



AGFD Aquatic Invasive Species Program

Fishing/Outreach Survey, 2014 Report

Location: Bartlett Lake and Lake Pleasant, Maricopa County, Arizona; Lake Havasu, Mohave County, Arizona; Lake Powell, Cochise County.

Date: February 2014 to October 2014

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Objectives:

- I. To determine the fishing/catch habits of anglers at Bartlett Lake, Lake Havasu, Lake Pleasant and Lake Powell.
- II. To determine the percentage of the boating public's awareness of the AGFD "Don't Move a Mussel – Now it's the Law" (DMAM) outreach campaign, such that where/how did they hear of the DMAM message and what they are doing to proactively stop the spread, by Arizona law and rule.
- III. "Pull the Plug" surveys
 - A. To determine the percentage of the boating public's effort to abide by Arizona law/rule to remove any watercraft/boat plugs before leaving the vicinity of an infested water body.

Materials:

- "Aquatic Invasive Species (AIS) program angling and boating survey" form
- "Don't Move a Mussel- Now it's the Law" brochures.
- "Aquatic Invasive Species (AIS) programs spot check survey-pulling plug" form
- Binoculars

Methods:

Using the AIS program angling and boating survey, employees would briefly talk with watercraft users at the boat ramp. The boat ramps were selected daily at random. The angling portion of the survey was to determine if the boaters had been fishing that day, how many people were fishing in their party, if bait or lures were used while fishing, and what fish species they caught and how many. Next, they were asked if they had heard about the quagga mussel and if they had heard or seen the 'Stop Aquatic Hitchhikers' or the 'Don't Move a Mussel-Now it's the Law' messages. If they had heard or seen either of the messages, they were then asked where they had heard or seen the message. Their options were as follows: radio announcement, billboard, TV, info signs at lake, or other. The last question asked was what they were doing to prevent transporting quagga mussels. Their options were as follows: clean/wiped down my boat, drain the boat and pulled the plug, let my boat sit and dry for about a week, complete decontamination of my boat, including hot water pressure washing, hot water flush engines cooling system and all compartments and let dry for about a week, or other.

Using an AIS program spot check survey ("Pulling their boat plugs"), AGFD personnel would sit and observe watercraft owners/transporters leaving the vicinity of an infested water body. If needed, employees would use binoculars to determine if the plug was pulled prior to any boater leaving the boat ramp area. These boat ramps were selected daily and semi-randomly according to the most boat traffic. In 2014, we noted additional information to the survey, such as boat ramp locations and boat types.

Conclusions:

A total of 134 surveys were done at **Bartlett Lake**. The data showed 25% of boaters had been fishing, with vast majority of anglers used lures over bait. Anglers identified mainly catching largemouth bass at Bartlett Lake, with the total number of each species caught as follows: 211 largemouth/smallmouth bass, 1 bluegill or other sunfish, and 5 catfish. Data showed that 90% had heard of quagga mussels, 82% had heard or seen the 'Stop Aquatic Hitchhikers' message, and 96% had heard or seen the 'Don't Move a Mussel' message. Of these boaters who had heard or seen the 'Don't Move a Mussel' message, our results showed the following means of recognition to be the following: 14% radio, 17% billboard, 7% TV, 94% info signs at lake, and 23% other (majority from personal communication) and 3% didn't know. The results of boaters self inspection and preventing transportation were as follows; 84% cleaned/wiped down boat, 87% pulled the drain plug, 77% let boat sit a week, 0% did complete decontaminations, 7% did other, in which they said they used vinegar, and 3% did nothing or refused to answer.

