

Recreational Use Survey

Survey Results



Background

- Draft results presented at Oct. TEC Mtg.
- TEC generated several recommendations for followup work.
- Water Quality Review Committee considered TEC recommendations as follows:

Summary of Oct Mtg. Outcomes

- Issue #1:
 - Phone survey results intuitively seem high and are high compared with field data.
- Water quality review Committee concerned that repeating the survey might create more uncertainty, not less.
- And the statistical uncertainty around phone survey results was quite low

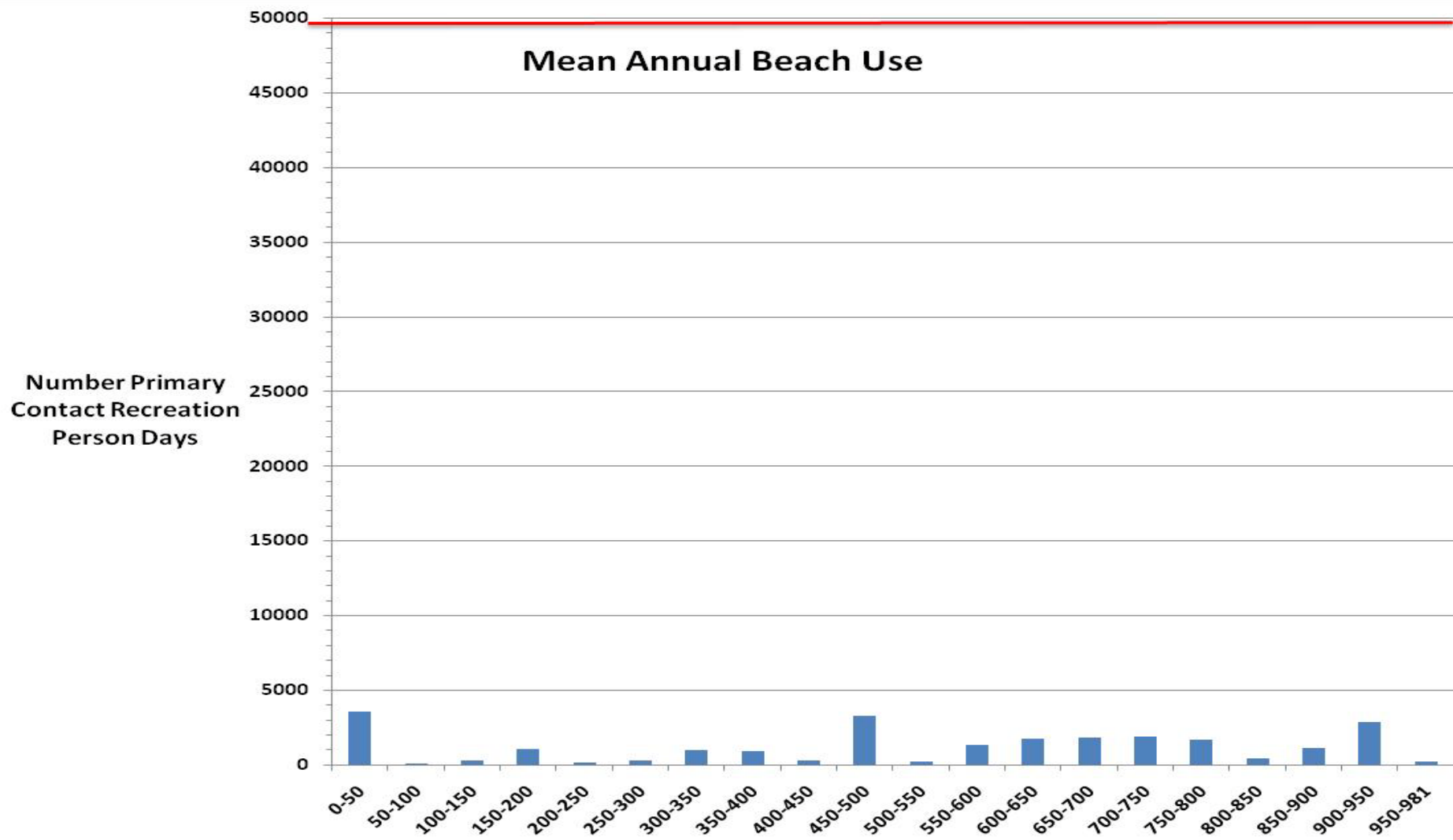
River-Wide Comparison of Results

- Phone Survey Error = 1.37% at 95% Confidence.
- Phone Survey = 8.2 million total person days
- Field Survey = 5.2 million max
2.7 million avg
- It appears that the phone survey results may over-estimate reality (possibly by a factor of 2-3).

