

ARIZONA DEPARTMENT OF TRANSPORTATION

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2012 ARIZONA WATERCRAFT SURVEY

Volume I – Executive Summary

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Arizona Game & Fish Department
Arizona State Parks Board

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1.0 INTRODUCTION

The Arizona Department of Transportation (ADOT), the Arizona Game & Fish Department (AGFD) and the Arizona State Parks Board (ASPB) are required, under Arizona Revised Statutes (Sec. 28-5926), to conduct a study every three years on watercraft fuel consumption and recreational watercraft usage. The primary purposes of this effort are as follows:

- To determine the percentage of total state taxes paid to Arizona for motor vehicle fuel that is used for propelling watercraft; and
- To determine the number of days of recreational watercraft use in each of the state's counties by boat use days and person use days.

The fuel consumption data is collected to determine the allocation of motor vehicle fuel tax to the State Lake Improvement Fund (SLIF). The information on recreational watercraft usage patterns on Arizona's lakes and rivers is necessary, in part, to determine the distribution of SLIF funds to applicants.

In addition to collecting the above mandated information, this study also collected selected attitudinal and behavioral data on the following subjects:

- Water-based and non-water-based recreational activities participated in;
- Boating and water-based recreational facility needs;
- SLIF fund utilization priorities;
- Adequacy and focus of watercraft law enforcement activities; and
- Attitudes about selected watercraft and outdoor recreation issues.

The information contained in this report is based on two key study components:

- A statistically valid and projectable telephone survey of 6,803 registered watercraft owners in Arizona, California, Nevada and Utah.
- An audit/survey of the fuel sales and consumption patterns of: (1) marinas, (2) public agencies, and (3) concessionaires, commercial boat operators and excursion operators.

To develop the most accurate data possible, the data collection effort was divided into 24 separate data collection segments spread over the 12-month period from March 29, 2011, to March 8, 2012. Using this format, a total of approximately 560 interviews were conducted each month with one-half being conducted between roughly the 1st and 5th of the month and one-half between roughly the 16th and 20th of the month. During each of the 24 interviewing segments, boaters were asked to recall their boating patterns for only the 30 days prior to the interview.

This study was designed and executed under the direction of a Technical Advisory Committee (TAC) comprised of representatives from each sponsoring agency. The Behavior Research Center (BRC) wishes to thank each of the following TAC members for their indispensable assistance in the successful completion of this most important project:

- Anne Ellis, ADOT
- Dawn Collins, ASPB
- Kevin Bergersen, AGFD

The information generated from this study is presented in two volumes. **VOLUME I – EXECUTIVE SUMMARY** presents a brief summary review of the key study findings and the methodology employed. **VOLUME II – TECHNICAL REPORT** presents an in-depth analysis of the study findings and a detailed explanation of the study methodology.

The Behavior Research Center has presented all of the data germane to the basic research objectives of the project. However, if the TAC requires additional data retrieval or interpretation, we stand ready to provide such input.

