A RISK ASSESSMENT OF RECREATIONAL BOATING TRAFFIC AND AQUATIC NUISANCE SPECIES (DREISSENID MUSSEL) INVASION TO LAKES, RIVERS AND RESERVOIRS OF THE WESTERN UNITED STATES

Technical Report

on

Research carried out under USFWS Cooperative Agreement No. 60181AG02

at the University of California Davis

from the

U.S. Fish and Wildlife Service

for the

Western Regional Panel of the Aquatic Nuisance Species Task Force

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March 1, 2012

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I. Executive Summary

Recreational boating has been established as an important source of spread of aquatic invasive species to inland water bodies. The link between boater travel patterns and the presence of aquatic nuisance species (ANS) such as dreissenid mussels has been demonstrated for aquatic systems in the Midwestern United States, New Zealand, and in Canada. The rapid invasion of dreissenid mussel species and other ANS to freshwater systems in U.S. has prompted a public outreach and data collection efforts on behalf of the U.S. Fish and Wildlife Service's 100th Meridian Initiative program. This program addresses the spread of aquatic invasive species to inland freshwater bodies in the U.S. Western region. A major part of this effort is the widespread administration of recreational boater interviews to gather information that identifies origination points and destinations of boaters across the Western U.S. Since 2000, there have been over 23,000 interviews collected from the Western region. We have used this database to identify major sources and potential receptors of dreissenid mussel invasions. In addition, we assessed the spatial distribution of the sample (i.e., interview) collection sites, the amount of out-of-state trailered recreational boating per state, and the relationship between current dreissenid mussel distribution in the western region and the estimate of boater travel to those locations as indicated by the 100th Meridian Initiative Recreational Boating database. We have found that the spatial distribution of boater interview sites are highly heterogeneous, which can bias risk assessment of the western region as a whole. To address this, we present results with respect to interview site locations, boater destinations and out of state visitation on a state by state basis. With respect to current dreissenid mussel distribution and the 100th Meridian Initiative database, a number of states (Arizona, New Mexico, Texas and Utah) have significant undersampling of the boating population. To address this we present only relative values of boater visitation and strongly recommend further data collection within these regions to better identify risk presented by boater movement to these regions. The 100th Meridian database is the richest collection of data with respect to recreational boater movement. States such as California, Kansas, Nebraska, South Dakota, and North Dakota are well represented in

the database providing a list of waterways to monitor and an accurate correlation of risk with respect to current dreissenid mussel distribution for these regions.

In short, the three main recommendations for improving the 100th Meridian Recreational Boater database include:

1. Greater distribution of interview locations across the western region in order to increase the number of waterways represented, but also the ability to estimate the magnitude of the connectivity between them

2. Greater representation of interviews from water bodies and states in the southwestern region. Here are sites that have high density infestations of dreissenid mussels, knowledge of the boating behavior to and from these locations will greatly assist in the reduction of spread from these locations.

3. The ability for increased use and visualization of the 100th Meridian Initiative Recreational Boater database by scientists and managers to understand the change in connectivity with a water body of interest and the rest of the aquatic landscape and its invasive pattern. This may aid in annual decision making in terms of the amount of resource utilized to protect or quarantine particular locations.

II. Introduction and background

Humans play a critical role in the dispersal of aquatic nuisance species (ANS) and are a major vector in the overland transmission of quagga and zebra mussels to the western United States (Johnstone et al. 1985, Padilla et al. 1996, Johnson et al. 2001, Leung et al. 2006). Where these species have established in North America, they have dominated aquatic ecosystems, incurred high economic costs for water conveyance systems, impacted recreational opportunities, and have no known large scale eradication strategy. The Western U.S. contains some of the largest and most recreationally utilized lakes, rivers and reservoirs in the United States. These waterways attract millions of visitor days by boaters not only from within the region, but all over the U.S. and are currently experiencing increasing numbers of non-native species introductions. In particular, the establishment of dreissenid mussel species poses a threat to these western waterways. Because many aquatic species can become entrained on boats or boating equipment, transient recreational boating has often been used as an estimate of invasion pressure to inland freshwater bodies, and used to predict prior and future species invasions (MacIssac et al. 2004, Leung et al. 2006). As there are few control and no eradication strategies for dreissenid mussel species, the prevention of their introduction is the only known tactic to avoid their costly impacts. Through the prevention of nuisance species introductions to lakes and reservoirs, important agricultural, municipal and recreational resources such as aqueducts, irrigation canals, lakes, rivers, reservoirs and ponds can continue to provide utility while minimizing long-term control costs of these species.

A. 100th Meridian Initiative Recreational Boater Database

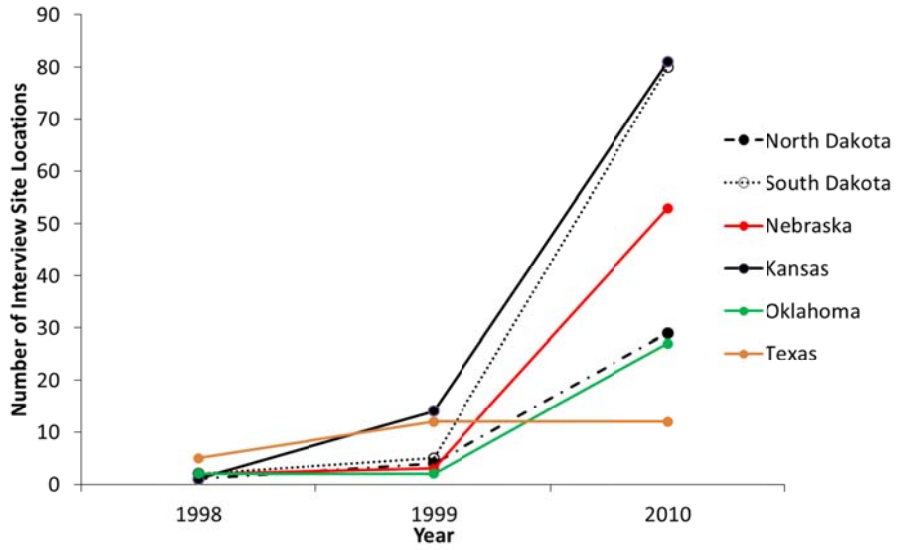
The federal government has a history of devoting significant resources to managing nonindigenous species that are agricultural pests and preventing the introduction of new ones, but the intent and allocation of resources that impact natural systems was sparse until the 1990's. The Office of Technology Assessment (OTA) 1993 overview of harmful ANS in the U.S. concluded that the federal framework to addressed ANS at the time was patchwork and not

designed to address the NAS problems facing the US. The federal government acknowledged the need for a comprehensive national ANS policy and passed the National Aquatic Nuisance Prevention and Control Act (P.L. 101-646) in 1990 and the National Invasive Species Act (P.L. 104-332) in 1996. Through these acts, the Aquatic Nuisance Species Task Force was created which was co-chaired by the National Oceanic and Atmospheric Association (NOAA) and the US Fish and Wildlife Service (USFWS). The ANS Task force formed the Western Regional Panel (WRP) on Aquatic Nuisance Species in 1997 to help limit the introduction, spread and impacts of Dreissenid mussels and other aquatic nuisance species into the western region (i.e., west of the 100th Meridian). To achieve these goals, the WRP formed the 100th Meridian Initiative which was a multi-agency partnership among the states and provinces along the 100th Meridian. The 100th Meridian Initiative was to address seven components aimed at slowing or preventing the spread of ANS: 1) information and education, 2) voluntary boat inspections and boater surveys, 3) commercially hauled boats, 4) monitoring, 5) rapid response, 6) identification and risk assessment of additional pathways and 7) evaluation.

This report assesses the results from component 2, by summarizing results of recreational boater interviews. As part of the interview process, recreational boaters were approached while entering or exiting a water body and sampled for information specific to boating site, boater demographic, knowledge/action, destination and inspection results (Appendix I). The Center for Biological Macrofouling Research at the University of Texas at Arlington became the 100th Meridian Recreational Boating Database (hereafter “the database”) manager and began collecting the first interviews for this project in 1998 – 1999 in the 100th Meridian States (TX, OK, KS, NE, SD). The first report of these data was prepared as a technical report (Buch and McMahon 2001) and later published in the peer-reviewed literature (Britton and McMahon 2005).

The 100th Meridian Initiative recreational boater program and database has grown substantially since its inception in 1998. Between 1998 and 2010, the number of interview site locations in the original 100th Meridian states contributing to the database has increased from 2 – 80 times

the number of sites in some states, indicating a continuously growing rate of contribution (Figure 1). Since this time, most western region states have contributed to the database and at present there are over 23,000 interviews recorded.



- Figure 1. 100th Meridian states have greatly improved the number of interview locations from program inception period to present: 2 to 80 times increase in some states

With the continued spread of Dreissenid mussels to western regions, the 100th Meridian Initiative program continues to develop with participation from academic, state, federal and general public stakeholders. Researchers at the University of Nevada Las Vegas used three survey formats (contact, mail-in, and trailer counts) as generated by the 100th Meridian Initiative to test whether boater awareness to ANS in the southwestern region has change since the establishment of dreissenid mussels in Lake Mead National Recreation Area (LMNRA) (Mueting and Gerstenberger 2011). In response to mussel invasion in LMNRA and other western locations, most states have adopted some form of watercraft screening or inspection (interception) program to go along with public outreach and education and early detection programs. Most of these programs are based on the Watercraft Inspection and Decontamination Training (WIT) programs that have been offered by the Pacific States Marine Fisheries Commission (PSMFC) and its partners, including the Western Regional Panel, throughout the western United States since 2007 (Zook and Phillips 2009).

B. Study objectives

The purpose of this study is to identify the highest risk waterways for ANS introduction in the U.S. Western region (west of the 100th Meridian) by examining the USFWS 100th Meridian Initiative recreational boater interview database. The specific objectives are as follows:

1) To identify the most intensively recreationally utilized and thus highest at-risk waterways for all ANS in the U.S. Western region (west of 100th Meridian to coastal states) based on the USFWS 100th Meridian Initiative recreational boater surveys. Additionally, to present the boater originations for these regions, and the rate of out of state visitation, on a state by state basis to identify regions at risk for long distance dispersal.

2) To present the relationship between current dreissenid mussel establishment in the western region and the magnitude of recreational boater visitation to these locations.

3) To identify data gaps in sample collection in order to make recommendations with which to increase the efficacy and accuracy of future risk assessment using the 100th Meridian Recreational boating database.

III. Methodology

All results presented herein have been assessed using the 100th Meridian Initiative Recreational Boater database which is fully accessible at http://www.100thmeridian.org. The database was queried August 2011 and so any data added after that time was not included in this report. The database includes recreational boater survey data collected from sites in the western region of the United States and parts of Canada. Interview collection methodology for the 100th Meridian Initiative database is summarized at http://www.100thmeridian.org. The format for the questionnaire is presented in Appendix I and all interview information in the database is based on this questionnaire or a similar format. The geographic boundaries of the sample (i.e.,

interview) collection region included 17 states of the continental US west of the 100th Meridian: North Dakota (ND), South Dakota (SD), Nebraska (NE), Kansas (KS), Oklahoma (OK), Texas (TX), New Mexico (NM), Colorado (CO), Wyoming (WY), Montana (MT), Idaho (ID), Utah (UT), Arizona (AZ), Nevada (NV), California (CA), Oregon (OR), and Washington (WA).

