A SURVEY OF SOUTHERN ILLINOIS BOATERS' BELIEFS AND PRACTICES ASSOCIATED WITH AQUATIC INVASIVE SPECIES

Final Report

by

Mae Davenport
Department of Forestry
Southern Illinois University Carbondale
Carbondale, Illinois

and

Steven Shults
Illinois Department of Natural Resources

Department of Forestry Research Publication
NS-027
August 2009

Southern Illinois University Carbondale

A Survey of Southern Illinois Boaters' Beliefs and Practices Associated with Aquatic Invasive Species

A Final Report

Submitted to the
Mississippi River Basin Panel on Aquatic Nuisance Species

Mae A. Davenport, Ph.D.
Assistant Professor
Human Dimensions Research Unit
Department of Forestry
Southern Illinois University Carbondale
Mailcode 4411
Carbondale, IL 62901

and

Steven J. Shults
Region V Administrator
Aquaculture / AIS Program Manager
Illinois Department of Natural Resources

August 1, 2009

TABLE OF CONTENTS

EXECUTIVE SUMMARY ..... **ii**

ACKNOWLEDGEMENTS ..... **iv**

STUDY PURPOSE **1**

STUDY DESIGN **1**

Sampling Technique 2

Survey Instrument Design 2

Data Collection, Management and Analysis 2

FINDINGS **3**

1. Who are respondents? 3

2. What are respondents' beliefs about the presence and control of aquatic invasive species in Illinois? 5

3. How knowledgeable are respondents about aquatic invasive species and where do they get their information? 8

4. How did respondents use their boats in 2008? 12

5. What actions did respondents take in 2008 to prevent the spread of aquatic invasive species? 16

6. How likely are respondents to take future action to prevent the spread of aquatic invasive species? 17

7. How willing are respondents to pay for activities that prevent the spread of aquatic invasive species? 18

8. How do respondents vary by their levels of boat use? 19

9. How do respondents vary by their primary purpose of boating (anglers versus non-anglers)? 23

DISCUSSION AND STUDY IMPLICATIONS **28**

LITERATURE CITED **30**

APPENDICES **32**

Appendix A. Survey Instrument 33

Appendix B. Cover Letter 36

Appendix C. Reminder Postcard 38

EXECUTIVE SUMMARY

This study was designed to assist natural resource managers in Illinois in efforts to prevent the spread of aquatic invasive species (AIS). This report describes the findings of a survey of southern Illinois boaters conducted by the Department of Forestry at Southern Illinois University Carbondale in collaboration with the Illinois Department of Natural Resources and the Mississippi River Basin Panel on Aquatic Nuisance Species in the spring of 2009. The specific focus of the study was boaters' beliefs and practices associated with AIS. Data were gathered through a self-administered mail survey distributed to 1,001 registered boaters in southern Illinois. The survey sample was proportionately distributed across the 11 southernmost counties of Illinois. A 27% response rate was achieved. The study's findings are organized to answer 9 general research questions of interest to natural resource managers.

1. **Who are respondents?**
   - The vast majority of respondents were male (93%). Respondents ranged from 18 to 85 years of age and the most frequent level of education category reported was "some college, but no degree."
   - Over 95% of respondents were white and not of Hispanic or Latino descent.

2. **What are respondents' beliefs about the presence and control of aquatic invasive species in Illinois?**
   - Respondents perceived that AIS are "somewhat common" in Illinois and three-quarters of respondents believed AIS to be somewhat to very common. Over 69% of respondents believe that AIS populations have increased in the last 5 years.
   - Respondents in general perceived AIS to be a "moderate problem" in Illinois. More than 70% of respondents rated the presence of AIS to be a moderate to serious problem.
   - Preventing the spread of Asian carp, zebra mussels, and viral hemorrhagic septicemia (VHS) were of highest importance to respondents. Respondents were notably unsure about the importance of preventing the spread of several aquatic invasive plants listed like purple loosestrife and Brazilian elodea—over 50% of respondents responded "don't know" for these species.
   - Almost half of respondents reported observing AIS in Illinois with the most common species observed being Asian carp and zebra mussels.

3. **How knowledgeable are respondents about aquatic invasive species and where do they get their information?**
   - On average, respondents claimed to be only "slightly" knowledgeable about AIS. Over 72% rated themselves as slightly to "not at all" knowledgeable.
   - Television, magazines or newsletters, newspapers, and fishing/boating regulation pamphlets were the most popular sources of information about AIS. These sources were also rated to be the "best" sources of information.
   - Of the information distributed by the IDNR, regulation pamphlets were rated the most popular (and the best source), followed by information provided at marinas or boat

launches, boat registration materials, internet websites, brochures/species ID cards/fact sheets, and educational exhibits or displays.

4. **How did respondents use their boats in 2008?**
   - Over 87% of respondents used a boat in 2008.
   - The most common types of boats used were Johnboats (39%) and small powerboats (34%).
   - The majority of respondents (67%) used their boats from 6 to 50 times in 2008.
   - The most common primary purpose of boat use was non-tournament fishing (55%) followed by pleasure cruising (24%).
   - Respondents most commonly visited Crab Orchard Lake, Lake of Egypt, Lake Kinkaid, Cedar Lake, and the Ohio River in 2008. The most commonly visited water body outside of Illinois was Kentucky Lake.

5. **What actions did respondents take in 2008 to prevent the spread of aquatic invasive species?**
   - The most common action taken in 2008 to prevent the spread of AIS was draining water from boats and bait buckets.
   - A large proportion of respondents reported "almost always" draining water from boats and bait buckets (75%), conducting visual inspections of boats and equipment (55%), and removing aquatic plants and animals from boats and equipment (50%).

6. **How likely are respondents to take future action to prevent the spread of aquatic invasive species?**
   - The most likely future action to be taken by respondents to prevent the spread of AIS from infested water bodies was the removal of aquatic plants and animals from boats and equipment. Over 87% of respondents reported they would be "very likely" to engage in this practice.
   - On average, respondents were only "somewhat likely" to allow their boat to dry for 5 days, flush the motor's cooling system with tap water, or rinse the boat with high pressure or hot water.

7. **How willing are respondents to pay for activities that prevent the spread of aquatic invasive species?**
   - Almost three-quarters of respondents were willing to pay at least $1 extra for a boating or fishing license to prevent the spread of AIS.

8. **How do respondents vary by their levels of boat use?**
   - Low use boaters (20 times or less in 2008) rated controlling hydrilla, water hyacinth, and Eurasian watermilfoil more important than high use boaters (more than 20 times in 2008).
   - High use boaters were more likely than low use boaters to receive information about AIS from magazines or newsletters and to rate this information as the best source.

- High use boaters were more likely to use small and large powerboats and low use boaters were more likely to use canoes or kayaks.
- High use boaters were more likely to conduct visual inspections of boats and rinse their boats with high pressure or hot water in 2008.

9. How do respondents vary by their primary purpose of boating (anglers versus non-anglers)?

- A greater proportion of non-anglers than anglers was female and had a master's, doctoral, or professional degree.
- Non-anglers were more likely to perceive the presence of AIS in Illinois as a problem.
- Non-anglers attributed higher importance to the control of 7 of the 9 species and pathogen listed than anglers. No differences were recorded on the importance of preventing the spread of Asian carp or curly pondweed.
- Anglers were more likely to get information about AIS from magazines or newsletters, sport or fishing show booths, and boat registration materials than non-anglers.
- Non-anglers were much more likely than anglers to use a large powerboat and canoe or kayak, and less likely to use a Johnboat.
- Non-anglers were more likely than anglers to have rinsed their boat and removed aquatic plants and animals from boats in 2008.
- Non-anglers were more likely than anglers to rinse their boat in the future, given the waters they use have been infested with AIS.

ACKNOWLEDGEMENTS

Funding for this project was provided by the Mississippi River Basin Panel on Aquatic Nuisance Species and the McIntire-Stennis Cooperative Forest Research Program. The authors would like to thank Chris Evans, Hunter Rawlings, and Seth Turner for their assistance in study design, survey administration, and data analysis, respectively. We would also like to extend gratitude to the study participants who took the time to provide their input. Cover photos were created by Chris Evans (top left), Coordinator of the River to River Cooperative Weed Management Area, and Mae Davenport (bottom right).

STUDY PURPOSE

This study was designed to assist natural resource managers in Illinois in efforts to prevent the spread of aquatic invasive species (AIS). Boaters and anglers are an important user group in AIS control programs. Invasive plants and animals or pathogens may be transferred by boaters as "hitchhikers" on boats and trailers or through water carried in a boat's live well, bilge or bait bucket (Johnson, Ricciardi & Carlton, 2001). Anglers also may unknowingly spread pathogens by releasing unused bait into lakes or streams. Studies have been conducted in the upper Midwest on overland transfer of AIS by transient boaters (Buchan & Padilla, 1999, Johnson et al., 2001), but currently there are little data available in southern Illinois where species type and climate conditions differ from other regions studied. This report describes the findings of a survey of southern Illinois boaters conducted by the Department of Forestry at Southern Illinois University Carbondale in collaboration with the Illinois Department of Natural Resources and the Mississippi River Basin Panel on Aquatic Nuisance Species in the spring of 2009. The overriding goal of the survey was to better understand boater beliefs and practices associated with AIS in southern Illinois. Specific objectives were to investigate southern Illinois boaters' (1) typical boating practices (2) awareness, knowledge, and observations of AIS in Illinois, (3) sources of information about AIS, (4) beliefs about the spread of AIS, and (5) past and future actions taken to prevent the spread of AIS through various control strategies.

STUDY DESIGN

The study was conducted through a self-administered survey of a random sample of registered boaters in the 11 southernmost counties of Illinois (Table 1). The survey was administered in March 2009.

