

**EVALUATION OF THE
EFFECTIVENESS OF WESTERN
STATES' AQUATIC INVASIVE
SPECIES PUBLIC AWARENESS
CAMPAIGNS FOR ELICITING
DESIRED PREVENTION BEHAVIORS**



Study Purpose

- Enhance the long-term success of AIS prevention outreach
- Analyze the effectiveness of current and potential messaging and delivery methods in western states to elicit desired behavior change from specific demographics.
- Applicability of the results of this effort are not limited to the project's geographical area.



Design

- Key informant interviews (31)
- Survey Questionnaire
 1. Watercraft ownership and use history;
 2. Knowledge and awareness of aquatic invasive species;
 3. AIS messaging awareness and preferences;
 4. AIS messaging experiment;
 5. Clean, drain, dry behavior, perceived effectiveness, perceived difficulty, and perceived prevalence; and
 6. Socio-demographic characteristics.



Design

- Data Collection – Solicitation Approaches
 1. TAMU email respondents a weblink to the questionnaire using database (registered boaters, licensed anglers) provided by states
 2. States emailed members of their databases (registered boaters, licensed anglers), posted the weblink on their agency websites with several promoting their URL weblink thru social media



Design

Completed questionnaires
by state

Total: 3,900 respondents

Lowest responses from
links on webpages

State	n
Alberta	1
Alaska	510
Arizona	8
California	297
Colorado	34
Hawaii	3
Idaho	15
Kansas	878
Montana	15
Nebraska	2
Nevada	72
New Mexico	1
North Dakota	2
Oklahoma	59
Oregon	501
South Dakota	2
Texas	495
Utah	955
Washington	42
Wyoming	8
Total	3900



Sample Profile

Age	n	%
18-25	28	.7
26-35	136	3.5
36-45	486	12.5
46-55	854	21.9
56-65	1256	32.2
66-75	923	23.7
> 75	217	5.6

Race	n	%
Asian	42	1.0
Spanish/Hispanic/Latino	89	2.2
White	3447	85.2
American Indian/Alaska Native	102	2.5
Black/African American	24	.6
Native Hawaiian/Pacific Islander	18	.4
Middle Eastern	9	.2
Prefer not to Answer	226	5.6
Other	91	2.2

Gender	n	%
Prefer not to answer	130	3.3
Female	420	10.8
Male	3346	85.8
Nonbinary	4	.1

Household Income	n	%
Prefer not to answer	131	3.4
Under \$20,000	83	2.1
\$20,000-\$39,999	159	4.1
\$40,000-\$59,999	271	6.9
\$60,000-79,999	421	10.8
\$80,000-\$99,999	434	11.1
\$100,000-\$119,999	530	13.6
\$120,000-\$139,999	381	9.8
\$140,000-\$159,999	334	8.6
\$160,000 and above	1156	29.6
Total	4048	100.0



Findings – Familiarity with AIS

- Most familiar with the need to Clean, Drain, Dry
- Least familiar with infected waterbodies

Familiarity with AIS

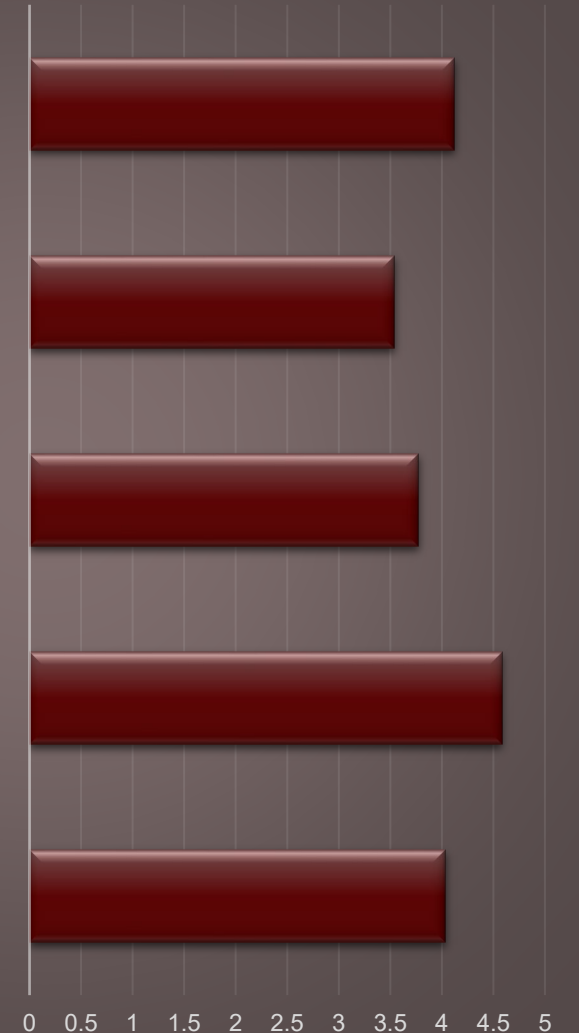
How familiar are you with the problems caused by aquatic invasive species in [state]?

How familiar are you with the locations (waterbodies) where aquatic invasive species have been detected in [state]?

How familiar are you with the aquatic invasive species that have been detected in [state]?

How familiar are you with the need for watercraft users to clean their boats and equipment, drain all water...

How familiar were you with aquatic invasive species before taking this survey?