The 100th Meridian Initiative Database contains three tables: the State Information Table (*StateInfo*'), Survey Data Table ('*SurveyData*'), and the Destinations Data Table ('*Destinations*'). '*StateInfo'* contains 69 state and provinces in the United States and Canada, an ID number assigned to each state and province, the abbreviation used for each state and province, and comments whether a state or province has any known cases of dreissenid mussels. '*SurveyData*' contains the majority of responses from the boat surveys with most common fields including the assigned *ID* number, the *Interview State*, *Date*, and *Time*; the *Waterbody* where the Interview took place; the *Launch Site* where the Interview took place (also referred to as the *Interview Site*); and the *Home State* and *Zip Code* of the Boater. All fields used in the '*SurveyData'* Table of the Database are listed in Appendix II. '*Destinations*' contains the names of all waterbodies boaters had been to or were planning on going to for recreation and includes the date of the visit, and the state and the county of the waterbodies. '*Destinations'* Table fields use herein included: the *Main Record ID*, the Destinations *Waterbody*, the Destinations *State*, the Destinations *County*, the *Date* that the boating occurred, and whether the Boater's had *Been* to a Destination or were *Going (BORG)*.

The '*SurveyData'* Table ('*SurveyData')* was used to create the individual state queries. Random records were compared from the filtered queried data with the original records before and after exporting the data from Access to Excel to ensure quality control. All record that did not have a zip code or waterbody associated with it were excluded from the analysis. In addition to deleting incomplete records, other records were cleaned by correcting spelling errors, selecting and using one common name for '*Waterbody*' and '*launchsites /interviewsites*' with multiple names or spelling, and filling in any obvious missing data such as a state abbreviation. Google Earth (Google Earth, 2010) and individual state boating sites (i.e. NRCS or

Fish and Game), and the US Gazetteer for each state were all used to check and validate the names, site locations, states, and counties of the '*Waterbodies*' and the '*Launchsites*/ *Interviewsites*' in '*SurveyData'* and *'Destinations'*.

Once data were cleaned the following database queries were carried out to perform the following analysis and synthesis: (1) The number of interviews collected per state, (2) the number of interviews collected per site, (3) the origination zip codes for each boater, per western region, (4) the origination zip codes for each boater, per state, (5) waterway destinations per boater, by western region, (6) waterway destinations per boater, by state (all destinations were calculated from the "been or going to" field from the database, using the "been to" rather than "going to" entries, (7) indicated boater visitation (i.e., destinations as queries by the "been to" category and the most recent record of dreissenid mussel distribution in the western U.S. (USGS NAS database, Accessed 2011).

All results are presented either graphically through maps created using a GIS or in tabular form in Appendix II. To create origination and interview maps waterbody names from the database were matched to names in the Geographic Names Information System (GNIS). Because exact matches are required, alternative name formulations for water bodies that were not initially matched. For example, if "Alamo Lake" did not return a match, the GNIS database was searched for "Lake Alamo" or "Alamo Reservoir" and obviously misspelled names were corrected. Each entry in the GNIS database is georeferenced and has an associated xy coordinate that represents the centroid of the water body; xy coordinates of matched water bodies were converted to point features in ArcGIS.

IV. Results

The '*Total Number of Interviews'* for all of the States was 13,001 records. '*SurveyData*' contained 22,711 records, and '*Destinations*' contained 47,038 records. Of these records, 9,710

'*SurveyData*' records did not have an origination zip code associated with the individual record making this 38, 328.

The total number of interviews for all states was 13,001 records with a total of 47,038 records indicated in the "been to" or "going to" field. Of these records, 9,710 did not have an origination zip code associated with the original record. In addition, because only the first- and second-most recent "been to" locations were considered, there were a total of 15,122 visits recorded to previous waterbodies. The following results are presented in the following order: Summary of the western region as a whole, then the presentation of results on a state by state basis, and finally a presentation of the of the 100th Meridian database visitation information in relation to the current known established populations of dreissenid mussels in the western region.

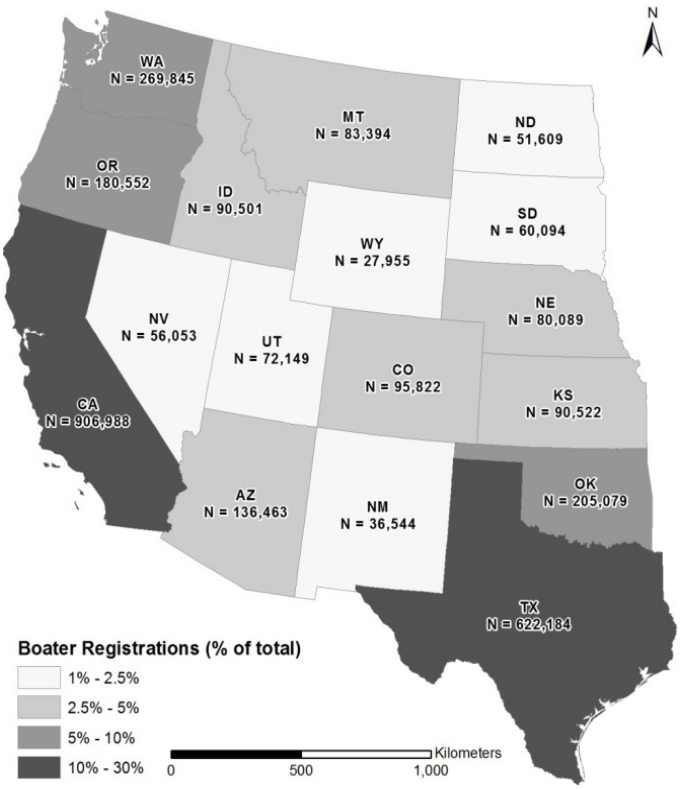
A. Western Region (All)

In order to understand whether a representative population of boaters was sampled through the inspection and interview process, we first present the spatial distribution of recreational boat vessel registrations (NMMA 2010) in the western region and its relationship to the number of recreational boating interviews collected as part of the 100th Meridian Initiative program (Figure 2). The greatest number of vessel registrations in the western region is from California (N = 906,988) and Texas (N = 622,184), which is likely a function of the extensive marine coastal shore line and boating activities associated with this. The fewest number of vessel registrations are found Wyoming (N = 27,955), New Mexico (N = 36,544), Nevada (N = 56,053), North Dakota (N = 51,609), South Dakota (N = 60,094) and Utah (N = 72, 149). Because the number of vessel registrations per state is an indicator of the recreational boating population (Bossenbroek et al. 2001) the number of recreational boater interviews conducted should correlate with registrations.

The spatial distribution of interviews collected from 1998 - 2010 varies widely by state and is not correlated with the number of vessel registrations (Figure 2, Figure 3). The Pearson's product-moment correlation between recreational boater interviews and vessel registration by

state is -0.016 (±0.484) (t = -0.062, df = 15, p-value = 0.95) indicating no relationship between the two variables. To looking at this at a finer resolution, Figure 4 shows the number of 100th Meridian Initiative interviews by water body or roadside location.

Vessel Registrations, Western Region, 2010



Number of interviews, Western Region, 2001-2010

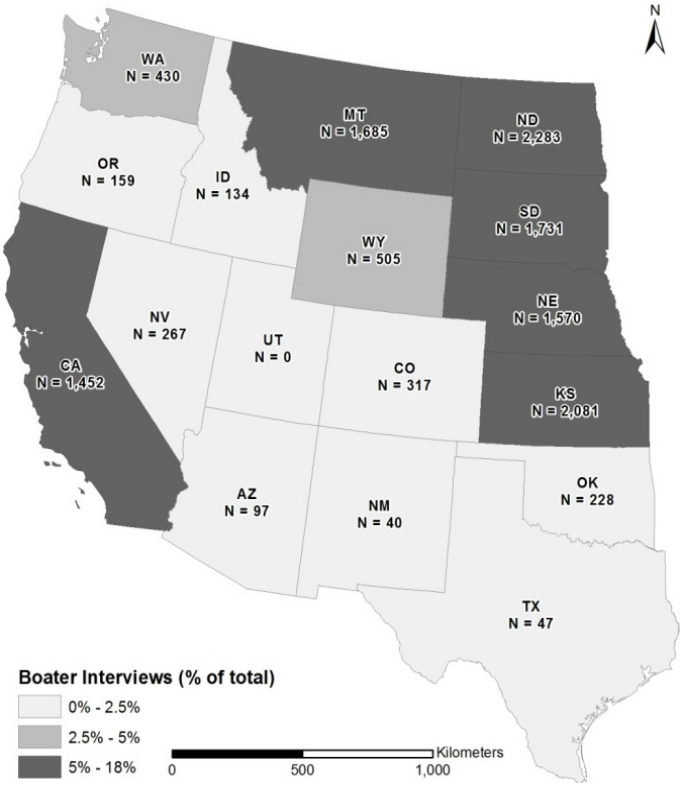


Figure 2. Recreational boating registrations (left panel) and number of recreational boater interviews collected (right panel) by state in the Western region.

Most interviews were and continue to be conducted in the northern and northeastern portion of the western region, which can contribute to error in the estimation of risk of introduction at the western regional scale. Of the top ten waterways indicated in this study as having the greatest visitation (over the entire western region), 6 of these are from this region (Table 1), and those waterways that currently have the greatest numbers of boater visitation and established mussel populations (i.e., Lake Mead, Lake Havasu) are not represented in this database in even the top 100 used waterways by visitation frequency (Appendix III).

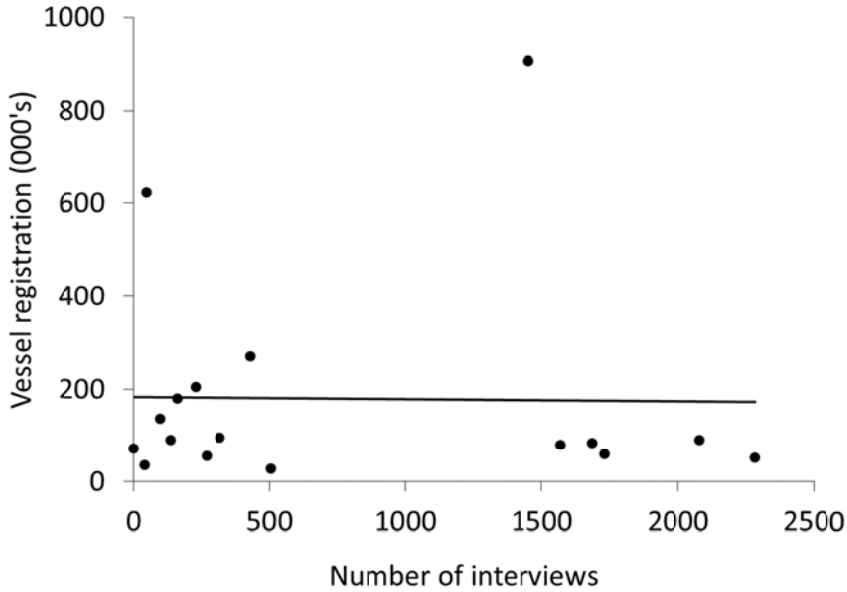


Figure 3. Relationship between the number of interviews conducted in the 100th Meridian Initiative recreational boater survey program and the number of recreational vessel registrations (NMMA 2010) by state. The two variables indicate little correlation with a Pearson's product-moment correlation: -0.016 (±0.484), t = -0.062, df = 15, p-value = 0.95.

