c]	−0.16	−0.11	0.57[b]	0.79[b]	0.89[b]			
14. Flood protection needed	0.989	0.12	−0.17	−0.18[c]	−0.15	0.30[b]	0.37[b]	0.30[b]	0.35[b]	0.46[b]	−0.22[c]	−0.26[b]	−0.32[b]	−0.29[b]		
15. Rehabilitation needed	0.866	−0.11	−0.28[b]	−0.25[b]	−0.27[c]	0.39[b]	0.26[b]	0.31[b]	0.29[b]	0.42[b]	−0.23[c]	−0.37[b]	−0.43[b]	−0.40[b]	0.57[b]	
16. Frequency of visits to site	1.08	0.03	0.04	−0.15	−0.10	0.18	0.22[c]	0.25[b]	0.28[b]	0.32[b]	−0.12	−0.15	−0.18	−0.22[c]	0.23[c]	0.22[c]

[a]Standard deviation.
[b]Correlation significant at 0.01 level (2-tailed).
[c]Correlation significant at 0.05 level (2-tailed).

rating scale were strongly correlated with the respondents' perceptions of all of these river features.

The frequency of the survey respondents' visits to the greenway trail was not correlated with their ratings of the river's attractiveness, naturalness, idealness, or overall environmental condition. Visit frequency did correlate positively with survey respondents' perceptions of pet waste, chemical contamination, runoff, and erosion as potential water quality issues. It also correlated negatively with respondents' perceptions of the river's overall environmental condition.

Perceived Need for Management

As Table 2 shows, a majority of the survey respondents agreed that there needs to be more flood control on the river and that the river needs to be rehabilitated. There was a strong correlation between survey respondents who agreed that both management options are necessary, and respondent frequency of greenway use was positively correlated with the respondent's perceived need for both flood control and rehabilitation for the river.

There were no significant correlations among survey respondents' perceptions of the river's naturalness or idealness and a perceived need for flood protection. There was a correlation between the respondents' perceived attractiveness of the river and a perceived need for flood control. A perceived need for flood control and rehabilitation for the river were positively correlated with survey responses about all of the specific water quality issues and negatively correlated with the respondents' ratings of the river's riparian vegetation quantity, water and habitat quality, and overall environmental condition. How attractive, natural, and ideal the respondents rated the river were all negatively correlated with a perceived need for rehabilitation.

Discussion

The survey respondents' perceptions of the river's habitat quality and general quality were well aligned with the actual physical and biological data available from the study site, which show that the river is in excellent condition. More than one third of the respondents, however, Strongly Agreed or Agreed with the survey statements that the specific water quality issues of pet waste, chemical contamination, runoff, and erosion create problems at this site, and almost a quarter of the respondents selected neutral responses for those statements. When asked about thermal pollution, one third of the survey respondents were neutral and almost half said they did not know if this was a concern for the river. The varied relationship between the available monitoring data and the respondents' subjective judgments of the river's quality suggests several possibilities. Some respondents appeared to be distinguishing between general concepts like water or habitat quality and very specific potential water quality issues like chemical contamination or erosion. Furthermore, simply providing a specific water quality issue on the survey may prompt some respondents to link that specific issue with an assumption that there is an actual problem at the site. Survey respondents may also have been drawing on an information base that is broader than just their personal observations of the river. For example, they may have learned in school or from the media that these specific issues can pose water quality problems. The high number of "do not know" responses to the survey questions about the specific water quality issues does suggest that respondents were honestly self-appraising their knowledge about specific water quality conditions on this river. The consistent logic in the survey responses, i.e., respondents who rated the river's conditions more highly were less likely to say that the river needed flood control or rehabilitation, provides further support for the validity of the survey results.

Despite the survey respondents' overall positive perception of the general conditions of the river and their high level of uncertainty about the river's specific water quality conditions, about half of the respondents agreed that the river needs to be rehabilitated and more should be done to prevent the river from flooding. There are undoubtedly multiple contributing factors at work in these results, including what people have seen and experienced at the study site. Several large flooding events in recent years have inundated the greenway trail. The survey respondents use the trail often and therefore have probably seen the impacts to the trail after high water events. As noted in the results section of this article, more frequent visitors to the greenway trail were significantly more likely to say that flood protection on the river is needed.