BEHAVIOR RESEARCH CENTER

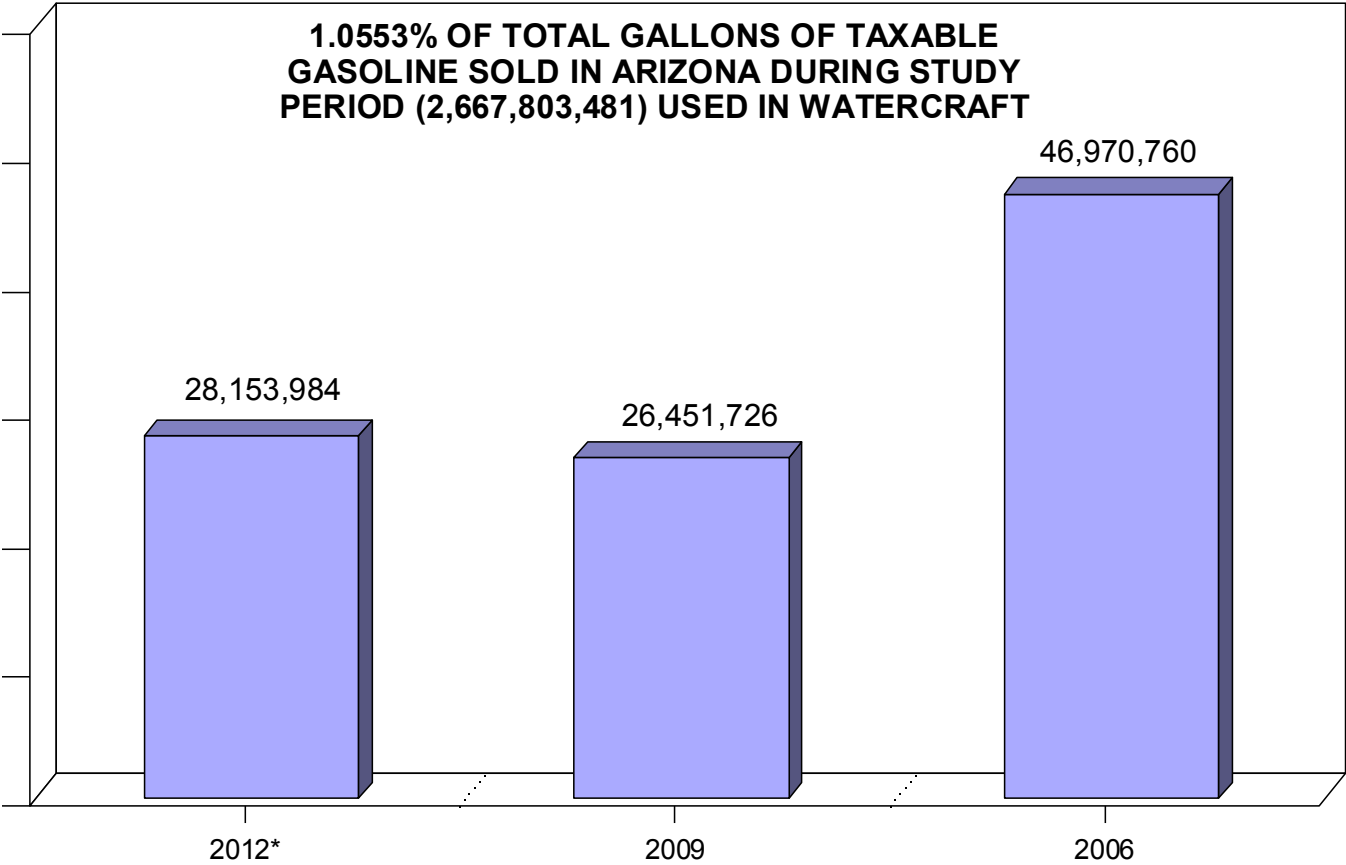
2.0 SUMMARY OF THE FINDINGS

FUEL CONSUMPTION DATA

- Total gasoline used to propel watercraft in the state of Arizona between March 1, 2011, and February 29, 2012, is estimated to be 28,153,984 gallons using Protocol Method Number One as agreed upon by the agencies in 1991. This total represents 1.0553 percent of the total 2,667,803,481 gallons of taxable gasoline sold in Arizona during the study period. This is the percentage which should be used for the SLIF allocation.

The 2012 SLIF allocation of 1.0553 percent is up slightly from the 2009 percentage of 1.0105 but well below the 2006 percentage of 1.7157.