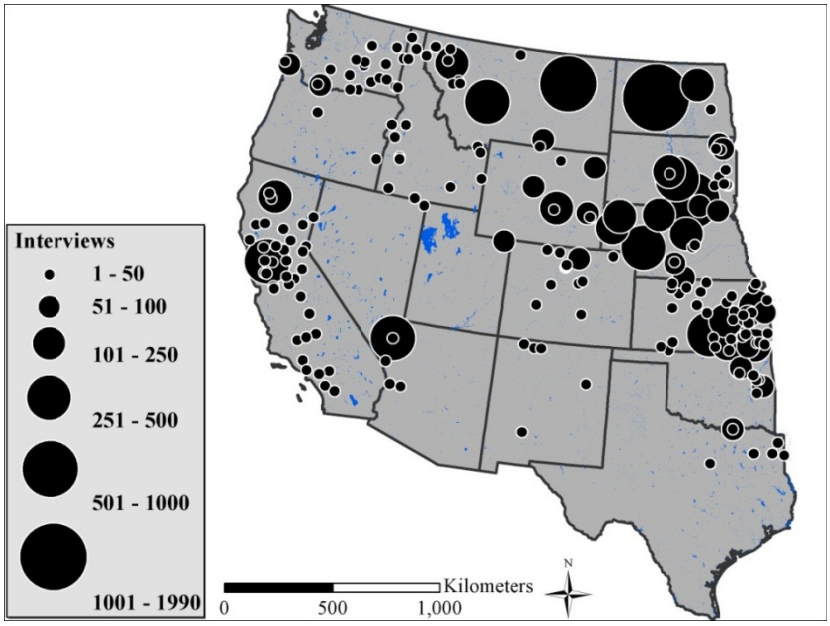


Figure 4. 100th Meridian database western region interview location sites (by water body).

Because the 100th Meridian Initiative recreational boater survey collects some demographic information specific to each boater, we were able to show the spatial distribution of boater origins, represented by the number of interviewees' home county (Figure 5). As expected there is a high correlation between the distribution of interview sites and the counties of origination, with most recreational boaters originating from counties that are in proximity to high volume interview sites such as the Sacramento-San Joaquin Delta in California, and the number of waterways in North Dakota, South Dakota and Kansas.

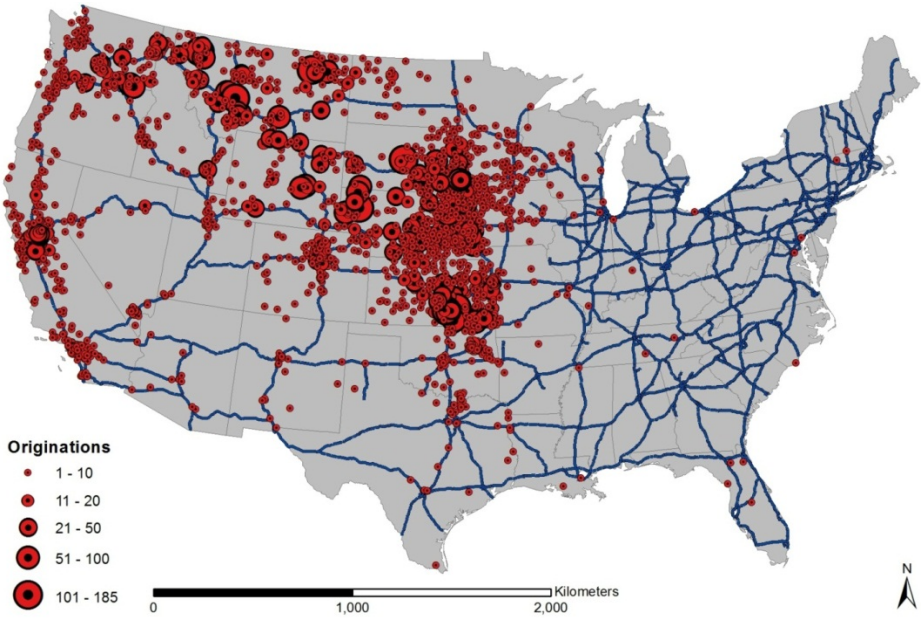


Figure 5. Recreational boater originations (home county based on zip code) in the western region (2001 – 2010).

The database does indicate, however, that there are a number of trailered vessels with origination points east of the 100th meridian that are travelling to waterways west of the 100th meridian (Figure 5), indicating the presence of the opportunity of risk for long distance dispersal of ANS such as the northern snakehead, dreissenid mussels, round goby, Eurasian ruffe and others that are that are established in the Great Lakes ecosystem, New England and Florida.

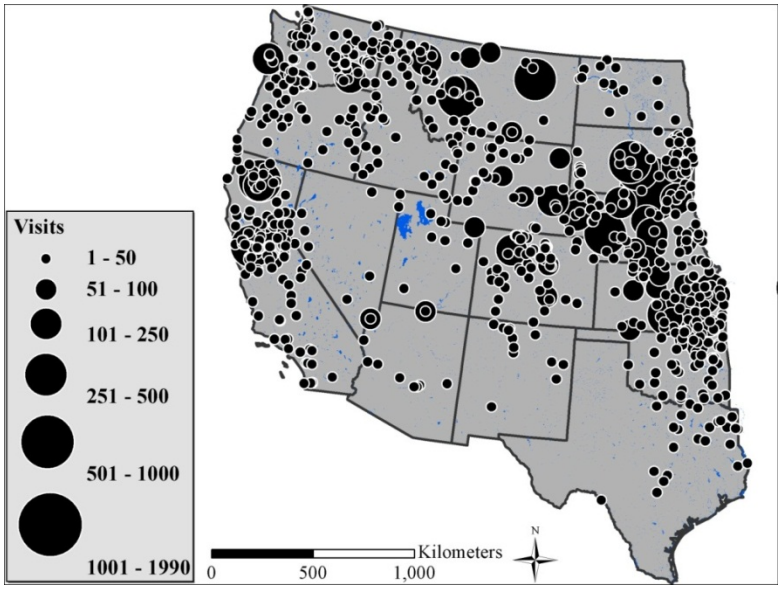


Figure 6. Recreational boater waterway destinations in the western region (2001 - 2010).

In order to represent the distribution of recreational boater destinations in the western region (Figure 6), the location of the boater's previous destination (BORG, Appendix I) was used to reduce site bias presented by the unbalanced sampling scheme (i.e., large numbers of interviews being conducted at a single site, representing an entire region). While the spatial distribution of inland waterways used is highly correlated with interview locations, there is a wider distribution of locations which serves as an indicator of visitation from vessels that have the ability to visit other locations. So, while estimating relative risk of waterbodies in the western region is not possible given the site bias, the database still allows for the estimation of waterbodies that are at some level of risk merely because of the potential for visitation. However, these maps **should not be used to interpret absolute risk of invasion or introduction because of errors in sampling bias.**

The top ten visited inland waterways as indicated by the 100th Meridian Initiative survey are shown in Table 1. As mentioned above, the top waterway represented is Lake Francis Case in South Dakota with 1069 visitations indicated (Appendix III), which is also the top visited waterbody as represented in the 2003 summary of the survey (Britton and McMahon 2005). The next five waterways represented are all from the eastern and northeastern portion of the

western region, with the Missouri River (NE), El Dorado Lake (KS), Fort Peck Reservoir (MT), Lake Sharpe (SD) and Canyon Ferry Reservoir (MT) making up the top six visited waterways. The Sacramento-San Joaquin Delta was indicated as the 7th most used waterway, which is a function of the high numbers of interviews conducted in California, and specifically in the Delta. For a full listing of the visitation to each waterway as indicated by the database, see Appendix III.

Table 1. Top visited inland waterways in the western region, 2003 and 2010.

Rank	2003*	2010
1	Lake Francis Case (SD)	Lake Francis Case (SD)
2	Cheney Reservoir (KS)	Missouri River (NE)
3	El Dorado Lake (KS)	El Dorado Lake (KS)
4	Table Rock Lake (MO)	Fort Peck Reservoir (MT)
5	Winfield City Lake (KS)	Lake Sharpe (SD)
6	Lake Fork Reservoir (TX)	Canyon Ferry Reservoir (MT)
7	Grand Lake O' the Cherokees (OK)	Sacramento San Joaquin Delta (CA)
8	Lake Oahe (SD)	Lake McConaughy (NE)
9	Lewis and Clark Lake (SD)	Lake Oahe (SD)
10	Keystone Lake (OK)	Cheney Reservoir (KS)

* As summarized by Britton and McMahon, 2005

B. Western Region (By State)

Because of the sampling bias presented herein, a quantitative risk assessment of the entire western region using the 100th Meridian Initiative boater database is not feasible. The following section presents the following three maps for each state in the lower western region (N = 17): with indication of interview site location (i.e. the number of interviews conducted specific to the state), visitation to waterways within the state, and the amount of trailered visitation from out of state with indication of each state. Again, these results **are not to be interpreted as the absolute representation of risk as the spatial distribution of samples do not provide the basis for a thorough risk assessment.** These data are intended to indicate: (1) site bias for interview

location and data gaps with respect to the abundance of interviews (2) to identify waterbodies that have any visitation by trailered vessels, and (3) the origins of out of state visitation by each state. Values associated with visitation statistics are listed in tabular form in Appendix III.

States with the lowest number of interviews recorded included Arizona (N = 97), New Mexico (N = 40), Texas (N = 47), and Utah (N = 0). As a result of the number of low interviews recorded, the amount of visitation represented to each state is also low, and also influenced with a heavy spatial bias given the location of the interviews conducted. For these states, the results presented in Figures 7 through Figure 57 should not be interpreted as an absolute representation of risk for the state, but rather an indication of which waterways have been visited by trailered recreational boats and also which regions should be sampled more frequently to represent an accurate measure of risk. A number of states contained a moderate number of samples including Colorado (N = 317), Idaho (N = 134), Nevada (N = 267), Oklahoma (N = 228), Oregon (N = 159), Washington (N = 430), and Wyoming (N = 505). For these states, the spatial distribution of interview sites had a great impact on the distribution of destination water bodies indicated by interviewees. However, as a result of the increased number of interviews submitted from these moderate states, a greater number of water bodies that received trailered boating traffic and relative magnitudes of propagule pressure were more accurately represented. Finally, a number of states were categorized as having a high number of interviews collected, providing for the most accurate risk assessments due to the increase in sample size and in some cases, the spatial distribution of the interview sites. These states included California (N = 1452), Kansas (N = 2081), Montana (N = 1685), Nebraska (N = 1570), North Dakota (N = 2283), and South Dakota (N = 1731).