Issue #2: Comparison of Ohio River Recreational Use to Beach Use

- Initial approach was to compare data from equivalent water body sizes (areas).
- Acreage of 10 mile river segment equal to average lake acreage of which beaches are located.
 - Water Quality Review Committee recommended re-evaluating the data by comparing equivalent lengths of beaches and river.

Comparison of Use Data for Equivalent River-Beach Lengths

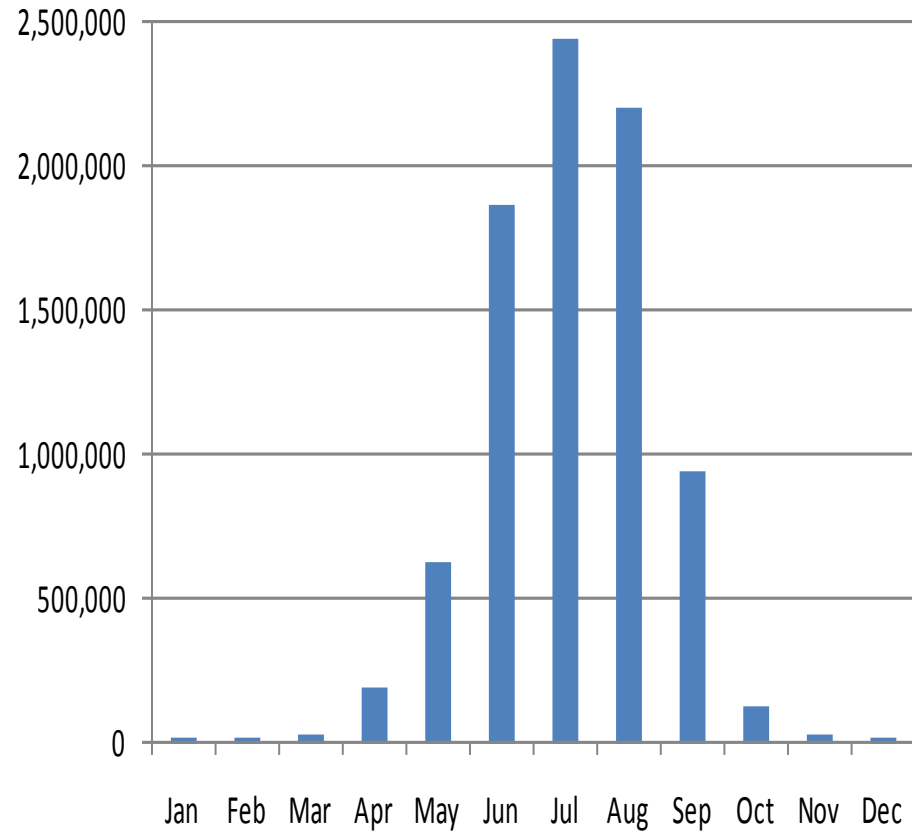
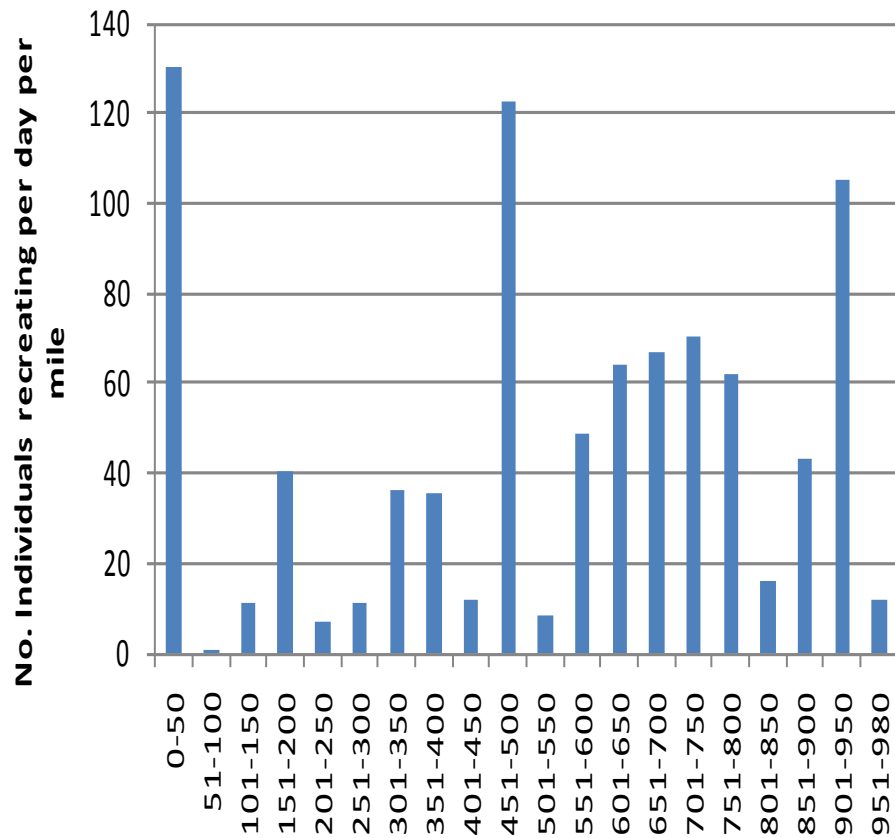