Table 1. County population, boat data and survey sample

County	Population[a]	Total registered boats[b]	Total registered boaters	Survey sample (8.19%)
Williamson	64,541	4,843	3,775	309
Jackson	58,841	3,588	2,718	223
Saline	26,551	1,654	1,267	104
Union	18,257	1,214	988	81
Massac	15,109	1,062	787	64
Johnson	13,065	1,259	919	75
Alexander	8,458	673	488	40
Pulaski	6,490	399	290	24
Gallatin	6,025	547	427	35
Hardin	4,468	331	263	22
Pope	4,182	379	287	24
Total	**225,987**	**15,949**	**12,209**	**1,001**

[a] U.S. Census 2007 estimate

[b] Registered boats and boaters in the 11 southernmost Illinois counties in 2007 (IDNR 2008).

Sampling Technique

The 11-county southern Illinois region has approximately 226,000 residents and 16,000 registered watercraft (Table 1). A list of 2007 registered watercraft including owner name and addresses provided by the IDNR was used to draw the survey sample. To ensure an adequate sample size, 1,001 surveys were distributed by U.S. mail. A proportionate sample of registered boaters in each county was randomly selected—approximately 8% of registered boaters in each of the 11 counties.

Survey Instrument Design

A survey instrument (Appendix A) was developed and refined based on discussions with natural resource managers, as well as peer and institutional review and pre-tests. Survey instrument design requires careful consideration of both substantive and structural aspects of the questionnaire to ensure ease and accuracy of its completion (Dillman 2000). The questionnaire encompasses the following thematic areas:

- Awareness and observation of AIS in southern Illinois
- Beliefs about AIS prevention
- AIS information sources
- Typical boating practices
- Use of AIS spread prevention practices
- Likelihood of future AIS spread prevention practices
- Willingness to pay for AIS prevention programs
- Basic sociodemographic background

The instrument integrates a variety of open ended, fixed-choice and scale questions. Several questions were adapted from survey instruments used in previous studies of public perceptions of AIS (James & Keller, 2009; Kansas Department of Wildlife and Parks, 2007). Individual questions were worded, grouped and ordered in a logical manner to sustain the respondents' interest, enhance navigational ease and reduce bias (Dillman, 2000). The instrument was accompanied by a cover letter (Appendix B) explaining the study objectives and instructions. Each survey instrument was labeled with a unique identification number. A postage-paid, self-addressed return envelope was provided.

Data Collection, Management and Analysis

The survey was administered in two waves. The first postal wave consisted of a questionnaire and cover letter sent by first class mail to the 1,001 registered boaters selected from the boat registration database provided by the IDNR. A first class thank you/reminder postcard was sent to each individual approximately 2 weeks following initial contact (Appendix C). Each survey was opened individually upon its return. Questionnaires were examined for data completeness and usability. Data were numerically coded, entered, and checked for accuracy using the Statistical Package for Social Sciences (SPSS, Release 14.0) statistical software package. Basic descriptive statistics were conducted to examine central tendency and frequency distributions of individual variables. Inferential statistics such as Student's T-tests and Chi-Square test of

association were conducted to assess the relationship between different levels of group membership (e.g., high and low boat use, angler and non-angler use) and awareness, beliefs, and practices variables. Significance levels are reported for the inferential statistics conducted. A significance level reflects the probability of rejecting the null hypothesis (Type-I error) when it is true. The null hypothesis is generally that no differences between subgroups exist or that no association exists between two variables. For example, a 0.05 significance level would indicate a 95% probability that two subgroups are truly different and a 5 percent or less probability that the difference is due to chance. A 0.001 significance level reflects a 99.9% probability that two subgroups are really different and a less than 0.1% probability that the difference is due to chance.

FINDINGS

The findings presented here are based on the 255 completed and returned questionnaires from the initial mailing of 1,001 questionnaires. Of the 1,001 questionnaires mailed, 57 were returned undeliverable yielding a final response rate of 27%. The study results are organized in 9 sections answering the following research questions:

1. Who are respondents?
2. What are respondents' beliefs about the presence and control of aquatic invasive species in Illinois?
3. How knowledgeable are respondents about aquatic invasive species and where do they get their information?
4. How did respondents use their boats in 2008?
5. What actions did respondents take in 2008 to prevent the spread of aquatic invasive species?
6. How likely are respondents to take future action to prevent the spread of aquatic invasive species?
7. How willing are respondents to pay for activities that prevent the spread of aquatic invasive species?
8. How do respondents vary by their levels of boat use?
9. How do respondents vary by their primary purpose of boating (anglers versus non-anglers)?

1. Who are respondents?

The majority of respondents reside in Williamson, Jackson, and Union Counties of Illinois (Table 2). The geographic distribution of respondents represented in the sample generally mirrors that of the overall distribution of registered boaters across the 11 southern Illinois counties. The vast majority of respondents (93%) were male (Table 3) and between 46 and 75 years of age (79%) (Table 4). Over three-quarters of respondents had attended at least some college (Table 5). While 4% of respondents reported being Native American or American Indian and White, the majority of respondents reported being white (95%) (Table 6). Less than 2% of respondents reported being Hispanic or Latino (Table 7).

Table 2. Respondents and registered boaters distribution by county

	Respondents		Total registered boaters	
County	**N**	**Percent**	**N**	**Percent[a]**
Williamson	75	29.4	3,775	30.9
Jackson	65	25.5	2,718	22.3
Union	27	10.6	988	8.1
Johnson	24	9.4	919	7.5
Saline	21	8.2	1,267	10.4
Massac	12	4.7	787	6.5
Gallatin	8	3.1	427	3.5
Pulaski	8	3.1	290	2.4
Alexander	7	2.8	488	4.0
Hardin	4	1.6	263	2.2
Pope	4	1.6	287	2.4
Total	255	100.0	12,209	100.2

[a]12,209 registered boaters (excluding boats registered to government agencies) in the 11 southernmost Illinois counties in 2007 (IDNR 2008).

Table 3. Respondents' gender

Gender	**N**	**Percent**
Male	235	93.3
Female	17	6.7
Total	252	100.0

Source: Question 18

Table 4. Respondents' age

Age group	**N**	**Percent**
18-30	5	2.0
31-45	35	13.9
46-60	114	45.2
61-75	85	33.7
76 or older	13	5.2
Total	249	100.0

Source: Question 19

Table 5. Respondents' highest level of formal education

Education level	N	Percent
9th grade or less	3	1.2
Some high school, but no diploma or GED	4	1.6
High school graduate or GED	51	20.2
Some college, but no degree	82	32.5
Associate degree	24	9.5
4-year degree	29	11.5
Some graduate school	14	5.6
Master's, doctoral, or professional degree	45	17.9
Total	252	100.0

Source: Question 20

Table 6. Respondents' race

Race category	N	Percent
White	236	95.2
American Indian or Alaskan Native and White	10	4.0
Black or African American	2	0.8
American Indian or Alaskan Native	0	0
Asian	0	0
Native Hawaiian or other Pacific Islander	0	0
Total	248	100.0

Source: Question 21

Table 7. Respondents' ethnicity

Ethnicity category	N	Percent
Not Hispanic or Latino	125	98.4
Hispanic or Latino	2	1.6
Total	127	100.0

Source: Question 21

2. What are respondents' beliefs about the presence and control of aquatic invasive species in Illinois?

Respondents were asked about their perceptions of the abundance of AIS in Illinois and recent population trends. On average respondents perceived that AIS are "somewhat common" in Illinois (Table 8) and that their populations have increased in the last five years (Table 9). Almost 70% believed that populations have increased. When asked the extent to which AIS are a problem in Illinois, respondents as a whole perceived them to be a moderate problem (Table 10). Over 70% of respondents believe AIS to be a moderate to a serious problem. Approximately 14% of respondents reported being "unsure" about species abundance, population trends and the extent to which AIS are a problem.

Table 8. Aquatic invasive species abundance in Illinois

	N	Mean[a]	SD	Very common	Somewhat common	Somewhat rare	Very rare	Do not exist	Unsure	Total
How common do you think aquatic invasive species are in Illinois?	219	1.74	0.76	35.7	39.6	7.8	2.7	0	14.1	99.9

Source: Question 1

[a]Responses based on five-point scale from 1 (very common) to 5 (they do not exist in Illinois)

Table 9. Aquatic invasive species population trends in Illinois

	N	Mean[a]	SD	Increased	Stayed the same	Decreased	Never existed	Unsure	Total
Over the past five years, do you believe the presence of aquatic invasive species in Illinois has:	218	1.19	0.41	69.4	15.7	0.4	0	14.5	100.0

Source: Question 2

[a]Responses based on four-point scale from 1 (increased) to 4 (never existed in Illinois)

Table 10. Extent aquatic invasive species are a problem in Illinois

	N	Mean[a]	SD	Not a problem	Slight problem	Moderate problem	Serious problem	Unsure	Total
To what extent do you believe the presence of aquatic invasive species is a problem in Illinois?	219	3.22	0.80	2.0	14.2	33.1	37.0	13.8	100.1

Source: Question 3

[a]Responses based on four-point scale from 1 (not a problem) to 4 (serious problem)

Respondents also were asked to rate the importance of preventing the spread of AIS and the pathogen viral hemorrhagic septicemia (VHS) between water bodies. Overall, Asian carp and zebra mussels ranked at the top of the list of AIS provided, while water hyacinth ranked at the bottom in importance of each species' control (Table 11). On average, respondents rated all species and the VHS pathogen moderately to extremely important to control. It was also revealed that respondents are much less familiar with VHS and the aquatic invasive plants listed than the Asian carp and zebra mussels—from 39% to 53% of respondents responded "don't

know" on how important it is for boaters and anglers to prevent the spread of VHS and the plants listed.

Survey Question: In your opinion how important is it that boaters and anglers take precautions to prevent the spread of the following aquatic invasive species and fish virus from one body of water to another?