A total of 1010 surveys were done at **Lake Havasu**. The data showed 10% of boaters had been fishing, with vast majority of anglers used lures over bait. Anglers mainly caught striped bass, largemouth/smallmouth bass, and sunfish at Lake Havasu, with a total number of each species caught as follows: 16 largemouth/smallmouth bass, 230 striped bass, 10 redear sunfish, 31 bluegill or other sunfish, 6 catfish, and 3 black bass. Data showed that 92% of the boaters surveyed had heard of quagga mussels, 88% had heard or seen the 'Stop Aquatic Hitchhikers' message, and 94% had heard or seen the 'Don't Move a mussel' message. Of these boaters who had heard or seen the 'Don't Move a Mussel' message, our results showed the following means of recognition to be the following: 33% radio, 47% billboard, 15% TV, 83% info signs at lake, and 25% other (majority by personal communication, LHMA sticker) and 1% didn't know. The results of boaters self inspection and preventing transportation were as follows; 83% cleaned boat/wiped down boat, 77% pulled the drain plug, 46% let boat sit a week, 4% did complete decontaminations, 16% did other, in which vast majority said they used vinegar or have had their boat detailed, and 2% did nothing or refused to answer.

A total of 453 surveys were done at **Lake Pleasant**. The data showed 15% of boaters had been fishing and preferred lures over bait. Anglers identified mainly catching striped bass and largemouth/smallmouth bass at Lake Pleasant, with the total number of each species caught as follows: 176 striped bass, 24 largemouth/smallmouth bass, 1 crappie, 1 bluegill or other sunfish, and 7 catfish. Data showed that 87% had heard of quagga mussels, 81% had heard or seen the 'Stop Aquatic Hitchhikers' message, and 94% had heard or seen the 'Don't Move a Mussel' message. Of these boaters who had heard or seen the 'Don't Move a Mussel' message, our results showed the following means of recognition to be the following: 16% radio, 25% billboard, 12% TV, 91% info signs at lake, and 22% other (majority from personal

communication) and 1% didn't know. The results of boaters self inspection and preventing transportation were as follows; 88% cleaned/wiped down boat, 85% pulled the drain plug, 73% let boat sit a week, 3% did complete decontaminations, 5% did other, in which vast majority said they used vinegar, and 3% did nothing or refused to answer.

A total of 436 surveys were done at **Lake Powell**. The data showed 19% of boaters had been fishing and used bait and lures at the same frequency. Anglers identified mainly catching striped bass, largemouth/smallmouth bass, and catfish at Powell, with the total number of each species caught as follows; 141 striped bass, 192 largemouth/smallmouth bass, 4 redear sunfish, 16 bluegill or other sunfish, 162 catfish, 14 carp, 6 walleye and 6 perch. Data showed that 99% had heard of quagga mussels, 92% had heard or seen the 'Stop Aquatic Hitchhikers' message, and 88% had heard or seen the 'Don't Move a Mussel' message. Of these boaters who had heard or seen the 'Don't Move a Mussel' message, our results showed the following means of recognition to be the following: <1% radio, 1% billboard, <1% TV, 70% info signs at lake, 27% other (majority from personal communication from the fee booth) and 3% didn't know. The results of boaters self-inspection and preventing transportation were as follows; 99% cleaned/wiped down boat, 99% pulled the drain plug, 55% let boat sit a week, 13% did complete decontaminations, 6% did other, in which vast majority said they put their boat in dry storage, and <1% did nothing or refused to answer.

A total of 2033 surveys were completed for **all four of these lakes**. The data showed out of the 14% of boaters that had been fishing, lures were preferred over bait. In total, most anglers of these four lakes identified catching mainly striped bass, largemouth/smallmouth bass, catfish, bluegill or other sunfish, with the total number of each fish species caught as follows; 333 striped bass, 657 largemouth/smallmouth bass, 1 crappie, 14 red ear sunfish, 51 bluegill or other sunfish, 180 catfish, 20 carp, 6 perch, 6 walleye and 3 black bass. When we asked the 2033 surveyed if they had heard of the quagga mussel 92% said yes. When asked if they had heard or seen the 'Stop Aquatic Hitchhiker' message, 87% said yes. We then asked if they had heard or seen the 'Don't Move a Mussel' message and 93% said yes. Of these boaters who had heard or seen the 'Don't Move a Mussel' message, our results showed the following means of recognition to be the following: 21% radio, 30% billboards, 11% TV, 83% info signs at lake, 25% other (e.g. personal communication, LHMA sticker, fee booth) and 2% didn't know. The last questions asked of the boat owner concerning self inspection and preventing transportation of aquatic invasive species were as follows: 88% cleaned their boat, 84% pulled the drain plug, 56% let boat sit a week, 9% did complete decontaminations, 11% did other, in which vast majority said they used vinegar, had their boat detailed or placed their boat in dry storage, and 3% did nothing or refused to answer.