The following section presents all data associated with the low, moderate and high sample size states, representing the frequency and location of interview sites, the visits (destinations) to water bodies, and the amount of out of state visitation per state. Tabular form of these data are included in Appendix III. **States with low sample sizes should not be considered as an accurate risk assessment.**

1. Arizona

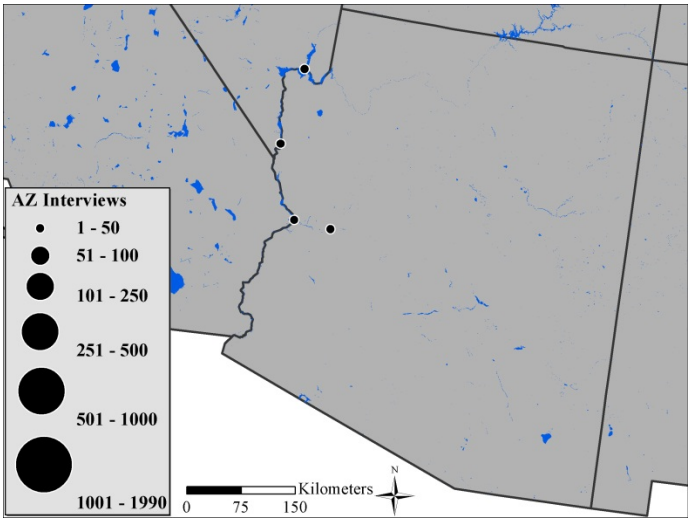


Figure 7. 100th Meridian interview locations in Arizona, N = 97 interviews collected.

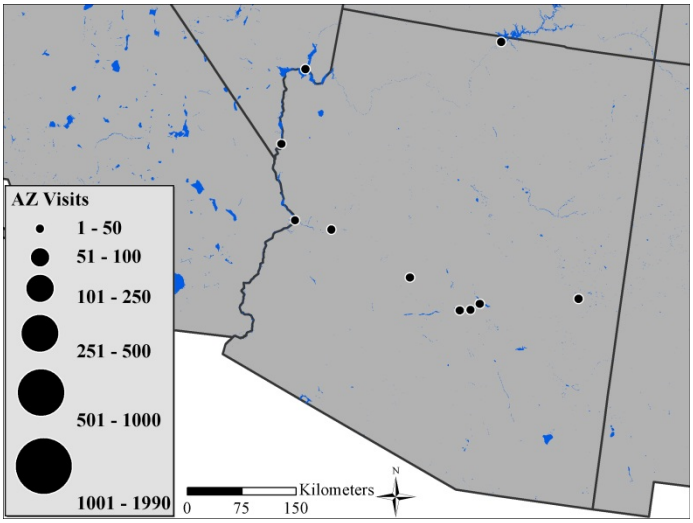


Figure 8 Visits (N = 81) to Arizona waterbodies as indicated by the 100th Meridian boater database

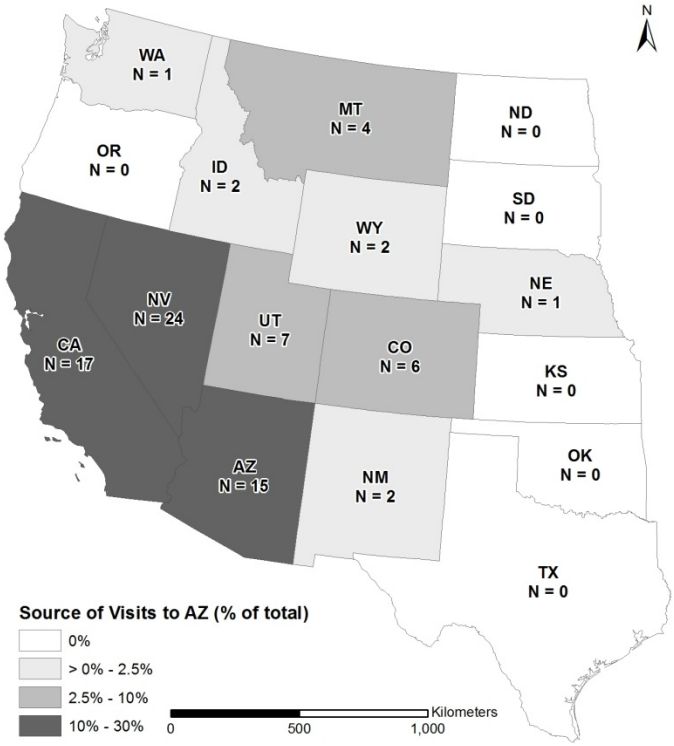


Figure 9. State originations of Arizona recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in Arizona

2. California

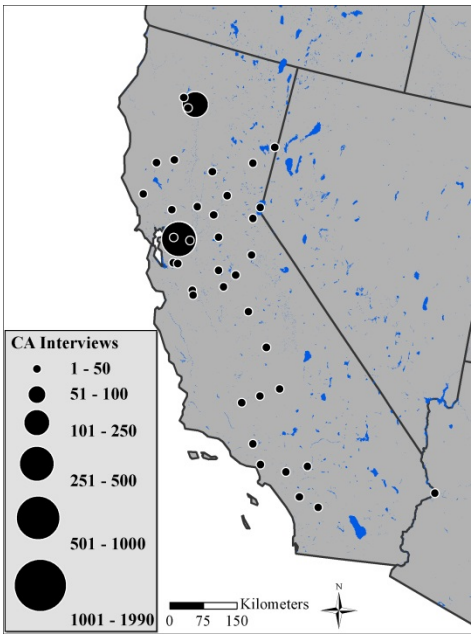


Figure 10. 100th Meridian interview locations in California, N = 1452 interviews collected.

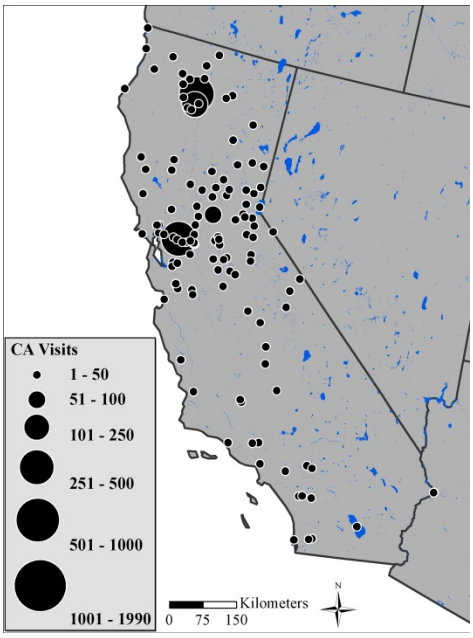


Figure 11. Visits (N= 1656) to California waterbodies as indicated by the 100th Meridian boater database

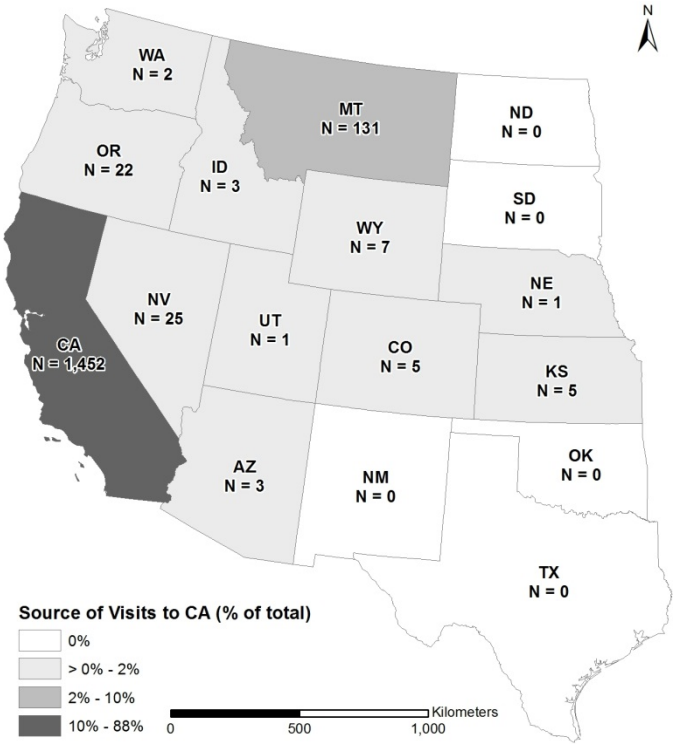


Figure 12. State originations of California recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in California

3. Colorado

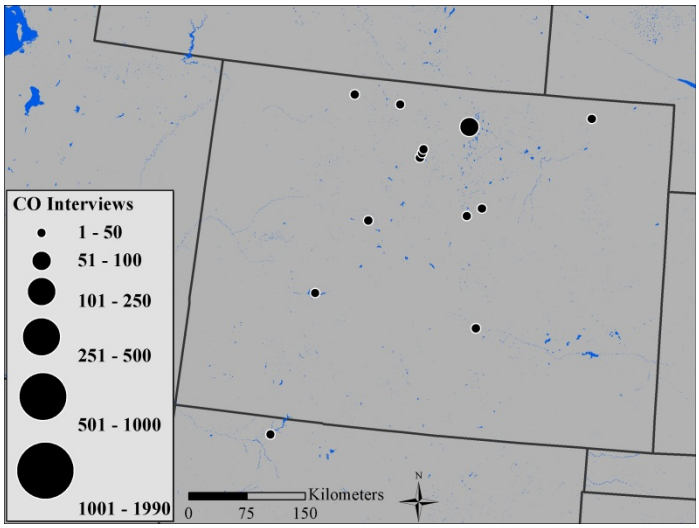


Figure 13. 100th Meridian interview locations in Colorado, N = 317 interviews collected.