Why compare results to beach use data?

- Comparison to EPA's criteria language:
 - Moderate use: At least half use of typical bathing beach.
 - Light use: Less than half use of typical bathing beach.

Indicator	Geometric mean CFU/100mL	Single Sample Maximum, CFU/100mL			
		Designated Bathing Beach	Moderate Full Body Contact Recreation	Lightly Used Full Body Contact Recreation	Infrequently Used Full Body Contact Recreation
E. coli	126	235	298	409	575

Primary Recreational Use



Issue #3: Need to Look at How Wet Weather Affects Recreational Use

	# Primary Contact Recreators			# Boaters	
	No Rain	Rain		No Rain	Rain
During Survey	3.8	1.3		32	6.6
24 Hours Prior	3.6	5.4		32	31.4
48 Hours Prior	3.8	3.9		32.3	30.9

Fish Consumption Data for Inner Zone

- Freshwater Fish Consumption Rate 90th percentile Inner Zone population = 37.3 gm per day.
- EPA's national fish default freshwater fish consumption rate 90th percentile general population = 17.5 gm per day.
- Ohio River Fish Consumption Rate 90th percentile Inner Zone population = 1.86 gm per day.
- 16% (9%) of the population consumed some Ohio River fish (6% don't know).
- 35% are aware of consumption advisories.
- 29% of those not eating Ohio River fish due to contamination.