During our “Pull the Plug” survey, results showed the following:

Bartlett Lake - A total of 266 boats were observed leaving this lake. The data showed that 77% of watercraft owners/transporters did pull the plug before leaving the vicinity. Bartlett Lake is not infested with quagga mussels as this time but was included in this study survey. All Bartlett Lake surveys were conducted at Jojoba boat ramp.

Lake Havasu - A total of 2569 boats were observed leaving this lake. The data showed that 55% of watercraft owners/transporters did pull the plug before leaving the vicinity. A total of 269 boats were observed leaving with attached vegetation, 96% of those boats were leaving Windsor State Park boat ramp and 4% were leaving Site Six boat ramp. Surveys were conducted at Lake Havasu State Park, Site Six, and Cattail Cove State Park boat ramps.

Lake Pleasant - A total of 815 boats were observed leaving this lake. The data showed that 76% of watercraft owners/transporters did pull the plug before leaving the vicinity. Surveys were conducted at the 10-lane, the 4-lane, and Lake Pleasant Harbor boat ramps.

Lake Powell – A total of 500 boats were observed leaving this lake. The data showed that 49% of watercraft owners/transporters did pull the plug before leaving the vicinity. Lake Powell was considered a quagga infested water body in late 2013. The surveys were done at Wahweap, Stateline, and Antelope boat ramps.

GRAND TOTAL - 4283 boats were observed leaving all three lakes total. The data showed that 59% of watercraft owners/transporters did pull the plug before leaving the vicinity. After observing specific boat types, our survey data showed that the following percentages in each specific boat type had pulled the plug upon leaving the vicinity of the lake: cabin cruisers=58%, cigarette boat=55%, deck boats=46%, fishing boats=76%, PWC=58%, runabout/bow riders=61%, wakeboard/ski boats=56%, other types not specified (e.g. jet boats, speed boats, sailboats)=61%. It is hard to determine if a pontoon style boat has a drain plug, thus data collected during this survey on pontoon style boats has been eliminated.

Recommendations:

The results show that boater awareness of the quagga mussels and other aquatic invasive species has increased through outreach and education since 2011, although efforts still need to continue to close the gap. Signs at the lake, radio announcements, and billboards along the Colorado River have proven to be valuable tools for passive outreach to the boating public and should continue with consideration of expanding efforts. Personnel on the ground at the boat ramps are still the best form of outreach and education, but with limited personal, not all lakes and launch ramps can be covered during the boating season. Explaining what ‘Don’t Move a Mussel-Now It’s the Law’ means and the protocols/methods watercraft users can employ to help prevent the spread of invasive species are fundamental to our outreach and public information education efforts. Specific future recommendations include:

1. There is an apparent need for “feet-on-the-ground” personnel communication and training at all affected waters to enhance the current outreach and education that is currently being done regarding Arizona aquatic invasive species laws and rules on proper, required decontamination protocols when leaving the vicinity of an affected water body (AIS Director’s Orders 1, 2, and 3).
2. Develop and implement a widespread “Don’t Move a Mussel – Now It’s the Law” outreach campaign on the Lower Colorado River, specifically Lake Havasu, which focuses on required “Pull the Plug” rules and decontamination protocols.
3. Lake Havasu appeared to have a large increase in aquatic vegetation growth during the summer of 2014 and watercraft users were observed leaving the vicinity with attached vegetation. This survey shows that, in general, watercraft users are not following proper clean, drain and dry procedures when leaving the vicinity of an affected water body. Increased presence at the boat ramps, especially from law enforcement personnel, may be needed to assist in public acceptance and future compliance.
4. In addition, due to low data results from anglers at Lakes Havasu, Pleasant and Powell, the 2014 surveys should be dispersed throughout the day and launch locations to maximize angling data.