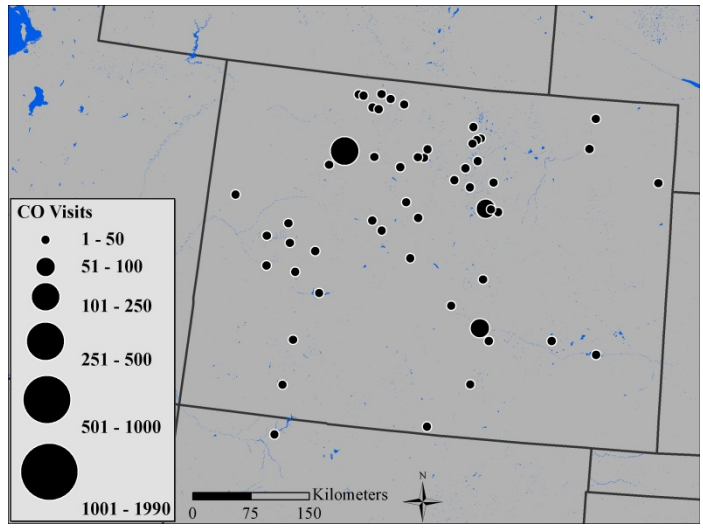


Figure 14. Visits (N = 671) to Colorado waterbodies as indicated by the 100th Meridian boater database

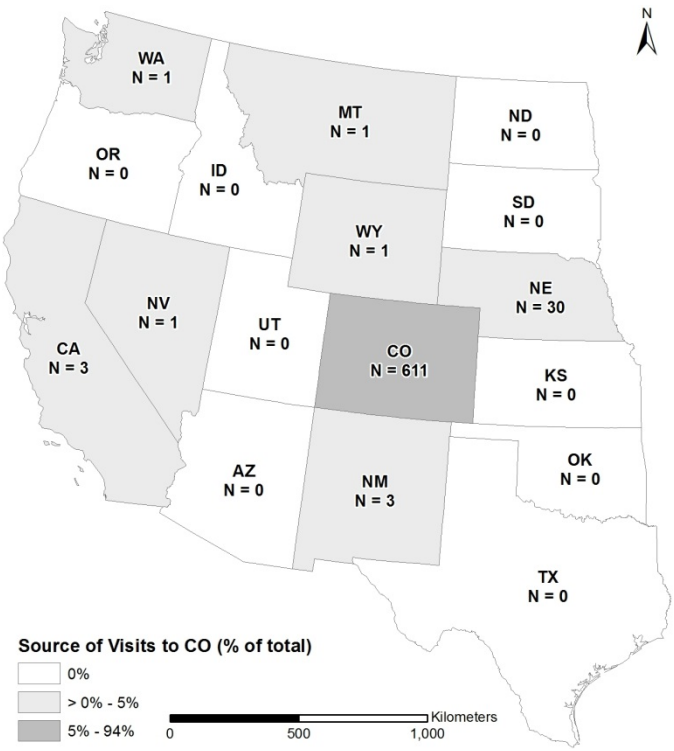


Figure 15. State originations of Colorado recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in Colorado

4. Idaho

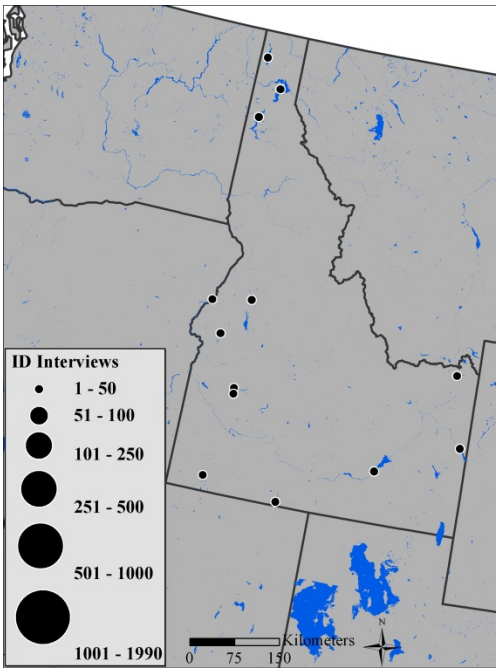


Figure 16. 100th Meridian interview locations in Idaho, N = 134 interviews collected.

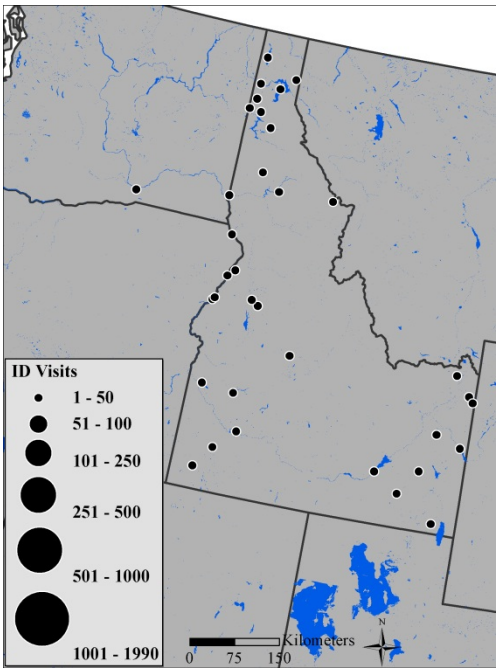


Figure 17. Visits (N = 191) to Idaho waterbodies as indicated by the 100th Meridian boater database.

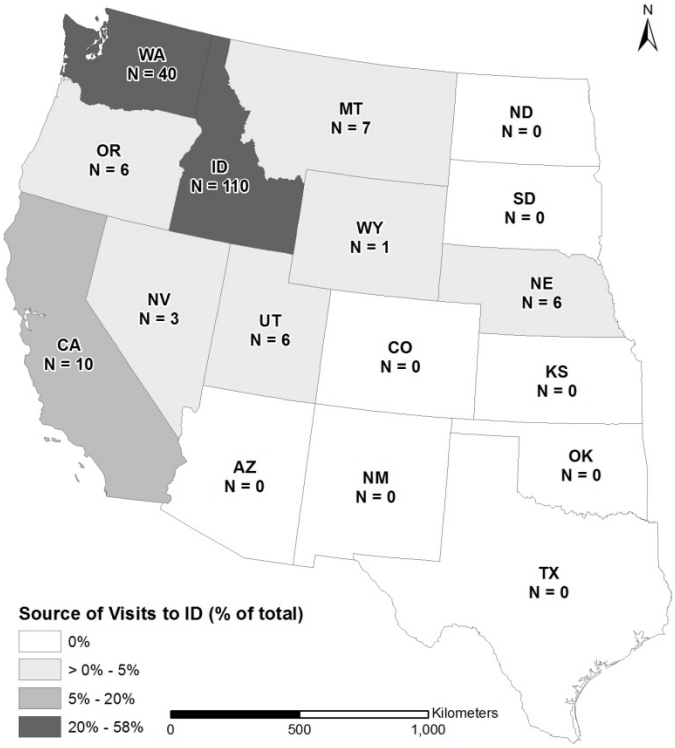


Figure 18. State originations of Idaho recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in Idaho

5. Kansas

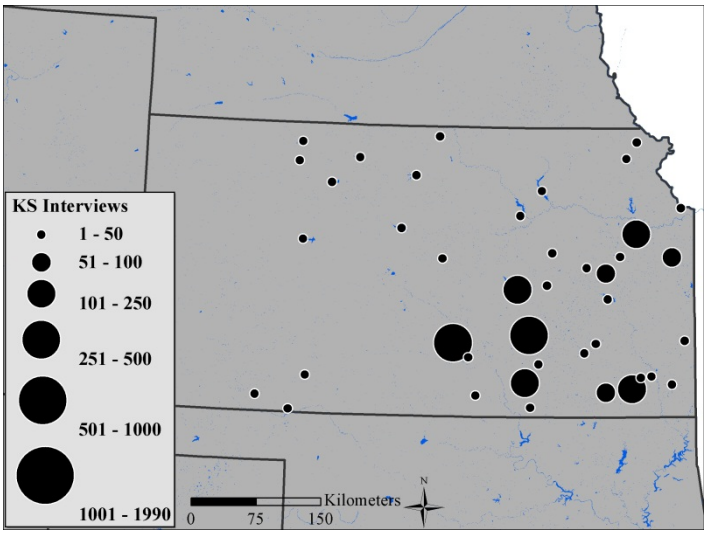


Figure 19. 100th Meridian interview locations in Kansas, N = 2081 interviews collected.

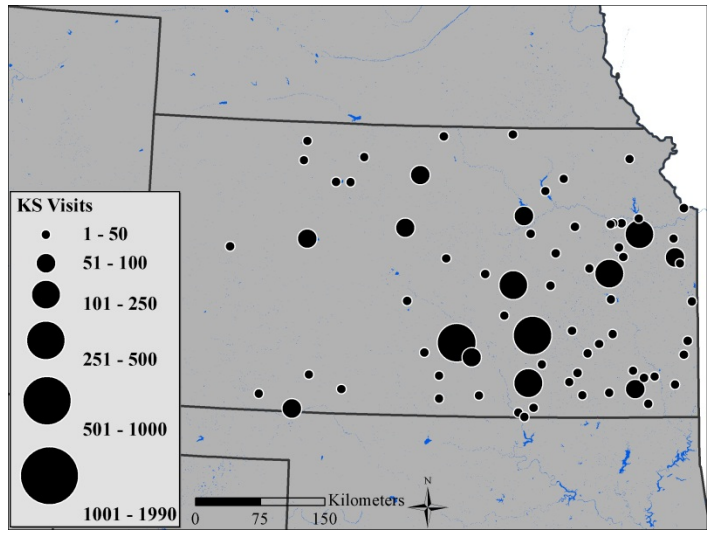


Figure 20. Visits (N = 2778) to Kansas waterbodies as indicated by the 100th Meridian boater database.

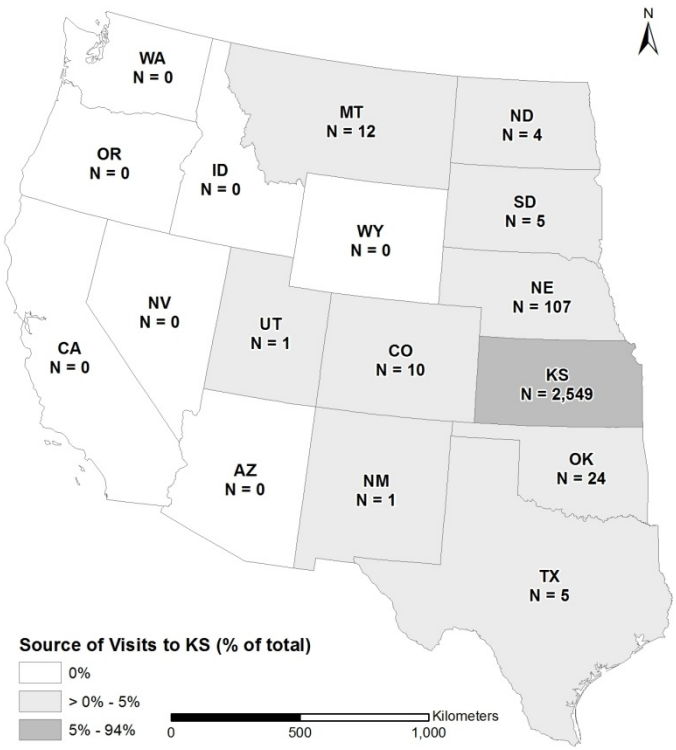


Figure 21. State originations of Kansas recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in Kansas

6. Montana

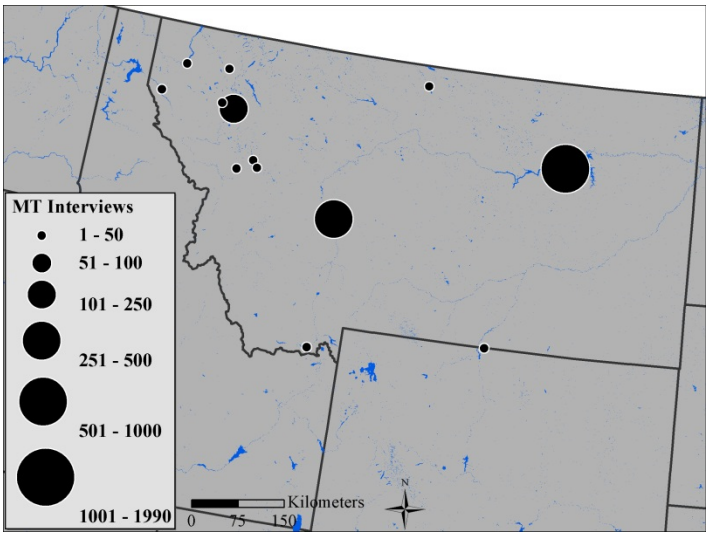


Figure 22. 100th Meridian interview locations in Montana, N = 1685 interviews collected.