Conclusions

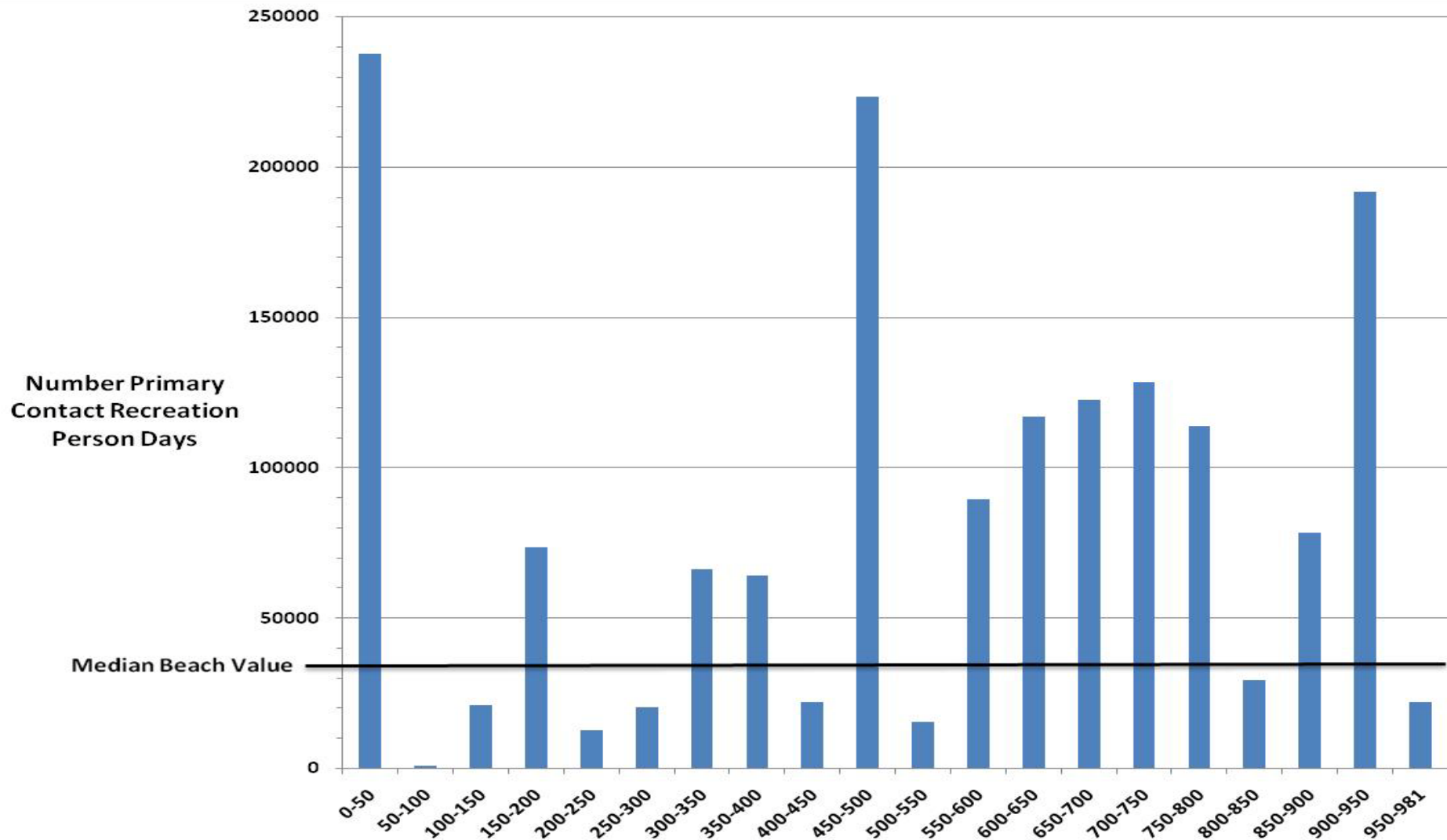
- The frequency/density of contact recreation in the Ohio River is significantly less than at public beaches.
 - Could have an implication for E. coli criterion.
- Frequency of contact recreation during April could have an implication for when criteria apply.
- Recreation is significantly reduced DURING rain events.
- Recreation is not significantly reduced when precipitation occurs 24-48 hrs prior.
- Watershed funding may be available to conduct additional fish consumption and contact recreation studies in the future.

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TEC Action

Are we ready to take the information public?

10-Mile River Segment Equivalent Area to Beach Use Lake Area



Survey Objectives

- **QUANTIFY THE RECREATIONAL USES OF OHIO RIVER.**
- **DESCRIBE THE LEVEL OF USE IN TERMS OF NATIONAL CRITERIA CATEGORIES.**
 - **Beach use, moderate use, light use.**
- **DETERMINE WHEN THE USES OCCUR.**
 - **Ohio River criteria apply May-Oct.**