Among the specific water quality conditions included in the survey, erosion had the strongest correlation with an expressed need for management interventions for the river. One explanation for this result is that, unlike thermal pollution or chemical contamination, erosion is highly visible. This may contribute to the negative correlation between perceptions of the river's attractiveness and a perceived need for flood control. The survey respondents may recognize or even have previously observed that flooding can exacerbate erosion, and, therefore, they may

see a need for flood protection to safeguard not only the built environment, but also the river itself. The order of the survey's questions may have also played a role here, because respondents were asked first about flood protection and then about rehabilitation, potentially reinforcing a perceived link between these activities. Additionally, other studies conducted in this watershed, including at the study site, have noted that decision makers invoke erosion as a problem requiring restoration in the watershed (Cockerill and Anderson, 2014; Swinson, 2014).

Previous studies have suggested that individuals' proximity to and familiarity with a waterway are relevant to their perceptions about that waterway (Brody, Highfield, and Alston, 2004; Lewis and Popp, 2013; Silvano et al., 2005). In this study, frequency of use of the greenway trail did not influence the survey respondents' general perceptions of the river's attractiveness, naturalness, or idealness, or their ratings of the general attributes of riparian vegetation quantity and water or habitat quality. Frequency of visits to the greenway trail did, however, positively correlate with the respondents' perceptions about specific water quality issues and was negatively correlated with their perceptions of the overall environmental condition of the river. These results suggest that the survey respondents' familiarity with a high-quality river is not correlated with knowledge of what constitutes a high-quality river.

This survey also confirmed previous studies that showed that how attractive a river is correlates with how natural the river is perceived to be (Junker and Buchecker, 2008; Nassauer, 1992). This study further linked the perceived idealness of a river with perceptions of its naturalness and attractiveness. The study results showed that how attractive, natural, and ideal the survey respondents rated the river also strongly correlated with their ratings of the river's overall environmental condition, indicating that these traits are all linked in the public mind. However, the difference in the respondents' ratings of the river's naturalness at the two survey collection sites suggests that the built environment is linked to the respondents' overall perceptions of the river. At the parking lot survey location (Site 1), the visible built environment includes the lot itself, a picnic pavilion, athletic fields, the greenway trail, a street, and several large buildings. At the more central greenway trail survey location (Site 2), the trail, a covered bridge, a split-rail fence, and athletic fields are visible. Hence, the magnitude of the built environment's presence may have influenced the respondents' perceptions that Site 1 is less natural than Site 2. Because the respondents' perceptions of the attractiveness, general environmental condition, or the idealness of the river did not differ based on where they were administered the survey (i.e., Site 1 or Site 2), the concept of "natural" appears to be a quality that the public contrasts with the visible built environment in a way that they do not do with the other descriptors. Of course, there may be other variables at work in these results, and, therefore, these results warrant more detailed assessment to examine the relationships between specific terms describing river conditions and the specific characteristics of the locations used when assessing public perceptions of those river conditions.

Conclusion

Returning to the rationale for this study, which was to better understand public perceptions of a high-quality river, the results highlight the complexity inherent in public perceptions about high-quality rivers and the relationships between those perceptions and potential management efforts for such rivers. Although the survey respondents' perceptions that general water and habitat quality on the New River are good do align with actual monitoring data collected from the river, these perceptions are coupled with respondents' uncertainty about whether specific water quality issues are impacting the river and with respondents' calls to more intensely manage the river. As noted in the introduction of this article, this disconnect between actual river conditions and a perceived need to manage the river have implications for attempts to ensure that the river remains in good condition. Indeed, since this public perception study was completed, a restoration project based on decision makers' perceptions of the river's degradation was implemented at the study site. Because the ecological conditions on this river were quite high already, the implemented restoration efforts could potentially decrease the overall quality of the river environment, at least in the short term (Tullos et al., 2009), and likely re-enforces erroneous public perceptions about what a high-quality river looks like (Cockerill and Anderson, 2014). Assessing these hypothesized impacts is fodder for future work.

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