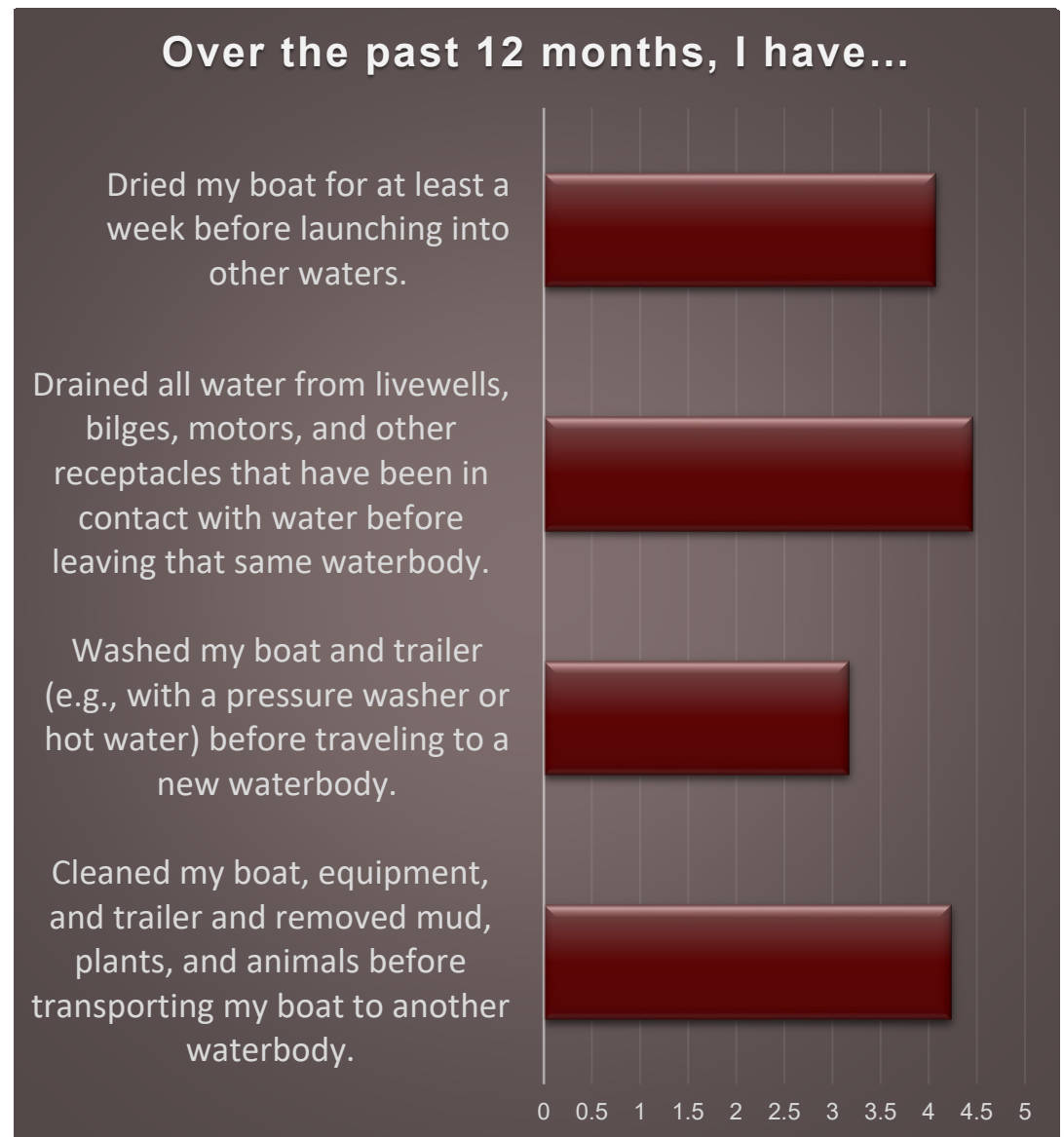


1=Not at all familiar to 5=Very familiar



Findings – Frequency of Clean, Drain, Dry

- Actions most commonly undertaken related to **draining** and **cleaning**
- **Washing** with a pressure washer or hot water less likely to be undertaken