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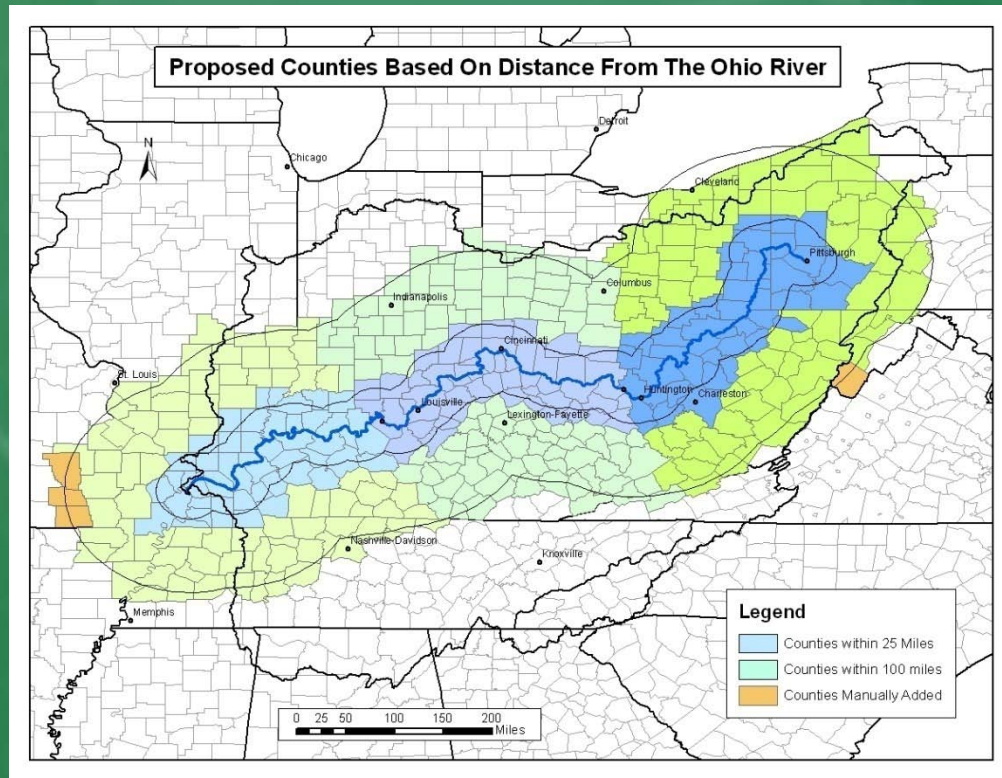
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Scope

- Budget set at \$100 K.
- Additionally requested to obtain fish consumption data if feasible within budget.
- Put out RFP and selected proposal using a phone survey approach.
- Augmented with field surveys including observations and interviews.

Survey Design

- 5102 random telephone surveys completed.
- 3,865 inner zone; 1,237 outer zone.