Table 11. Importance of boaters and anglers acting to prevent the spread of species

Species	N	Mean[a]	SD	Not at all important	Slightly important	Moderately important	Very important	Extremely important	Don't know
Asian carp (bighead, silver, and black carp)	208	4.54	0.78	1.2	1.2	4.1	22.2	56.8	14.4
Zebra mussels	198	4.37	0.92	0.8	4.2	6.2	22.3	47.9	18.2
Viral hemorrhagic septicemia (VHS virus)	137	4.31	0.90	0.8	2.1	5.4	18.8	30.1	42.7
Purple loosestrife	113	3.90	0.97	0.9	3.4	9.8	19.7	14.5	51.7
Brazilian elodea	110	3.89	1.00	0.4	4.7	9.4	17.6	15.0	52.8
Curly pondweed	128	3.84	1.08	1.7	5.1	10.5	19.4	17.3	46.0
Eurasian watermilfoil	126	3.82	1.06	2.1	4.2	10.1	21.5	15.2	46.8
Hydrilla	143	3.80	1.15	3.0	6.3	10.5	20.7	19.8	39.7
Water Hyacinth	147	3.72	1.19	3.3	7.9	10.5	20.5	19.2	38.5

Source: Question 4

[a]Responses based on five-point scale from 1 (not at all important) to 5 (extremely important)

Respondents were asked about their own observations of AIS in Illinois. Almost half of respondents reported that they had observed AIS (Table 12) and 42% were able to identify two or more species (Table 13). Of the species identified and listed on the questionnaire, Asian carp, zebra mussels, and Eurasian watermilfoil were the most common (Table 14). Other species listed include hydrilla, water hyacinth, curly pondweed, and purple loosestrife.

Survey Question: Have you personally observed aquatic invasive species in Illinois? If yes, what aquatic invasive species did you observe? Please list all of the species that you can.

Table 12. Personal observation

	Yes		No		Unsure		
	N	Percent	N	Percent	N	Percent	Total
Observed aquatic invasive species in Illinois	119	47.4	59	23.5	73	29.1	100.0

Source: Question 5

Table 13. Number of species identified

Number	N[a]	Percent
Zero species	25	21.0
One species	44	37.0
Two species	32	26.9
Three species	12	10.1
Four species	4	3.4
Five species	2	1.7
Total	119	100.1

Source: Question 5

Table 14. Species identified

Species	N	Percent
Asian carp	70	41.2
Zebra mussel	43	25.3
Eurasian watermilfoil	14	8.2
Hydrilla	12	7.1
Water hyacinth	11	6.5
Curly pondweed	7	4.1
Purple loosestrife	6	3.5
Coontail	2	1.2
VHS virus	1	0.6
Water willow	1	0.6
Lumholtz's daphnia	1	0.6
White perch	1	0.6
Pond lily	1	0.6
Total	170	100.1

Source: Question 5

3. How knowledgeable are respondents about aquatic invasive species and where do they get their information?

Respondents were asked to rate their knowledge about AIS. Overall, respondents reported being only slightly knowledgeable about AIS (Table 15.). Almost three-quarters of respondents believed they were either "not at all" or "slightly" knowledgeable.

Table 15. Respondents' knowledge about aquatic invasive species

Response	N	Mean[a]	SD	Not at all	Slightly	Moderately	Very	Extremely
How knowledgeable are you about aquatic invasive species?	251	2.09	0.76	21.5	51.0	25.1	2.0	0.4

Source: Question 8

[a]Responses based on five-point scale from 1 (not at all) to 5 (extremely)

To better understand where respondents receive information about AIS and what they perceive to be the *best* sources of information, a list of potential sources ranging from various popular media outlets to agency outreach materials to formal education courses was presented. Respondents were asked to identify all information sources from which they had seen or read about AIS during the past 12 months. Television news or programs, magazines or newsletter articles, newspaper articles, and fishing or boating regulation pamphlets ranked at the top of the list (Table 16). From 30% to 45% of respondents get their information about AIS from these sources. According to respondents, these sources are also the best sources of information about AIS (Table 17). The least popular sources were billboards, radio public service announcements, formal education courses, and hotline or clearinghouse information. Over one-quarter of respondents get information from signs or information posted at marinas or boat launches and family, friends, or neighbors.

Survey Question: During the past twelve months, have you seen or read information about aquatic invasive species from any of the following sources?

Table 16. Sources of information about aquatic invasive species

Information sources	Responses[a] N	Responses[a] Percent	Percent of respondents
Television news or programs	114	12.0	44.7
Magazine or newsletter articles	109	11.5	42.7
Newspaper articles	91	9.6	35.7
Fishing or boating regulation pamphlets	75	7.9	29.4
Signs or information provided at a marina or boat launch	71	7.5	27.8
Family, friends, or neighbors	69	7.3	27.1
A booth at a sport or fishing show or similar event	51	5.4	20.0
Signs or information provided at a bait shop or sporting goods store	43	4.5	16.9
Boat registration materials	38	4.0	14.9
Internet websites	36	3.8	14.1
Brochures, species ID cards, fact sheets	34	3.6	13.3
A fishing, boating, sporting, or environmental organization	33	3.5	12.9
An educational exhibit or display	29	3.1	11.4
Television public service announcements	27	2.8	10.6
Conservation officer	25	2.6	9.8
Radio news or programs	18	1.9	7.1
Books	18	1.9	7.1
Creel surveys or inspection-education programs on roads or at boat launches	18	1.9	7.1
Fishing contests or derbies or sailboat regattas	14	1.5	5.5
Educational videos	8	0.8	3.1
Conferences, presentations, or meetings	7	0.7	2.7
Billboards	5	0.5	2.0
Radio public service announcements	3	0.3	1.2
Formal educational courses	3	0.3	1.2
Other (no information received)	3	0.3	1.2
Hotline or information clearinghouse	1	0.1	0.4
Other [b] (Illinois Outdoor News)	1	0.1	0.4
Other (work on waterways)	1	0.1	0.4
Other (IDNR biologist)	1	0.1	0.4
Other (roadside rest stop)	1	0.1	0.4
Other (survey)	1	0.1	0.4
Other (IDNR poster)	1	0.1	0.4
Total	949	99.9	--

Source: Question 6

[a]Respondents could give more than one response

[b] Respondents could choose “other” and write in response

Survey Question: Of the sources of information that you checked in question 6, which four do you consider to be the best source of information about aquatic invasive species?

Table 17. Best sources of information about aquatic invasive species

Information sources	Responses[a] N	Responses[a] Percent	Percent of respondents
Television news or programs	92	16.4	36.1
Magazine or newsletter articles	74	13.2	29.0
Newspaper articles	59	10.5	23.1
Fishing or boating regulation pamphlets	55	9.8	21.6
Signs or information provided at a marina or boat launch	41	7.3	16.1
Family, friends, or neighbors	31	5.5	12.2
Boat registration materials	23	4.1	9.0
Television public service announcements	19	3.4	7.5
A booth at a sport or fishing show or similar event	19	3.4	7.5
Signs or information provided at a bait shop or sporting goods store	18	3.2	7.1
Brochures, species ID cards, fact sheets	17	3.0	6.7
Internet websites	16	2.9	6.3
An educational exhibit or display	15	2.7	5.9
Creel surveys or inspection-education programs on roads or at boat launches	15	2.7	5.9
A fishing, boating, sporting, or environmental organization	13	2.3	5.1
Conservation officer	13	2.3	5.1
Radio news or programs	10	1.8	3.9
Fishing contests or derbies or sailboat regattas	6	1.1	2.4
Educational videos	5	0.9	2.0
Conferences, presentations, or meetings	4	0.7	1.6
Radio public service announcements	3	0.5	1.2
Billboards	3	0.5	1.2
Hotline or information clearinghouse	2	0.4	0.8
Books	2	0.4	0.8
Formal educational courses	2	0.4	0.8
Other[b] (IDNR biologist)	1	0.2	0.4
Other (IDNR poster)	1	0.2	0.4
Other (roadside rest stop)	1	0.2	0.4
Total	--	100.0	--

Source: Question 7

[a]Respondents could give more than one response

[b]Respondents could choose “other” and write in a response

4. How did respondents use their boats in 2008?

To better understand boating practices, respondents were asked whether they used a boat in 2008, what type of boat they used, how often they used the boat, and their primary use of the boat. Over 87% of respondents used a boat in 2008 (Table 18). Most respondents use small motorboats—almost 73% of respondents reported using a Johnboat or motorboat less than 20 feet in length (Table 19). Fewer than 14% reported using a large motorboat (20 feet or greater). Respondents appear to be relatively frequent boat users. Thirty-seven percent of respondents reported using their boat 6-20 times in 2008 (Table 20). Almost 44% used a boat 21 times or more in 2008. Non-tournament fishing (55%) was the most popular primary boating activity followed by pleasure cruising (24%) (Table 21). Less than 4% of respondents use the boat primarily for tournament fishing.

Survey Question: Did you use a boat or boats for recreation in 2008 in Illinois?

Table 18. Boat use in 2008

Response	N	Percent
Yes	211	87.2
No	31	12.8
Total	242	100.0

Source: Question 9

Survey Question: What type of boat(s) did you use during 2008?

Table 19. Type of boat used in 2008

	Responses[a]		Percent of
Boat	N	Percent	respondents
Johnboat	99	32.5	38.8
Small powerboat (< 20ft)	86	28.2	33.7
Large powerboat (≥ 20ft)	35	11.5	13.7
Canoe or kayak	30	9.8	11.8
Other (pontoon)	28	9.2	11.0
Personal watercraft (jet ski)	16	5.2	6.3
Small sailboat (< 20ft)	9	3.0	3.5
Driftboat or raft	1	0.3	0.4
Other (paddle boat) [b]	1	0.3	0.4
Large sailboat (> 20ft)	0	0	0
Total	305	100.0	--

Source: Question 10

[a]Respondents could give more than one response

[b] Respondents could choose "other" and write in response

Survey Question: Approximately how many times did you use a boat or boats for recreation in 2008?

