

# FISH CONSUMPTION PATTERNS ALONG THE UPPER CHATTAHOOCHEE RIVER

G. Loeffler<sup>1</sup>, J.L. Meyer<sup>2</sup>, H. Trammell<sup>3</sup>, and S. Holmbeck-Pelham<sup>4</sup>

---

*AUTHORS:* <sup>1</sup>Ph.D. Candidate, <sup>2</sup>Research Professor, River Basin Science and Policy Center and Institute of Ecology, University of Georgia, Athens, GA 30602, <sup>3</sup>Boat Captain, and <sup>4</sup>Policy Director, Upper Chattahoochee Riverkeeper, 3 Puritan Mill, 916 Joseph Lowery Blvd., Atlanta, GA 30318.

*REFERENCE:* *Proceedings of the 2003 Georgia Water Resources Conference*, held April 23-24, 2003, at the University of Georgia. Kathryn J. Hatcher, editor, Institute of Ecology, The University of Georgia, Athens, Georgia.

---

**Abstract.** Anglers utilize the Chattahoochee River for both recreational fishing and fishing to supplement their family's diet. Along the mainstem of the Chattahoochee River, individuals are fishing in areas that are under fish consumption guidelines for PCBs and mercury. The anglers are either choosing to ignore the fish consumption guidelines or are unaware that these guidelines exist. The reach of the river between Peachtree Creek and Hwy 27 in Franklin is of particular interest since it is receiving inputs from the metropolitan Atlanta area. Ninety-two surveys were taken from 1999 through 2002 from anglers found fishing along the mainstem of the Chattahoochee River. Information regarding the age and ethnicity of anglers, frequency of fishing, types of fish caught, and consumption of catches was collected from participants. Fifty percent of the anglers interviewed were African American, 36% Caucasian, 11% Hispanic, and 3% Asian. Minority anglers were twice as likely to consume fish than non-minority anglers. Based on these findings, the authors recommend that warnings be posted in English and Spanish and local community education be implemented.

## INTRODUCTION

Fish consumption guidelines have been established to provide protection for the health of recreational anglers. In 1999, the Environmental Protection Agency reported that 7% of river miles in the United States are under consumption advisories (Burger and Waishwell, 2001). In the metropolitan Atlanta area, there are PCB and mercury fish consumption guidelines for carp, largemouth bass, and striped bass for different reaches of the Chattahoochee River between Buford Dam and Franklin, Georgia. During routine river patrols, Upper Chattahoochee Riverkeeper staff observed anglers fishing reaches of the Chattahoochee River that are under fish consumption guidelines. Riverkeeper staff

were concerned that these individuals were keeping their catch, suggesting that either the anglers were ignoring fish consumption guidelines or were unaware that these guidelines existed. Currently, fish consumption guidelines are only available in English and there is additional concern that many of the anglers do not speak English or lack the literacy to interpret the handbooks. In 1999, Riverkeeper staff began conducting surveys of anglers along the Chattahoochee River to quantify the behavior of anglers in the metropolitan Atlanta area.

## METHODS

During water quality monitoring trips and routine river patrols between 1999 and 2002, Upper Chattahoochee Riverkeeper staff interviewed anglers who were fishing either from the bank or by boat along the Chattahoochee River between Morgan Falls and Franklin, Georgia. Interviews took place primarily during the week and throughout the daylight hours. Interviewers identified themselves as staff of Upper Chattahoochee Riverkeeper and inquired if the anglers would be willing to participate in a survey regarding fishing behavior. Anglers were asked a series of nine questions that addressed the frequency of fishing and fish consumption, types of fish caught, and whether or not fish were shared with others (Table 1). The interviewers also noted the age, location, and ethnicity of the angler. Relative risk was calculated by measuring the proportion of minority anglers that consumed fish divided by the proportion of non-minority anglers that reported they consumed fish (Kelsey et al. 1996).

## RESULTS

In total, 92 surveys were collected. Fifty percent of the anglers interviewed were African American, 36%

**Table 1. Fish consumption survey questions**

Question	Response Categories
1. Have you been interviewed by Riverkeeper before?	Yes/no
2. How often do you fish here?	Every day, 2-3/wk, 1/wk, 2-3/mn, 1/mn, <1/mn
3. What kind of fish do you usually catch here?	Trout, crappie, catfish, striper, bass, carp, bream, other
4. How large are the fish that you usually catch here?	<8", 8-12", >12"
5. Do you eat the fish that you catch?	Always, sometimes, never, used to but not anymore
6. If you eat the fish, what kind do you usually eat?	Trout, crappie, catfish, striper, bass, carp, bream, other
7. How often do you eat the fish?	Every day, 2-3/wk, 1/wk, 2-3/mn, 1/mn, <1/mn
8. Do you share the fish you catch with others who eat them?	Always, sometimes, never
9. Have you ever caught fish here that were unusual in appearance?	Yes/no

