

# Appendix B

## Boater Survey Report

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This appendix describes the Beaver Lake Boating survey administered to recreational boaters at Beaver Lake following the summer 2016 boating season. Section B.1 describes development and administration of the survey. Section B.2 provides the survey questionnaire that was administered. Section B.3 presents the basic frequency of response for each question and Section B.4

## B.1 User Survey Development and Administration

### B.1.1 Survey Design and Approval

To avoid overburdening the public with federally sponsored data collections, the Paperwork Reduction Act (PRA) of 1995 requires that U.S. federal government agencies obtain Office of Management and Budget (OMB) approval before requesting or collecting most types of information from the public. In accordance with the PRA, OMB approval must be obtained prior to collecting federally sponsored data in any situation where 10 or more respondents, within a 12-month period, are involved. The questions are standardized in nature whether they are delivered in-person, on the telephone, or online.

The Beaver Lake Boating Survey was submitted to OMB under the Interagency Generic Clearance for Federal Land Management Agencies Collaborative Visitor Feedback Surveys on Recreation and Transportation Related Programs and Systems (OMB control number 0596-0236). The generic clearance was submitted jointly to help the signatory Federal Land Management Agencies, including the Bureau of Land Management, U.S. Fish and Wildlife Service, National Park Service, Forest Service, and Army Corps of Engineers, improve transportation conditions and recreation and resource management. The FLMA clearance was designed to collect information about visitors' perceptions, experiences, and expectations, with respect to transportation conditions, services, and recreation opportunities at various FLMA locations and across areas that could include multiple locations managed by different FLMAs. OMB approval is still required for each survey requested to be administered under the FLMA clearance.

Survey questions related to these topics have been compiled for use in designing surveys submitted under the FLMA clearance, use of which helps to streamline the approval process. The OMB approval process requires identification of which questions in the proposed survey are taken from the previously compiled questions. Questions that are not in the collection are allowed, but the source for these questions must be clearly identified (e.g., are they new or are they taken from a previous survey that has been approved by OMB), and these questions must be reviewed and approved by OMB.

Pulling from the question collection, 21 questions were selected to determine respondent characteristics, assess visitor experiences, and characterize trip behaviors. One non-compendium question was asked from a recently expired OMB Clearance (0710-0001). The questions were combined into a survey instrument with an accompanying cover letter. Experts in graphic design and development of publicly distributed materials were involved in designing the cover letter in an effort to improve the response rate.

Pre-testing and consultation were conducted with five volunteer participants with no specific background or training in survey research methods or analysis (i.e., representative of the public, rather than survey experts). Specifically, the individuals were asked to complete the questionnaire and then asked a series of debriefing questions to elicit their feedback on the practical utility of the study, questionnaire/respondent burden, quality and clarity of the questions and instructions, and

ways to minimize respondent burden. Comments were incorporated into the final instrument. Time to complete the survey ranged from 5 to 9 minutes.

The survey was offered through two mediums: online and paper copy via a mail out/mail back method. The online survey was hosted at surveygizmo.com. The online survey was tested on a variety of operating systems and hand-held, personal devices to ensure those who preferred to take the survey online could access and complete each question. No Personally Identifiable Information was maintained during the survey process.

The final mail out survey instrument approved by OMB is provided in Section B.2.

### **B.1.2 Photo Simulation Question Development**

A question was allowed by OMB that simulates maximum acceptable impact using photo simulation of a scale of watercraft density. This method has been widely used in the parks and recreation assessment field for simulating hiker and vehicular traffic that is acceptable to visitors. The method has been applied in numerous boating capacity studies as well. The photo simulation is effective for collecting evaluative information about use levels that are higher and lower than the current, existing lake use levels. The goal of the photo simulation is to provide a foundation for careful assessment of the reasonable range for social carrying capacity at Beaver Lake.

The survey Question 18 asked respondents: *Please review the boating conditions depicted in the photos below. Which photo shows the maximum number of boaters you could see at one time on Beaver Lake without thinking it was too crowded?*

To develop the photo images that correspond to the question, a photograph was taken at Lost Bridge Marina while no boats were present, as shown in **Figure B-1**. Using Photoshop, the buoys and ropes were removed from the photo. GIS was used to estimate the number of acres present in the use area of the photo (**Figure B-2**). Boats were then added to simulate a range of reservoir use levels per **Table B-1**. Results are provided in **Figure B-3**.



Figure B-1. Photo at Lost Bridge Marina Used as Basis of Photo Simulation.

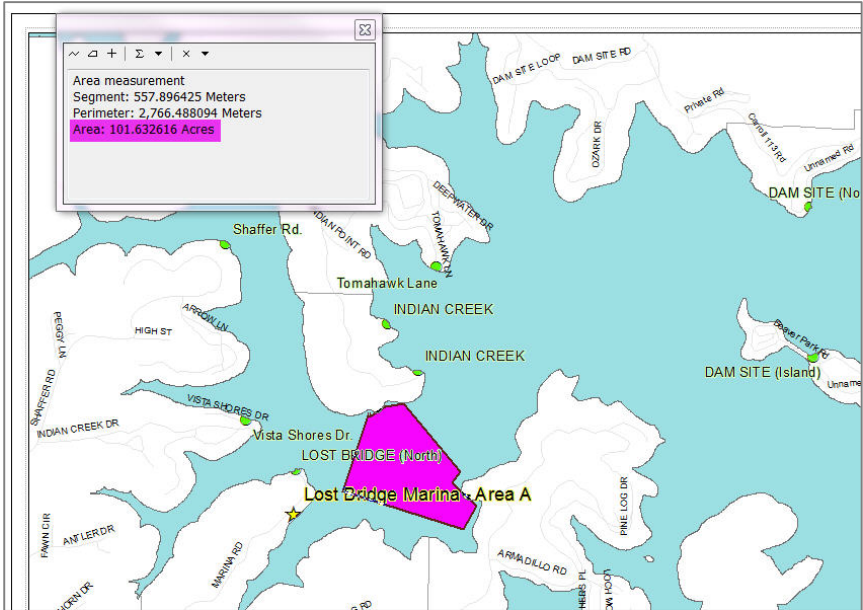


Figure B-2. Calculation of Acres Present in Photo Simulation Base Photo

Table B-1. Photo Simulation Acres Per Boat

Photo	Acres	Number of Boats	Acres/Boat
A	100	2	50.0
B	100	5	20.0
C	100	7	14.3
D	100	10	10.0
E	100	12	8.3

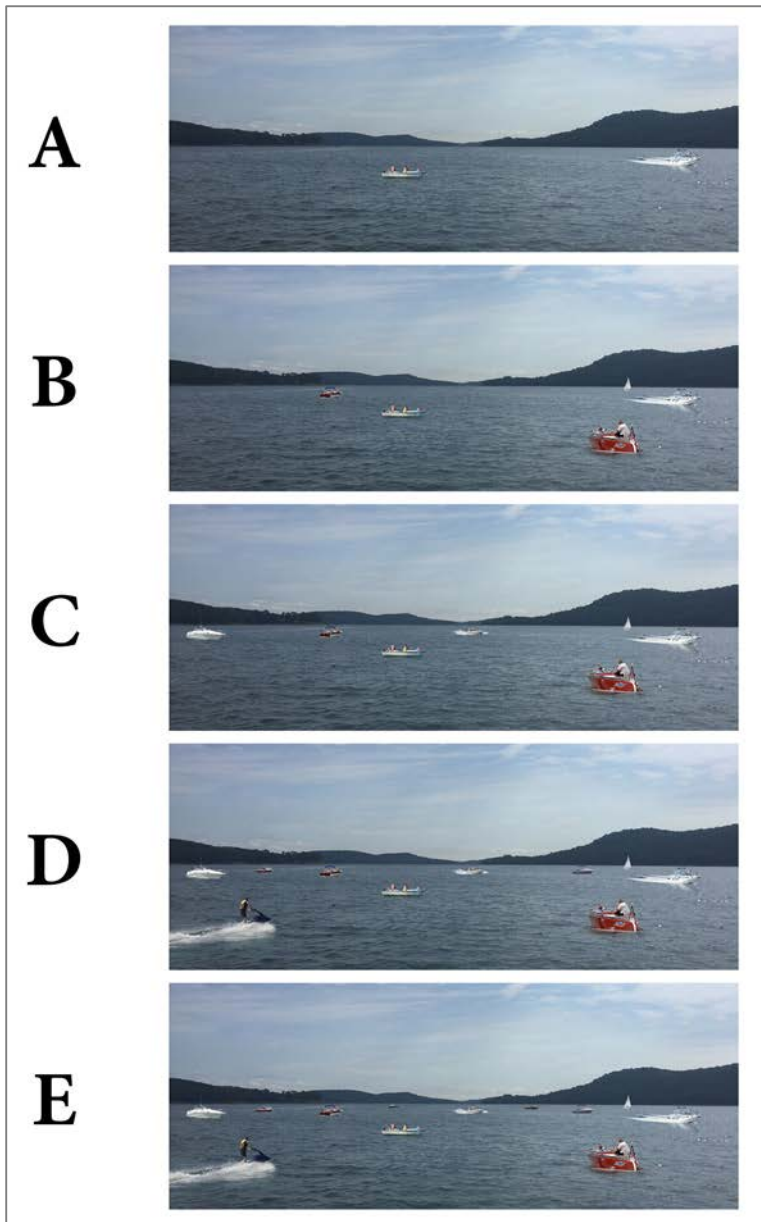


Figure B-3. Resulting Photo Simulation Question Pictures A-E

### B.1.3 Population Sampling

The target population for the Beaver Lake boater survey is the public who participate in boating recreation activities at Beaver Lake. Target respondents include residents living along the shoreline with private/community boat dock permits, marina slip renters, and public boat ramp users.

The procedure for administering the Beaver Lake boater survey followed guidance found in Dillman et al. (2009). OMB reviewed and approved the survey administration procedures. Because it is not possible to survey every single boater who used the lake in 2016, a *sample* of boaters was selected to receive the survey, and their responses are assumed to be representative of the population. A sample consists of all units of the population that are drawn from for inclusion in the survey. The sample was drawn based on standard statistical methods, as further described below.

The survey **population** consists of all the units to which one desires to generalize the survey results. For this survey, the population is boaters on Beaver Lake. A “boater” is defined as an operator of a boat that is placed on the water at Beaver Lake for recreational purposes. An owner could be a single individual, family, or two persons or more who jointly own and operate a boat. The population of boaters at Beaver Lake is estimated from summing the number of private/community dock slips, number of marina slip renters, and estimated number of boaters who launch from public use facilities such as launch lanes at marinas, parks, campgrounds, and end of road access points. At Beaver Lake, there are an estimated 3,473 boaters served by private and community docks and 1,987 marina slips available. An estimated 1,736 of the slips were rented in 2016<sup>1</sup>. Including an estimated population for public launch users, the total boating population that currently recreates on Beaver Lake within a year is estimated at 10,000 boaters.