WATERCRAFT FUEL CONSUMPTION OF ARIZONA GASOLINE -- GALLONS

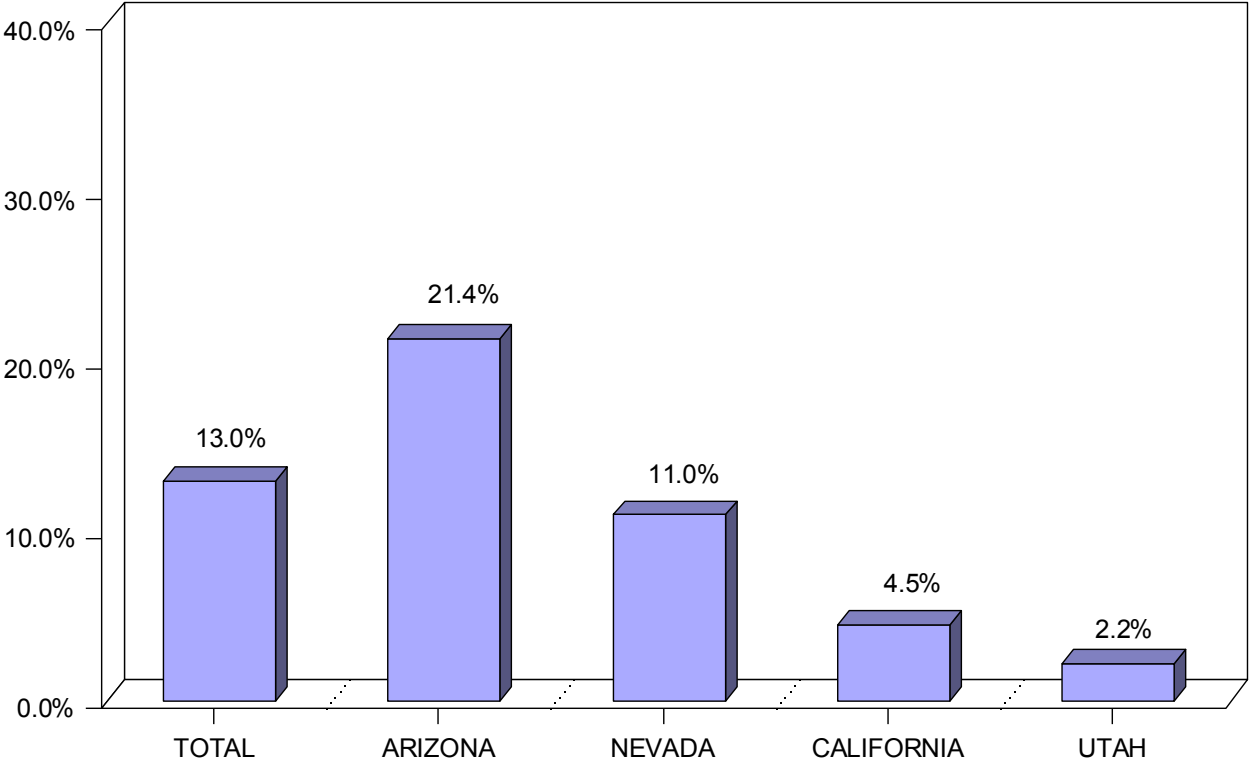


- The boating classifications which continue to account for the largest amount of non-marina consumption are Class 5 (16' to 25' inboard and in/out) with a reading of 38.9 percent and Class 2 (predominantly jet skis) with a reading of 34.0 percent.
- Gasoline is used to propel 98.9 percent of all boats, with the remainder utilizing diesel and aviation fuel.
- 95.1 percent of Arizona boaters purchase Arizona fuel compared to 80.2 percent of California boaters, 40.0 percent of Utah boaters and 29.3 percent of Nevada boaters.
- 91.3 percent of Arizona boaters purchase their Arizona fuel at a non-marina location compared to 90.4 percent of California boaters, 64.6 percent of Nevada boaters and 96.7 percent of Utah boaters.

USE OF WATERCRAFT IN ARIZONA

- 13.0 percent of registered watercraft owners in Arizona, California, Nevada and Utah use their boats in Arizona during any given 30 day period. Among Arizona watercraft owners, usage reaches 21.4 percent compared to 4.5 percent of California owners, 11.0 percent of Nevada owners and 2.2 percent of Utah owners.