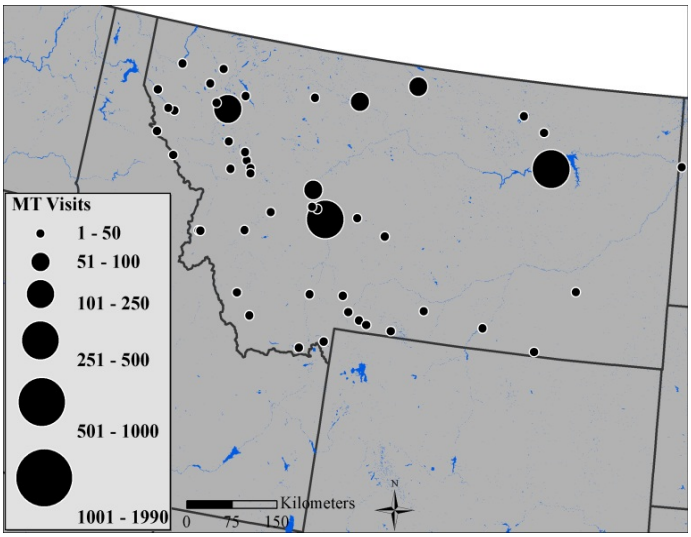


Figure 23. Visits (N = 1746) to Montana waterbodies as indicated by the 100th Meridian boater database.

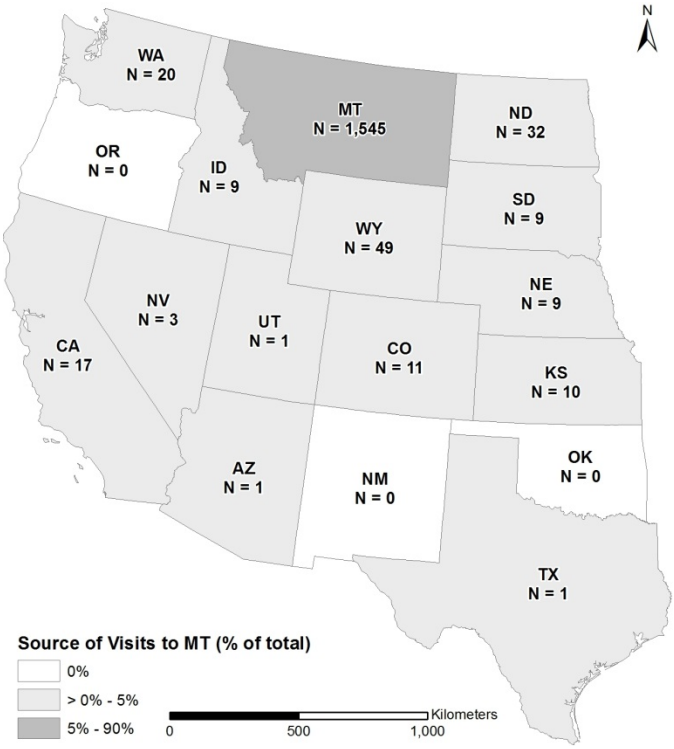


Figure 24. State originations of Montana recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in Montana

7. Nebraska

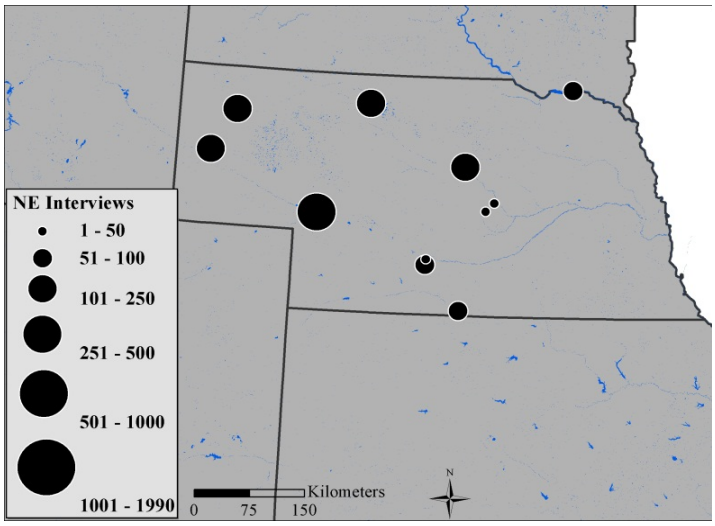


Figure 25. 100th Meridian interview locations in Nebraska, N = 1570 interviews collected.

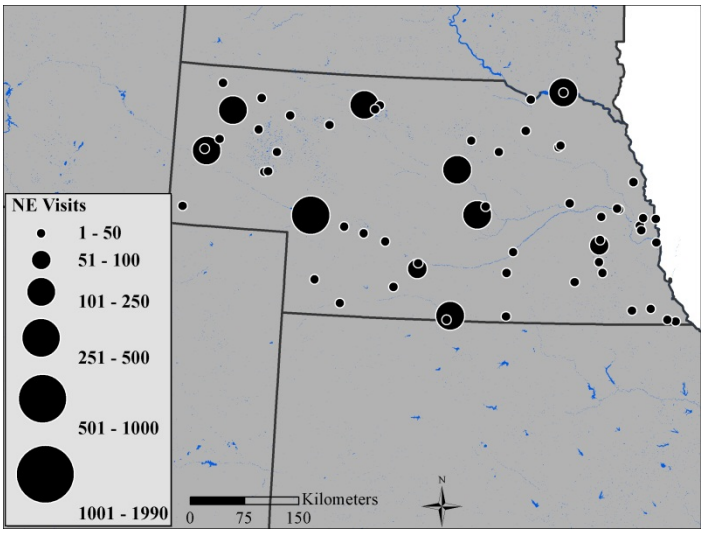


Figure 26. Visits (N = 2407) to Nebraska waterbodies as indicated by the 100th Meridian boater database

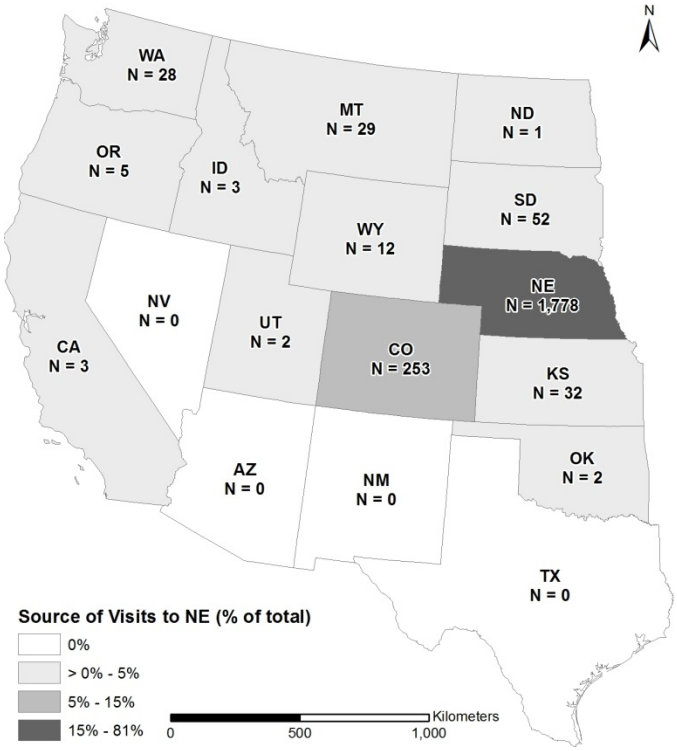


Figure 27. State originations of Nebraska recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in Nebraska

8. Nevada

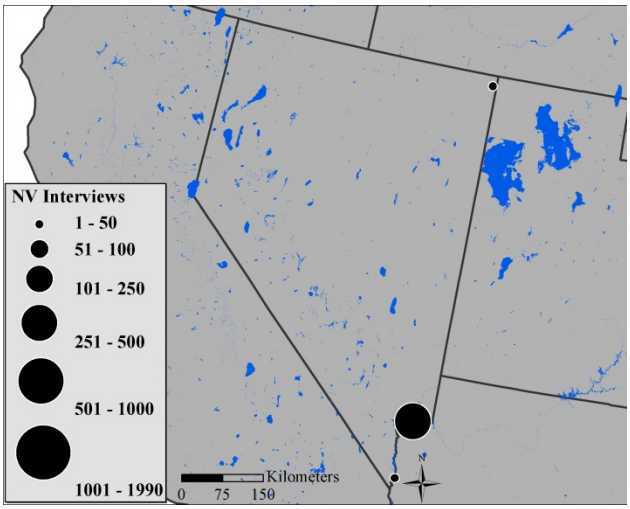


Figure 28. 100th Meridian interview locations in Nevada, N = 267 interviews collected.