Given the estimated population, the completed number of returned surveys (*completed sample*) needed to provide statistically significant results can be calculated as given in Equation 1.

$$N_s = \frac{(N_p)(p)(1-p)}{(N_p - 1)\left(\frac{B}{C}\right)^2 + (p)(1-p)}$$

Equation 1

Where:  $N_s$  = the completed sample size needed for the desired level of precision  
 $N_p$  = the size of the population  
 $p$  = the proportion of the population expected to choose 1 of 2 response categories  
 $B$  = margin of error  
 $C$  = Z score associated with confidence level (1.96 corresponds to 95 percent)

The required Beaver Lake complete sample size for statistically significant results with a 5 percent margin of error is estimated to be 370 total completed surveys.

To determine the estimated response rate for the survey and thus the needed sample to be drawn, the various sources of boater contact information were taken into consideration. The mailing and email address list that makes up the sample frame for the survey was generated from three sources:

- Corps database of private dock owners
- Mailing address of marina slip renters
- Study participant registration database

There are 3,473 dock owners in the Corps database, of which 2,295 have an address. Eight duplicate owners were found in the database. The database addresses were processed through an address verification tool, and several were found to be invalid. In total, 2,200 dock owners have unique, valid addresses and were included in the sample frame. In total, marina slip rentals for the 2016 season totaled 1,736. For the marina slip renters, 1,425 total rows of addresses were provided by 6 of the 7 marinas located on the lake. This list was reduced to 1,259 unique, valid physical addresses. The study participant database was developed based on voluntary study registration of users parked at public access areas. That is, from July through Labor Day, vehicles with empty boat trailers who

<sup>1</sup> Note that these numbers were estimated prior to completion of the watercraft and facility census and thus are only estimates and may not correspond to the counted values.

were parked at public access areas were invited via a postcard on their windshield to register to participate in the Beaver Lake study. In all, 174 unique registrations were received. Of those, 123 requested to be contacted via email and 50 requested to be contacted via postal mail. One email address was found to be invalid, and no physical address was provided. Thus, the email registrants totaled 122.

Of those who registered to participate in the study, a 50 percent response rate was assumed for those who asked to be contacted via email. That left 309 (370-61) as the target for completed surveys from postal mail-out/mail-back. A conservative 10 percent response rate on mail-out/mail-back was assumed. Thus, 3,090 paper surveys were mailed (309/0.10).

All 50 who registered via the windshield postcard and asked for the paper survey were provided with the opportunity to respond. This was done to balance the targeted completed sample for those who access the lake via public launch areas. To draw a sample from the dock owners and slip renters, the valid, unique addresses were organized in an Excel workbook by group. The target was set in proportion to the known population (known = 1,736 marina slip renters and 3,473 dock owners; target 1,013 marina slip renters and 2,027 dock owners). A random number between 0 and 10,000 was assigned to each address by type. The addresses were then sorted by type and the random number from smallest to largest. The smallest 1,013 random numbers for marina slip renters were selected to receive a survey. The smallest 2,027 random numbers for dock owners were selected to receive a survey.

#### **B.1.4 Survey Administration**

The survey was administered on October 19 and left open for 30 days. Responses received through November 28 were included in the results. The additional time allowed for responses mailed back at the end of the 30-day request period to be counted. The mail out survey included a postage paid, self-addressed envelope. The respondents were also provided the online survey web address for those who preferred to complete the survey online.

Email requests to complete the survey were sent from an email address created specifically for the study (beaverlakesurvey@cdmsmith.com). To avoid or reduce the chance of the email being marked as spam, individual emails were sent rather than a bulk email to all possible respondents. The initial email was sent out on October 19, and email reminders were sent out on November 3.

Responses received through the postal mail were added to the online database using the surveygizmo.com interface. Quality checking procedures were employed to ensure accuracy of entered data. No “undeliverable” surveys were returned, indicating all were received by the target recipients.

#### **B.1.5 Quality Procedures**

To ensure quality and reduce potential error that was possible during the survey administration process, quality discussions occurred between the Project Manager and Program Manager. Potential sources of error were identified, and a mitigation plan was developed.

The greatest potential was determined to be in collection and entry of the surveys received via postal mail. The following steps were taken to reduce and mitigate potential error:

- As surveys were received, each was removed from the envelope and stamped with the date received.



- The same trained technician handled and entered all paper surveys received to reduce potential entry error and ensure consistency in entry.
- Survey responses were recorded per the date received, with the first surveys received entered first, and so on.
- As survey responses were entered via the online survey interface, each paper survey was clearly marked as recorded and initialed by the technician and filed per date received.
- Independent checking was conducted on approximately 10 percent of the surveys. Knowing the IP address of the entry technician, 140 surveys were independently checked and verified. Seven errors in total were found, representing 5 percent of those checked. Entry errors were documented and corrected in the response database.
- A procedure was established for dealing with responses received past the open period. Responses were marked as such and filed per the date received.

Additionally, the online survey responses were checked for quality. In total, 12 responses were removed from the online database. These responses were verified as being duplicate entries from the same IP address. In all instances, it was obvious that the respondent had begun the survey, navigated away from the page, then returned to the survey starting a new entry.

## B.2 Beaver Lake Survey Questionnaire

This section provides the mail questionnaire. Questions for the online version were exact, with question skipping built into the design.

# SUMMER BOATING EXPERIENCE AT BEAVER LAKE

U.S. Army Corps of Engineers Survey

Beaver Lake, located in Northwest Arkansas, is the headwaters of the White River. The U.S. Army Corps of Engineers (Corps) is the steward of the lands and waters around Beaver Lake and is responsible for providing the public with quality outdoor recreation experiences.

As such, the Corps is currently examining future management of recreation and natural resources at Beaver Lake. **You are invited to participate in a short survey to better understand your experiences and preferences regarding Beaver Lake!**

The survey is brief and will take approximately 10 minutes to complete. You can complete the survey online by entering the following address into any web browser

<http://beaverlake.boater.sgizmo.com/s3/> or

mail back the paper survey in the postage paid envelope provided. The response period will be open for 30 days, so we kindly ask that you complete the survey at your earliest convenience.

If you have questions regarding the survey, please contact the Beaver Lake Operations Project Manager for more information at (479) 636-1210 ext. 1701.

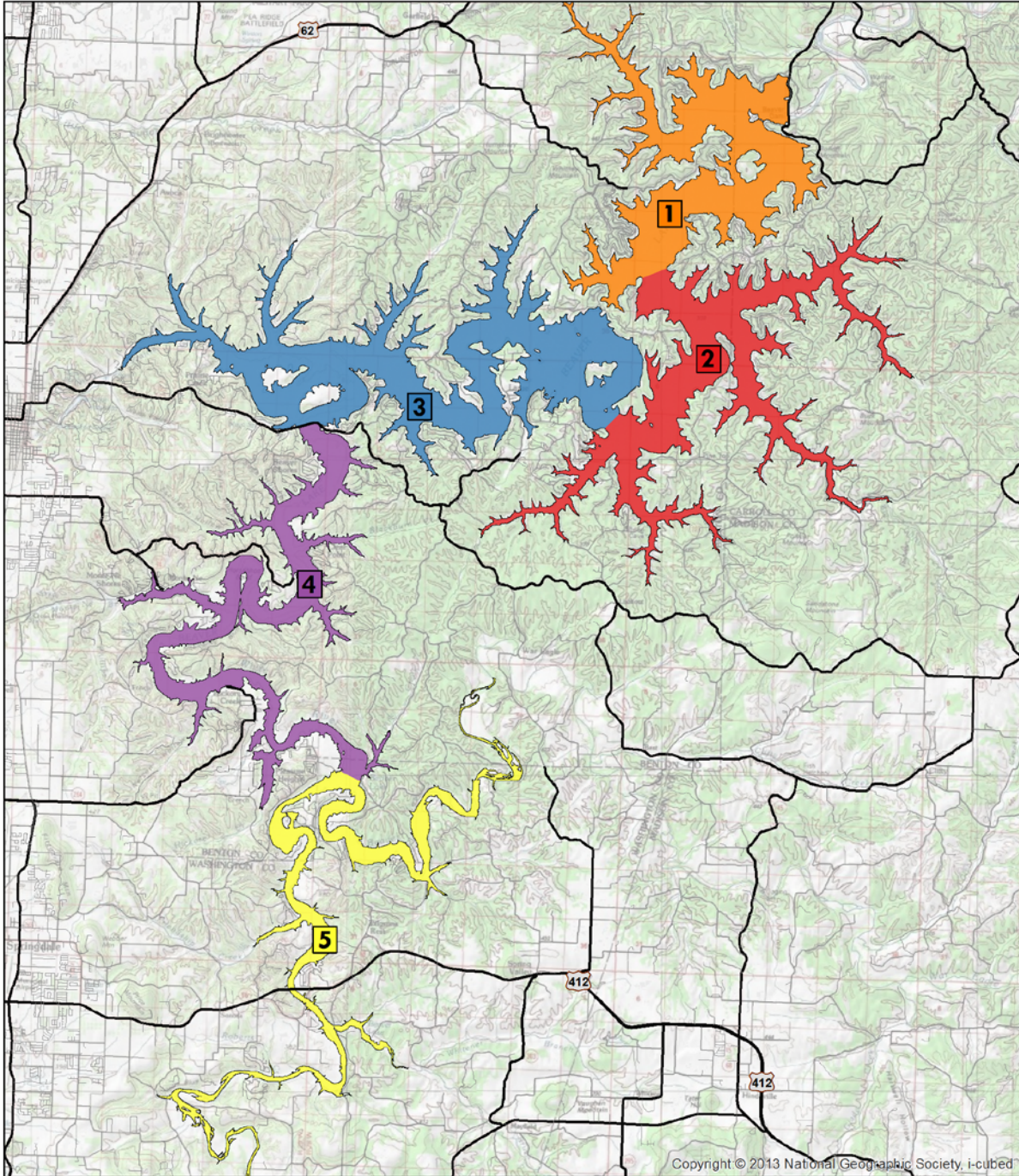


**THANK YOU FOR HELPING WITH THIS IMPORTANT EFFORT TO UNDERSTAND PEOPLE'S EXPERIENCES AND PREFERENCES FOR BOATING AT BEAVER LAKE!**

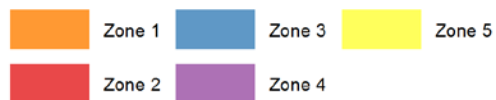
*This study is being conducted by CDM Smith, a contractor, on behalf of the U.S. Army Corps of Engineers.*

The public reporting burden for this collection of information is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Washington Headquarters services, Executive Services Directorate, Information Management Division, 4800 Mark Center Drive, East Tower, Suite 02G09, Alexandria, VA 22350-3100 (0596-0236, expiration 11-30-17). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. **PLEASE DO NOT RETURN YOUR RESPONSE TO THE ABOVE ADDRESS.**