Data:

Bartlett Lake Results - Total Surveys = 134

(Un-infested water in 2014)

<u>Fishing</u>	<u>Yes</u>	<u>No</u>	<u>Bait</u>	<u>Lure</u>	<u>Both</u>
Did you go fishing today?	25%	75%			
Did you use bait, lure or both?			4%	16%	4%

<u>Type of Fish caught</u>	<u>How many?</u>
Striped bass	0
Yellow/white bass	2
Largemouth/smallmouth bass	211
Crappie	0
Rainbow trout or other trout	0
Redear sunfish	0
Bluegill or other sunfish	1
Other = catfish	5

<u>Knowledge about invasive mussels ?</u>	<u>Yes</u>	<u>No</u>
Ever heard of QM?	90%	10%
Heard/Seen 'SAH' message?	82%	18%
Heard/Seen 'DMAM' message?	96%	4%

<u>How did you hear about message?</u>	<u>Yes</u>	<u>No</u>
Radio	14%	86%
Billboard	17%	83%
TV	7%	93%
Info signs at Lake	94%	6%
Other (e.g. personal communication-AZGFD)	23%	77%
Don't Know	1%	99%

<u>How they prevented transport??</u>	<u>Yes</u>	<u>No</u>
Clean boat	84%	16%
Pulled the drain plug	87%	13%
Let sit for week	77%	23%
Complete decon	0%	100%
Other (e.g. use vinegar)	7%	93%
Did nothing/refused to answer	3%	97%

Lake Havasu Results – Total surveys = 1010

(Infested water in 2014)

Fishing	Yes	No	Bait	Lure	Both
Did you go fishing today?	10%	90%			
Did you use bait, lure or both?			2%	6%	1%

Type of Fish caught	How many?
Striped bass	16
Yellow/white bass	0
Largemouth/smallmouth bass	230
Crappie	0
Rainbow trout or other trout	0
Redear sunfish	10
Bluegill or other sunfish	31
Other = catfish	6
Other = black bass	3

Know ledge about invasive mussels?	Yes	No
Ever heard of QM?	92%	7%
Heard/Seen 'SAH' message?	88%	12%
Heard/Seen 'DMAM' message?	94%	6%

How did you hear about message?	Yes	No
Radio	33%	77%
Billboard	47%	53%
TV	15%	85%
Info signs at Lake	83%	17%
Other (e.g. personal communication, LHMA sticker)	25%	75%
Don't Know	1%	99%

How they prevented transport?	Yes	No
Clean boat	8%	17%
Pulled the drain plug	77%	23%
Let sit for week	46%	54%
Complete decon	4%	96%
Other (e.g. use vinegar)	16%	84%
Do nothing/refused to answer	2%	98%

Lake Pleasant Results – total surveys = 453

(Infested water in 2014)

Fishing	Yes	No	Bait	Lure	Both
Did you go fishing today?	15%	85%			
Did you use bait, lure or both?			4%	7%	3%

Type of Fish caught	How many?
Striped bass	176
Yellow/white bass	0
Largemouth/smallmouth bass	24
Crappie	0
Rainbow trout or other trout	0
Redear sunfish	0
Bluegill or other sunfish	1
Other = catfish	7