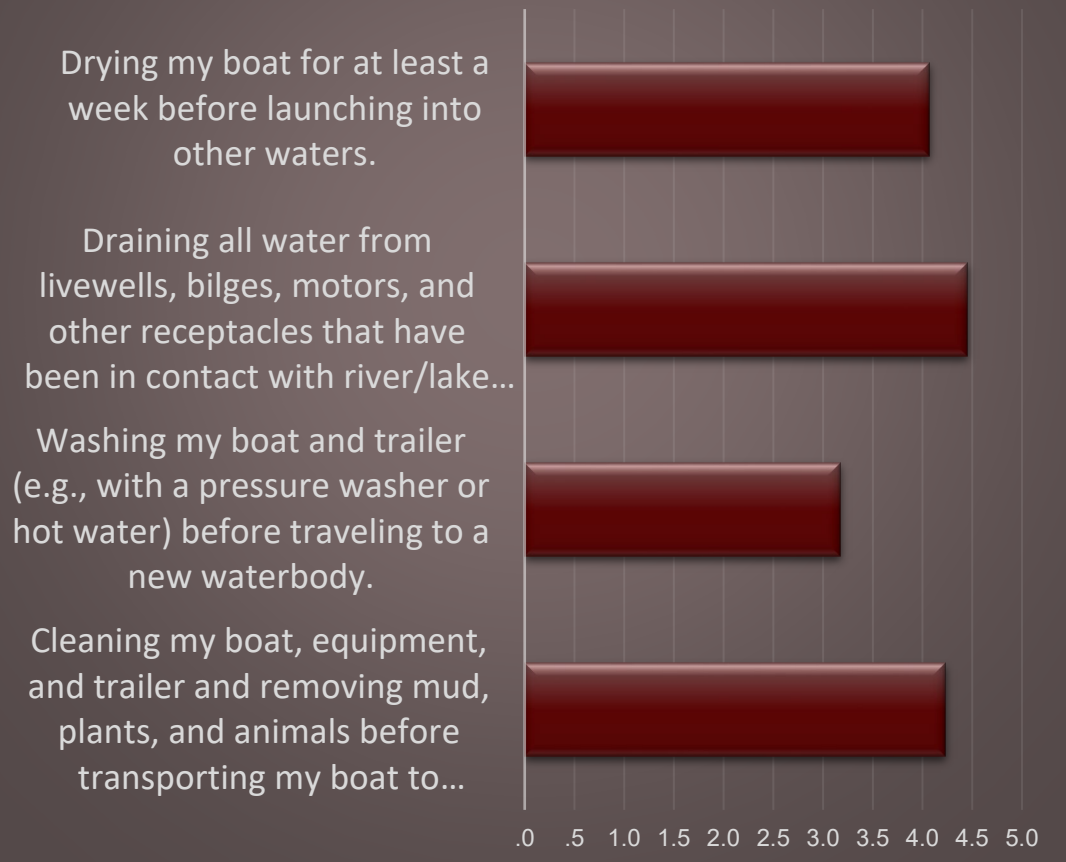
1=Never to 5=Always



Findings – Effectiveness of Clean, Drain, Dry

- Actions considered most effective related to **draining** and **cleaning**
- **Respondents considered washing** with a pressure washer or hot water **least effective**

How effective do you feel the following behaviors are at stopping or reducing the spread of aquatic invasive species in [state]'s freshwaters?

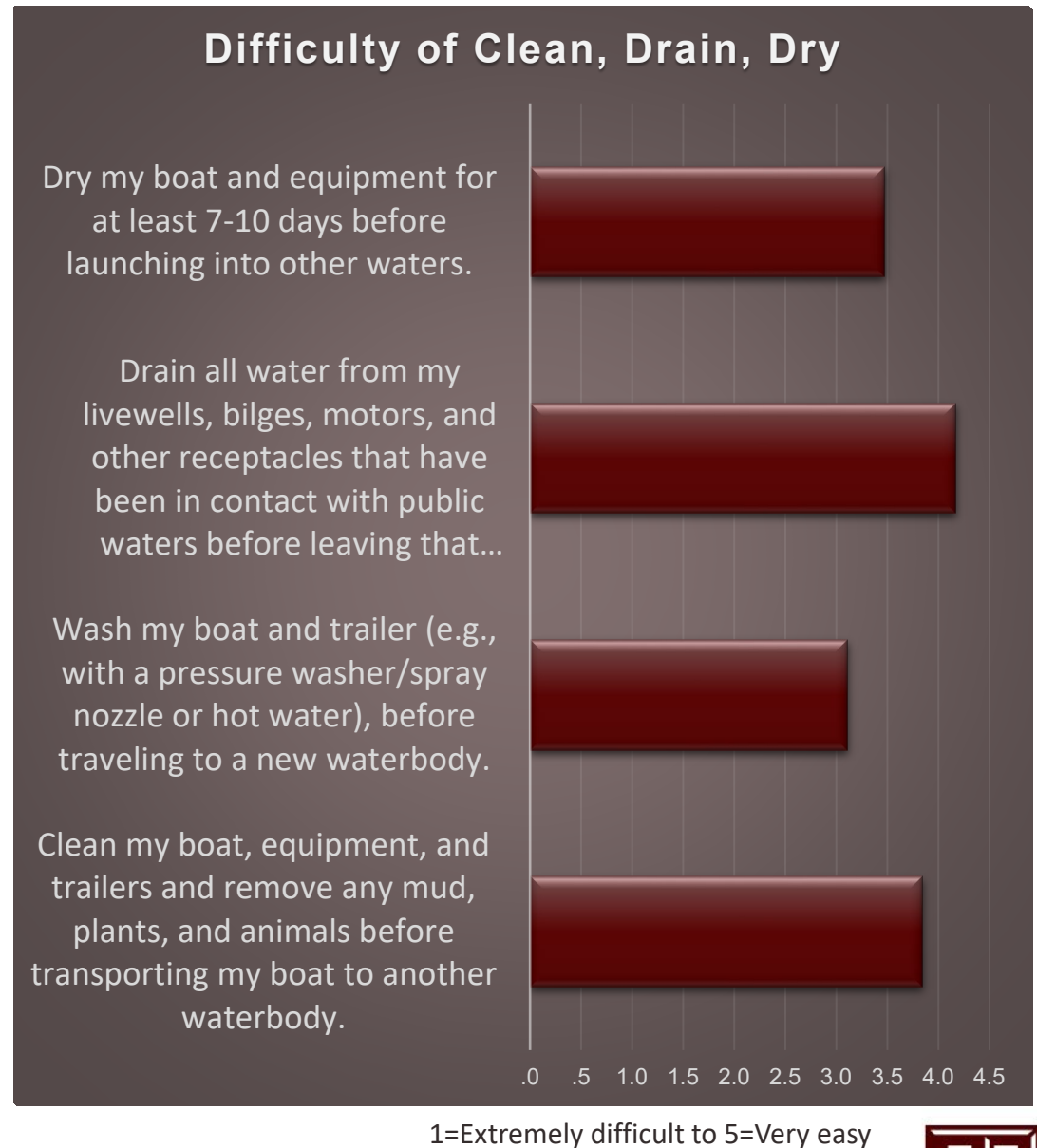


1=Not at all effective thru 5=Very effective



Findings – Difficulty of Clean, Drain, Dry

- Actions related to **washing** (boat & trailer) with a pressure washer or hot water were considered most challenging



Findings – Constraints to Clean, Drain, Dry

- 25% of respondents indicated being constrained from undertaking Clean, Drain, Dry
- Items considered most constraining were:
 - Absence of cleaning stations at boat ramps
 - Crowding at boat ramps
 - Belief that others don't Clean, Drain, Dry (descriptive norm)

... indicate the extent to which any of the following keeps you from being able to do Clean, Drain, Dry.