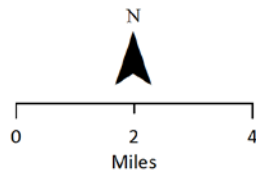




**Legend**



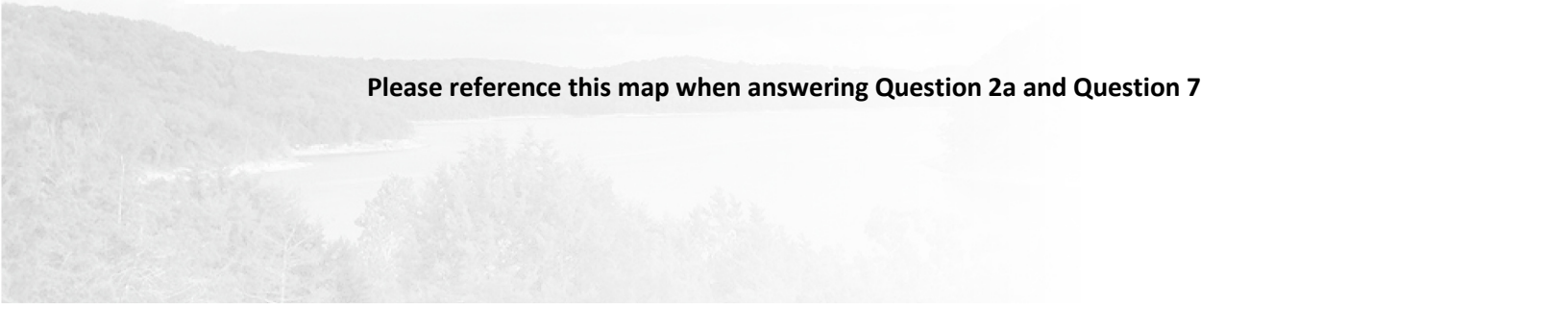
Basemap Source: National Geographic Society



U.S. Army Corps of Engineers  
Little Rock District  
Beaver Lake Carrying Capacity Study  
Lake Areas  
Created: June 15, 2016



Please reference this map when answering Question 2a and Question 7





5. How many years have you been boating? (*Round up*) \_\_\_\_\_ Years

6. How many years have you been boating at Beaver Lake? (*Round up*) \_\_\_\_\_ Years

7. During a typical boating trip on Beaver Lake, please indicate the primary area where you do most of your recreation activities. Use the map included with this survey as a reference. (*Circle only one*)

Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
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8. Please provide the type and size of the primary boat that you use at Beaver Lake and whether this boat was trailered to the lake or launched from the lake.

<b>Boat Type</b> ( <i>Mark one</i> )	<b>Boat Size</b> ( <i>Mark one</i> )	<b>Was this boat transported (e.g., trailered or car/truck roof) to the lake, kept at a marina on the lake, or rented/borrowed?</b> ( <i>Mark one</i> )
<input type="checkbox"/> I don't know	<input type="checkbox"/> less than 16'	<input type="checkbox"/> Trailered/transported to the lake
<input type="checkbox"/> Runabout/Speedboat	<input type="checkbox"/> 16 - 20'	<input type="checkbox"/> Kept at a marina on the lake
<input type="checkbox"/> Ski or Wake Boat	<input type="checkbox"/> 21 - 28'	<input type="checkbox"/> Kept at my private or community boat dock
<input type="checkbox"/> Fishing boat/bass boat	<input type="checkbox"/> 29'+	<input type="checkbox"/> Kept at the resort I stayed at
<input type="checkbox"/> Pontoon boat		<input type="checkbox"/> Rented
<input type="checkbox"/> House boat		<input type="checkbox"/> Borrowed
<input type="checkbox"/> Cabin cruiser		<input type="checkbox"/> Other _____
<input type="checkbox"/> Sailboat/Sailboard		_____
<input type="checkbox"/> Personal Watercraft (e.g. Jet Ski)		
<input type="checkbox"/> Rowboat/Kayak/Canoe		
<input type="checkbox"/> Other _____		

***Please continue to the next page***





9. In general, what percent of your time do you spend on the following activities while recreating on Beaver Lake? (Consider time spent getting to or moving between fishing locations as "Fishing")

- Fishing \_\_\_\_\_ %
- Cruising \_\_\_\_\_ %
- Swimming \_\_\_\_\_ %
- Water Skiing \_\_\_\_\_ %
- Relaxing/Sunning  
in boat (stationary) \_\_\_\_\_ %
- Other activities \_\_\_\_\_ % ...please describe \_\_\_\_\_

(BE SURE THE TOTAL = 100%)

### B. Management Questions

10. Is there a problem from too many boats on Beaver Lake? (*Circle one*)

1. Yes, there is a problem
2. No, there is not a problem

If Yes, please indicate how serious of a problem there is from too many boats on Beaver Lake. (*Circle one*)

Minor Problem	Moderate Problem	Serious Problem
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11. How safe are boating conditions on Beaver Lake? (*Circle one*)

Not at All Safe	Slightly Safe	Somewhat Safe	Very Safe	Extremely Safe
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Please describe any safety concerns you have:

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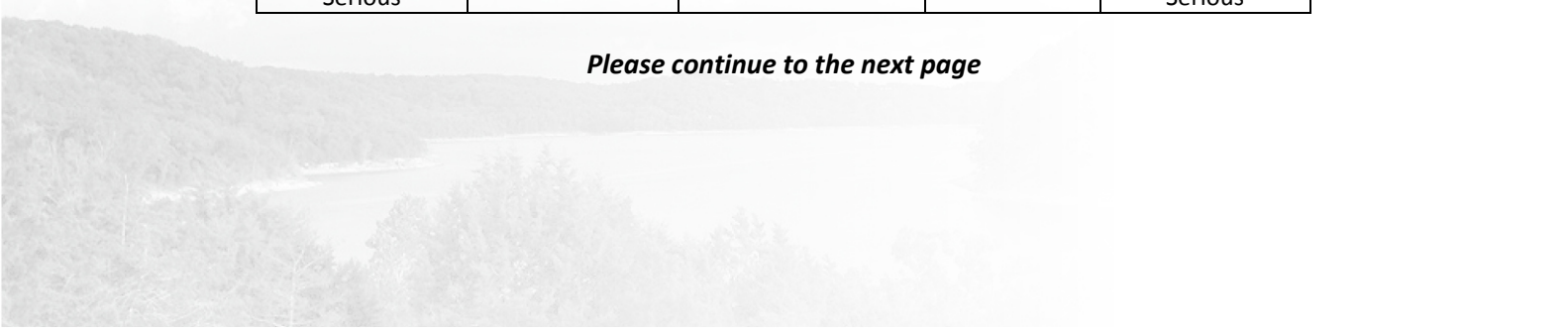


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12. How serious of a safety problem is the number of boats on Beaver Lake? (*Circle one*)

Not At All Serious	Slightly Serious	Moderately Serious	Very Serious	Extremely Serious
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***Please continue to the next page***



13. How much do private docks interfere with your use of Beaver Lake? (*Circle one*)

Do Not Interfere at All	Slightly Interfere	Somewhat Interfere	Seriously Interfere	Tremendously Interfere
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14. How much, if at all, has the noise from other boats reduced your enjoyment of Beaver Lake? (*Circle one*)

Not at All	Slightly	Somewhat	Quite a Bit	Extremely
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15. How likely is it that the presence of too many boats would cause you to avoid your favorite parts of Beaver Lake? (*Circle one*)

Not at All Likely	Slightly Likely	Somewhat Likely	Quite Likely	Extremely Likely
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16. Which of these statements best describes your **expectation** for the number of boats on Beaver Lake? Please refer to your last outing on the lake when answering this question. (*Mark one*)

- I saw ABOUT AS MANY boats as I expected to see that day
- I saw MORE boats than I expected to see that day
- I saw FEWER boats than I expected to see that day

16b. Please indicate the date of your last outing:

\_\_\_\_\_ (month) \_\_\_\_\_ (day) \_\_\_\_\_ (year)

17. Which of these statements best describes your **preference** for the number of boats on the lake? Please refer to your last outing on the lake when answering this question. (*Mark one*)

- I saw ABOUT AS MANY boats as I wanted to see that day
- I saw MORE boats than I wanted to see that day
- I saw FEWER boats than I wanted to see that day

***Please continue to the next page***



18. Please review the boating conditions depicted in the photos below. Which photo shows the maximum number of boaters you could see at one time on Beaver Lake without thinking it was too crowded? (*Circle one*)

A	B	C	D	E	I don't think it looks crowded in any of the photos
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**A**



**B**



**C**



**D**



**E**



*Please continue to the next page*





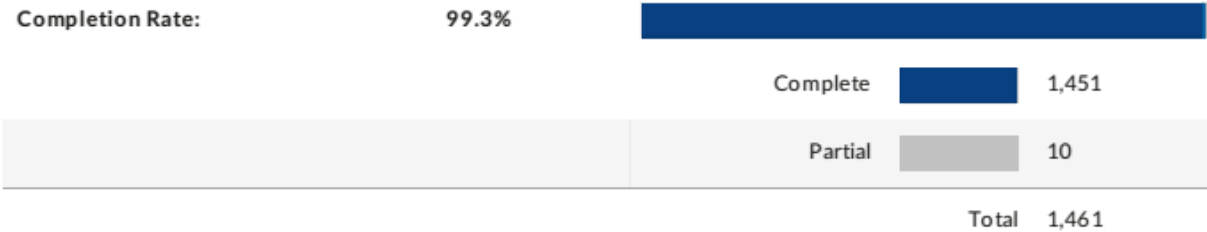


### B.3 Beaver Lake Survey Responses

After removal of duplicates, a total of 1,461 responses were received. This represents a 45 percent response rate (1,461 received of the 3,212 administered). A total of 202 responses were completed online and 1,259 were received via postal mail. With the 1,461 surveys that were received, a general Margin of Error for any question where the ratio of response is 50/50 is calculated as +/-2.6 percent. Of the survey responses received, 10 were partial completions for a completion rate of 99.3 percent.

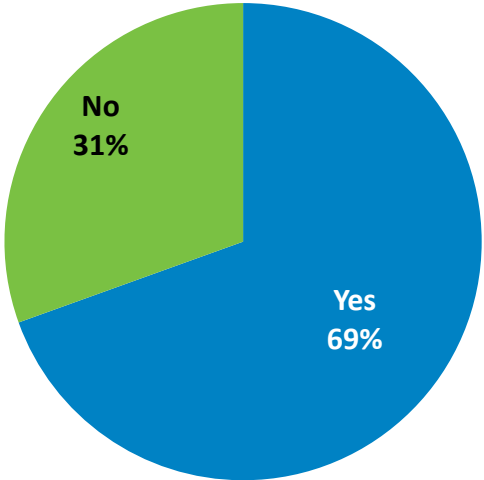
The basic frequency for all responses are provided below.