Table 20. Frequency of use in 2008

Use level	N	Percent
1 – 5 times	41	19.2
6 - 20 times	79	37.1
21 – 50 times	64	30.0
51 or more times	29	13.6
Total	213	99.9

Source: Question 11

Survey Question: What was the primary purpose of your use of a boat or boats in 2008?

Table 21. Primary purpose of boat use

Response	N	Percent
Non-tournament fishing	114	54.8
Pleasure cruising	50	24.0
Sightseeing/watching wildlife	12	5.8
Waterskiing/tubing	12	5.8
Tournament fishing	7	3.4
Exercise/fitness	5	2.4
Other (hunting) [a]	4	1.9
Research	2	1.0
Commercial/industrial use	1	0.5
Other (work on waterways)	1	0.5
Transportation	0	0
Total	208	100.1

Source: Question 13

[a] Respondents could choose “other” and write in response

The survey inquired further about boating practices, specifically where respondents use their boats. The most intensively visited water bodies include Crab Orchard Lake, Lake of Egypt, Lake Kinkaid, Cedar Lake and the Ohio River (Table 22). From 36% to 53% of respondents reported using these lakes at least once in 2008. Of those who reported using a boat in 2008 (n=211), 52% used a boat on an Illinois water body other than 11 listed in the questionnaire and 20% used a boat on an out-of-state water body. Respondents were asked to list these water bodies. The most common in-state water bodies listed were the Big Muddy River, “private” water bodies, and Dutchman Lake (Table 23). The most common out-of-state water bodies listed were Kentucky Lake, the Ohio River in Kentucky, Table Rock in Missouri, and the Tennessee River (Table 24).

Survey Question: In 2008 how often did you use a boat or boats on the following lakes or streams?

Table 22. Water bodies visited in 2008

Water bodies	N	0 (never before) [a]	0 (not in 2008)	Once	2-5 times	6-11 times	12 times or more
Crab Orchard Lake	173	22.5	24.9	5.2	19.7	8.7	19.1
Ohio River	173	43.9	20.2	3.5	14.5	6.9	11.0
Cedar Lake	172	43.0	20.9	4.1	17.4	9.3	5.2
Lake of Egypt	170	27.1	25.3	4.7	14.1	6.5	22.4
Lake Kinkaid	165	41.2	17.6	4.8	17.0	9.7	9.7
Little Grassy Lake	164	40.9	29.9	3.7	15.2	4.3	6.1
Mississippi River	160	55.0	29.4	1.9	7.5	3.8	2.5
Horseshoe Lake	160	56.9	33.1	3.1	3.1	1.3	2.5
Devils Kitchen Lake	159	45.3	33.3	3.8	11.3	3.1	3.1
Rend Lake	159	48.4	27.0	6.9	9.4	5.0	3.1
Mermet Lake	158	59.5	25.9	3.8	8.9	0.6	1.3
Other (Illinois) [b]	109	--	6.4	11.0	42.2	12.8	27.5
Other (out-of-state)	42	--	9.5	33.3	42.9	9.5	4.8

Source: Question 12

[a] Ranked in descending order by percentage of "0 (never before) responses".

[b] Respondents could choose "other" and write in a response (see Tables 23 and 24 for list of these responses)

Table 23. Illinois water bodies visited in 2008 ("other water bodies" written in responses)

Water bodies	N	0 (not in 2008)	Once	2-5 times	6-11 times	12 times or more
Big Muddy River	12	0	8.3	58.3	16.7	16.7
Private	9	0	0	22.2	11.1	66.7
Dutchman Lake	7	0	14.3	57.1	14.3	14.3
Cache River	6	0	16.7	33.3	33.3	16.7
Glen O Jones Lake	4	0	0	25.0	50.0	25.0
Herrin Lake	4	0	0	100.0	0	0
Dongola Lake	3	0	0	0	33.3	66.7
Kaskaskia River	3	66.7	0	33.3	0	0
Harrisburg City Lake	3	0	33.3	33.3	33.3	0
Lake Glendale	3	0	0	66.7	33.3	0
Marion Reservoir	3	0	0	100.0	0	0
Murphysboro Lake	2	0	0	50.0	0	50.0
Scatters	2	0	50.0	0	0	50.0
Lake Michigan	2	0	0	100.0	0	0

Water bodies (cont'd)	N	0 (not in 2008)	Once	2-5 times	6-11 times	12 times or more
Saline	2	0	0	0	0	100.0
Lusk Creek	2	50.0	50.00	0	0	0
Bay Creek	2	0	50.0	50.0	0	0
Sugar Creek Watershed	2	0	0	100.0	0	0
New Thompson Lake	2	0	0	0	0	100.0
Lake Du Quoin	2	0	0	50.0	50.0	0
Kentucky Lake	1	0	0	0	0	100.0
Lake Chautauqua	1	0	0	0	0	100.0
Lake Barkley	1	0	0	0	0	100.0
Bowman Lake	1	0	0	100.0	0	0
West Frankfort Lakes	1	0	0	0	0	100.0
Grand Tower Chute	1	0	0	100.0	0	0
Newton Lake	1	0	0	100.0	0	0
Lake Shelbyville	1	0	100.0	0	0	0
East Fork Lake	1	0	100.0	0	0	0
Tacoma Lake	1	0	0	100.0	0	0
Lake Carlyle	1	100.0	0	0	0	0
Bar Pits – Illinois	1	0	0	0	0	100.0
Smithland Pool	1	0	0	0	0	100.0
Little Wabash	1	0	0	100.0	0	0
Big Wabash	1	0	0	100.0	0	0
Pounds Hollow	1	0	0	0	100.0	0
North Fork	1	0	0	0	0	100.0
Dolan	1	0	0	0	0	100.0
Millstone Watershed	1	100.0	0	0	0	0
Arrowhead	1	0	0	100.0	0	0
Spring Arbor	1	0	100.0	0	0	0
Big Lake, Gallatin Co.	1	0	0	0	0	100.0
Fish Lake, Gallatin Co.	1	0	0	0	0	100.0
Baldwin Lake	1	100.0	0	0	0	0
Randolph City Lake	1	100.0	0	0	0	0
Lyrla Lake	1	0	100.0	0	0	0
Clear Creek	1	0	0	0	100.0	0
Coffeen Lake	1	0	0	100.0	0	0
Robbs Watershed	1	0	0	100.0	0	0
Ohio River Bottoms	1	0	0	0	0	100.0
Winters Pond	1	0	0	100.0	0	0
Big Creek	1	0	100.0	0	0	0
Peters Creek	1	0	0	100.0	0	0
Pyramid	1	0	0	100.0	0	0

Source: Question 12

Table 24. Out-of-state water bodies visited in 2008 ("other water bodies" written in responses)

Water bodies	N	0 (not in 2008)	Once	2-5 times	6-11 times	12 times or more
Kentucky Lake	17	11.8	17.7	58.8	5.9	5.9
Ohio River, Kentucky	2	0	50.0	50.0	0	0
Table Rock, Missouri	2	0	100.0	0	0	0
Tennessee River	2	0	50.0	50.0	0	0
Out-of-state, private	1	0	0	100.0	0	0
Dale Hollow	1	100.0	0	0	0	0
Lake Barkley	1	0	0	100.0	0	0
Pickwick Lake, Mississippi	1	0	0	100.0	0	0
Tunica Cutoff	1	0	100.0	0	0	0
Grenada Lake, Mississippi	1	100.0	0	0	0	0
White River, Arkansas	1	0	0	0	100.0	0
Cache River, Arkansas	1	0	0	0	100.0	0
Reelfoot Lake, Tennessee	1	0	100.0	0	0	0
Bayou	1	0	50.0	0	0	0
Norfolk, Arkansas	1	0	100.0	0	0	0
English River , Canada	1	0	0	100.0	0	0
Lake of the Ozarks , Missouri	1	0	0	0	0	100.0
Sardis Lake, Mississippi	1	0	100.0	0	0	0
Northwest Ontario, Canada	1	0	0	0	100.0	0
Okavango Delta, Botswana	1	0	0	100.0	0	0
Leech Lake, Minnesota	1	0	100.0	0	0	0
Swan Lake, Kentucky	1	0	0	100.0	0	0
Table Shoals, Arkansas	1	0	100.0	0	0	0

Source: Question 12

5. What actions did respondents take in 2008 to prevent the spread of aquatic invasive species?

To learn more about boating practices aimed at preventing the spread of AIS, respondents were asked about the actions they took in 2008. Respondents were requested to identify how often they took actions from a list of practices designed to prevent the spread of AIS. The most popular action was draining water from the boat. On average, respondents reported that they drained water from their boats "almost always" (Table 25). Three-quarters of respondents engaged in this practice in 2008. Respondents reported that they "sometimes" avoided release of unwanted bait into the water, conducted visual inspections of boats and equipment, removed aquatic plants and animals from boats and equipment, and allowed boats to dry for at least five days. While over half of respondents "almost always" conducted visual inspections

and removed aquatic plants, less than one-fifth of respondents were as diligent about rinsing their boat with high pressure or hot water or flushing the motor's cooling system with tap water.

Survey Question: Please indicate how often you took any of the following actions after removing your boats from the water in 2008?