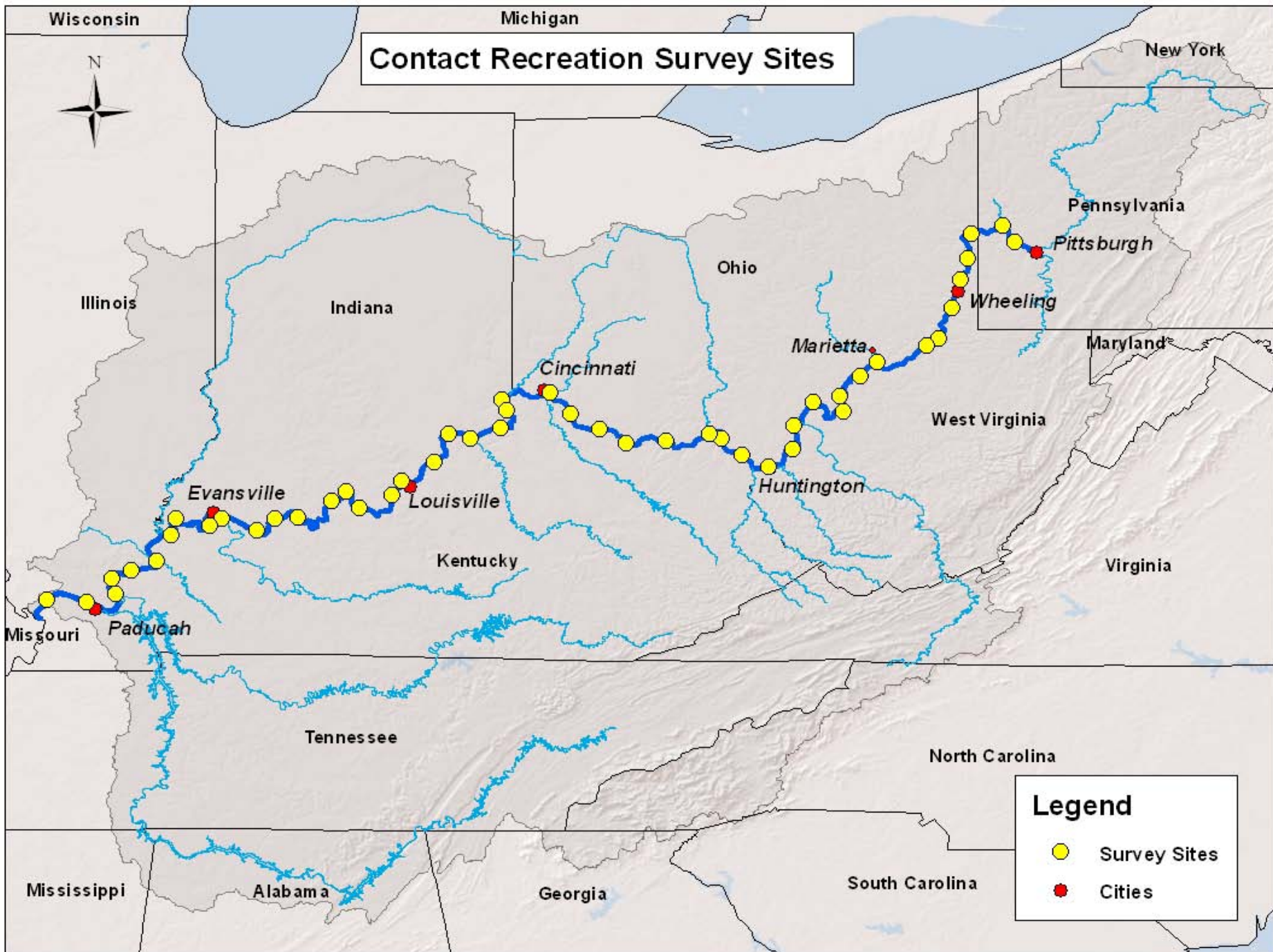


170 Field Surveys

285 Interviews

- Ground-truth phone survey results.
- Sites every 20 miles “randomly” selected.
- 4-hour surveys completed 2-3 times at each location during rec season.
- Observational counts of recreational activities – Ground Surveys.
- In-person interviews – Intercept Surveys.





Results for 2008 Primary Contact Recreation

River Segment	Recreation Season: May - October				Non-Recreation Season: November - April			
Mile Points	Total number of Events	Person-Days	Persons per day	Persons per day per mile	Total Number of Events	Person-Days	Persons per day	Persons per day per mile
0-50	1,913,649	1,188,602	6,460	129	188,745	117,233	648	13
51-100	5,821	3,615	20	0	0	0	0	0
101-150	168,533	104,679	569	11	0	0	0	0
151-200	593,074	368,369	2,002	40	2,557	1,588	9	0
201-250	100,863	62,648	340	7	0	0	0	0
251-300	163,024	101,257	550	11	0	0	0	0
301-350	532,223	330,573	1,797	36	0	0	0	0
351-400	517,668	321,533	1,747	35	0	0	0	0
401-450	177,234	110,083	598	12	12,107	7,520	42	1
451-500	1,797,900	1,116,708	6,069	121	49,417	30,694	170	3
501-550	125,755	78,109	425	8	0	0	0	0
551-600	720,151	447,299	2,431	49	4,320	2,683	15	0
601-650	943,169	585,819	3,184	64	104,098	64,657	357	7
651-700	985,647	612,203	3,327	67	0	0	0	0
701-750	1,035,258	643,018	3,495	70	591	367	2	0
751-800	916,226	569,084	3,093	62	0	0	0	0
801-850	237,920	147,777	803	16	0	0	0	0
851-900	631,223	392,064	2,131	43	0	0	0	0
901-950	1,542,746	958,227	5,208	104	5,604	3,480	19	0
951-980	109,759	68,174	371	12	128,555	79,848	441	14
Total	13,217,842	8,209,840			495,994	308,071		

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**Are the numbers right & what
do they mean?**

They are all estimates!!!