**Response Counts**



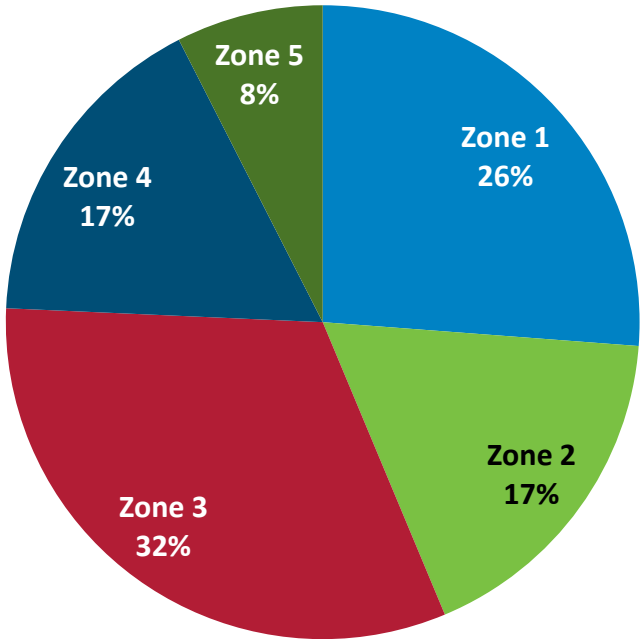
	Count	Percent
Complete	1,451	99.3
Partial	10	0.7
Total	1,461	

**Do you own a residence located within 1/4 mile of the Beaver Lake shoreline?**



Value	Percent	Count
Yes	69.5%	980
No	30.5%	430
Total		1,410

Referencing the map below, please mark the lake zone number indicating where along the shoreline this residence is located.



Value	Percent	Count
Zone 1	26.2%	252
Zone 2	17.5%	169
Zone 3	32.0%	308
Zone 4	16.8%	162
Zone 5	7.5%	72
Total		963

What are the City, State, and Zip Code of your permanent residence?

CITY



Count	Response	Count	Response	Count	Response
455	Rogers	1	Argonia	1	Lewisville
122	Springdale	1	Avon	1	Lincoln
108	Eureka Springs	1	Ballwin	1	Little Rock
102	Fayetteville	1	Bellevue	1	Loplin

Count	Response	Count	Response	Count	Response
85	Garfield	1	Belton	1	Lyndon
83	Bentonville	1	Bentonville	1	Manchester
53	Garfield	1	Bethel Heights	1	Manhattan
38	Lowell	1	Bewear	1	Marion
23	Bella Vista	1	Blue Springs	1	McPherson
20	Wichita	1	Brentwood	1	Merriam
18	Fort Smith	1	Carl Junction	1	Miami
12	Joplin	1	Carson City	1	Monticello
11	Cave Springs	1	Carthage	1	Mountainburg
9	Tulsa	1	Cave City	1	N Richland Hills
8	Overland Park	1	Chicago	1	Naperville
7	Centerton	1	Clearwater	1	Nixa
7	Oklahoma City	1	Cleveland	1	Noel
6	Dallas	1	Collinsville	1	Norwalk
6	Edmond	1	Colwich	1	O'Fallon
6	Kansas City	1	Crystal Lake	1	Oakwood
5	Broken Arrow	1	Cypress	1	Oceanside
5	Neosho	1	Dardanelle	1	Omaha
5	Siloam Springs	1	Des Moines	1	Papillion
4	Bixby	1	Duncan	1	Parkville
4	Farmington	1	Eagle Rock	1	Pierce
4	Leawood	1	Elbert	1	Pinevilla
4	Pea Ridge	1	Englewood	1	Pleasant Hill
4	Shawnee	1	Eudera	1	Ponca City
4	Springfield	1	FSM	1	Prairie Grove
4	Van Buren	1	Fairview	1	Prosper
4	West Fork	1	Fayetteville	1	Rogers
3	Ankeny	1	Fort Worth	1	San Francisco
3	Enid	1	Ft. Scott	1	Sioux Falls
3	Greenwood	1	Galena	1	Southlake
3	Little Flock	1	Galva	1	St. Charles
3	Olathe	1	Gardner	1	Stillwell
3	Stillwater	1	Garfield	1	Strafford
3	Valley Center	1	Germantown	1	Summers
2	Augusta	1	Grand Island	1	Sylvia
2	Austin	1	Green Forest	1	Tontitown

Count	Response	Count	Response	Count	Response
2	Bartlesville	1	Grimes	1	Topeka
2	Beloit	1	Gt. Bend	1	Trabuco Canyon
2	Berryville	1	Halstead	1	Treynor
2	Colorado Springs	1	Hays	1	Tuttle
2	Dodge City	1	Hennessey	1	Tyler
2	Goddard	1	Hesston	1	Udall
2	Great Bend	1	Holiday Island	1	Vinita
2	Houston	1	Huntsville	1	Wagoner
2	Kimberling City	1	Hutchinson	1	Waverly
2	Lenexa	1	Independence	1	White Water
2	Newton	1	Independence	1	Windser
2	Ottawa	1	Jasper	1	Winslow
2	Owasso	1	Joliet	1	Wisner
2	Pittsburg	1	Katy		
2	Prairie Village	1	Kearney		
2	Russellville	1	Keavney		
2	Stilwell	1	Keystone		
2	Wesley	1	Lake Jackson		
1	Adel	1	Lawreme		
1	Andover	1	Lees Summit		

**STATE**



Count	Response
1,157	AR
90	KS
50	MO
49	OK
21	TX
10	IA
6	CO
5	NE
4	IL
3	CA
2	GA
1	AR
1	FL
1	IN
1	NV
1	SD
1	TN

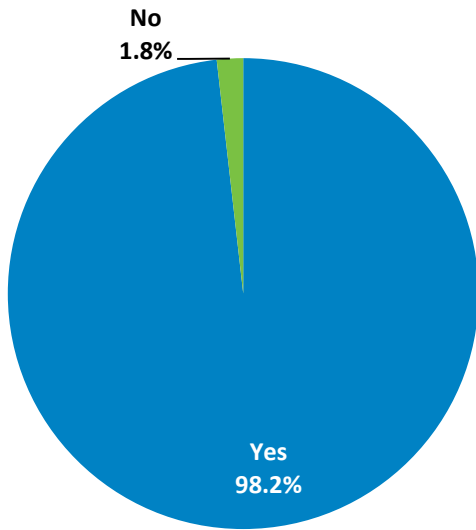
ZIP CODE



Count	Response	Count	Response	Count	Response	Count	Response	Count	Response	Count	Response
331	72756	3	72936	1	50211	1	66224	1	72716	1	76111
137	72732	3	73013	1	50314	1	66451	1	72740	1	76182
125	72758	3	73703	1	51575	1	66503	1	72744	1	77005
84	72712	3	74014	1	52249	1	66610	1	72753	1	77070
77	72764	3	74137	1	52302	1	66701	1	72757	1	77429
72	72631	3	75225	1	57106	1	66739	1	72766	1	77474
47	72762	2	63021	1	60012	1	66871	1	72769	1	77566
45	72701	2	64060	1	60435	1	67002	1	72770	1	78701
39	72745	2	65686	1	60563	1	67004	1	72772	1	78746
34	72632	2	66061	1	60638	1	67026	1	72801	1	80106
33	72703	2	66206	1	63303	1	67030	1	72811	1	80113
22	72704	2	66209	1	63366	1	67056	1	72834	1	80550
12	72714	2	66221	1	64012	1	67062	1	72918	1	80650
11	72715	2	66223	1	64015	1	67146	1	72946	1	89703
11	72718	2	66762	1	64055	1	67154	1	73025	1	92056
10	64804	2	67010	1	64082	1	67203	1	73089	1	92679
7	72719	2	67052	1	64138	1	67204	1	73108	1	94116
7	72903	2	67114	1	64145	1	67207	1	73131		
5	64850	2	67205	1	64151	1	67226	1	73162		
5	67206	2	67217	1	64152	1	67235	1	73533		
5	72761	2	67230	1	64154	1	67301	1	73723		
4	65809	2	67420	1	64734	1	67443	1	73742		
4	72730	2	67801	1	64755	1	67460	1	74021		
4	72751	2	72616	1	64834	1	67502	1	74074		
4	72916	2	72773	1	64836	1	67581	1	74103		
4	72956	2	72959	1	64854	1	67601	1	74105		
4	73170	2	73034	1	64856	1	68005	1	74114		
4	74008	2	74006	1	65641	1	68104	1	74132		
3	50023	2	74012	1	65714	1	68133	1	74301		
3	64801	2	74055	1	65757	1	68791	1	74354		
3	66067	2	74075	1	66025	1	68803	1	74467		
3	66085	2	74133	1	66030	1	69080	1	74604		
3	66207	2	80920	1	66049	1	707230	1	75056		

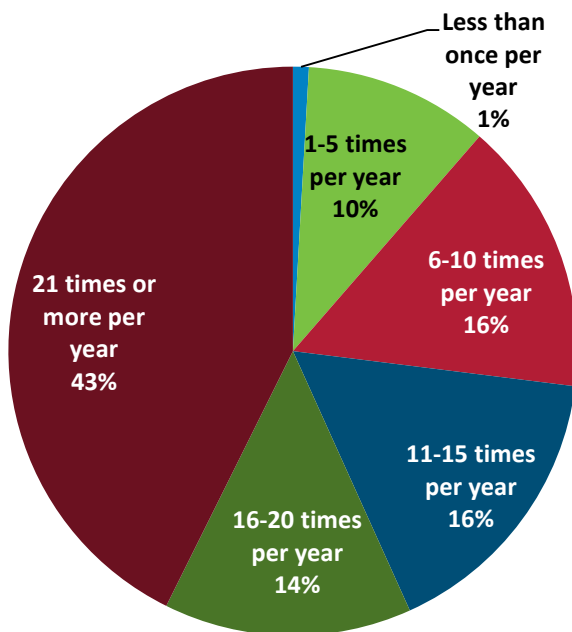
Count	Response	Count	Response	Count	Response	Count	Response	Count	Response	Count	Response
3	66226	1	30215	1	66109	1	71655	1	75069		
3	67147	1	30566	1	66202	1	72003	1	75078		
3	67212	1	33756	1	66205	1	72201	1	75206		
3	67530	1	38139	1	66208	1	72362	1	75214		
3	72774	1	46123	1	66215	1	72521	1	75248		
3	72901	1	50003	1	66216	1	72634	1	75707		
3	72908	1	50111	1	66220	1	72638	1	7609		