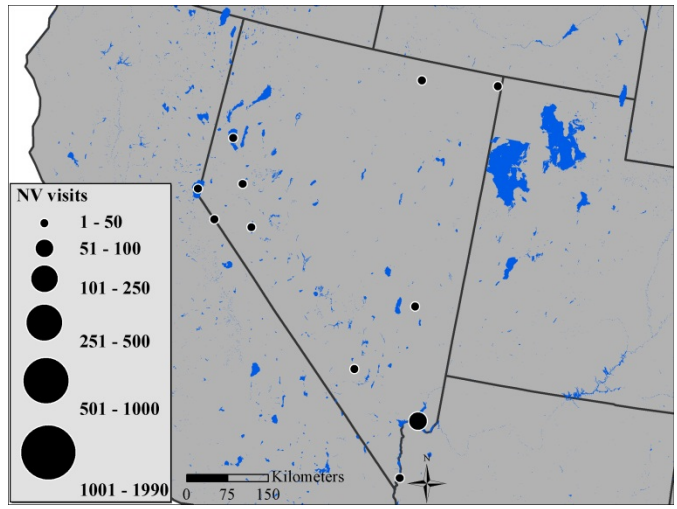


Figure 29. Visits (N = 123) to Nevada waterbodies as indicated by the 100th Meridian boater database

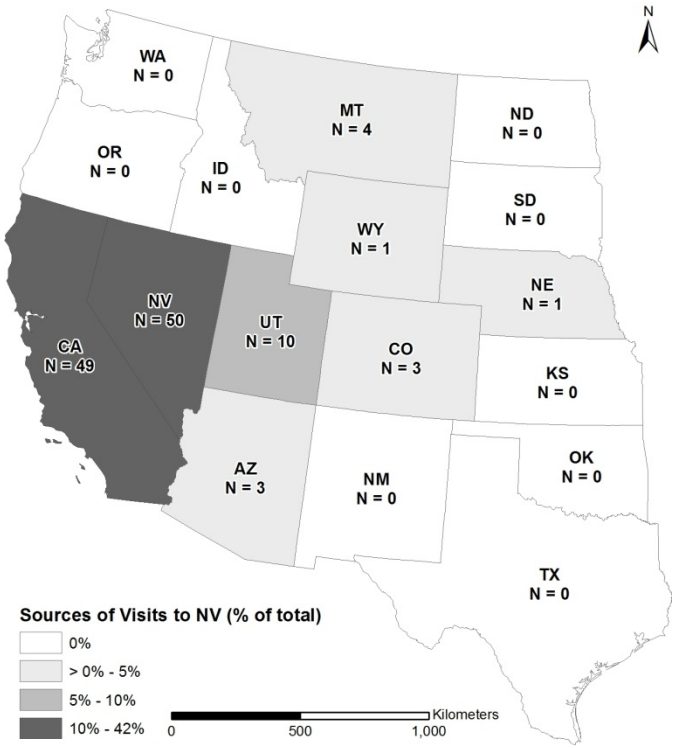


Figure 30. State originations of Nevada recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in Nevada

9. New Mexico

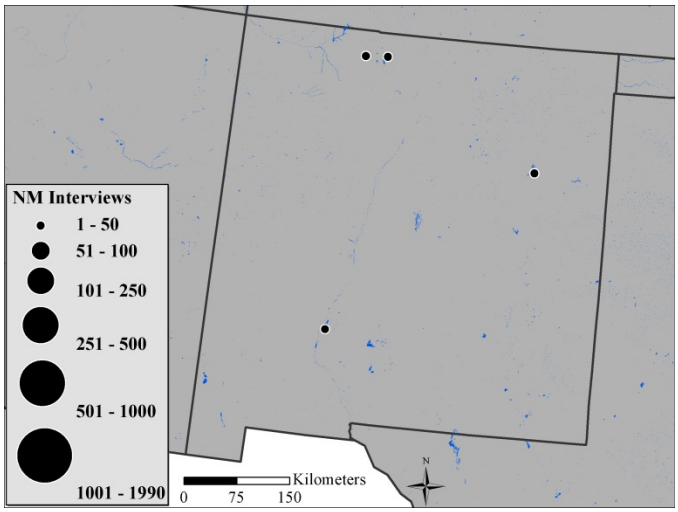


Figure 31. 100th Meridian interview locations in New Mexico, N = 40 interviews collected.

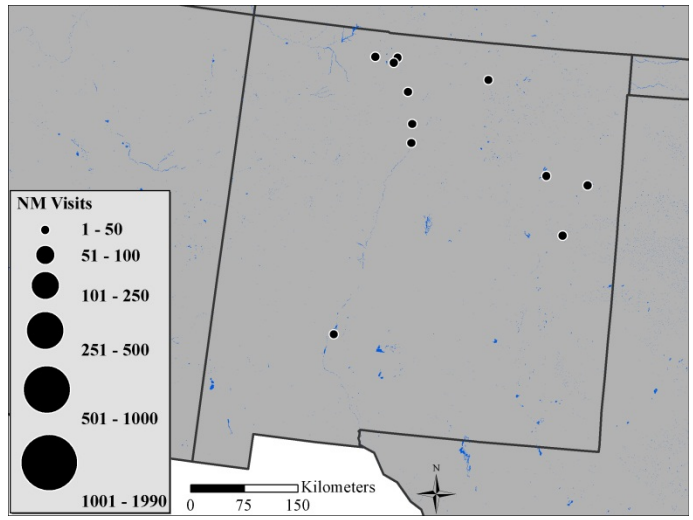


Figure 32. Visits (N = 48) to New Mexico waterbodies as indicated by the 100th Meridian boater database

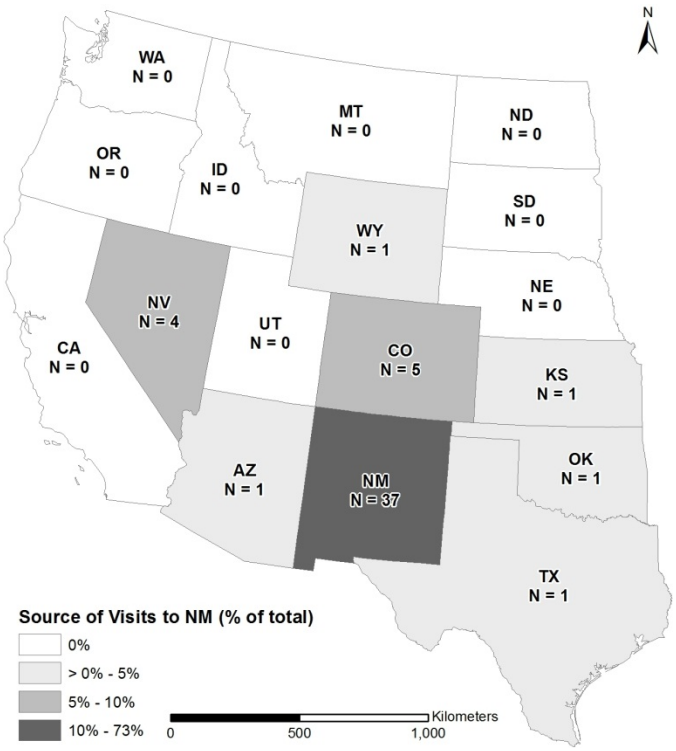


Figure 33. State originations of New Mexico recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in New Mexico

10. North Dakota

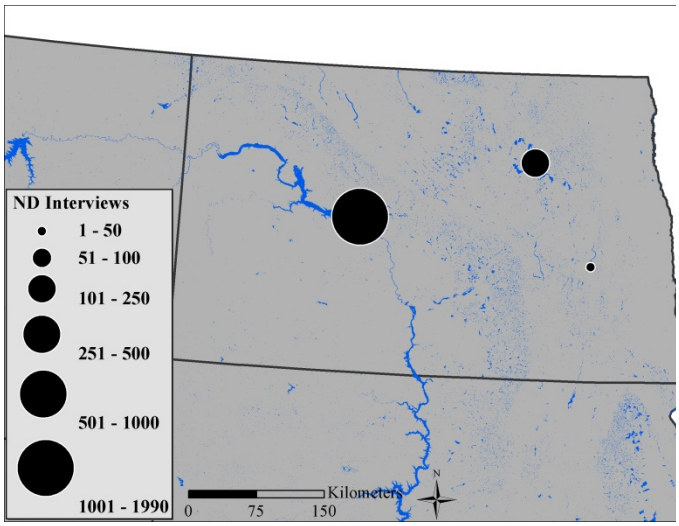


Figure 34. 100th Meridian interview locations in North Dakota, N = 2283 interviews collected.

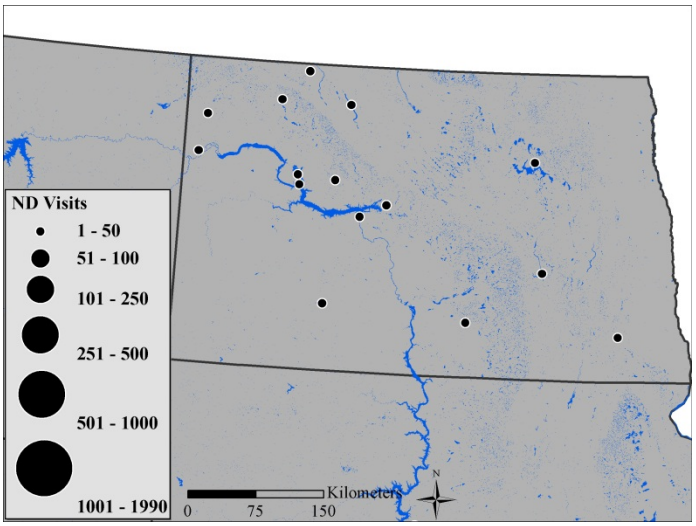


Figure 35. Visits (N = 86) to North Dakota waterbodies as indicated by the 100th Meridian boater database

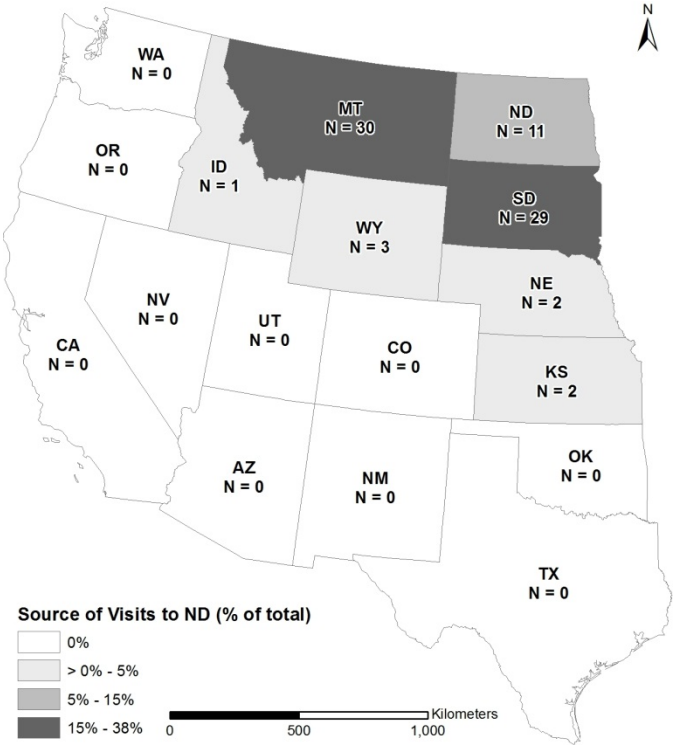


Figure 36. State originations of North Dakota recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in North Dakota

11. Oklahoma

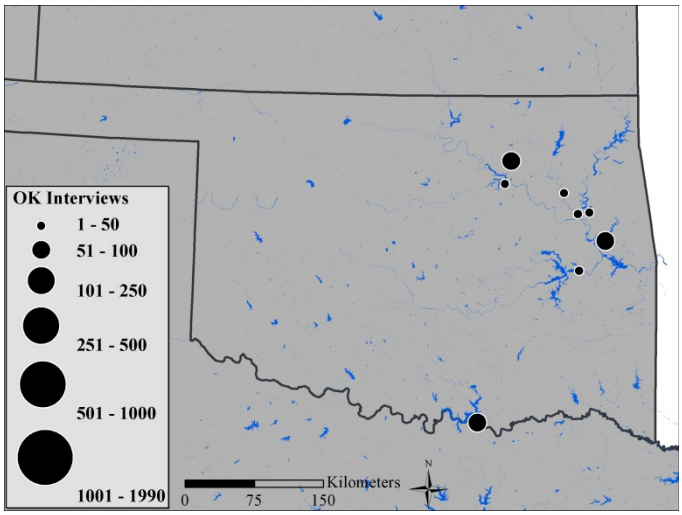


Figure 37. 100th Meridian interview locations in Oklahoma, N = 228 interviews collected.