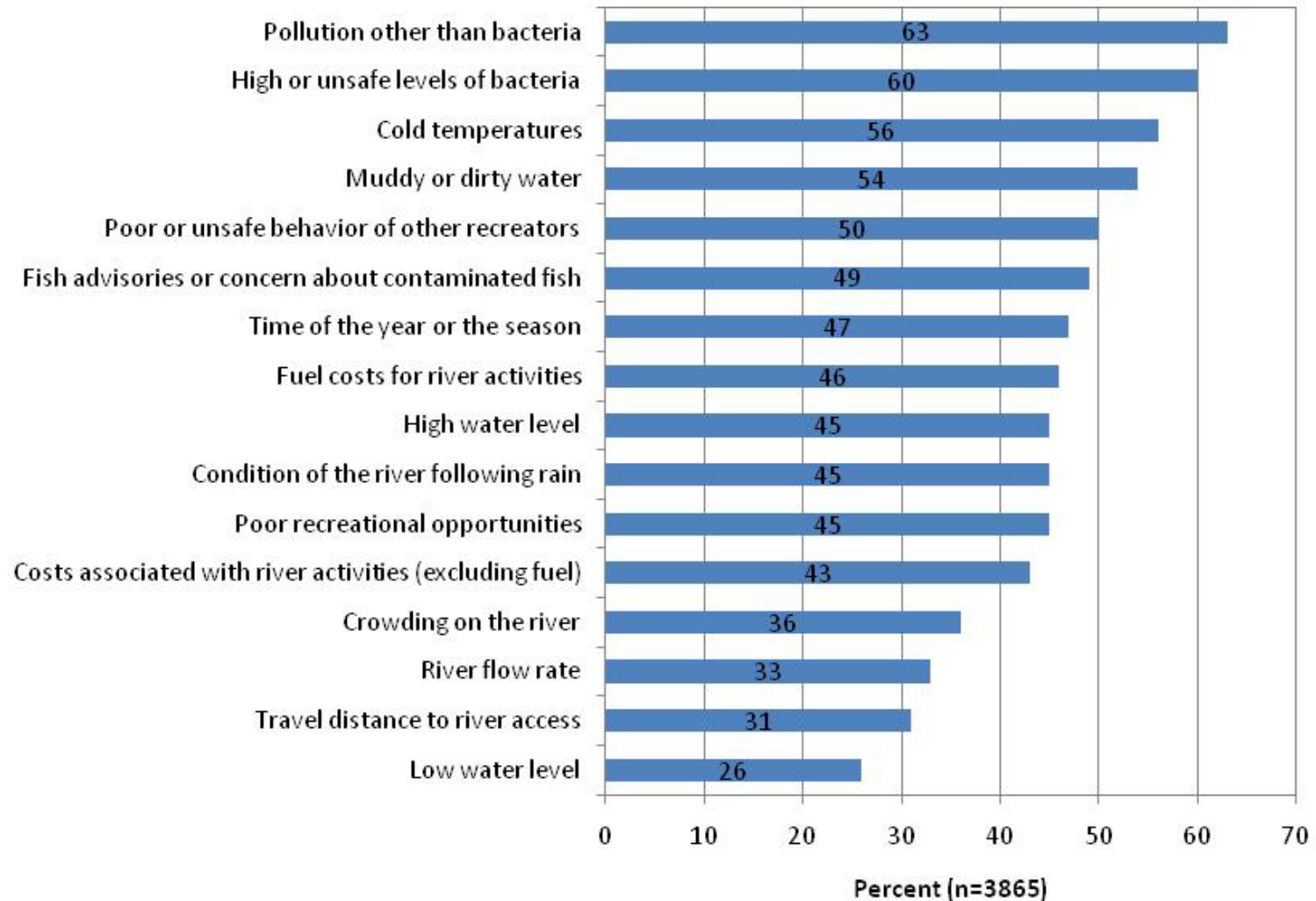
Extrapolating the Field data

- Surveyed 49 public access sites 2-3 times during the rec season.
- 4-hour observations & in-person interviews.
- Recorded the field of vision and counted recreators.
- Extrapolated the data to entire river for entire recreation season.