*Do you engage in any boating activities on Beaver Lake?*



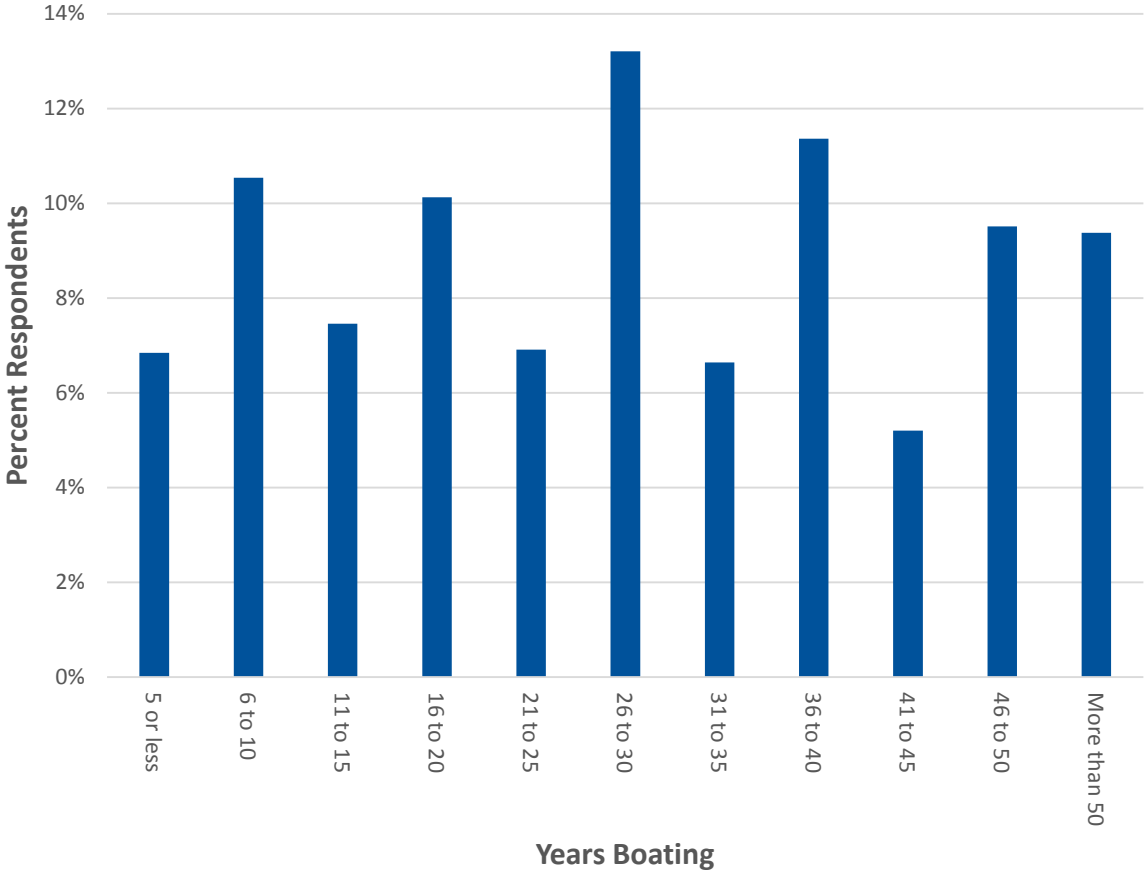
Value	Percent	Count
Yes	98.2%	1,433
No	1.8%	26
Total		1,459

*How often do you engage in boating activities on Beaver Lake?*

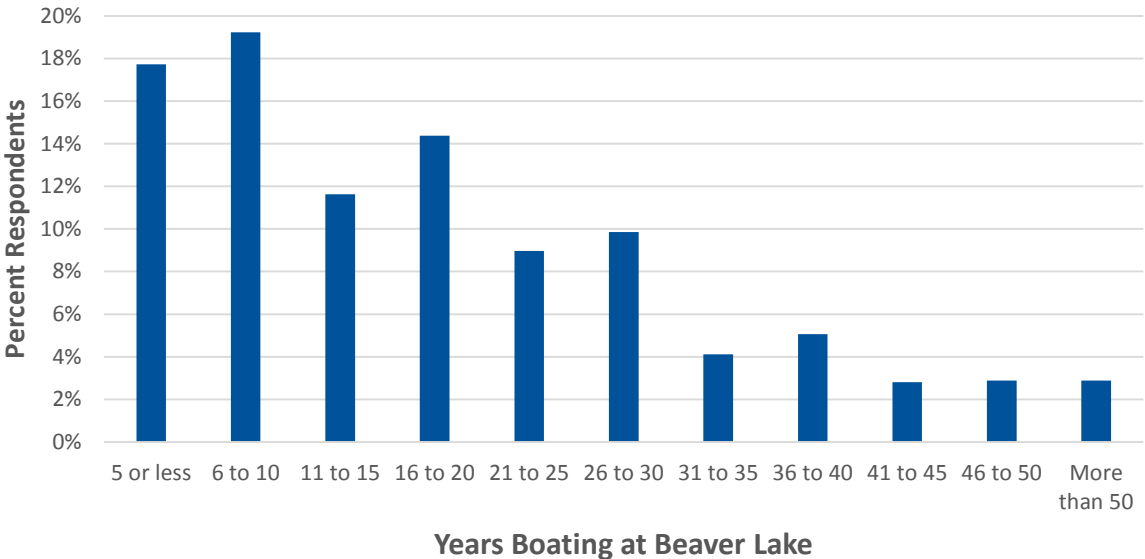


Value	Percent	Count
Less than once per year	0.9%	13
1-5 times per year	10.5%	148
6-10 times per year	15.6%	220
11-15 times per year	16.3%	230
16-20 times per year	14.1%	199
21 times or more per year	42.7%	604
Total		1,414

*How many years have you been boating? (round up)*

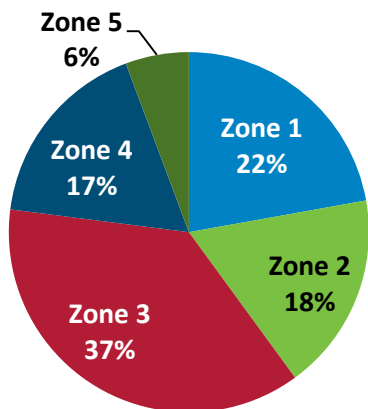


*How many years have you been boating at Beaver Lake (round up)?*





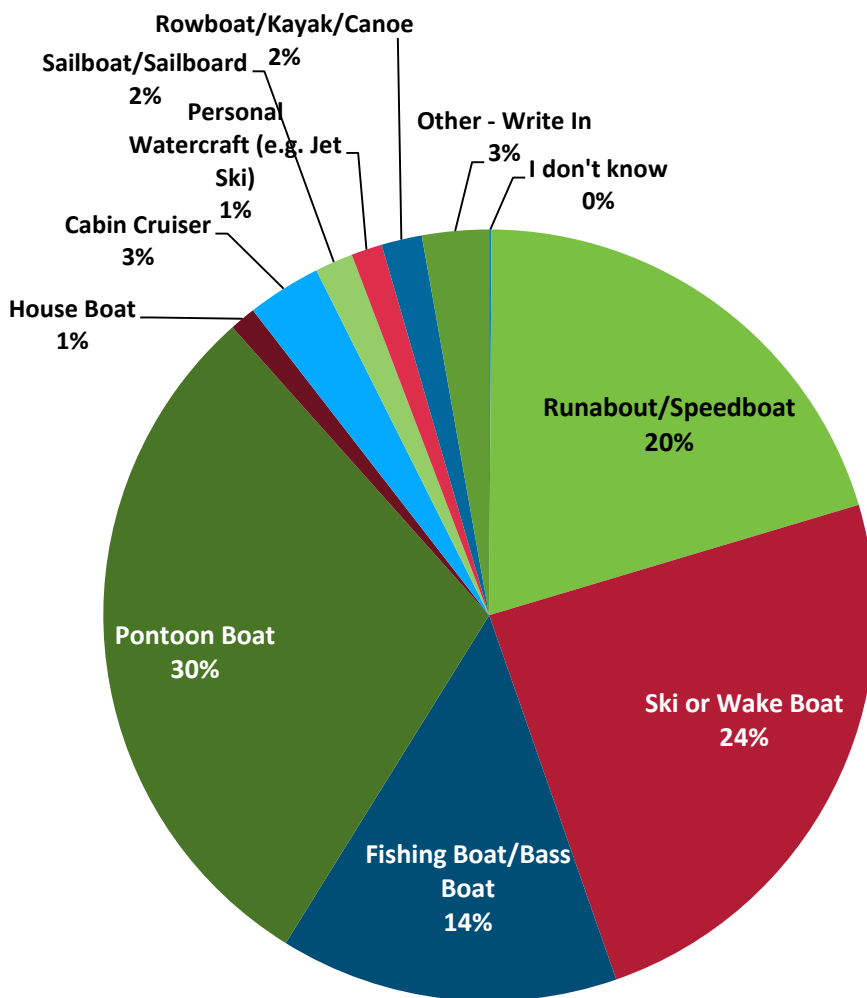
During a typical boating trip on Beaver Lake, please indicate the primary area where you do most of your recreation activities. Use the map below as a reference.



Value	Percent	Count
Zone 1	22.2%	307
Zone 2	17.8%	246
Zone 3	37.1%	514
Zone 4	17.3%	239
Zone 5	5.7%	79
	Total	1,385

Please provide the type and size of the primary boat that you use at Beaver Lake and whether this boat was trailered to the lake or launched from the lake.

**BOAT TYPE**

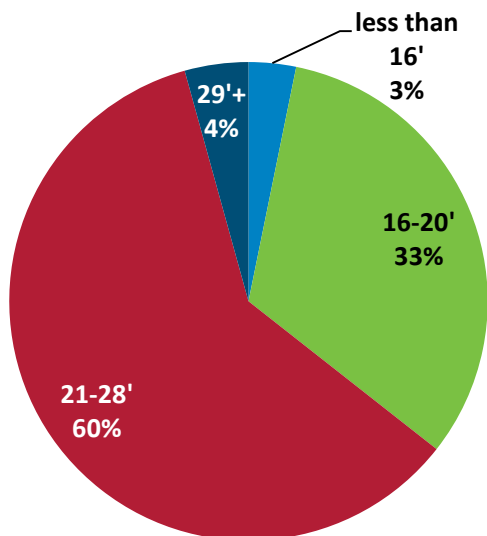


Value	Percent	Count
I don't know	0.1%	1
Runabout/Speedboat	20.3%	288
Ski or Wake Boat	24.3%	344
Fishing Boat/Bass Boat	14.2%	201
Pontoon Boat	29.6%	420
House Boat	1.1%	15
Cabin Cruiser	3.1%	44
Sailboat/Sailboard	1.6%	22
Personal Watercraft (e.g. Jet Ski)	1.3%	19
Rowboat/Kayak/Canoe	1.7%	24
Other - Write In	2.8%	39
	Total	1,417

