



# Crowds, Kayaks, and Canoes: Socio-Economic Preferences for Congestion on the Upper Illinois River

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# Background

- The Illinois River north of Tahlequah receives 150,000-250,000 visitors per year that float the river.
- July 1, 2016, the Oklahoma Scenic River Commission transferred authority to the Grand River Dam Authority (GRDA).



# Objective

- To identify recreation user preferences for crowd levels when floating the UIR and estimate users' willingness to pay (WTP) for day.
- To modify prior travel cost results to reflect change in the demand by floaters as a result of fee increases.



A summer  
Saturday 2016

Photo Credit: F.  
Soltani

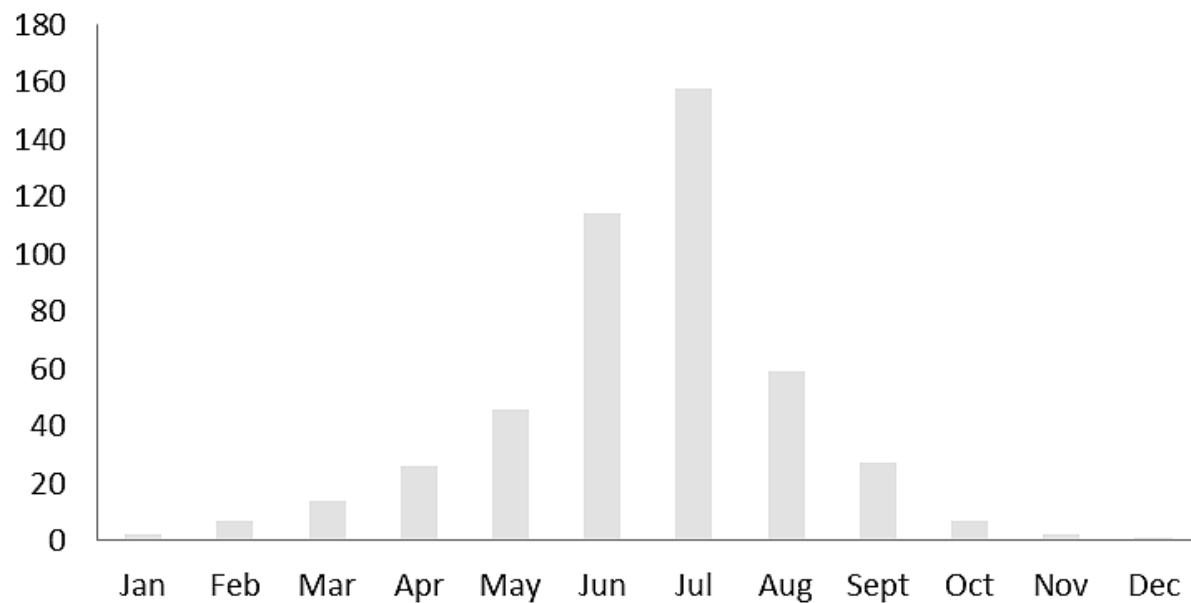
# Hypotheses

- Willingness to pay to float will decrease as crowd levels increase.
- Willingness to pay for some users will differ as they will prefer a social and congested atmosphere.

# Methods and data

- A random utility, discrete choice model (McFadden, 1974)
- A web-based survey administered in Qualtrics (August 30-September 20, 2016)
- 461 respondents who had visited the UIR in the last 10 years from Oklahoma statewide from a purchased panel from Survey Sampling International.