Knowledge about invasive mussels ?	Yes	No
Ever heard of QM?	87%	13%
Heard/ Seen 'SAH' message?	81%	19%
Heard/Seen 'DMAM' message?	94%	6%

How did you hear about message?	Yes	No
Radio	16%	84%
Billboard	25%	75%
TV	12%	88%
Info signs at Lake	91%	9%
Other (e.g. personal communication, Powell inspections)	22%	78%
Don't Know	1%	99%

How they prevented transport	Yes	No
Clean boat	88%	12%
Pulled the drain plug	85%	15%
Let sit for week	73%	27%
Complete decon	3%	97%
Other (e.g. use vinegar)	5%	95%
Do nothing/refused to answer	3%	97%

Lake Powell Results – total surveys = 436

(Infested water in 2014)

Fishing	Yes	No	Bait	Lure	Both
Did you go fishing today?	19%	81%			
Did you use bait, lure or both?			8%	7%	3%

Type of Fish caught	How many?
Striped bass	141
Yellow/white bass	0
Largemouth/smallmouth bass	192
Crappie	0
Rainbow trout or other trout	0
Redear sunfish	4
Bluegill or other sunfish	16
Other = catfish	155
Other = carp	14
Other = perch	6

Knowledge about invasive mussels ?	Yes	No
Ever heard of QM?	99%	1%
Heard/ Seen 'SAH' message?	92%	8%
Heard/Seen 'DMAM' message?	88%	12%

How did you hear about message?	Yes	No
Radio	<1%	>99%
Billboard	1%	99%
TV	3%	97%
Info signs at Lake	70%	30%
Other (e.g. personal communication, fee booth)	27%	73%
Don't Know	3%	97%

How they prevented transport	Yes	No
Clean boat	99%	1%
Pulled the drain plug	99%	1%
Let sit for week	55%	45%
Complete decon	13%	87%
Other (e.g. use vinegar)	6%	94%
Do nothing/refused to answer	<1%	>99%

Total Results - All 4 lakes (Bartlett, Havasu, Pleasant and Powell) - Total surveys = 2033

Fishing	Yes	No	Bait	Lure	Both
Did you go fishing today?	14%	86%			
Did you use bait, lure or both?			4%	7%	2%

Type of Fish caught	How many?
Striped bass	333
Yellow/white bass	0
Largemouth/smallmouth bass	657
Crappie	1
Rainbow trout or other trout	0
Redear sunfish	14
Bluegill or other sunfish	51
Other: catfish	180
Other: carp	20
Other: walleye	6
Other: perch	6
Other: black bass	3

Know about Quagga Mussel ?	Yes	No
Ever heard of QM?	92%	8%
Heard/Seen 'SAH' message?	87%	13%
Heard/Seen 'DMAM' message?	93%	7%

How did you hear about message?	Yes	No
Radio	21%	79%
Billboard	30%	70%
TV	11%	89%
Info signs at Lake	83%	17%
Other (e.g. AzGFD, LHMA sticker, fee booth, state check stations)	25%	75%
Don't know	2%	98%

Prevent transporting	Yes	No
Clean/wiped down boat	88%	12%
Pulled the drain plug	84%	16%
Let sit for week	56%	44%
Complete decon	9%	91%
Other	11%	89%
Do nothing/Refused to answer	3%	97%

Pull the Plug Survey Results from March 23 to October 4, 2014

All Lakes; boats observed/surveyed = 4283

Pulled plug Yes = 2545 (59%) No = 1738 (41%)

Bartlett Lake; boats observed/surveyed = 266

Pulled plug Yes = 205 (77%) No = 61 (23%)

Lake Havasu; boats observed/surveyed = 2585

Pulled plug Yes = 1419 (55%) No = 1166 (45%)

Lake Pleasant; boats observed/surveyed = 904

Pulled plug Yes = 657 (73%) No = 247 (27%)

Lake Powell; boats observed/surveyed = 528

Pulled plug Yes = 264 (50%) No = 264 (50%)