**BOAT TYPE: OTHER – WRITE-IN**

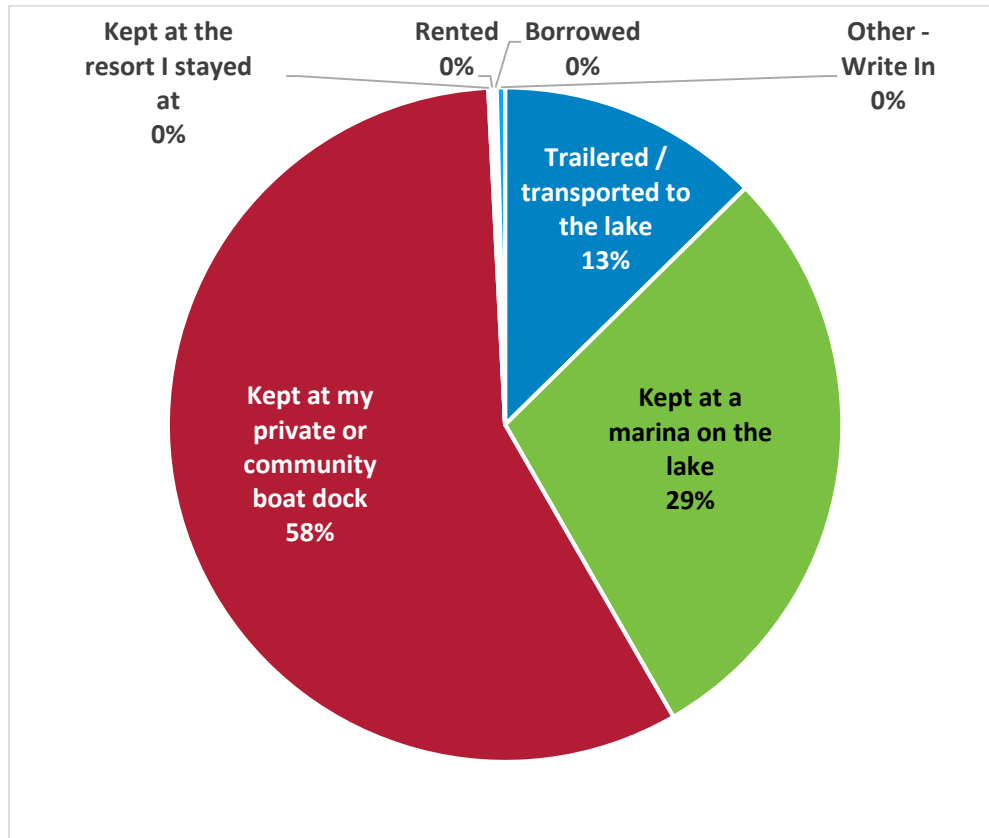
Count	Response
33	Deck Boat
1	Pontoon and Bass Boat
1	Tahoe Deck Boat I/O
1	Tri-Bull Deck boat
1	V Hull 21' "Deck Boat"
1	no boat now
1	offshore

**BOAT SIZE**



Value	Percent	Count
less than 16'	3.2%	45
16-20'	32.4%	455
21-28'	60.1%	843
29'+	4.3%	60
	Total	1,403

**WAS THIS BOAT TRANSPORTED (E.G., TRAILED OR CAR/TRUCK ROOF) TO THE LAKE, KEPT AT A MARINA ON THE LAKE, OR RENTED/BORROWED?**



Value	Percent	Count
Trailered/transported to the lake	12.6%	179
Kept at a marina on the lake	29.0%	411
Kept at my private or community boat dock	57.4%	814
Kept at the resort I stayed at	0.1%	2
Rented	0.2%	3
Borrowed	0.1%	2
Other - Write In	0.4%	6
	Total	1,417

**BOAT TRANSPORT: OTHER – WRITE-IN**

Count	Response
1	All the above
1	Beaver Lake Sail Club
1	Friend's boat and dock
1	Kept at house and lunched on weekends
1	Sail Club
1	Trailered to lake and kept at private dock

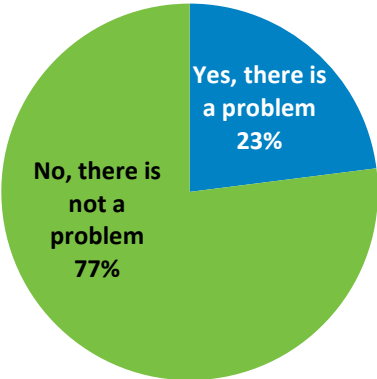


Count	Response
9	Wakeboarding
8	Jet ski
5	Wake boarding and Surfing
4	Wake Surfing
2	Camping
2	Hiking
2	Relaxing
2	Scuba Diving
2	Surfing
1	Bird and wildlife viewing
1	Boat ride
1	Canoeing
1	Cooking/ Eating
1	Dining at restaurants
1	Dinner
1	Dinner on boat
1	Diving
1	Dock gathering events
1	Dock life
1	Eating
1	Eating at JJs, Ventris or Starkey
1	Eating by the water.
1	Enjoying outdoors
1	Floating
1	Floating beside boat.
1	Floating off of dock
1	Going to marina to eat at the restaurant
1	Hiking, cooking out
1	Hunting water fowl
1	I do not
1	Looking at fall foliage a looking for bald eagles
1	Looking at the lake
1	Messing around
1	Moving docks
1	N/A
1	NWA Boat Club Activities
1	No boat
1	On Fords Creek we have boat dock with swim dock- so we spend lots of time swimming, playing and some night fishing there while sometimes boats pulls skiers or leaves from here to fish.
1	Other
1	Paddle Board, Kayak,
1	Paddle Board/Canoeing
1	Paddle board
1	Paddle boarding Jet skiing

Count	Response
1	Paddling
1	Paddling canoe
1	Paddling in Kayak
1	Picnic
1	Playing on shoreline
1	Racing
1	Relaxing in cabin
1	Relaxing on shore
1	Relaxing watching lake
1	Relaxing, Sightseeing
1	Rescue
1	Rising a Hydrofoil
1	Sail boarding
1	Sailing and Kayaking
1	Sailing, catch with dog, walking shoreline
1	Sailing, wakeboarding
1	Sight seeing
1	Sitting on deck
1	Socializing and eating
1	Spending night on boat
1	Studying H2O quality in my area (3).
1	Sunset Cruises
1	Surfing/ tubing
1	Towing Floatables
1	Traveling
1	Traveling to restaurant
1	Tubing/ Wake boarding
1	Visiting neighbors
1	Visiting private dock's that belong to friends.
1	Visiting with other dock owners.
1	Wake Board/ Tubing
1	Wake board, tubing, surfing
1	Wake board, wake surf, tubing
1	Walking shoreline
1	Walking, relaxing on dock
1	Watching fireworks
1	Water boarding/ tubing
1	Working
1	bird and nature watching
1	eating
1	exploring
1	exploring, picnic, traveling to visit friends on their docks.
1	grandchildren use parks, playgrounds, and beach areas.

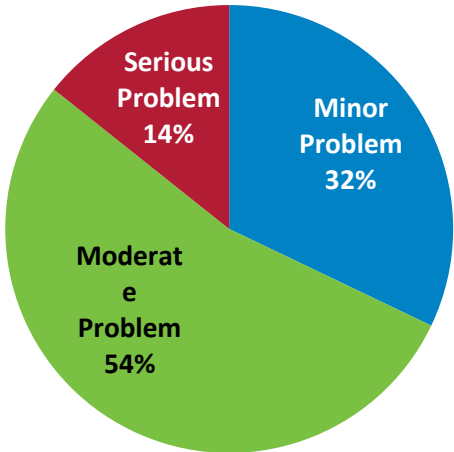
Count	Response
1	heading to dinner
1	kayaking, birding
1	maintaining my boat dock
1	other activities for us is tubing or dining/marina time
1	picnics
1	sailing
1	surfing
1	swimming, canoeing, dock fishing Jet Skiing
1	towing water towable
1	wake boarding, surfing, tubing, knee boarding
1	wakeboarding/tubing

*Is there a problem from too many boats on Beaver Lake?*



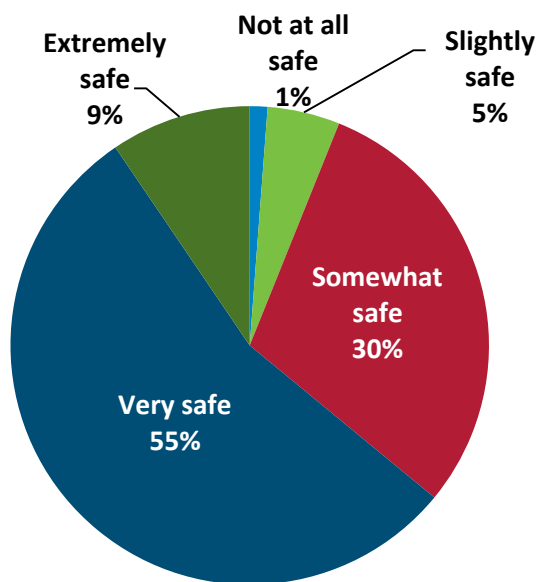
Value	Percent	Count
Yes, there is a problem	23.0%	326
No, there is not a problem	77.0%	1,094
Total		1,420

*If yes, please indicate how serious of a problem there is from too many boats on Beaver Lake.*



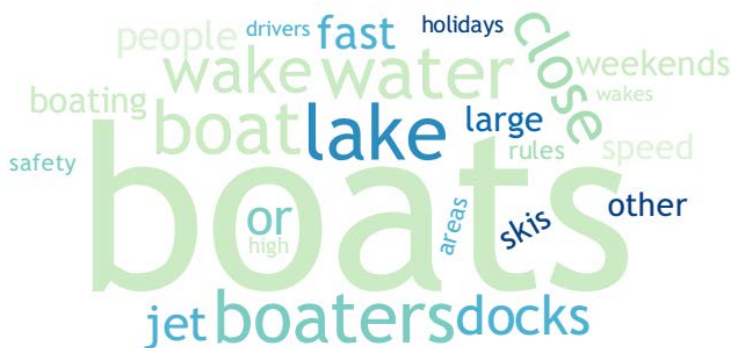
Value	Percent	Count
Minor Problem	32.1%	103
Moderate Problem	53.6%	172
Serious Problem	14.3%	46
Total		321

*How safe are boating conditions on Beaver Lake?*



Value	Percent	Count
Not at all safe	1.2%	17
Slightly safe	4.9%	69
Somewhat safe	29.9%	420
Very safe	54.6%	767
Extremely safe	9.5%	133
Total		1,406