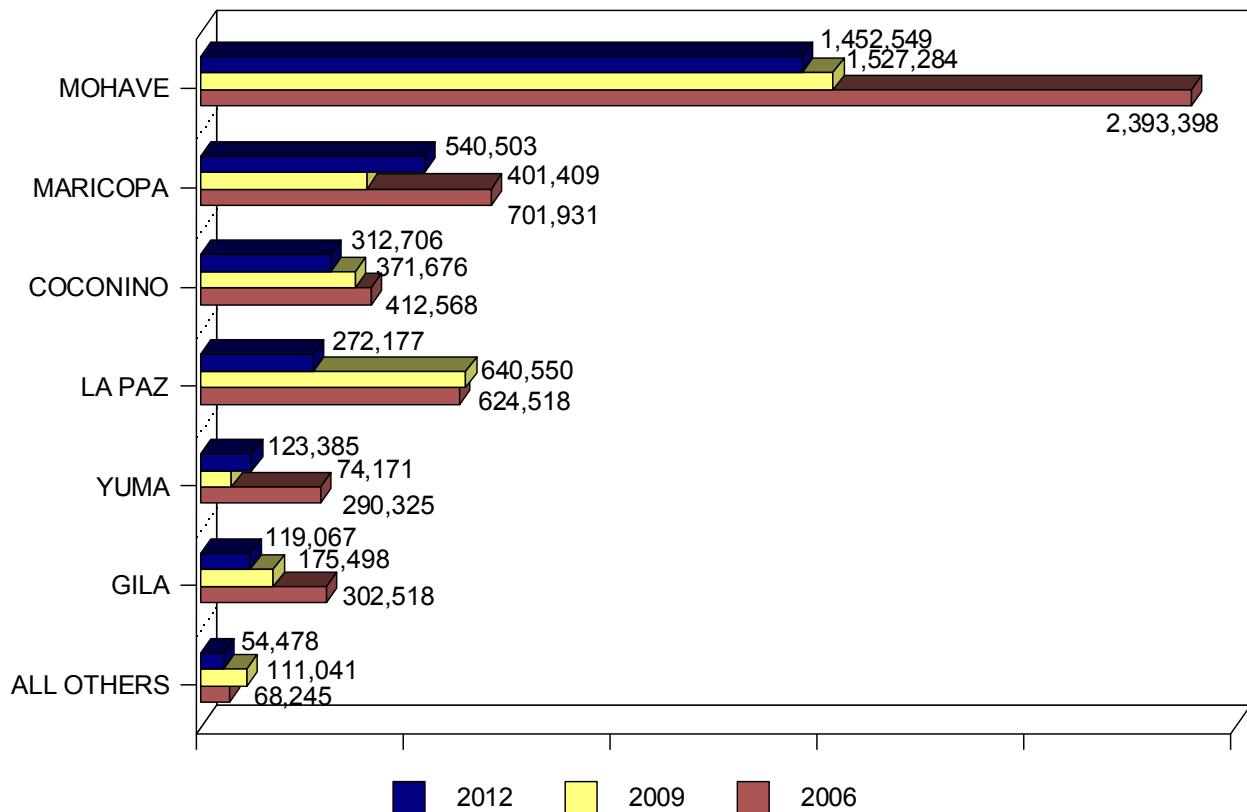
BOAT USE IN ARIZONA IN ANY GIVEN 30 DAY PERIOD



- 42.5 percent of all watercraft owners in the four-state survey universe utilized their boat in Arizona during the prior year which is up from 38.8 percent in 2009. Among Arizona users, the figure reaches 64.1 percent (up from 62.8%) compared to 19.9 percent among California owners (up from 16.2%), 41.1 percent among Nevada owners (up from 37.8%) and 14.9 percent among Utah owners (little changed from 14.9).
- Total boat use days in 2012 were 2,874,866 – a 13 percent decrease from 2009 and a 40 percent decrease from 2006. Similar to the prior studies, Mohave County is the dominant boating location in Arizona with 50.5 percent of total boat use days – a figure which is up from 46.3 percent in 2009. Also note the increased use of Maricopa County lakes since the prior study and the major decreased use of La Paz County lakes.