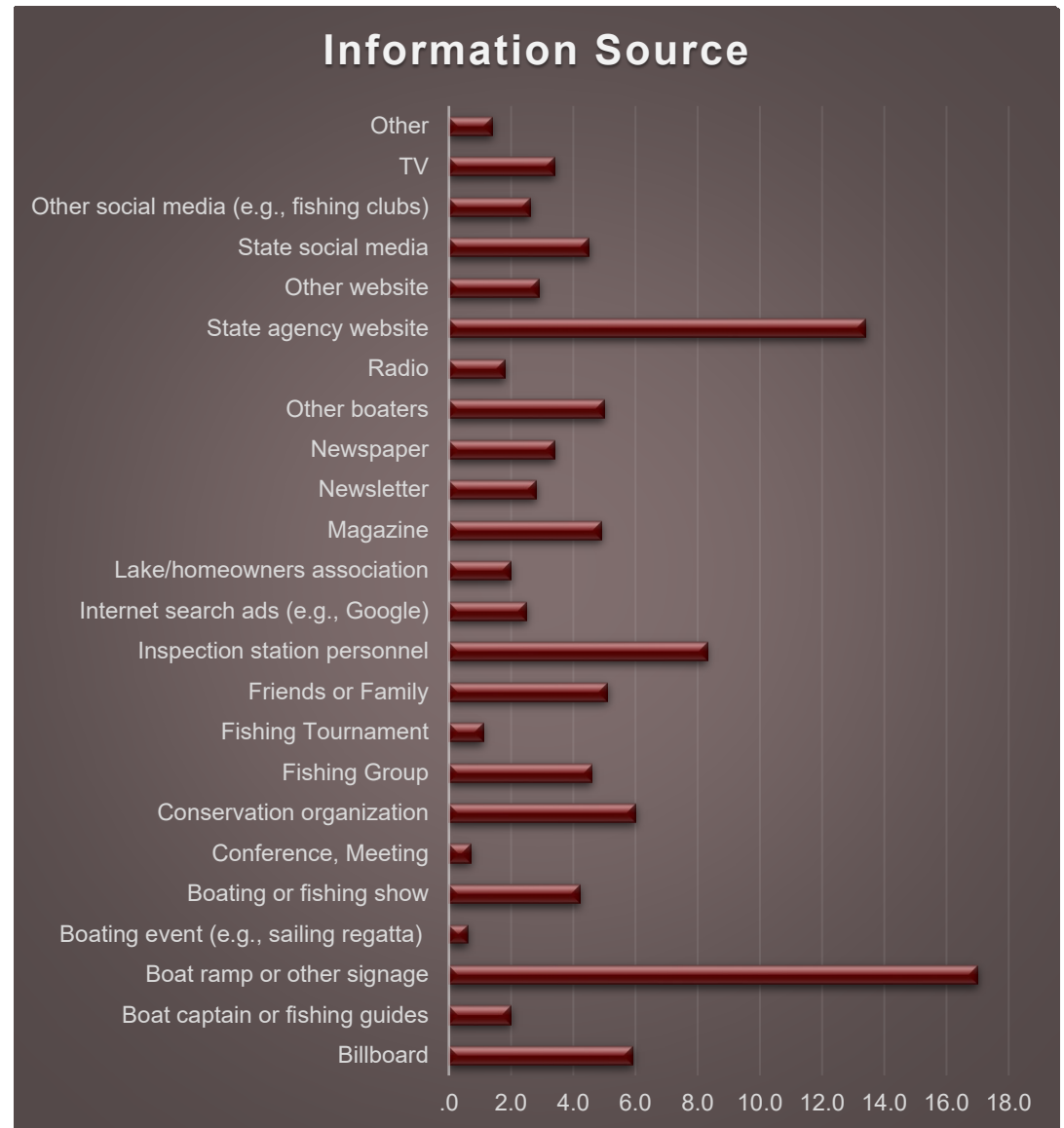
1=Strongly disagree thru 5=Strongly agree



Findings – Information Source about AIS & Prevention

Most common:

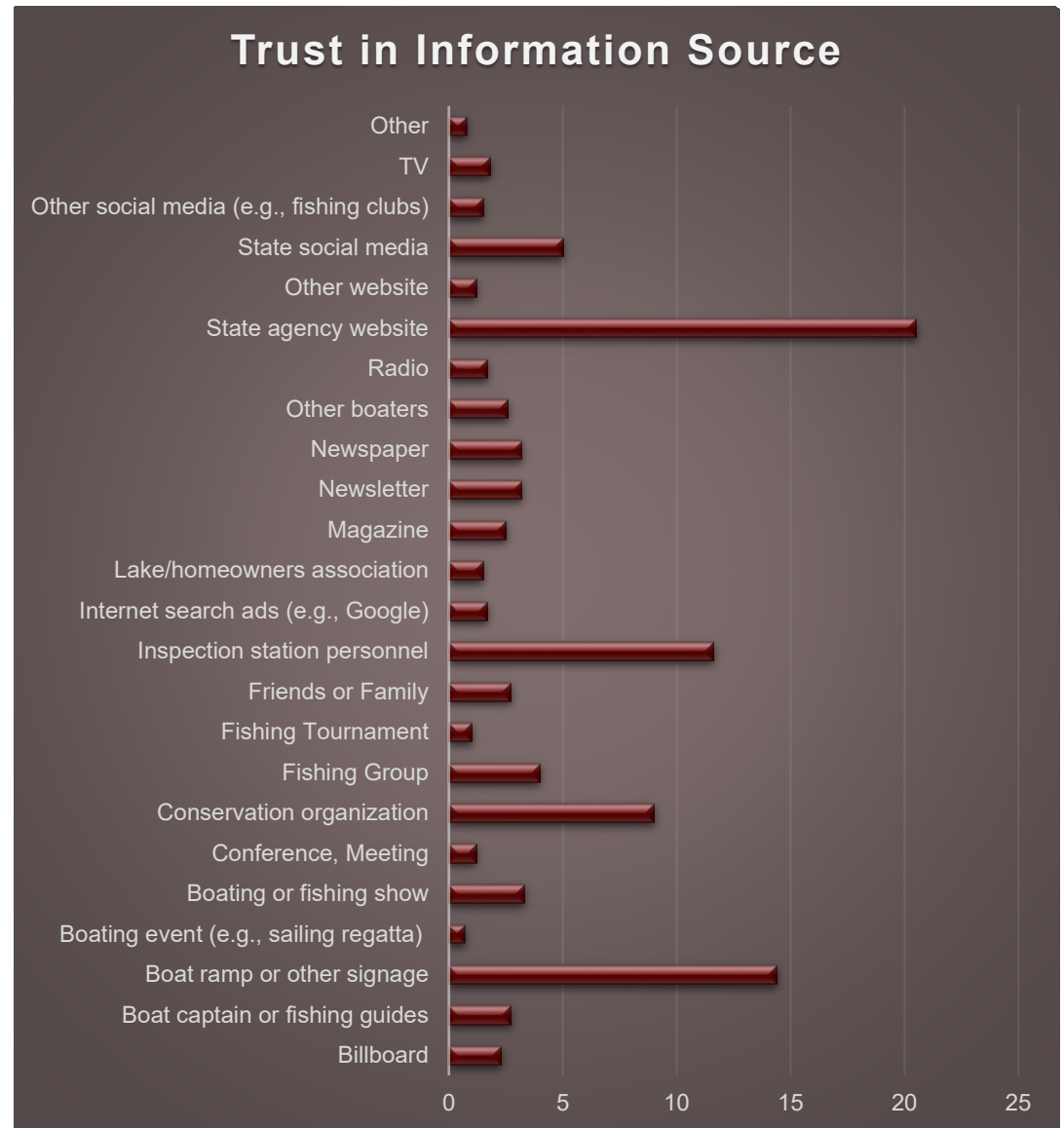
- Boat ramp signage
- State agency websites
- Inspection station personnel



Findings – Information Trust about AIS & Prevention

Most trusted sources of information:

- State agency websites
- Boat ramp signage
- Inspection station personnel
- Conservation organizations... especially among 18-25 year olds



Findings – Info. Effectiveness about AIS & Prevention

Most effective for reaching boaters:

- Boat ramp signage
- State agency websites
- TV

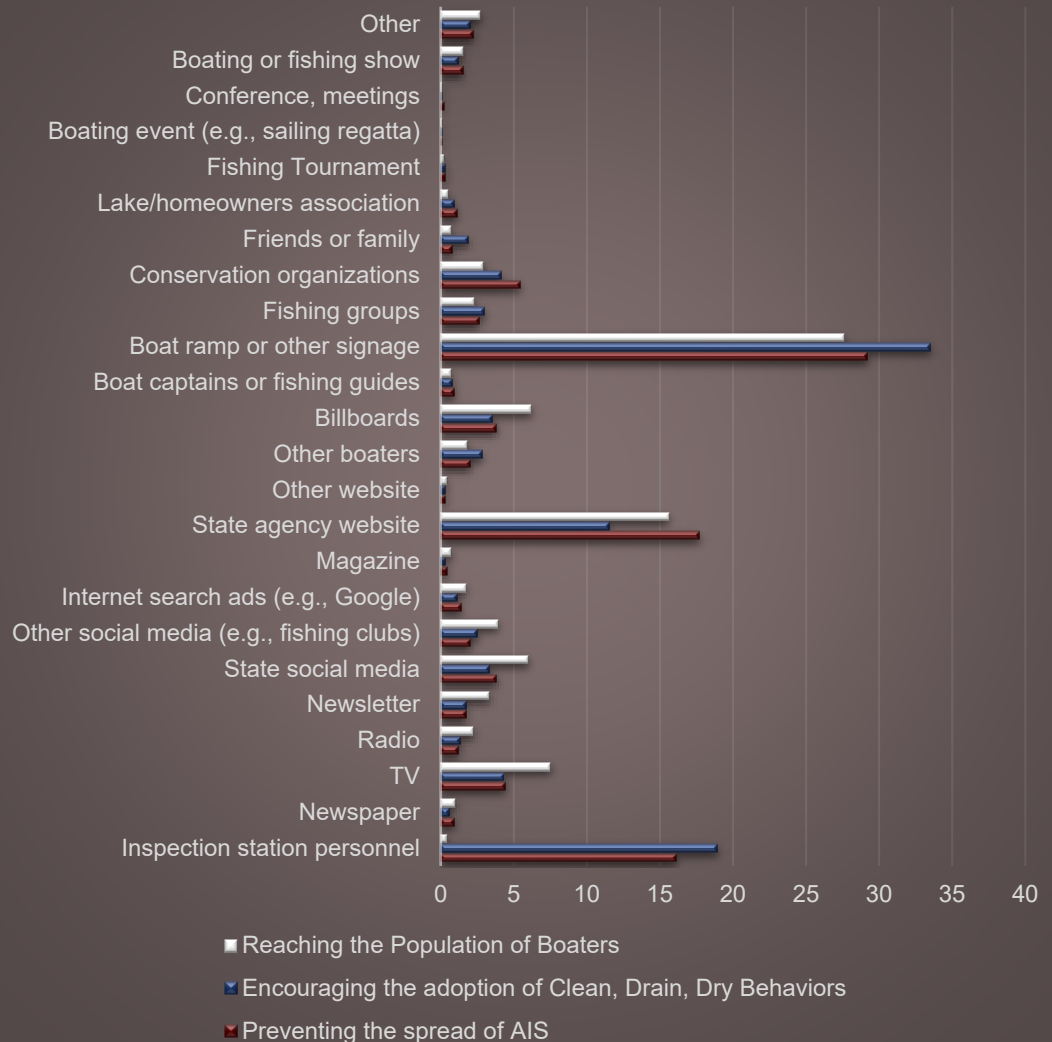
Encouraging Clean, Drain, Dry:

- Boat ramp signage
- Inspection station personnel
- State agency websites

Preventing the spread of AIS:

- Boat ramp signage
- State agency websites
- Inspection station personnel

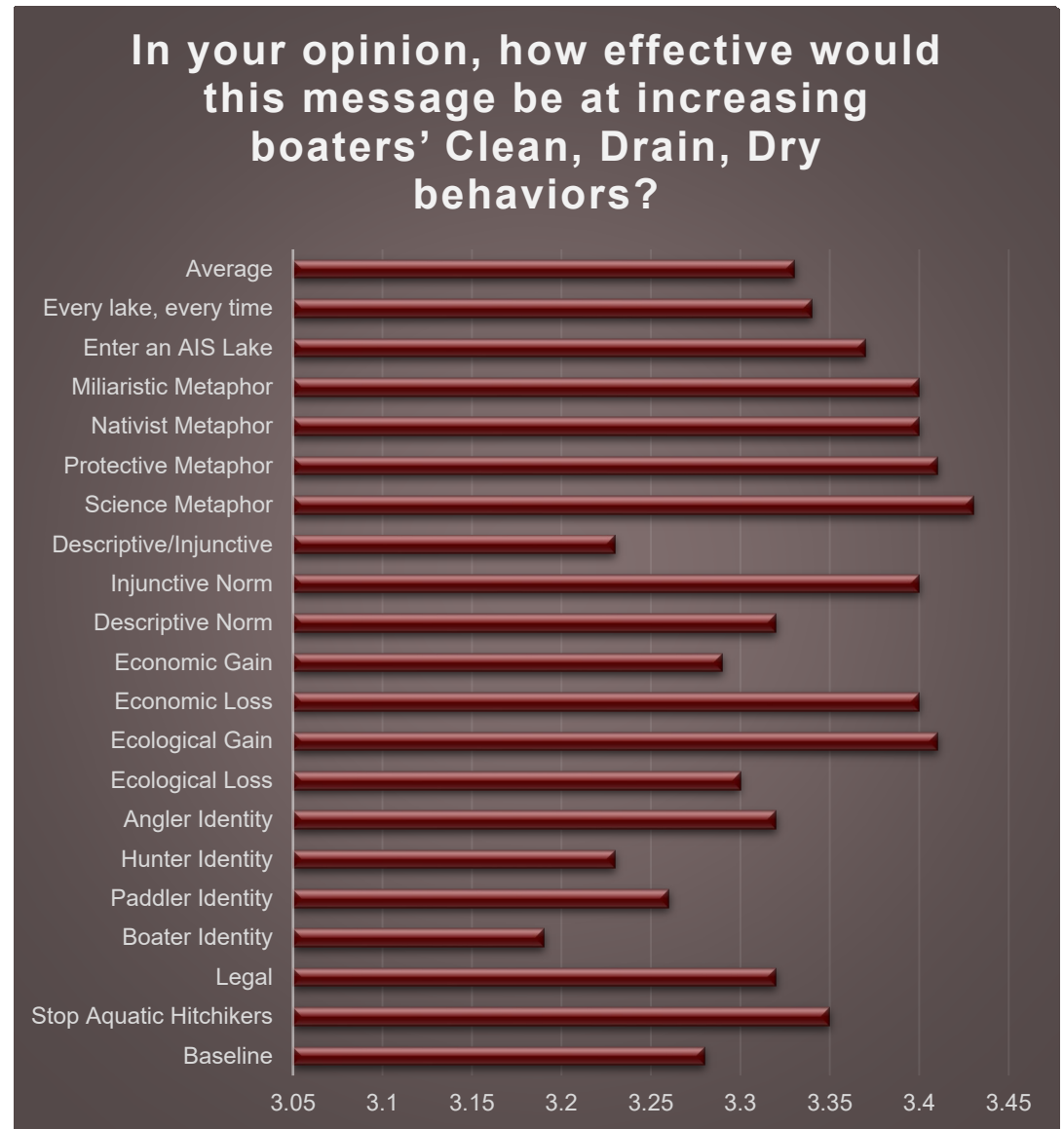
Perceived Effectiveness



Findings – Message Treatments

No statistically significant variation

All rated at least “moderately effective” (3) to “quite effective” (4)



1=Not at effective thru 5=Extremely effective



Findings - Most Effective Messages

Metaphor

- Science
 - “factual information”

ATTENTION:

PREVENT THE SPREAD OF AQUATIC INVASIVE SPECIES

Aquatic invasive species are present in our state's lakes and rivers and can severely impact these ecosystems.