*Please describe any safety concerns you have*



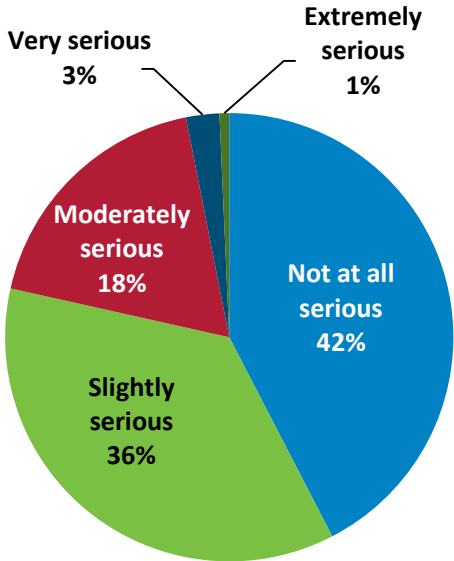
Concern (Analyzed and Grouped)	Count
Uneducated/Inexperienced Boaters Cause Safety Issues	140
Highspeed/Cigarette/Wake Boats Cause Safety Issues	133
Crowded on Holidays	83
Passing too Close to Boats/Skiers/Docks Causes Safety Concerns and Damages Docks	81
Speeding Causes Safety Concerns	79
PWC/Jet Skis Create Safety Concerns	78
Unmarked Hazards/Shallows	70
Debris in Water is Dangerous	49
Wake Boards/Tubes/Skiers Create Safety Concerns	47
Drinking on the Lake is a Problem	45
Crowded on Weekends	33
Low Water Level Causes Safety Issues	26
Need More No Wake Zones	20
Prairie Creek Area is Crowded	17
Noise is a Problem	17



Concern (Analyzed and Grouped)	Count
Underage Drivers Create Safety Concerns	12
No Safety Concerns	10
Not Enough Parking at Marinas	8
Crowded during Tournaments	7
Dangerous for Canoes/Kayaks	7
Boats without Lights Cause Safety Issues	7
Unclear Map/Questions	6
Dangerous for Swimmers	6
Inconsistent Water Level Causes Safety Issues	6
Fishing Boats Go Too Fast	6
Crowded During Summer	6
Overloaded Boats/Jet Skis	5
Not Crowded	5
Motorized vs. Non-Motorized Craft	5
More Boat Ramps	5
USACE Regulations are too Strict	5
Narrow Coves/Channels	4
More Water Patrol	4
People aren't Wearing Life Jackets	4
Unsafe for Divers	4
Shoreline Maintenance	3
Rocky Branch Area Crowded	3
Garbage in Lake is a Problem	3
More Enforcement	3
Docks too Close Together	2
Too Many Water Patrol	2
Texting while Driving	2
Sandbars Create Safety Hazards	2
Nighttime is Unsafe	2
High Water Level Causes Safety Issues	2
Good Lake Patrol	2
Cost/Purpose of Study	2
Too Many Docks	1
Too Many Abandoned Docks	1
Commercial Docks are too Large	1
Theft is a Problem	1
Improve Starkey Boat Ramp	1
Ramps are Crowded	1
Primary Marina Crowded	1
Like Wintertime	1
Lights on Goat Island are Needed	1
Jugs left Overnight Cause a Safety Issue	1
Inconsistent USACE Property Line	1

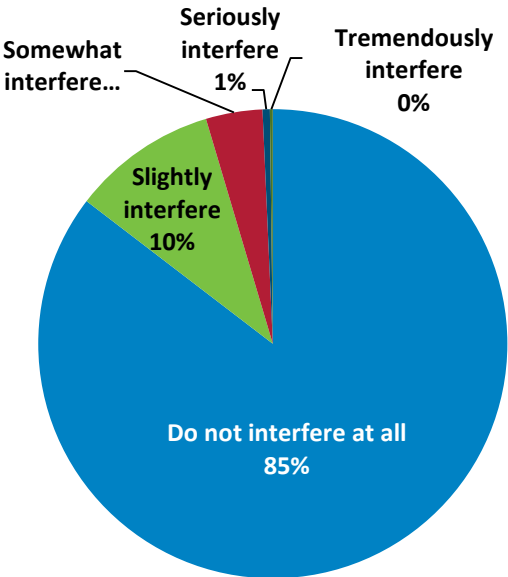
Concern (Analyzed and Grouped)	Count
Future Crowding is a Concern	1
Don't Reduce Number of Boats	1
Dock at JJ Restaurant is Unsafe	1
Cliff Jumping is Unsafe	1
Alice Walton at Camp War Eagle is a Problem	1
Buoys at Boat Ramps Needed	1
Airplanes Landing/Flying Over Lake Cause Safety Issue	1

*How serious of a safety problem is the number of boats on Beaver Lake?*



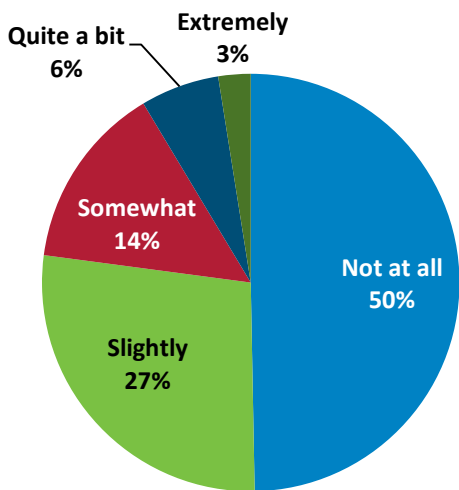
Value	Percent	Count
Not at all serious	42.4%	595
Slightly serious	36.1%	506
Moderately serious	18.4%	258
Very serious	2.4%	34
Extremely serious	0.7%	10
Total		1,403

*How much do private docks interfere with your use of Beaver Lake?*



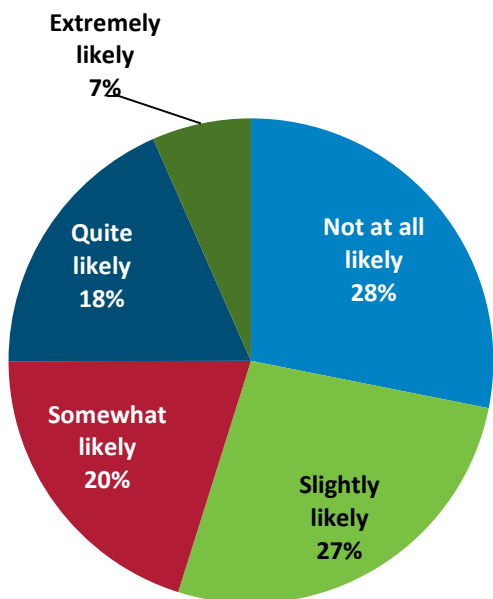
Value	Percent	Count
Do not interfere at all	85.4%	1,209
Slightly interfere	10.0%	141
Somewhat interfere	3.9%	55
Seriously interfere	0.5%	7
Tremendously interfere	0.2%	3
Total		1,415

*How much, if at all, has the noise from other boats reduced your enjoyment of Beaver Lake?*



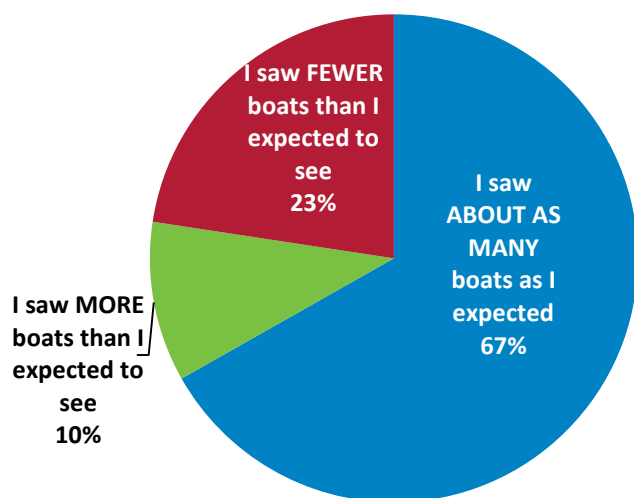
Value	Percent	Count
Not at all	49.7%	704
Slightly	27.4%	388
Somewhat	14.3%	202
Quite a bit	6.1%	87
Extremely	2.5%	35
Total		1,416

*How likely is it that the presence of too many boats would cause you to avoid your favorite parts of Beaver Lake?*



Value	Percent	Count
Not at all likely	28.1%	395
Slightly likely	26.7%	375
Somewhat likely	20.1%	283
Quite likely	18.4%	259
Extremely likely	6.6%	93
Total		1,405

*Which of these statements best describes your expectation for the number of boats on Beaver Lake? Please refer to your last outing on the lake when answering this question.*



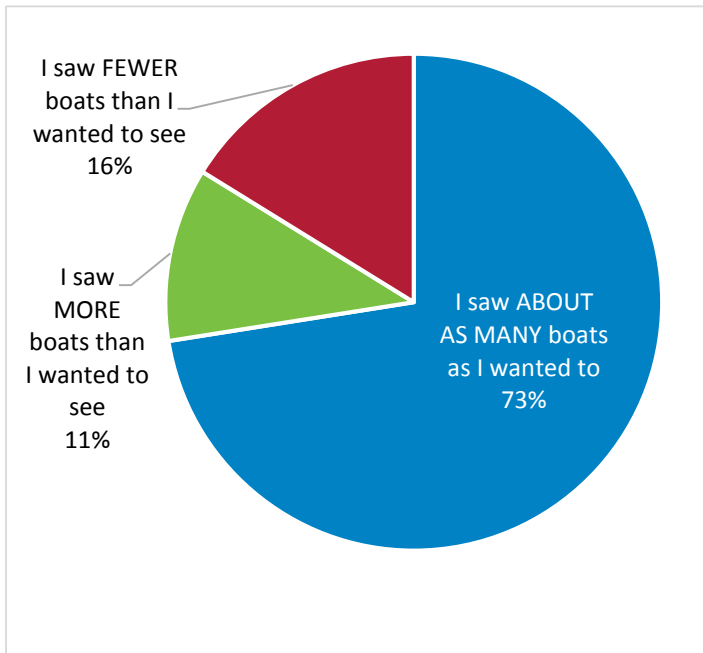
Value	Percent	Count
I saw ABOUT AS MANY boats as I expected	66.8%	936
I saw MORE boats than I expected to see	10.6%	149
I saw FEWER boats than I expected to see	22.6%	317
Total		1,402

**b. Please indicate the date of your last outing**

Count	Response	Count	Response	Count	Response
84	9/5/2016	5	9/16/2016	1	6/21/2016
59	10/15/2016	5	9/21/2016	1	6/25/2016
53	10/22/2016	5	10/4/2016	1	7/3/2013
52	10/1/2016	5	10/5/2016	1	7/6/2016
51	10/23/2016	5	10/31/2016	1	7/9/2016
41	9/1/2016	4	8/14/2016	1	7/13/2016
39	10/25/2016	4	8/21/2016	1	7/15/2016
39	10/30/2016	4	8/28/2016	1	7/17/2016
38	9/4/2016	4	9/29/2016	1	7/18/2016
32	10/16/2016	4	10/6/2016	1	7/19/2016
30	9/24/2016	4	11/2/2016	1	7/21/2016
29	9/3/2016	4	11/9/2016	1	7/22/2016
29	9/10/2016	3	6/1/2016	1	7/23/2016
26	8/1/2016	3	7/2/2016	1	7/24/2016
25	10/24/2016	3	7/30/2016	1	7/25/2016
24	9/17/2016	3	8/9/2016	1	7/26/2016
23	9/15/2016	3	8/10/2016	1	7/28/2016
23	10/8/2016	3	8/26/2016	1	8/2/2016
22	10/20/2016	3	8/31/2016	1	8/3/2016
20	8/15/2016	3	9/8/2016	1	8/7/2016
19	10/28/2016	3	9/14/2016	1	8/8/2016
18	10/2/2016	3	9/22/2016	1	8/16/2016
18	10/29/2016	3	11/4/2016	1	8/19/2016