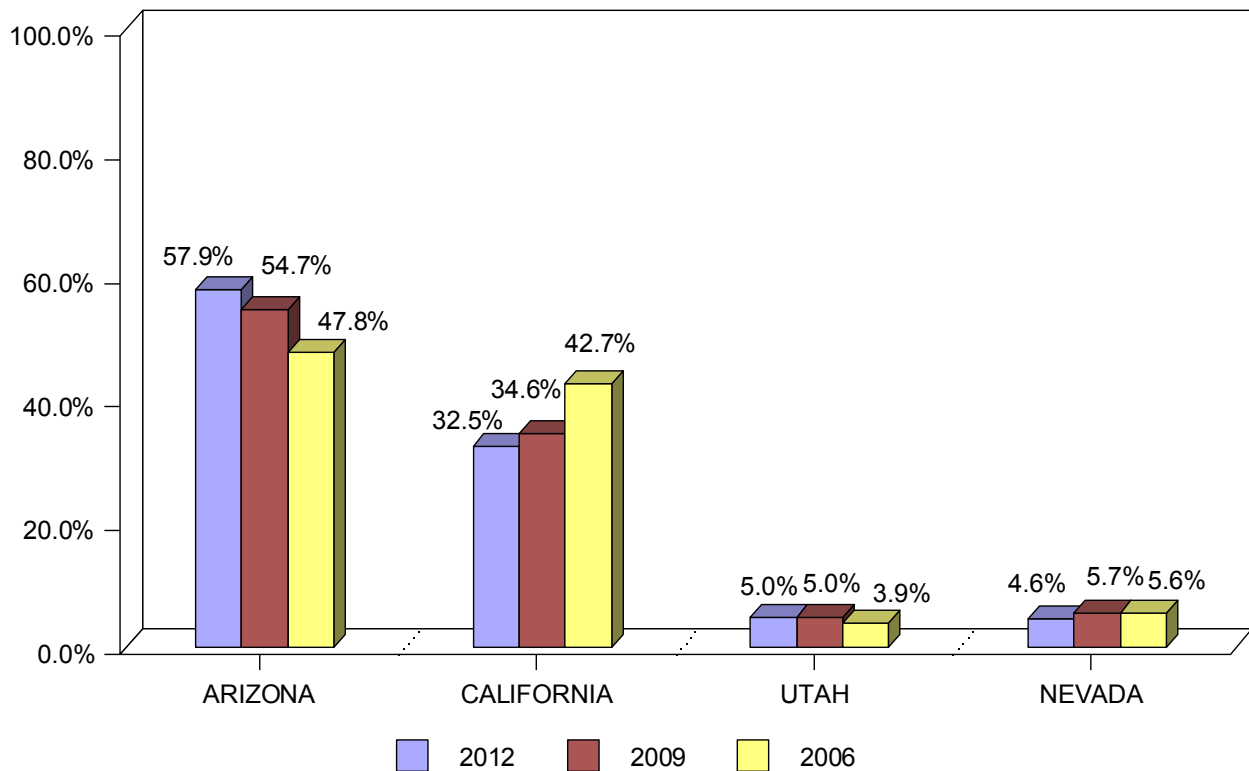
BOAT USE DAYS BY ARIZONA COUNTY

TOTAL BOAT USE DAYS: '09 = 3,301,629; '06 = 4,793,501; '03 = 3,229,153



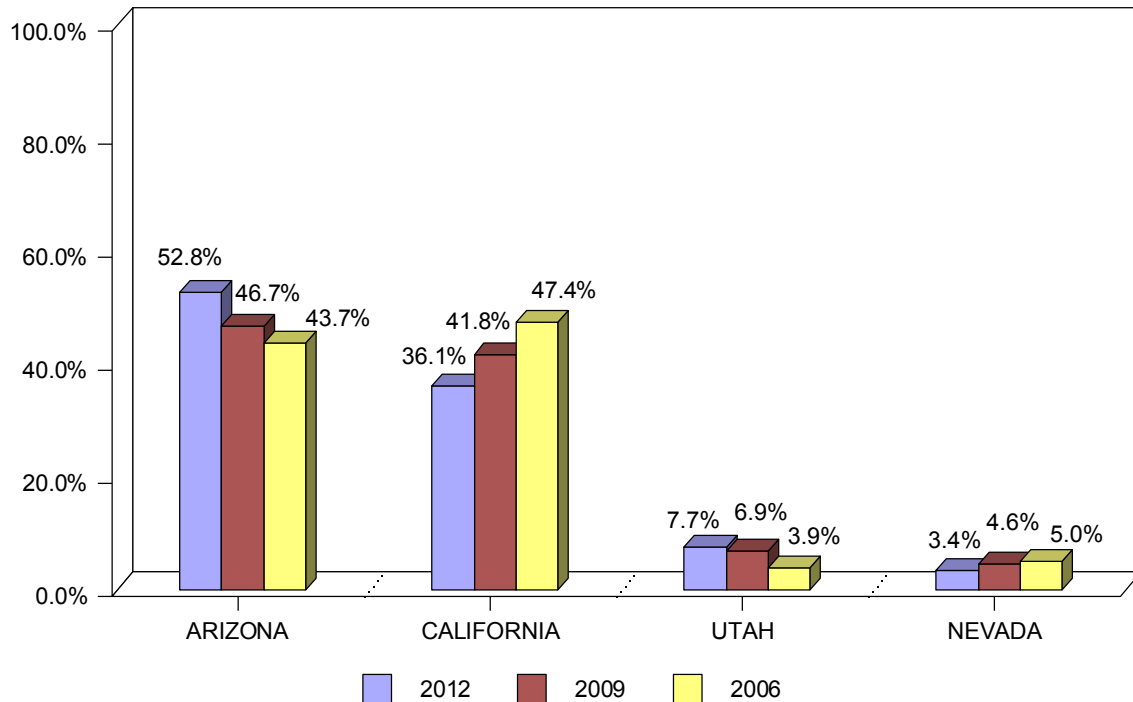
- Person use days also decreased from 15,941,792 in 2009 to 13,406,815 in 2012 – a 16 percent decrease. As is the case with boat use days, Mohave County is the dominant boating location in Arizona, accounting for 52.7 percent of all person use days.
- Arizona boaters account for 57.9 percent of boat use days followed by California boaters with 32.5 percent, Utah boaters with 5.0 percent and Nevada boaters with 4.6 percent. These figures represent a continuation of a pattern of increased boat use days among boaters from Arizona and decreased boat use days among boaters from California.

BOAT USE DAYS BY STATE GIVEN 30 DAY PERIOD



- Unlike the studies before 2009, California boaters no longer account for the largest share of person use days. Thus we find that California boaters account for 36.1 percent of person use days (down from 41.8% in 2009) compared to 52.8 percent for Arizona boaters (up from 46.7% in 2009). In the prior studies, the primary reason for California’s high percentage was the fact that California boaters tended to have very large boating parties which was not necessarily the case during the last two studies.
- Lake Havasu continues to be the state’s most utilized lake in terms of both boat use days (900,712) and person use days (4,386,115).

PERSON USE DAYS BY STATE GIVEN 30 DAY PERIOD



ADDITIONAL BOATING DATA

- The average daily expenditure for a boating trip in Arizona is \$316 – up slightly from \$302 in 2009. The typical Arizona boater spends \$235 per day compared to \$421 for California boaters, \$125 for Nevada boaters and \$238 for Utah boaters.
- Public restrooms (19%) and launch ramps (18%) continue to be the most frequently mentioned needed facilities at boaters' favorite lakes.
- When boaters are asked to evaluate each of 22 specific boating and water-based recreational facilities at their favorite lake, the facility registering the highest net positive reading is access roads (+53%) followed by parking facilities for boat trailers (+48%) and parking facilities for vehicles (+47%). Two items continue to register net negative readings from one-quarter of boaters or more: emergency telephones (-30%) and drinking water outlets (-25%).