Beach Use Data

State	Waterbody	Site Name	FY2008 Visitation	Waterbody Area, Acres	Source
KY	Barren River Lake	Bailey's Point Beach	33,876	10,100	CORPS
KY	Barren River Lake	Quarry Road Beach	30,243		CORPS
KY	Barren River Lake	State Resort Park Beach	124,094		CORPS
KY	Buckhorn Lake	State Resort Park Beach	6,253	1,230	CORPS
KY	Carr Creek Lake	Irishman Creek (State Park)	11,790	710	CORPS
KY	Green River Lake	Holmes Bend Beach	27,232	8,200	CORPS
KY	Green River Lake	Smith Ridge Beach	10,550		CORPS
KY	Green River Lake	Pikes Ridge Beach	3,805		CORPS
KY	Green River Lake	State Park Beach	88,087		CORPS
KY	Nolin River Lake	Iberia Beach	4,915	5,795	CORPS
KY	Nolin River Lake	Dog Creek Beach	7,645		CORPS
KY	Nolin River Lake	Brier Creek (State Park)	15,171		CORPS
KY	Rough River Lake	Laurel Branch Beach	3,990	5,000	CORPS
KY	Rough River Lake	North Fork Beach	9,622		CORPS
KY	Rough River Lake	Axtel Beach	22,953		CORPS
KY	Rough River Lake	State Resort Park Beach	22,107		CORPS
OH	Caesar Creek Lake	Fumas Shores (State Park)	86,615	2,830	CORPS
OH	CJ Brown Lake	Merriitt State (State Park)	51,819	2,120	CORPS
OH	WH Harsha Lake	Greenbrier (state Park)	66,659	2,160	CORPS
OH	WH Harsha Lake	Tate (State Park)	17,900		CORPS
IN	Brookville Lake	Mounds State Beach	48,890	5,260	CORPS
IN	Brookville Lake	Quakertown State Beach	6,090		CORPS
IN	Cagles Mill Lake	Lieber State Recreation Area	82,197	1,400	CORPS
IN	CM Harden Lake	Raccoon State Beach	73,821	2,110	CORPS
IN	JE Roush Lake	Little Turtle State Beach	47,079	900	CORPS
IN	Mississinewa Lake	Miami State Beach	21,217	3,210	CORPS
IN	Monroe Lake	Hardin Ridge Beach	32,889	10,750	CORPS
IN	Monroe Lake	Fairfax Beach	51,603		CORPS
IN	Monroe Lake	Paynetown State Rec. Area	68,446		CORPS
IN	Patoka Lake	Newton-Stewart State Beach	85,421	8,800	CORPS
IN	Salamonie Lake	Lost Bridge West State Beach	58,585	2,855	CORPS
PA	Chapman		12,094	68	PADCNR
PA	Keystone		50,403	78	PADCNR
PA	Kooser		5,511	4	PADCNR
PA	Laurel Hill		33,985	63	PADCNR
PA	Lyman Run		8,902	45	PADCNR
PA	Moraine		112,968	3,225	PADCNR
PA	Pymatuning		46,818	17,088	PADCNR
PA	Raccoon Creek		97,492	101	PADCNR
PA	Yellow Creek		25,429	720	PADCNR
PA	Crooked Creek Lake		62,458	350	CORPS
PA	Youghiogheny Lake		59,859	2,840	CORPS
75th percentile Value			61808	5065	
Median Value			33383	2140	
25th Percentile Value			11866	620	

Why/When Don't Recreators Recreate





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Questions?