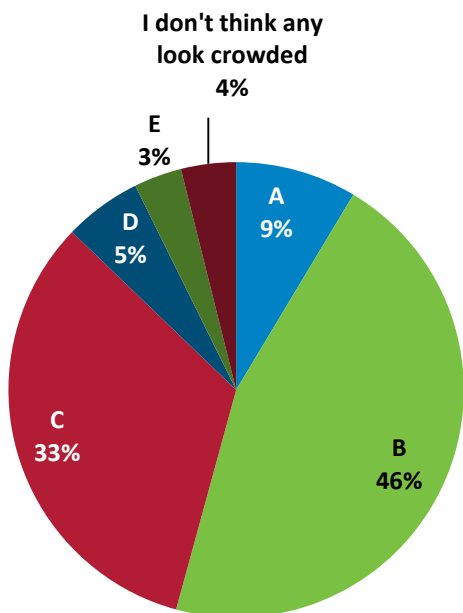
Count	Response	Count	Response	Count	Response
17	7/4/2016	2	6/6/2016	1	8/22/2016
16	10/26/2016	2	6/13/2016	1	8/29/2016
15	8/20/2016	2	6/15/2016	1	09.24.16
14	10/9/2016	2	7/10/2016	1	9/3/2016
13	9/12/2016	2	7/16/2016	1	9/5/1994
13	10/12/2016	2	8/4/2016	1	9/9/2016
12	9/11/2016	2	8/11/2016	1	9/13/2016
12	10/27/2016	2	8/12/2016	1	9/17/2017
11	9/30/2016	2	8/23/2016	1	10/16/2016
11	10/10/2016	2	8/24/2016	1	10/18/2016
11	10/14/2016	2	8/25/2016	1	10/22/2016
10	7/1/2016	2	9/19/2016	1	10/9/2016
10	9/23/2016	2	9/26/2016	1	10/1/2016
10	9/25/2016	2	11/3/2016	1	10/10/1916
10	10/18/2016	2	11/7/2016	1	10/30/2016
9	8/27/2016	2	11/10/2016	1	10/8/2016
9	9/7/2016	2	11/12/2016	1	10/8/2016
9	9/20/2016	2	11/16/2016	1	11/8/2016
9	10/3/2016	2	11/18/2016	1	11/11/2016
8	9/2/2016	2	11/19/2016	1	11/15/2016
8	9/18/2016	1	1/20/2016	1	11/28/2016
8	10/7/2016	1	3/1/2016	1	6/15/2016
8	10/19/2016	1	4/10/2016	1	8/16/2016
8	11/1/2016	1	4/11/2015	1	9/3/2016
7	8/30/2016	1	4/25/2016	1	9/9/2016
7	9/6/2016	1	5/1/2015	1	9/18/2016
7	10/17/2016	1	5/1/2016	1	9/20/2016
7	10/21/2016	1	5/8/2016	1	9/27/2016
7	11/5/2016	1	5/10/2016	1	9/30/2016
7	11/6/2016	1	5/20/2016		
6	9/27/2016	1	5/27/2016		
6	9/28/2016	1	5/29/2016		
6	10/11/2016	1	6/4/2016		
6	10/13/2016	1	6/5/2016		
5	8/5/2016	1	6/16/2016		
5	8/6/2016	1	6/17/2016		
5	8/13/2016	1	6/19/2016		

*Which of these statements best describes your preference for the number of boats on the lake?  
Please refer to your last outing on the lake when answering this question.*



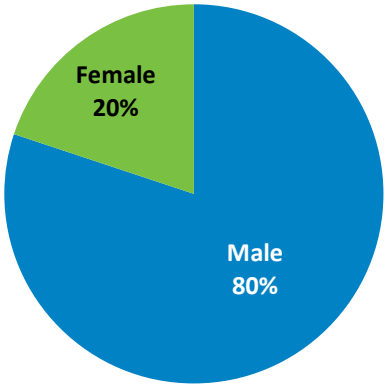
Value	Percent	Count
I saw ABOUT AS MANY boats as I wanted to	72.5%	1,016
I saw MORE boats than I wanted to see	11.3%	158
I saw FEWER boats than I wanted to see	16.2%	227
Total		1,401

*Please review the boating conditions depicted in the photos below. Which photo shows the maximum number of boaters you could see at one time on Beaver Lake without thinking it was too crowded?*



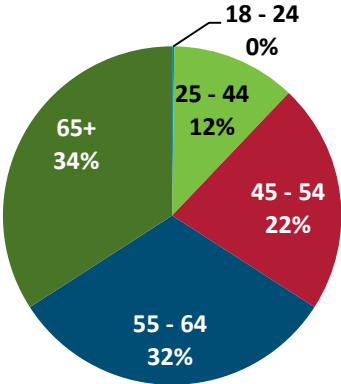
Value	Percent	Count
A	8.6%	121
B	45.6%	641
C	32.9%	463
D	5.5%	78
E	3.4%	48
I don't think any look crowded	3.9%	55
Total		1,406

*What is your gender?*



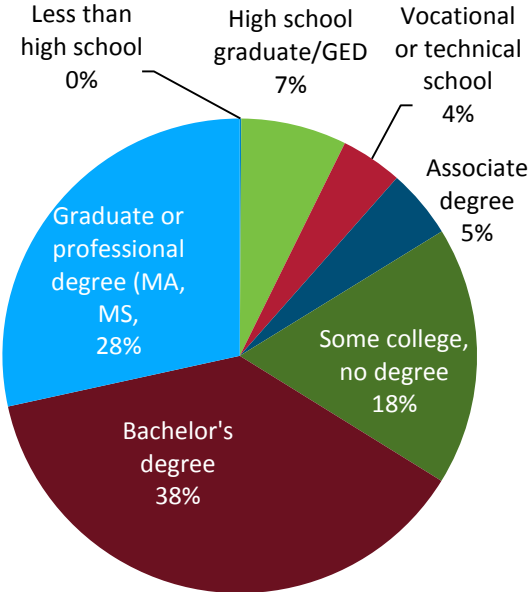
Value	Percent	Count
Male	80.1%	1,142
Female	19.9%	283
Total		1,425

*What is your age?*



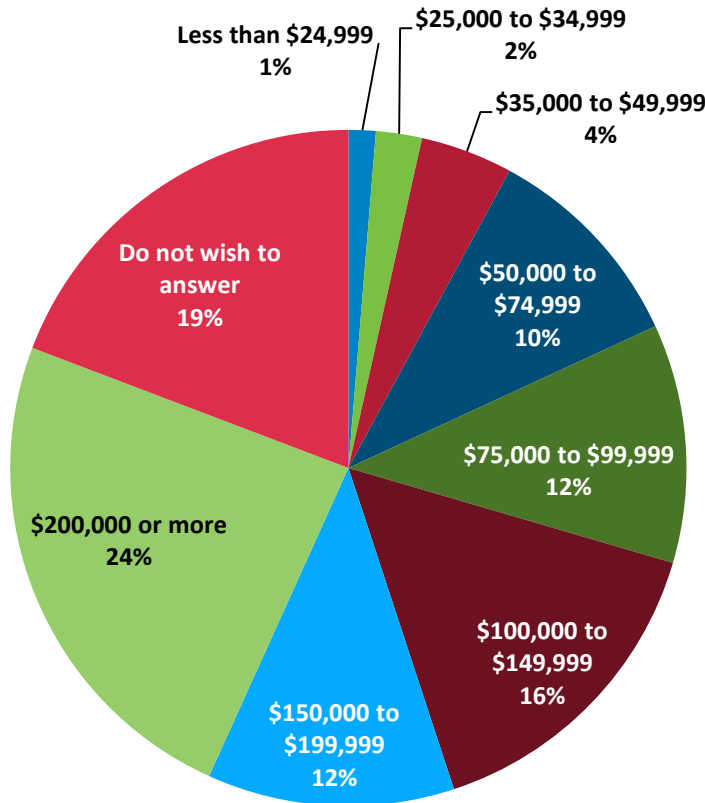
Value	Percent	Count
18 - 24	0.2%	3
25 - 44	11.9%	171
45 - 54	22.0%	317
55 - 64	31.8%	457
65+	34.1%	490
Total		1,438

*Please indicate the highest level of education you have completed.*



Value	Percent	Count
Less than high school	0.1%	2
High school graduate/GED	7.2%	103
Vocational or technical school certification	4.2%	61
Associate degree	4.7%	68
Some college, no degree	17.6%	253
Bachelor's degree	37.7%	542
Graduate or professional degree (MA, MS)	28.4%	408
Total		1,437

*Which category best represents your annual household income (before taxes) last year?*



Value	Percent	Count	
Less than \$24,999	1.3%	19	
\$25,000 to \$34,999	2.2%	31	
\$35,000 to \$49,999	4.4%	63	
\$50,000 to \$74,999	10.2%	145	
\$75,000 to \$99,999	11.4%	162	
\$100,000 to \$149,999	15.4%	219	
\$150,000 to \$199,999	11.8%	167	
\$200,000 or more	24.0%	341	
Do not wish to answer	19.2%	273	
Total		1,420	

## B.4 User Survey Discussion and Limitations

To characterize non-response rates, the response to Question 8 - Was this Boat Transported to the Lake, Kept at a Marina on the Lake, or Rented/Borrowed - was checked against the sampled households. Considering the universe of 3,473 private boat dock owners, 814 respondents indicate they access the lake via their private or community boat dock (23 percent representation). Of the 1,736 marina slip renters, there were 411 respondents that indicated that they access the lake via their boat, which is kept at a marina on the lake (24 percent representation). Responses from users who access the lake via



public launch sites or other categories (rented, borrowed, or from a resort) is likely underrepresented, with only 192 responses. This category of users is difficult to quantify and target. Responses by access type were checked and responses are noted where there are significant differences between groups of users (slip renters, public launch users, private/community dock owners).

Non-response count for any question ranged between 41 and 60, or under 5 percent, with a few notable exceptions. The question asking for the primary zone where boating activities occurred had a non-response rate of 5.2 percent. No difference was measurable between those completing the survey online or via paper mail back. The slightly higher nonresponse rate is likely due to respondents simply not knowing or possibly that they perceived their use as equally distributed between two or more zones. The question asking for respondents to indicate the date of their last outing had a non-response rate of 8.9 percent. This is likely because the survey was administered in October and the respondents simply could not identify the date.