✓ CLEAN

Clean all plants, mud, and debris from gear and equipment. This includes all types of watercraft, waders, boots, clothing, buckets — anything that comes in contact with the water. Never move a plant or animal from one location to another.

✓ DRAIN

Drain all water from your gear and equipment. This includes all types of watercraft, buckets, and anything that comes in contact with the water.

✓ DRY

Dry watercraft, equipment, and gear for a week or more. Leave wet compartments open to dry. Remove drain plugs during transport.



Science Metaphor

Findings - Most Effective Messages

Metaphor

- Protective
 - “nurturing nature”

Ecological Gain

- “a natural asset”

ATTENTION:

HELP PROTECT OUR WATERS

Aquatic invasive species harm our lakes and rivers.



✓ CLEAN

Clean all plants, mud, and debris from gear and equipment. This includes all types of watercraft, waders, boots, clothing, buckets — anything that comes in contact with the water. Never move a plant or animal from one location to another.

✓ DRAIN

Drain all water from your gear and equipment. This includes all types of watercraft, buckets, and anything that comes in contact with the water.

✓ DRY

Dry watercraft, equipment, and gear for a week or more. Leave wet compartments open to dry. Remove drain plugs during transport.



Protective Metaphor

ATTENTION:

PROTECT YOUR WATERS

CLEAN, DRAIN, DRY.

Your aquatic ecosystems will benefit tremendously.



✓ CLEAN

Clean all plants, mud, and debris from gear and equipment. This includes all types of watercraft, waders, boots, clothing, buckets — anything that comes in contact with the water. Never move a plant or animal from one location to another.

✓ DRAIN

Drain all water from your gear and equipment. This includes all types of watercraft, buckets, and anything that comes in contact with the water.

✓ DRY

Dry watercraft, equipment, and gear for a week or more. Leave wet compartments open to dry. Remove drain plugs during transport.



Ecological Gain



Findings - Most Effective Messages

Injunctive Norm

- Instill a sense of personal obligation

Metaphors

- Militaristic
 - “invasion, fight, battle”
- Nativist
 - “non-native=threatening”
 - *may have negative responses

Economic Loss

- Loss aversion

ATTENTION:

PROTECT YOUR WATERS

The state's boaters EXPECT you to CLEAN, DRAIN, DRY your boat.



✓ CLEAN

Clean all plants, mud, and debris from gear and equipment. This includes all types of watercraft, waders, boots, clothing, buckets — anything that comes in contact with the water. Never move a plant or animal from one location to another.

✓ DRAIN

Drain all water from your gear and equipment. This includes all types of watercraft, buckets, and anything that comes in contact with the water.

✓ DRY

Dry watercraft, equipment, and gear for a week or more. Leave wet compartments open to dry. Remove drain plugs during transport.



Injunctive Norm

ATTENTION:

NOT NATIVE, NOT WELCOME

Keep aquatic invasive species out of our state's lakes and rivers.



✓ CLEAN

Clean all plants, mud, and debris from gear and equipment. This includes all types of watercraft, waders, boots, clothing, buckets — anything that comes in contact with the water. Never move a plant or animal from one location to another.

✓ DRAIN

Drain all water from your gear and equipment. This includes all types of watercraft, buckets, and anything that comes in contact with the water.

✓ DRY

Dry watercraft, equipment, and gear for a week or more. Leave wet compartments open to dry. Remove drain plugs during transport.



Nativist Metaphor

ATTENTION:

STOP THE INVASION OF AQUATIC INVASIVE SPECIES

Help fight the battle against aquatic invasive species.



✓ CLEAN

Clean all plants, mud, and debris from gear and equipment. This includes all types of watercraft, waders, boots, clothing, buckets — anything that comes in contact with the water. Never move a plant or animal from one location to another.

✓ DRAIN

Drain all water from your gear and equipment. This includes all types of watercraft, buckets, and anything that comes in contact with the water.

✓ DRY

Dry watercraft, equipment, and gear for a week or more. Leave wet compartments open to dry. Remove drain plugs during transport.



Militaristic Metaphor

ATTENTION:

PROTECT YOUR WATERS

CLEAN, DRAIN, DRY.

It will cost our state (YOU) \$ millions.



✓ CLEAN

Clean all plants, mud, and debris from gear and equipment. This includes all types of watercraft, waders, boots, clothing, buckets — anything that comes in contact with the water. Never move a plant or animal from one location to another.

✓ DRAIN

Drain all water from your gear and equipment. This includes all types of watercraft, buckets, and anything that comes in contact with the water.

✓ DRY

Dry watercraft, equipment, and gear for a week or more. Leave wet compartments open to dry. Remove drain plugs during transport.