Table 25. Action taken to prevent the spread of aquatic invasive species in 2008

Actions	N	Mean[a]	SD	Never	Sometimes	Almost always	Does not apply
Drain water from boats, including live wells, bilge, and bait buckets	175	2.74	0.64	9.5	3.5	74.5	12.5
Avoid release of unwanted bait into the water	142	2.38	0.87	18.6	8.2	46.4	26.8
Conduct visual inspections of boats and equipment for aquatic plants and animals	192	2.36	0.81	19.8	20.8	54.5	5.0
Remove aquatic plants and animals from boats and equipment	178	2.35	0.81	19.1	20.1	50.3	10.6
Allow boat to dry for at least five days	185	2.22	0.79	20.3	30.7	40.6	8.4
Rinse boat with high pressure and/or hot water	170	1.69	0.75	42.1	29.7	15.4	12.8
Flush motor's cooling system with tap water	146	1.54	0.78	47.4	13.8	13.3	25.5
Other (wipe down boat and motor) [b]	6	3.00	0	0	0	100.0	0
Other (use boat lift)	1	3.00	0	0	0	100.0	0

Source: Question 14

[a]Responses based on three-point scale from 1 (never) to 3 (almost always)

[b] Respondents could choose "other" and write in a response

6. How likely are respondents to take future action to prevent the spread of aquatic invasive species?

To help predict future practices aimed at preventing the spread of aquatic invasive species, respondents were asked to rate the likelihood of future action given that they learned the waters they use are infested with AIS. On average, respondents reported being "very likely" to remove aquatic plants and animals, drain water from boats, conduct visual inspections of boats and equipment, and avoid release of bait into the water (Table 26). In each case, at least 64% of respondents were "somewhat" to very likely to engage in the practice.

Survey Question: If you became aware that the waters you boat on are infested with aquatic invasive species, how likely is it that you would take the following actions to prevent the spread to other water bodies?

Table 26. Likelihood of future action to prevent the spread of aquatic invasive species

Actions	N	Mean[a]	SD	Not at all likely	Somewhat likely	Very likely	Does not apply
Remove aquatic plants and animals from boats and equipment	197	2.87	0.40	2.0	9.0	87.1	2.0
Drain water from boats, including live wells, bilge, and bait buckets	178	2.83	0.50	5.0	5.0	79.0	11.0
Conduct visual inspections of boats and equipment for aquatic plants and animals	198	2.82	0.46	3.0	11.4	84.1	1.5
Avoid release of unwanted bait into the water	173	2.80	0.54	5.5	6.0	75.4	13.1
Allow boat to dry for at least five days	191	2.45	0.75	15.3	23.0	59.2	2.6
Flush motor's cooling system with tap water	161	2.29	0.80	17.2	23.2	40.9	18.7
Rinse boat with high pressure and/or hot water	188	2.26	0.84	24.2	21.7	49.0	5.1
Other (wipe down boat and motor) [b]	2	3.00	0	0	0	100.0	0
Other (whatever it takes)	1	3.00	0	0	0	100.0	0

Source: Question 15

[a]Responses based on three-point scale from 1 (not at all likely) to 3 (very likely)

[b]Respondents could choose "other" and write in response

7. How willing are respondents to pay for activities that prevent the spread of aquatic invasive species?

When asked about their willingness to pay more for boating or fishing licenses to support dedicated AIS control programs, almost three-quarters of respondents reported they were willing to pay from $1 to more than $10 extra provided the money was used to fund activities to prevent the spread of AIS (Table 27).

Survey Question: How much more would you be willing to spend for a boating or fishing license, if the additional money was used to fund activities to prevent the spread of aquatic invasive species and to reduce their harmful effects?

Table 27. Willingness to pay

Response category	N	Percent
$1	31	12.8
$2	35	14.5
$3	14	5.8
$4 to $5	66	27.3
$6 to $10	19	7.9
More than $10	14	5.8
I would not be willing to spend more	63	26.0
Total	242	100.1

Source: Question 16

8. How do respondents vary by their levels of boat use?

To investigate differences in beliefs and practices associated with the level of boat use, respondents were categorized into two subgroups consisting of high (more than 20 times) and low use (20 times or less) levels (Table 28). When appropriate, significance tests were conducted to identify any statistical differences between the two groups in behavioral characteristics. No statistical differences were found in the sociodemographic characteristics of the two subgroups, their beliefs about the presence of AIS, their observations of AIS, their self-rated knowledge about AIS, primary purpose of boat use, the likelihood of their future actions, or their willingness to pay more for licenses.

Table 28. High and low levels of use

Subgroup[a]	N	Percent
Low use	120	56.3
High use	93	43.7
Total	213	100.0

Source: Question 11

[a]Respondents were grouped based on how many times they used their boats in 2008 (low use ≤ 20 times and high use > 20 times)

Low use boaters deemed preventing the spread of hydrilla, Eurasian watermilfoil, and water hyacinth to be more important than high use boaters (Table 29). Differences between the subgroups were statistically significant for these species and especially high for hydrilla and water hyacinth.

Table 29. Importance of preventing spread of aquatic invasive species by use level

Species	Use level	N	Mean[a]	SD	Not at all important	Slightly important	Moderately important	Very important	Extremely important	Don't know
Hydrilla***	Low	64	4.09	0.99	0	4.5	11.8	15.5	26.4	41.8
	High	60	3.40	1.25	7.9	9.0	10.1	29.2	11.2	32.6
Eurasian	Low	60	4.03	0.88	0	2.7	11.6	20.5	18.8	46.4
Watermilfoil*	High	49	3.51	1.21	5.6	5.6	9.0	24.7	10.1	44.9
Water Hyacinth***	Low	66	4.03	1.04	1.8	2.7	11.5	18.6	23.9	41.6
	High	60	3.35	1.26	5.6	15.7	7.9	25.8	12.4	32.6

Source: Question 4

[a]Responses based on five-point scale from 1 (not at all important) to 5 (extremely important)

*p ≤ 0.05, ***p ≤ 0.001

With respect to where respondents have received information about AIS, high use boaters were more likely to receive information from television news or programs and internet websites, while low use boaters were more likely to receive information from a fishing, boating or sports environmental organization or an educational exhibit or display (Table 30). High use boaters were also more likely than low use boaters to rate magazine or newsletter articles as the best source of information about AIS (Table 31).

Table 30. Sources of information about aquatic invasive species by use level

Information source	Low Use N	Low Use Percent	High Use N	High Use Percent	Total N[b]
Magazine or newsletter articles	49	51.0	49	57.6	98
Television news or programs	46	47.9	51	60.0	97
Newspaper articles	41	42.7	41	48.2	82
Fishing or boating regulation pamphlets	35	36.5	33	38.8	68
Signs or information provided at a marina or boat launch	34	35.4	33	38.8	67
A booth at a sport or fishing show or similar event	30	31.3	17	20.0	47
Family, friends, or neighbors	27	28.1	32	37.6	59
Signs or information provided at a bait shop or sporting goods store	21	21.9	20	23.5	41
Brochures, species ID cards, fact sheets	21	21.9	12	14.1	33
A fishing, boating, sporting, or environmental organization	20	20.8	11	12.9	31
An educational exhibit or display	20	20.8	8	9.4	28
Boat registration materials	19	19.8	17	20.0	36
Television public service announcements	13	13.5	11	12.9	24
Internet websites	10	10.4	24	28.2	34
Books	9	9.4	9	10.6	18
Creel surveys or inspection-education programs on roads or at boat launches	9	9.4	8	9.4	17
Radio news or programs	9	9.4	5	5.9	14
Conservation officer	7	7.3	15	17.6	22
Fishing contests or derbies or sailboat regattas	3	3.1	9	10.6	12

Source: Question 6

[a]Respondents could give more than one response

[b]If total N was less than 10, the responses were not reported here

Table 31. Best information source by use level (top choice only)

Information source*	Low use N	Low use Percent	High use N	High use Percent	Total N[b]
Television news or programs	21	17.5	13	14.0	34
Newspaper articles	17	14.2	15	16.1	32
Magazine or newsletter articles	13	10.8	21	22.6	34
Fishing or boating regulation pamphlets	8	6.7	10	10.8	182
Total respondents	120	56.3	93	43.7	213

Source: Question 7

[a]Respondents could give more than one response

[b]If total N was less than 10, the responses were not reported here

*$p \leq 0.05$

High use boaters were more likely to use small and large powerboats and less likely to use canoes or kayaks than low use boaters (Table 32).

Table 32. Type of boat used in 2008 by use level

Response	Low Use N	Low Use Percent	High Use N	High Use Percent	Total N
Johnboat	54	45.0	45	48.4	99
Small powerboat (< 20ft)	43	35.8	43	46.2	86
Canoe or kayak	23	19.2	7	7.5	30
Large powerboat (> 20ft)	13	10.8	22	23.7	35
Other (Pontoon	13	10.8	15	16.1	28
Small sailboat (< 20ft)	5	4.2	4	4.3	9
Personal watercraft (jet ski)	4	3.3	12	12.9	16
Other (paddleboat)	1	0.8	0	0	1
Driftboat or raft	0	0.0	1	1.1	1
Large sailboat (> 20ft)	0	0	0	0	0
Total respondents	120	56.3	93	43.7	213

Source: Question 10

[a]Respondents could give more than one response

Level of use also had an effect on 2008 boating practices associated with preventing the spread of AIS. Significance tests revealed that high use boaters were slightly more likely than low use boaters to conduct visual inspections of boats and equipment and highly more likely to rinse their boats in 2008 (Table 33).

Table 33. Actions taken to prevent the spread of aquatic invasive species in 2008 by use level

Response	Use level	N	Mean[a]	SD	Never	Sometimes	Almost always	Does not apply
Conduct visual inspections of boats and equipment for aquatic plants and animals*	Low	108	2.24	0.84	24.6	22.8	47.4	5.3
	High	84	2.52	0.74	13.6	18.2	63.6	4.5
Rinse boat with high pressure and/or hot water***	Low	90	1.50	0.71	51.9	21.3	10.2	16.7
	High	80	1.91	0.75	29.9	40.2	21.8	8.0

Source: Question 14

[a]Responses based on three-point scale from 1 (never) to 3 (almost always)

*p ≤ 0.05, ***p ≤ 0.001

9. How do respondents vary by their primary purpose of boating (anglers versus non-anglers)?

To examine any differences associated with the primary purpose of boat use, respondents were categorized into two subgroups consisting of anglers (tournament or non-tournament) and non-anglers (any other primary use of boat—see Table 21) (Table 34). When appropriate, significance tests were conducted to identify any statistical differences between the two groups. No statistical differences were found between subgroups in age, ethnicity or race, their self-rated knowledge about AIS, level of boat use, or their willingness to pay more for licenses.