### Trip date by month, n=463



### Watercraft type used, n=444

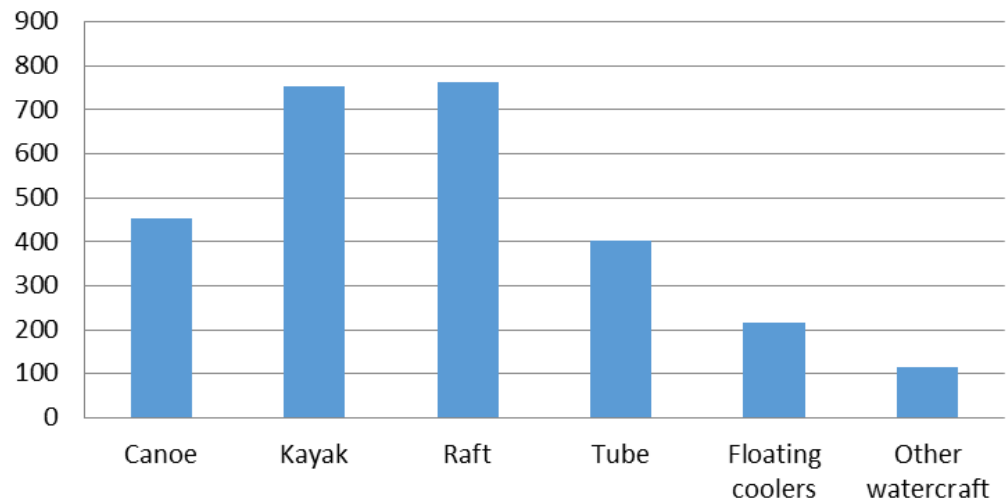


Table 1. Illinois River Survey Respondent Descriptive Statistics			
Characteristic	(SSI) Sample n=461	2015 US Census Estimates for Oklahoma	
Median age (years)	37	36.2	
Gender			
Female	61.40%	50.50%	
Male	38.60%	49.50%	
Identification by race			
White	82.60%	77.10%	
African American	3.50%	6.80%	
Native American	8.00%	6.40%	
Asian	1.50%	2.00%	
Pacific islander	0.20%	0.10%	
Multiple races	2.80%	5.30%	
Other race(s)	1.30%	2.20%	
Hispanic or Latino origin	7.60%	7.30%	
Education level			
Less than high school	1.50%	12.70%	
High school	37.10%	31.60%	
Some college/vocational training	3.70%	23.70%	
Associate's degree	18.90%	7.40%	
Bachelor's degree	25.20%	16.50%	
Graduate or professional degree	13.60%	8.10%	
Household annual income			
Less than \$25,000	15.40%	26.50%	
\$25,000 to \$49,999	29.70%	26.70%	
\$50,000 to \$74,999	23.90%	18.70%	
\$75,000 to \$99,999	14.30%	11.40%	
\$100,000 to \$124,999	8.70%	16.6%*	
\$125,000 to \$149,999	2.60%		

Native American	8.00%	6.40%	
Asian	1.50%	2.00%	
Pacific islander	0.20%	0.10%	
Multiple races	2.80%	5.30%	
Other race(s)	1.30%	2.20%	
Hispanic or Latino origin	7.60%	7.30%	
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Less than \$25,000	15.40%	26.50%	
\$25,000 to \$49,999	29.70%	26.70%	
\$50,000 to \$74,999	23.90%	18.70%	
\$75,000 to \$99,999	14.30%	11.40%	
\$100,000 to \$124,999	8.70%	16.6%*	
\$125,000 or more	8.00%		
Mean household annual income	\$62,228	\$62,871	
Own property adjacent to Illinois River	3.90%		
(SSI) is the sample taken from Survey Sampling International			
Census data taken from <a href="https://www.census.gov/">https://www.census.gov/</a>			
*US Census annual income for Oklahoma for households with over \$100,000			



# Example of Congestion Definitions

A



**None:** you see no other floaters on the river

C



**Moderate:** you see a dozen floaters at a time

B



**Light:** you see a few other floaters on the river

D



**Heavy:** you see several dozen floaters at a time

# Example of a Discrete Choice Question

1. Suppose you are taking a trip to the Upper Illinois River and there are only two float options from which to choose. These trips are identical except for the characteristics listed in the table. For example, the scenery and quality of amenities are the same in the two trips. For each of the 3 scenarios listed below, compare the crowding and price characteristics and choose float A or float B.

Please select the option that you would most likely choose. Please answer this question separately, independent of any other questions you may have seen.

	Float trip A	Float trip B	Neither A nor B
Crowd level	Light	Moderate	
Price per person	\$34	\$18	

Float Trip A



Float Trip B



Neither A nor B



# Willingness to pay for reducing crowding per trip

Parameter	SSI
Crowd level light	-\$0.69
Crowd level moderate	-\$4.10*
Crowd level high	-\$9.76*
Won't Float	-\$33.11*

## Shares of individuals with a leading preference for attributes

crowd level none	15.92%
crowd level light	16.77%
crowd level moderate	16.85%
crowd level high	16.94%
price per person	15.98%
won't float	17.55%



**Table 9. WTP to Float the Illinois River Relative to Crowding Levels Interacted with Crowd Level Experienced During Last Float Trip (SSI Sample)**

			95% Confidence Interval	
Crowd level from model		\$ WTP/Trip	Lower Bound	Upper Bound
Light	Light	-0.16*	-6.11*	6.55*
Moderate	Light	-1.45*	-7.30*	5.13*
High	Light	2.94*	-3.66*	10.37*
Light	Moderate	-2.84*	-9.41*	4.56*
Moderate	Moderate	-5.44*	-11.82*	1.79*
High	Moderate	1.27*	-5.94*	9.40*
Light	High	-8.09*	-16.66*	1.57*
Moderate	High	-12.39*	-20.71*	-3.01*
High	High	-0.99*	-10.27*	9.48*

**\* Represents estimates computed using statistically significant estimates from the models**



# Selected Anonymous Comments

- We participated in the full day float. There seemed to be certain areas during our float that were more crowded than others. As the day went on the crowding got worse, to the point it was hard to maneuver the raft through all the other rafts, canoes and people in the water.
- We would NEVER take our children to the river on a weekend! The Saturday crowd is way too rowdy, fueled by alcohol consumption. Weekday visits/floats are definitely preferred..
- I know when the river is going to be busy. There for I go when I know it isn't a "party weekend". I don't like the rope thing as we've seen a kid get hurt really bad.
- The river operators have taken over the public access points and the public is hindered from use.
- Myself and a large group of friends make this an annual trip because it's fun. We enjoy meeting new people and the creativity of what people will bring to the river.

# Conclusions

- The congestion model results indicate that most users prefer lower crowding levels.
- The lower the crowding level, the higher most users' satisfaction.
- There is a minority of users who prefer higher crowd levels. These users may prefer higher crowd levels because they prefer the float trip experience to be a group activity or because they like to participate in the float trip as a “party” activity.
- Results corroborate current management principles of segmenting the river into different management zones such as “Wild and Scenic” vs. “Recreational”



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