- Six percent of boaters are aware of the SLIF program, similar to the seven percent recorded in 2009 and eight percent in 2006. As might be expected, awareness is highest in Arizona with a reading of nine percent. When boaters are asked how important they feel each of six SLIF funding functions are, four of the functions are rated very or somewhat important by over eight out of ten boaters or more: 1) the construction of recreation support facilities such as restrooms, campgrounds and picnic tables (82%); 2) the construction of water-based boating facilities such as marinas, launch ramps and piers (82%); 3) the construction of first-aid stations and other safety facilities (81%); and 4) the purchasing of law enforcement and safety equipment such as patrol boats, radios and lights (79%). These four functions have remained at the top of the importance list over the past five studies.
- Stopping people who are boating while drunk (48%) and stopping people who are boating recklessly (44%) continue to be the two law enforcement activities which boaters would most like to see increased at their favorite lake or river. Also relating to law enforcement and safety issues at Arizona lakes, roughly three out of four boaters or more agree with the following attitudes:
 - That boating law violators should be required to take a boating safety class, (86%)
 - That hands-on training should be required for boat rental customers (86%)
 - That laws and regulations are being adequately enforced (82%)
 - That the minimum age for boat operators should be 16 years old (75%)
- Seven out of ten boaters (71%) support boating safety educational centers at Arizona lakes.
- A majority of boaters (71%) do not believe their favorite lake is too crowded, while 25 percent do.
- A majority of boaters (57%) believe the number of people using a lake should not be restricted during high use periods, while 38 percent do.
- A majority of boaters (56%) do not believe the launch ramps at their favorite lake are too crossed, while 39 percent do.
- 53 percent of boaters would support designating special areas for use only by jet skies – 44 percent would not.
- 51 percent of boaters believe their favorite lake does not need additional developed campgrounds, while 40 percent do.
- 50 percent of boaters do not believe their favorite lake needs additional RV hookups, while 39 percent do.
- 48 percent of boaters do not believe their favorite lake needs additional primitive-type campgrounds, while 41 percent do.
- Boaters' top three single favorite boating activities continue to be fishing (27, general pleasure boating (26%) and water skiing (18%).

- Eighty-nine percent of boaters indicate that they are aware of the Quagga mussel with 53 percent indicating they know “a lot” – up from 46 percent in 2009. In addition, 60 percent of boaters who are aware of the mussel, believe it is a “major threat” to Arizona’s lakes and rivers.

3.0 RESEARCH METHODOLOGY

3.1 Introduction

To properly address the Departments' informational needs, it was necessary to collect information from a variety of population universes which either consume or sell Arizona fuel or utilize Arizona's lakes and rivers for recreational purposes. The specific universes studied during the course of this project were as follows:

Surveyed Universes:

- Arizona registered owners;
- Non-Arizona registered boat owners who utilize Arizona's lakes and rivers.

Audited/Surveyed Universes:

- Concessionaires, commercial boat operators and excursion operators who consume Arizona fuel;
- Public agencies which consume Arizona fuel; and
- Marinas servicing Arizona lakes and rivers which sell fuel.

The purpose of this section of the report is to address the procedures followed to collect the necessary information from these universes.

3.2 Boat Owner Survey – Sample Selection

In order to get an accurate picture of boaters' use of Arizona's lakes and rivers, this project component utilized a very large random sample of 6,803 Arizona, California, Nevada and Utah watercraft owners. A sample of this size is very unusual but was deemed necessary for this project due to its importance.

The sample of 6,803 watercraft owners utilized on this project component represents 1.27 percent of the 534,573 owners in the four-state region studied. As an example of how large this 1.27 percent sample of the total universe is, the typical statewide Arizona sample consists of approximately 800 respondents, or .00033 percent of Arizona's estimated 2,439,788 households, while the typical national United States sample consists of 1,500 respondents, or .00001 percent of the United States' estimated 118,582,568 households.

The following several pages of this report offer a detailed description on how the boat owner survey was conducted.

To determine the percentage of all fuel sold in Arizona attributable to propelling watercraft, it was first necessary to determine the total number of gallons sold to watercraft within the state. To arrive at this figure, the consumption patterns of two distinct user groups were studied: (1) Arizona registered boats for which gasoline is purchased in Arizona, and; (2) non-Arizona registered boats for which gasoline is purchased in Arizona.

A total of 534,573 Arizona and non-Arizona registered boat owners stratified by boat class were systematically random-sampled via telephone from current boat registration lists obtained from each state included in the study (Arizona Game & Fish Department, California Department of Motor Vehicles, Nevada Division of Wildlife and Utah Division of Motor Vehicles) to determine their fuel consumption and usage patterns during the study period. These figures were then projected to total boat registrations and the findings presented later in this report were calculated. The non-Arizona boaters' sample was drawn from the neighboring California counties of Imperial, Los Angeles, Orange, Riverside, San Diego and San Bernardino, the Nevada county of Clark and the state of Utah.

As may be seen on the following table, a total of 534,573 watercraft are registered in the sample universe. Of this total, 57.9 percent are located in California, while 24.6 percent are located in Arizona, 4.8 percent in Nevada and 12.7 percent in Utah.