Table 34. Anglers (tournament or non-tournament) and non-anglers

Subgroup[a]	N	Percent
Anglers	121	58.2
Non-anglers	87	41.8
Total	208	100.0

Source: Question 13

A significantly higher proportion of non-anglers (13%) were women than anglers (2%) (Table 35). Non-anglers were more likely to have had a master's, doctoral, or professional degree than anglers (Table 36).

Table 35. Respondents' gender (angler/non-angler)

	Non-angler		Angler		
Gender***	N	Percent	N	Percent	Total N
Male	76	87.4	118	98.3	194
Female	11	12.6	2	1.7	13
Total respondents	87	100.0	120	100.0	207

Source: Question 18

***p ≤ 0.001

Table 36. Respondents' highest level of formal education (angler/non-angler)

	Non-angler		Angler		
Level of formal education* **	**N**	**Percent**	**N**	**Percent**	**Total N**
9th grade or less	2	2.3	1	0.8	3
Some high school, but no diploma or GED	1	1.1	3	2.5	4
High school graduate or GED	7	8.0	30	25.0	37
Some college, but no degree	27	31.0	42	35.0	69
Associate degree	4	4.6	17	14.2	21
4-year degree	13	14.9	12	10.0	25
Some graduate school	5	5.7	7	5.8	12
Master's, doctoral, or professional degree	28	32.2	8	6.7	36
Total respondents	87	99.8	120	100.0	207

Source: Question 20
***p ≤ 0.001

Non-anglers were slightly more likely to perceive that the presence of AIS in Illinois is a problem (Table 37). Several differences between subgroups in the importance of controlling the spread of particular species were revealed—in all cases, non-anglers deemed preventing the spread of these species more important than anglers. Highly significant differences were noted between anglers and non-anglers in the importance of controlling hydrilla, Eurasian watermilfoil, and water hyacinth (Table 38). Differences in the importance of preventing the spread of Brazilian elodea, VHS, zebra mussels, and purple loosestrife were moderate to slight.

Table 37. Extent aquatic invasive species are a problem in Illinois (angler/non-angler)

	Type of Boater	**N**	**Mean[a]**	**SD**	**Not a problem**	**Slight problem**	**Moderate problem**	**Serious problem**	**Unsure**
To what extent do you believe the presence of aquatic invasive species is a problem in Illinois?*	Non-angler	75	3.37	0.71	0	11.5	31.0	43.7	13.8
	Angler	108	3.12	0.86	3.3	18.3	32.5	35.8	10.0

Source: Question 3
[a]Responses based on four-point scale from 1 (not a problem) to 4 (serious problem)
*p ≤ 0.05

Table 38. Importance of boaters and anglers acting to prevent the spread of species (angler/non-angler)

Species	Group	N	Mean[a]	SD	Not at all important	Slightly important	Moderately important	Very important	Extremely important	Don't know
Viral hemorrhagic septicemia (VHS virus)**	Non-angler	50	4.54	0.61	0	0	3.5	20.0	35.3	41.2
	Angler	64	4.14	1.01	1.8	2.7	6.2	21.2	24.8	43.4
Zebra mussels*	Non-angler	70	4.53	0.72	0	1.2	7.0	20.9	52.3	18.6
	Angler	99	4.21	1.07	1.7	8.7	5.2	24.3	46.1	13.9
Hydrilla***	Non-angler	43	4.23	0.81	0	1.2	8.3	19.0	22.6	48.8
	Angler	79	3.49	1.26	6.3	10.7	12.5	24.1	17.0	29.5
Brazilian elodea**	Non-angler	39	4.21	0.89	0	2.4	7.1	15.5	21.4	53.6
	Angler	53	3.68	1.00	0.9	5.5	11.9	20.2	10.1	51.4
Eurasian Watermilfoil***	Non-angler	41	4.20	0.81	0	1.2	8.2	18.8	20.0	51.8
	Angler	67	3.58	1.13	4.5	5.4	12.5	25.9	11.6	40.2
Purple loosestrife*	Non-angler	39	4.08	0.96	1.2	1.2	8.5	18.3	18.3	52.4
	Angler	53	3.66	0.98	0.9	5.5	11.8	20.9	9.1	51.8
Water hyacinth***	Non-angler	49	3.98	1.07	1.2	5.9	8.2	20.0	22.4	42.4
	Angler	74	3.54	1.22	4.5	10.7	11.6	23.2	16.1	33.9

Source: Question 4

[a]Responses based on five-point scale from 1 (not at all important) to 5 (extremely important)

*p ≤ 0.05, **p ≤ 0.01 ***p ≤ 0.001

Anglers were more likely to get their information about AIS from magazine or newsletter articles, sport or fishing show booths, and boat registration materials than non-anglers (Table 39). No differences were found in perceptions of the best sources of information.

Table 39. Sources of aquatic invasive species information (angler/non-angler)

	Non-angler		Angler		
Information sources	**N**	**Percent**	**N**	**Percent**	**Total N[b]**
Television news or programs	39	51.3	57	55.3	96
Newspaper articles	38	50.0	44	42.7	82
Magazine or newsletter articles	34	44.7	64	62.1	98
Signs or information provided at a marina or boat launch	27	35.5	40	38.8	67
Fishing or boating regulation pamphlets	26	34.2	41	39.8	67
Family, friends, or neighbors	26	34.2	33	32.0	59
Internet websites	18	23.7	16	15.5	34
Signs or information provided at a bait shop or sporting goods store	16	21.1	24	23.3	40
A booth at a sport or fishing show or similar event	15	19.7	31	30.1	46
Brochures, species ID cards, fact sheets	14	18.4	19	18.4	33
An educational exhibit or display	12	15.8	16	15.5	28
Television public service announcements	11	14.5	13	12.6	24
Boat registration materials	10	13.2	26	25.2	36
A fishing, boating, sporting, or environmental organization	9	11.8	21	20.4	30
Conservation officer	8	10.5	14	13.6	22
Books	8	10.5	9	8.7	17
Radio news or programs	7	9.2	7	6.8	14
Fishing contests or derbies or sailboat regattas	5	6.6	7	6.8	12
Creel surveys or inspection-education programs on roads or at boat launches	3	3.9	13	12.6	16
Total respondents	76	42.5	103	57.5	179

Source: Question 6

[a]Respondents could give more than one response

[b]If total N was less than 10, the responses were not reported here

Non-anglers (32%) were much more likely to use a large powerboat than anglers (6%) and less likely to use a Johnboat with 61% of anglers and only 26% of non-anglers using a Johnboat (Table 40). Non-anglers also were more likely to use a canoe or kayak than anglers.

Table 40. Type of boat used in 2008 (angler/non-angler)

	Non-angler		Angler		
Boat	**N**	**Percent**	**N**	**Percent**	**Total N**
Small powerboat (< 20ft)	32	36.8	54	44.6	86
Large powerboat (> 20ft)	28	32.2	7	5.8	35
Johnboat	23	26.4	74	61.2	97
Canoe or kayak	20	23.0	10	8.3	30
Other (pontoon)	20	23.0	5	4.1	25
Personal watercraft (jet ski)	11	12.6	5	4.1	16
Small sailboat (< 20ft)	5	5.7	4	3.3	9
Driftboat or raft	0	0	1	0.8	1
Other (paddleboat)	0	0	1	0.8	1
Large sailboat (> 20ft)	0	0	0	0	0
Total respondents	87	41.8	121	58.2	208

Source: Question 10

[a]Respondents could give more than one response

Slight differences existed between the two groups in actions taken to prevent the spread of AIS in 2008 and likelihood of actions taken in the future. Non-anglers removed aquatic plants and animals from boats and equipment and to rinse their boats to a greater extent in 2008 than anglers (Table 41). Non-anglers also were more likely to rinse their boat in the future than non-anglers, given the waters they use have been infested with AIS (Table 42).

Table 41. Actions taken to prevent the spread of aquatic invasive species in 2008 (angler/non-angler)

Actions	**Group**	**N**	**Mean[a]**	**SD**	**Never**	**Sometimes**	**Almost always**	**Does not apply**
Remove aquatic plants and animals from boats and equipment*	Non-angler	67	2.52	0.75	12.5	15.0	56.3	16.3
	Angler	111	2.24	0.83	23.7	23.7	46.6	5.9
Rinse boat with high pressure and/or hot water*	Non-angler	66	1.85	0.83	35.4	25.3	22.8	16.5
	Angler	104	1.60	0.69	47.0	33.0	10.4	9.6

Source: Question 14

[a]Responses based on three-point scale from 1 (never) to 3 (almost always)

*$p \leq 0.05$

Table 42. Likelihood of future action to prevent the spread of aquatic invasive species (angler/non-angler)

Action	Type of Boater	N	Mean[a]	SD	Not at all likely	Somewhat likely	Very likely	Does not apply
Rinse boat with high pressure	Non-angler	79	2.43	0.76	15.7	22.9	56.6	4.8
and/or hot water*	Angler	108	2.13	0.88	30.7	21.2	43.0	5.3

Source: Question 14

[a]Responses based on three-point scale from 1 (never) to 3 (almost always)

*$p \leq 0.05$

DISCUSSION AND STUDY IMPLICATIONS

This study was conducted to assist natural resource managers in Illinois in efforts to prevent the spread of AIS. The study provides insight into southern Illinois boaters' beliefs and practices associated with AIS. A few study limitations exist, which should be noted. The survey response rate was 29%. Though this rate is acceptable, the results may not be applicable across the entire population of southern Illinois boaters. Although a non-response bias check was not conducted, similar recreation use studies have found that survey respondents are generally older and have higher levels of formal education than non-respondents. These limitations should be taken into consideration when interpreting the study findings. At the same time, our survey protocol was effective in ensuring that our respondent pool was geographically representative of the 11 southernmost counties of Illinois.