Caucasian, 11% Hispanic, and 3% Asian. Fifty-five percent of African American and 89% of Hispanic anglers reported that they consumed fish on a regular basis as compared with only 29% of Caucasian anglers (Table 2). Using the relative risk method, minority anglers were twice as likely to consume fish than non-minority anglers (Kelsey et al. 1996). Distinct differences in the types of fish caught occurred between ethnic groups. Twenty-three percent of African American anglers fished for catfish and bream as compared with twenty-two percent of Caucasian anglers who fished for trout and catfish (Table 3). Bass are considered a predator species and catfish are predominately bottom feeders. Both species tend to accumulate high concentrations of contaminants in their tissues. Different species will have varying concentrations of contaminants (mercury for example) depending on their trophic level so it is important to understand both the frequency and type of fish being consumed. Previous studies have demonstrated these ethnic differences in the number of meals and types of fish consumed (Burger 1998; Burger et al. 1999).

### DISCUSSION

The survey results suggest that there are ethnic differences in the behavior of anglers both in the frequency of consumption and types of fish caught along the Chattahoochee River. Although sample size was small, the surveys demonstrate that there is a population relying on subsistence fishing rather than

recreational fishing. Those relying on fish for diet supplementation are consuming fish on a more regular basis than recreational anglers, but current fish consumption guidelines have primarily focused on recreational fishing. In 1999, analysis of mercury concentration in muscle fillets along the Chattahoochee River found that 59% of the samples corresponded to less than three 8oz. meals per month for adults based on EPA consumption guidelines (Rosi-Marshall, 2002). One of the next steps would be to address the number and size of meals consumed by each angler rather than the overall daily frequency. This information would be valuable in better understanding the risk for minority populations in the Atlanta area in comparison with the current EPA consumption guidelines.

Effective dissemination of guidelines is one component of protecting the population, and in the metropolitan Atlanta area, these guidelines do not appear to be widely understood. It appears that the majority of anglers interviewed were unaware of the fish consumption guidelines and which areas have limits on the number of meals consumed. In surveys conducted along the Savannah River, Caucasians reported that their knowledge of fish consumption guidelines came from media sources whereas African Americans received the majority of information from friends (Burger and Waishwell, 2001). A more effective method of educating the public may be through local arenas.

**Table 2. Summary of fish consumption frequency grouped by ethnicity of angler**

Ethnicity	Never	<1/month	1/month	2-3/month	1/week	2-3/week	Total	% Eating fish
African American	21	5	8	3	9	1	47	55
Asian	1	0	0	1	0	0	2	50
Caucasian	24	2	4	2	2	0	34	29
Hispanic	1	1	1	3	2	1	9	89

**Table 3. Percentage of types of fish consumed grouped by ethnicity of angler**

Ethnicity	Bass	Trout	Striper	Carp	Crappie	Bream	Catfish
African American	17	4	4	13	17	23	23
Asian	0	0	0	0	0	100	0
Caucasian	17	22	11	6	17	6	22
Hispanic	11	6	6	17	6	11	44

### CONCLUSION

From the survey results, minority populations are twice as likely to consume fish from the Chattahoochee River than non-minority populations. These results need further, more intensive evaluation, but do raise the issue that subsistence fishing is occurring more frequently than recreational fishing. More intensive interviewing trips with additional questions addressing the quantity and size of meals need to be undertaken to increase the sampling size and strength of the study. Additionally, development of educational programs directed towards local community centers that serve the at-risk populations should be designed to educate the public. Along with these local community initiatives, fish guideline handbooks and posted fish consumption warnings should be written in Spanish and English.

### ACKNOWLEDGEMENTS

We would like to thank the Waterfall Foundation, Turner Foundation, and the Price Gilbert, Jr. Charitable Foundation for funding this research. Matt Kales and Emma Rosi-Marshall were instrumental in the initiation and collection of survey data during the first two years of the project. We would also like to acknowledge the countless hours that Riverkeeper staff and volunteers devoted to collecting survey information from local anglers.

### LITERATURE CITED

- Burger J. 1998. Fishing and risk along the Savannah River: Possible intervention. *Journal of Toxicology and Environmental Health* 55: 405-419.
- Burger J., W. Stephens, C.S. Boring, M. Kuklinski, J.W. Gibbons, and M. Gochfeld. 1999. Factors in exposure assessment: Ethnic and socioeconomic differences in fishing and consumption of fish caught along the Savannah River. *Risk Analysis* 19: 421-431.
- Burger J. and L. Waishwell. 2001. Are we reaching the target audience? Evaluation of a fish fact sheet. *The Science of the Total Environment* 277: 77-86.

Kelsey J.L., A.S. Whittemore, A.S. Evans, W.D. Thompson. 1996. *Methods in observational epidemiology*. New York, NY: Oxford University Press.

Rosi-Marshall E. 2002. Quality of suspended fine particulate matter and its role as a conduit for metals in riverine food webs. Dissertation, University of Georgia.