In addition to the sheer volume of watercraft California contributes to the sample universe, several other interesting findings are also worth noting in Table 1:

Arizona Watercraft:

- High proportions of watercraft in class 4 (16' to 25' outboards).

California Watercraft:

- High proportion of class 2 watercraft (under 16' & in/out which is predominantly jet skis).

Nevada Watercraft:

- High proportion of watercraft in class 5 (16' to 25' in/out & in) and class 8 (over 25' in & in/out).

Utah Watercraft:

- High proportion of watercraft in class 5.

TABLE 1: WATERCRAFT POPULATION IN SAMPLE

STATE OF REGISTRATION

BOAT CLASS	ARIZONA		CALIFORNIA		NEVADA		UTAH		TOTAL	
	Number	%	Number	%	Number	%	Number	%	Number	%
1	24,990	19.1	44,295	14.3	2,820	11.0	11,712	17.2	83,817	15.7
2	27,412	20.9	101,568	32.8	7,599	29.7	11,242	16.5	147,821	27.6
3	626	.5	12,181	3.9	30	.1	900	1.3	13,737	2.6
4	30,049	22.9	38,480	12.4	3,408	13.4	12,135	17.8	84,072	15.7
5	38,357	29.3	88,429	28.6	9,386	36.7	28,048	41.2	164,220	30.7
6	841	.6	8,032	2.6	163	.6	953	1.4	9,989	1.9
7	1,756	1.3	1,409	.5	211	.8	773	1.1	4,149	.8
8	7,003	5.3	9,618	3.1	1,886	7.4	2,235	3.3	20,742	3.9
9	167	.1	5,671	1.8	72	.3	116	.2	6,026	1.1
TOTAL	131,201	100.0	309,683	100.0	25,575	100.0	68,114	100.0	534,573	100.0
CUMULATIVE TOTAL	57.9%		24.6%		4.8%		12.7%		100.0%	

To develop the most accurate data possible, the data collection effort was divided into 24 separate data collection segments spread over the 12-month period from March 29, 2011, to March 8, 2012. Using this format, a total of approximately 560 interviews were conducted each month with one-half being conducted between roughly the 1st and 5th of the month and one-half between roughly the 16th and 20th of the month. During each of the 24 interviewing segments, boaters were asked to recall their boating patterns for the 30 days prior to the interview. Under instructions from the TAC, this format varied from the prior studies which asked boaters to recall their boating patterns for only the prior two weeks.

At the beginning of this process, an analysis was made of the gasoline consumption variances that existed within each of the nine size/propulsion categories from the 2009 Arizona Watercraft Survey to determine the best method to stratify the current sample of boat owners to optimize sampling accuracy and efficiency. This analysis revealed that certain categories are very homogeneous and thus render relatively small standard deviations, while other classes are very heterogeneous and thus render relatively large standard deviations. This situation called for the use of a disproportional stratified sample in this segment of the study.

CLASS	LENGTH	PROPULSION
1	Under 16'	Outboard (prop)
2	Under 16'	Inboard & In/Out (prop & jet)
3	Under 16'	Other (sail, oar, electric)
4	16' to 25'	Outboard (prop)
5	16' to 25'	Inboard & In/Out (prop & jet)
6	16' to 25'	Other (sail, oar, electric)
7	Over 25'	Outboard (prop)
8	Over 25'	Inboard & In/Out (prop & jet)
9	Over 25'	Other (sail, oar, electric)

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In disproportional stratified sampling, disproportionate sampling fractions are used to manipulate the number of cases selected from each strata (in this case, the nine size/propulsion classes), with the strata's standard deviations being used as the basis for allocation of cases. Those classes with proportionately larger standard deviations receive a proportionately larger number of cases, while those with proportionately smaller standard deviations receive a proportionately smaller number of cases. In essence, this sampling method allows us to select fewer cases from homogeneous classes and more cases from heterogeneous classes, thereby increasing overall sampling efficiency and accuracy. As a result, the final gasoline consumption estimates are sensitive to variations in consumption within the size/propulsion classes, thereby increasing the accuracy of the final estimate. In addition, this methodology meets the contract-required minimum of a margin of error of less than five percent at a 95 percent confidence level.