Study findings reveal that southern Illinois boaters believe AIS are common, that populations are increasing, and that the presence of AIS represents at least a moderate problem in Illinois. At the same time, respondents varied in the importance they assigned to boaters and anglers preventing the spread of certain species. Animals like Asian carp and zebra mussels appear to be more familiar to boaters and more of a perceived threat than plant species. VHS, a pathogen that has yet to be documented in Illinois' inland water bodies, was rated as very important to control on average, though a large proportion of respondents indicated they were unsure of its importance. Similarly, the study revealed that southern Illinois boaters appear to be largely uncertain of the importance of boaters preventing the spread of purple loosestrife, Brazilian elodea, curly pondweed, Eurasian watermilfoil, hydrilla, and water hyacinth. Boater uncertainty about AIS in general was further confirmed in self-ratings of respondents' knowledge about AIS. Unfortunately, aquatic invasive plant species are more likely to be spread through recreational boating than Asian carp or zebra mussels, and thus their control should be a higher priority among boaters and they should receive a good deal of attention during boat use and maintenance. One explanation for the emphasis boaters place on controlling Asian carp and zebra mussel populations may be that boaters are actually observing these species and potentially experiencing their impacts firsthand. These animals were by far the most common

AIS observed by respondents. One distinct challenge natural resource managers face is convincing anglers that their efforts are needed in controlling AIS, especially plant species. The study findings suggest that anglers assign significantly less importance to preventing the spread of hydrilla, Eurasian watermilfoil, and water hyacinth, in particular. These species may be viewed as sport fish habitat and anglers may believe their presence will improve the quality of fishing opportunities.

Understanding past and future practices among boaters is important for AIS control programs, because recreational boating and fishing are activities that mediate the transfer of AIS from one water body to the next. State and federal natural resource management agencies have identified several actions that prevent the spread of AIS during boating and fishing activities. The question becomes to what extent are boaters practicing these strategies and how likely are they to practice them in the future? The study indicates that boating practices in southern Illinois may be contributing to the spread of AIS in the region. Respondents reported that in 2008 on average they "almost always" drained water from their boats and bait buckets, and they only "sometimes" engaged in other prevention actions like conducting visual inspections of their boats and equipment, or removing aquatic plants and animals from boats and equipment. High use boaters and non-anglers were more likely to have engaged in these actions in 2008 than low use boaters and anglers. Boaters clearly need to take more ownership in and responsibility for the role they play as vectors of AIS. At the same time, an emerging theme in this study is that boaters are unfamiliar with AIS and unsure about the importance of their control. The implications of this phenomenon are revealed in respondents' projections about their future actions. If boaters are aware that the waters they use are infested with AIS, the likelihood of their engagement in actions to prevent the spread of AIS increases dramatically. For example, in the case of removing aquatic plants and animals from boats and equipment compliance increases from 50% to over 85%. The need for the IDNR and other agencies to inform boaters and anglers about the water bodies they use and the presence of AIS in those water bodies is underscored here. Efforts to inform boaters and anglers through regulation pamphlets and marina or launch area signage should be continued and increased where possible.

The issues emerging here—a lack of familiarity and knowledge about AIS, uncertainty about plant species in particular, the differing perceptions of anglers and non-anglers regarding the importance of AIS control, and the need for more consistent AIS control practices—clearly support the need to examine where boaters are getting information about AIS. This study found that popular media sources like television, magazines, and newspapers are the most common sources of information about AIS. However, a large proportion of boaters still rely on fishing and boating regulation pamphlets. Of all the AIS information that is distributed by the IDNR or other natural resource agencies, the regulation pamphlets are the most popular, followed closely by signs or information provided at marinas and boat launches. Regulation pamphlets are also deemed to be among the four "best" sources of information about AIS. These resources are used by anglers, non-anglers, high use boaters, and low use boaters alike. Information campaigns by the IDNR and other natural resource agencies should use a balanced approach between public service announcements, advertisements, or articles in popular media

sources and AIS messages in more traditional media outlets like regulation pamphlets and boat launch signage. Although internet information campaigns and species ID cards may have success elsewhere, they do not appear to be connecting well with respondents in our study. With regard to the message itself, while "charismatic" species like Asian carp may make a more provocative news story, future information campaigns should strive to increase awareness of aquatic invasive plants including their defining characteristics for easy identification, their status and range in Illinois, and the threats they pose to native habitat, recreational opportunities, and economies. Assistance with identification of these plant species appears to be needed. As boaters become more familiar with AIS, citizen-based monitoring programs may have more traction in the region. One interesting note is that 12 respondents reported observing hydrilla in Illinois water bodies. To date, hydrilla has not been officially documented in Illinois by natural resource management agencies. Though it may be likely these plants were misidentified, these unconfirmed sightings further underscore the need for increased awareness and improved communication between boaters and natural resource agencies.

The recommendations provided here—continuing or increasing AIS information campaigns—may require additional resources dedicated to these programs. The study shows that one potential untapped funding source might be boaters or anglers themselves. Almost three-quarters of study respondents reported that they would be willing to pay at least $1 more for a boating or fishing license to support dedicated programs that control the spread of AIS or mitigate their harmful effects. While increasing fees may be controversial, this finding suggests that boaters and anglers are ready to commit resources to this important issue. In addition, funds may be more effective if they are focused on particular audiences like anglers, high use boaters, and boaters who visit several different lakes. These specialized groups can be reached through fishing or boating magazines, fishing and boat shows, and regulation pamphlets.

The benefits of this survey of southern Illinois boaters are diverse, and include providing natural resource managers, scientists, and environmental educators with an understanding of boater beliefs and practices associated with AIS. With this information, public information campaigns can be developed that are tailored to boaters' knowledge levels and practices. Knowing what information boaters have and where they get it will allow state and local officials and educators to target certain media for information delivery to particular boater populations.

LITERATURE CITED

Buchan, L.A. & D.K. Padilla. 1999. Estimating the probability of long-distance overland dispersal of invading aquatic species. *Ecological Applications, 9(*1) 254-265.

Dillman, D. A. 2000. *Mail and internet surveys: The tailored design method. Second edition*. John Wiley & Sons, New York, New York.

James, W.J. & D.C. Keller. 2009. *2008 survey of Indiana anglers to determine their awareness of aquatic invasive species and steps taken to prevent their spread*. Indiana Department of Natural Resources Division of Fish and Wildlife, Indianapolis, IN.

Johnson, L.E., A. Ricciardi & J.T. Carlton. 2001. Overland dispersal of aquatic invasive species: A risk assessment of transient recreational boating. *Ecological Applications, 11(*6) 1789-1799.

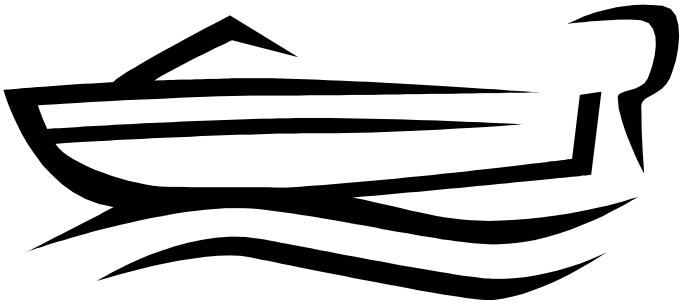
Kansas Department of Wildlife & Parks. 2007. *Kansas aquatic nuisance species and boating survey*, Emporia, KS. Unpublished survey.

APPENDICES

Appendix A. Survey Instrument

ID# _____
(Used for mail tracking only)

Southern Illinois Boater Survey on Aquatic Invasive Species



Human Dimensions Research Unit
Department of Forestry
Southern Illinois University
Carbondale, Illinois

and

Mississippi River Basin Panel on Aquatic Nuisance Species

Before you begin:

- ***Why are we conducting this survey?*** We want to better understand boater knowledge, beliefs, and practices associated with aquatic invasive species.
- ***What are aquatic invasive species?*** They are plants or animals that enter water bodies where they have not always lived. They may become invasive when they compete with or displace native species.

Once you've completed the survey:

- ***Thank you for your help!*** Please return the survey in the postage-paid return envelope.

This information will be used by natural resource managers to better serve the public. Response to this request is voluntary. No action may be taken against you for refusing to supply the information requested. You have been selected through a random selection process. This questionnaire is estimated to take 10 to 15 minutes to complete. When analysis of the questionnaire is completed, all name and address files will be destroyed. Thus, permanent data will be anonymous. This project was reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to: Committee Chairperson, Office of Research Development and Administration, Mailcode 4709, Southern Illinois University, Carbondale, IL 62901. Phone (618) 453-4533.

Section 1. We would like to begin by asking you some questions about your knowledge and beliefs about aquatic invasive species.

1. How common do you think aquatic invasive species are in Illinois?

[ ] very common
[ ] somewhat common
[ ] somewhat rare
[ ] very rare
[ ] they do not exist in Illinois
[ ] unsure

2. Over the past five years do you believe the presence of aquatic invasive species in Illinois has:

[ ] increased
[ ] stayed about the same
[ ] decreased
[ ] never existed in Illinois
[ ] unsure

3. To what extent do you believe the presence of aquatic invasive species is a problem in Illinois?

[ ] not a problem
[ ] slight problem
[ ] moderate problem
[ ] serious problem
[ ] unsure

4. In your opinion, how important is it that boaters and anglers take precautions to prevent the spread of the following aquatic invasive species and fish virus from one body of water to another? (Circle one number for each statement)

	Not at all important	Slightly important	Moderately important	Very important	Extremely important	Don't know
Curly pondweed	1	2	3	4	5	0
Eurasian watermilfoil	1	2	3	4	5	0
Brazilian Elodea	1	2	3	4	5	0
Purple loosestrife	1	2	3	4	5	0
Zebra mussels	1	2	3	4	5	0
Asian carp (bighead, silver, and black carp)	1	2	3	4	5	0
Hydrilla	1	2	3	4	5	0
Water hyacinth	1	2	3	4	5	0
Viral hemorrhagic septicemia (VHS virus)	1	2	3	4	5	0

5. Have you personally observed aquatic invasive species in Illinois? [ ] yes [ ] no [ ] unsure
If YES, what aquatic species did you observe? Please list all species that you can:

[ ] I am unsure of the names of the species I observed.