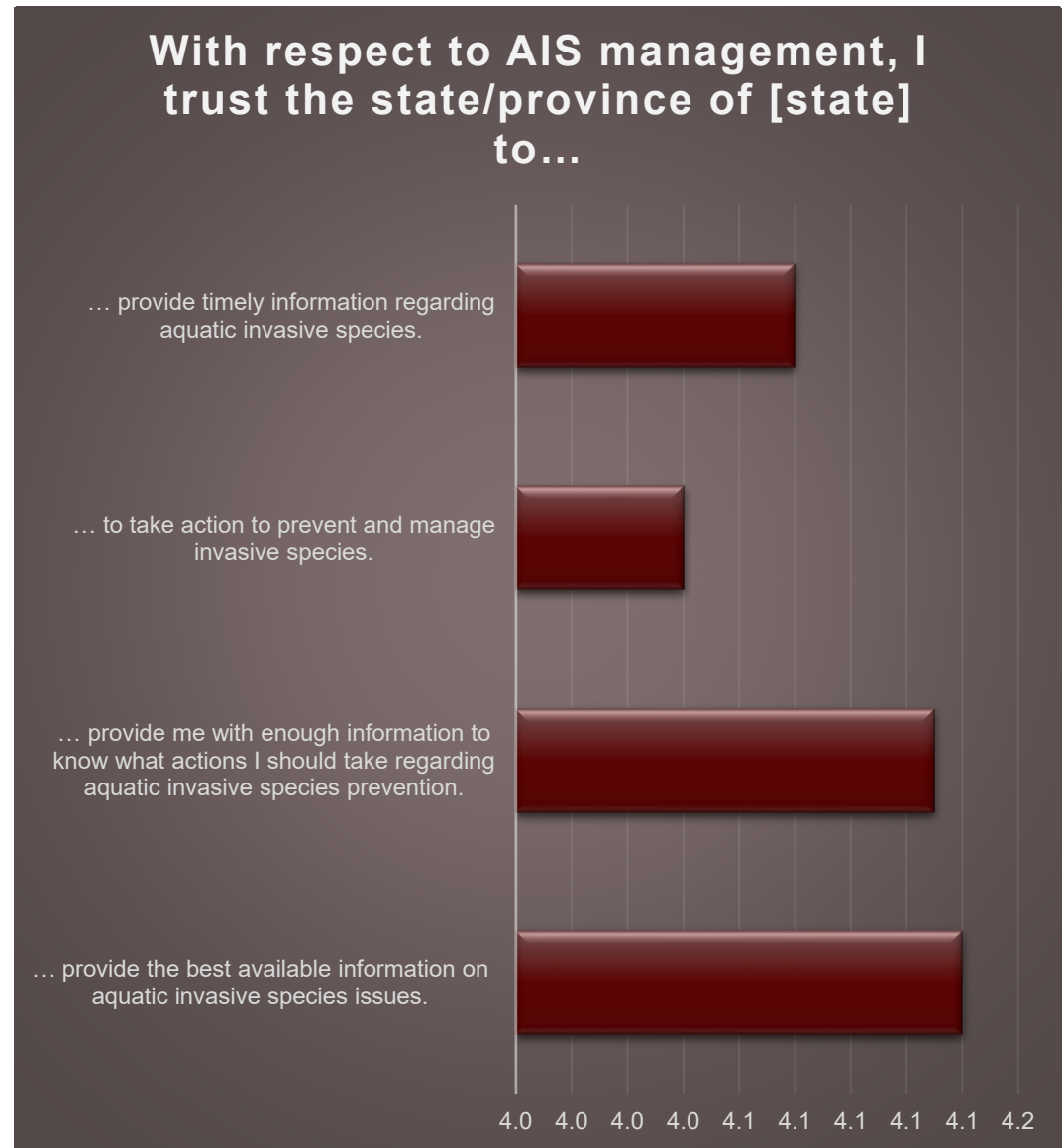


Economic Loss



Findings – Agency Trust

- Confidence in agencies' provision of AIS information and prevention... less confident in agencies' ability to prevent and manage AIS



1=Strongly disagree thru 5=Strongly agree



Recommendations

- Age associated with awareness and knowledge of AIS and Clean, Drain, Dry behavior; older boaters score higher.
 - Messaging toward a younger cohort ought to occur early in their boating careers.
 - Younger (18-25) respondents were more likely to trust conservation organizations; these can be strategic partners to amplify outreach efforts.



Recommendations

- Familiarity with AIS (prior to taking survey) linked to activity frequency (e.g., houseboat owners, tournament anglers, avid boaters). Least familiar with AIS (e.g., pontoon and sailboat owners, paddlers, hunters) reported less concern over AIS and a lower likelihood of implementing Clean, Drain, Dry.
 - Reaching infrequent boaters will be an ongoing challenge.
 - Targeted outreach needed to least familiar groups (e.g., information with hunting licenses/duck stamps)



Recommendations

- In terms of AIS information to which respondents had been previously exposed:
 - Most common sources were boat ramp kiosks, followed by the state's agency website, and then inspection station personnel. These were considered most effective for encouraging CDD.
 - Inspection personnel rated higher in states with WID programs (e.g., CA, UT, NV).
 - State's agency websites were most trusted.
 - AIS information should be easily accessible on agency websites and feature prominently.
 - Boat ramp signage should be highly visible.
 - Inspection personnel should provide information.



Recommendations

- Messaging:
 - Statistically, there was no significant variation among message treatments – all moderately effective at encouraging Clean, Drain, Dry.
 - Science messaging metaphor (factual) was the strongest performer in terms of respondents' reported effectiveness for encouraging CDD— followed by protective and ecological gain.
 - Framing the impact of AIS on aquatic ecosystems and the state's economic health is also compelling.
 - Injunctive norm message, also ranked highly, attempts to instill a personal obligation that rests on the perception of others' expectations. Boaters reported a sense of personal obligation to CDD.



Recommendations

- Respondents indicated that they almost always engaged in cleaning and draining behaviors; 25% occasionally do not. They indicated being less likely, however, to wash their boat with a pressure washer or hot water. Boaters ambivalent about whether others CDD.
- Barriers: no cleaning stations, crowding at boat ramps, others not CDD
 - The installation of cleaning stations with clear messaging kiosks would help eliminate barriers and negate the perception that few undertake CDD by providing equipment and evidence of others taking action.
 - The more boaters are seen to be engaging in these actions, the more normative the behavior becomes.



Want more information?

- WRP Education and Outreach Webpage
 - Full report
 - Survey instrument
 - Detailed presentation
 - Analyses of key survey responses (e.g., familiarity with AIS, information sources, CDD behavior, etc.) by key boating/boater demographics
 - Additional messaging analysis



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