_____

_____

_____

6. During the past 12 months, have you seen or read information about aquatic invasive species from any of the following sources? (Check all that apply)

Media sources

[ ] a. Newspaper articles
[ ] b. Magazine or newsletter articles
[ ] c. Television news or programs
[ ] d. Radio news or programs
[ ] e. Television public service announcements
[ ] f. Radio public service announcements
[ ] g. Billboards
[ ] h. Internet websites

Events

[ ] i. Conferences, presentations, or meetings
[ ] j. An educational exhibit or display
[ ] k. Fishing contests or derbies or sailboat regattas
[ ] l. A booth at a sport or fishing show or similar event

Fishing or boating sources

[ ] m. Fishing or boating regulation pamphlets
[ ] n. Boat registration materials
[ ] o. Creel surveys or inspection-education programs on roads or at boat launches
[ ] p. Signs or information provided at a marina or boat launch
[ ] q. Signs or information provided at a bait shop or sporting goods store
[ ] r. A fishing, boating, sporting, or environmental organization

Other sources

[ ] s. Hotline or information clearinghouse
[ ] t. Books
[ ] u. Educational videos
[ ] v. Formal education courses or training
[ ] w. Brochures, species ID cards, fact sheets
[ ] x. Family, friends, or neighbors
[ ] y. Conservation officer
[ ] z. Other (please specify) _____

7. Of the sources of information that you checked in Question 6, which four do you consider to be the best sources of information about aquatic invasive species? (Write the letter for each item in the lines provided below)

1. ____ 2. ____ 3. ____ 4. ____

8. How knowledgeable are you about aquatic invasive species?

[ ] not at all
[ ] slightly
[ ] moderately
[ ] very
[ ] extremely

Section 2. Now we would like to ask you some questions about your recreational use of ALL boats during the 2008 boating season.

9. Did you USE a boat or boats for recreation in 2008 **in Illinois**?

[ ] Yes [ ] No **(If NO, please skip to question 16 on pg. 6)**

10. What type of boat(s) did you use during 2008? (Check all that apply)

[ ] Small sailboat (less than 20 ft.)
[ ] Large sailboat (20 ft. or longer)
[ ] Personal watercraft (jet ski)
[ ] Johnboat
[ ] Small powerboat (less than 20 ft.)
[ ] Large powerboat (20 ft. or longer)
[ ] Canoe or kayak
[ ] Driftboat or raft
[ ] Other type of watercraft (please specify) _____

11. Approximately how many times did you use a boat or boats for recreation in 2008? (Check one)

[ ] 1 – 5 times
[ ] 6 – 20 times
[ ] 21 – 50 times
[ ] 51 or more times

12. In 2008 how often did you use a boat or boats on the following lakes or streams? (Circle one letter per lake)

	Zero (I have never been on this water body)	**Zero (I have been on it - but not in 2008)**	**Once**	**2 – 5 times**	**6 – 11 times**	**12 times or more**
Cedar Lake	a	b	c	d	e	f
Crab Orchard Lake	a	b	c	d	e	f
Devils Kitchen Lake	a	b	c	d	e	f
Horseshoe Lake	a	b	c	d	e	f
Lake Kinkaid	a	b	c	d	e	f
Lake of Egypt	a	b	c	d	e	f
Little Grassy Lake	a	b	c	d	e	f
Mermet Lake	a	b	c	d	e	f
Mississippi River	a	b	c	d	e	f
Ohio River	a	b	c	d	e	f
Rend Lake	a	b	c	d	e	f
Other Illinois lakes/streams (specify):						
Other (specify):	a	b	c	d	e	f
Other (specify):	a	b	c	d	e	f
Other (specify):	a	b	c	d	e	f
Other (specify):	a	b	c	d	e	f
Out-of-state lakes/streams (specify):						
Other (specify):	a	b	c	d	e	f
Other (specify):	a	b	c	d	e	f

13. What was the primary purpose of your use of a boat or boats in 2008? (Check one)

[ ] sightseeing/watching wildlife	[ ] exercise/fitness
[ ] tournament fishing	[ ] waterskiing/tubing
[ ] non-tournament fishing	[ ] commercial/industrial use
[ ] pleasure cruising	[ ] research
[ ] transportation	[ ] other purpose (please specify) _____

14. Please indicate how often you took any of the following actions after removing your boat(s) from the water in 2008. (Circle one number per item)

	Never	Sometimes	Almost always	Does not apply
Conduct visual inspections of boats and equipment for aquatic plants and animals	1	2	3	0
Drain water from boats, including live wells, bilge, and bait buckets	1	2	3	0
Avoid release of unwanted bait into the water	1	2	3	0
Remove aquatic plants and animals from boats and equipment	1	2	3	0
Flush motor's cooling system with tap water	1	2	3	0
Rinse boat with high pressure and/or hot water	1	2	3	0
Allow boat to dry for at least five days	1	2	3	0
Other (please specify) _____	1	2	3	0

15. If you became aware that the waters you boat on are infested with aquatic invasive species, how likely is it that you would take the following actions to prevent their spread to other water bodies? (Circle one number per item)

	Not at all likely	Somewhat likely	Very likely	Does not apply
Conduct visual inspections of boats and equipment for aquatic plants and animals	1	2	3	0
Drain water from boats, including live wells, bilge, and bait buckets	1	2	3	0
Avoid release of unwanted bait into the water	1	2	3	0
Remove aquatic plants and animals from boats and equipment	1	2	3	0
Flush motor's cooling system with tap water	1	2	3	0
Rinse boat with high pressure and/or hot water	1	2	3	0
Allow boat to dry for at least five days	1	2	3	0
Other (please specify) _____	1	2	3	0

Section 3. In this last section, we have a few questions about you and your background.

16. How much MORE would you be willing to spend for a boating or fishing license, if the additional money was used to fund activities to prevent the spread of aquatic invasive species and to reduce their harmful effects? (Check one)

[ ] $1
[ ] $2
[ ] $3
[ ] $4 to $5
[ ] $6 to $10
[ ] More than $10
[ ] I would not be willing to spend more

17. What is your zip code? _____

18. What is your gender? [ ] female [ ] male

19. What is your age? _____ years

20. What is highest level of education you have completed? (Check one)

[ ] 9th grade or less
[ ] some high school but no diploma or GED
[ ] high school graduate or GED
[ ] some college, but no degree
[ ] associate degree
[ ] 4-year degree
[ ] some graduate school
[ ] master's, doctoral or professional degree

21. In what ethnicity and race would you place yourself? (Check all that apply)

Ethnicity
[ ] Hispanic or Latino
[ ] Not Hispanic or Latino

Race
[ ] American Indian or Alaska Native
[ ] Asian
[ ] Black or African American
[ ] Native Hawaiian or other Pacific Islander
[ ] White

22. Any other comments or suggestions about aquatic invasive species or their control are welcome. Please use the following space to write your comments.

Thank you for your help! Please return this questionnaire by folding in thirds and enclosing it in the postage-paid envelope provided. If you would like more information about this study please contact us at (618) 453-3341 or mdaven@siu.edu.

Appendix B. Cover Letter

March 5, 2009

Dear [BOATER'S NAME]:

We need your help! You have been selected at random from a statewide database that classified you as an owner of a boat registered with the Illinois Department of Natural Resources. We are gathering information from boaters about their knowledge, beliefs, and practices associated with aquatic invasive species in Illinois.

We have enclosed a survey that contains questions that will help us better understand your perspective. Please take a few minutes to respond. **Your responses are very important and will be used to develop education and outreach campaigns about aquatic invasive species**. Aquatic invasive species are plants or animals that enter water bodies where they have not always lived. They may become an invasive by outcompeting or displacing native plants and animals.

The survey analysts involved will take every effort to keep your questionnaire responses **strictly confidential**. The identification number on the front page of the questionnaire is included only for efficient distribution of the reminder mailings. Within two weeks of this mailing, you will receive a follow-up postcard from us as a "thank you" for completing the questionnaire or a reminder to do so. If you complete and return this questionnaire, you may receive a shorter, follow-up questionnaire later this year.

Any inquiries about the questionnaire or the survey project in general should be directed to: Dr. Mae Davenport, Assistant Professor, Department of Forestry, Southern Illinois University Carbondale, Carbondale, Illinois 62901, (618) 453-3341. Your participation in this study is completely voluntary. This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Research Development and Administration, SIUC, Carbondale, IL 62901. Phone (618) 453-4533. E-mail: siuhsc@siu.edu

Please complete as much of the enclosed questionnaire as possible; **the entire task should take about 15 minutes of your time**. We appreciate your willingness to share your insights about this important topic. A self-addressed, stamped envelope is enclosed for your response. Responses are completely confidential and voluntary. However, as we are sending out only a limited number of these surveys, each response is valued and sincerely appreciated. Thank you for your participation.

Yours truly,

Mae A. Davenport, Ph.D.

Appendix C. Reminder Postcard

Dear Southern Illinois Boater:

Recently you were sent a questionnaire seeking information on your knowledge and practices associated with aquatic invasive species. Your name was drawn from a random sample of southern Illinois registered boaters. If you have already completed and returned the questionnaire, please accept our thanks.

If you have not completed and returned the questionnaire, could you please do so today? As the questionnaire has been sent to a small but representative sample, it is extremely important that we receive your input. Your help is greatly appreciated and we thank you again for donating your valuable time.

Sincerely,

Mae A. Davenport, Ph.D.
Department of Forestry
Southern Illinois University Carbondale