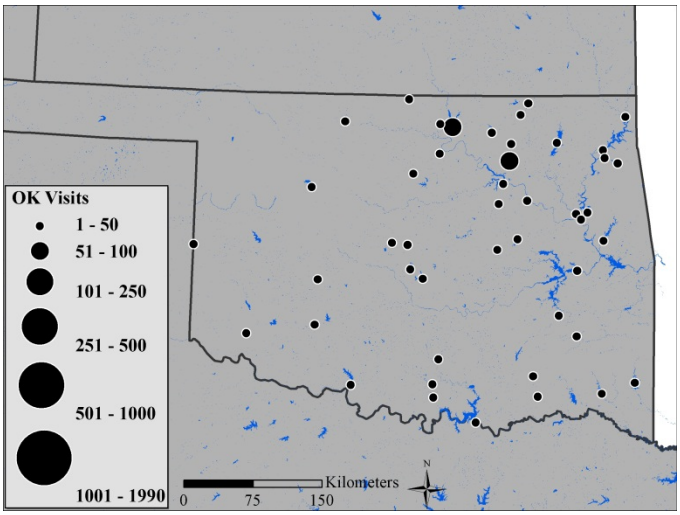


Figure 38. Visits (N = 533) to Oklahoma waterbodies as indicated by the 100th Meridian boater database

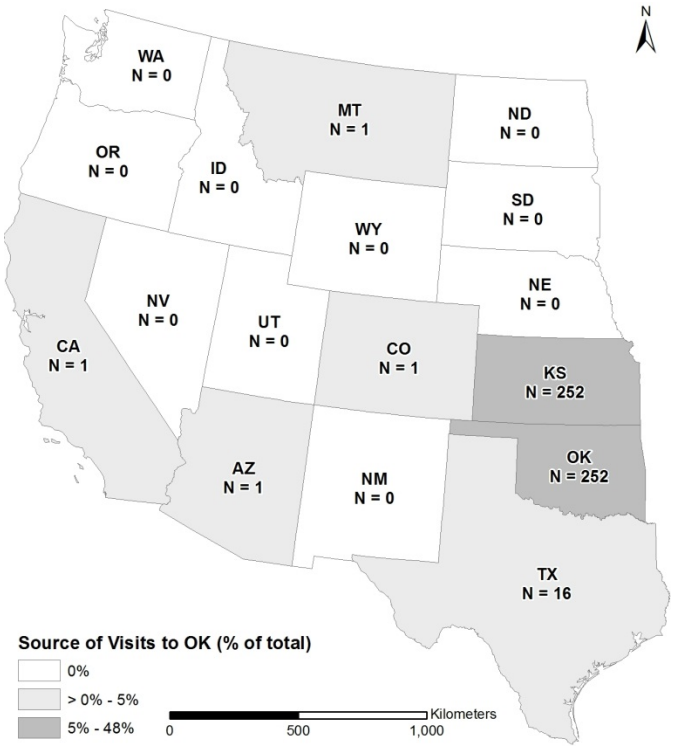


Figure 39. State originations of Oklahoma recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in Oklahoma

12. Oregon

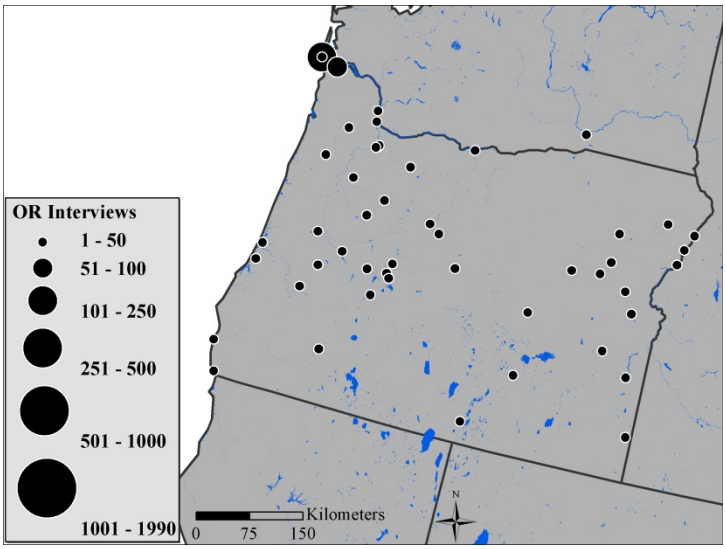


Figure 40. 100th Meridian interview locations in Oregon, N = 159 interviews collected.

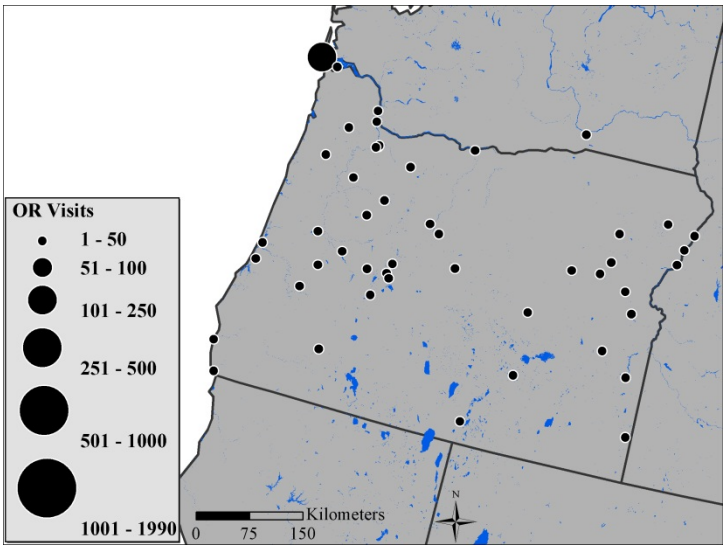


Figure 41. Visits (N = 285) to Oregon waterbodies as indicated by the 100th Meridian boater database

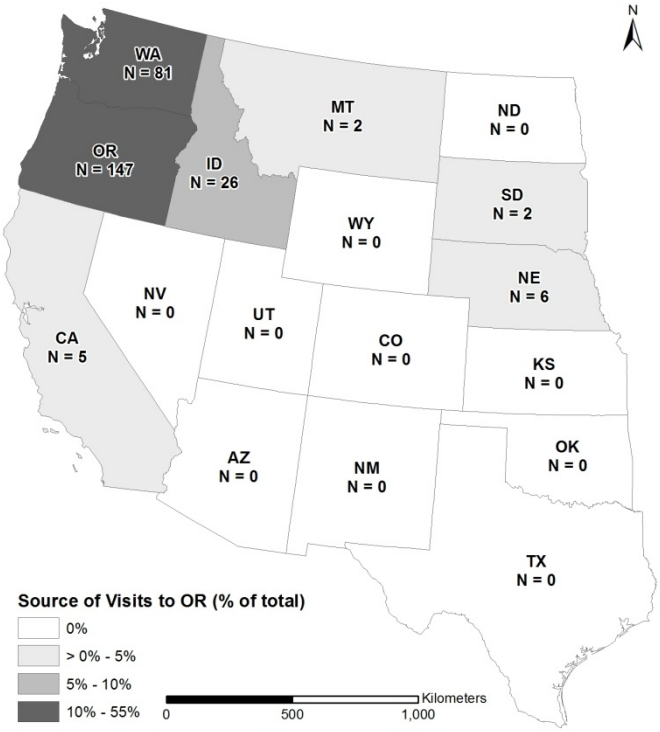


Figure 42. State originations of Oregon recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in Oregon

13. South Dakota

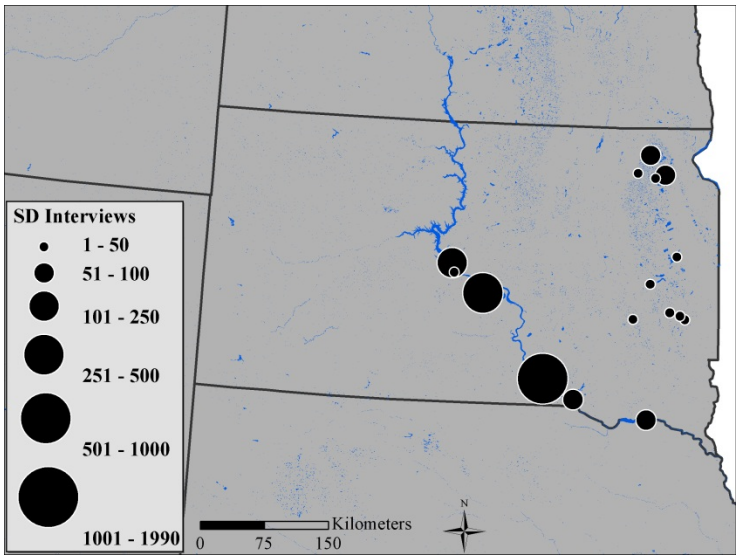


Figure 43. 100th Meridian interview locations in South Dakota, N = 1731 interviews collected.

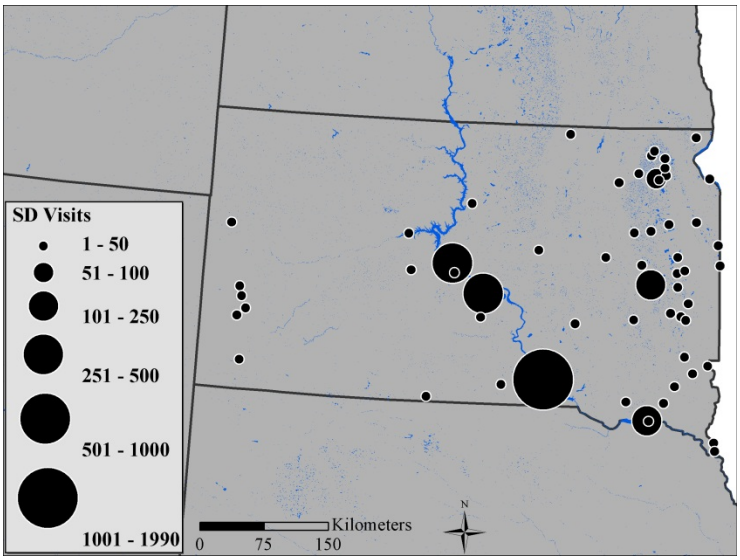


Figure 44. Visits (N = 2687) to South Dakota waterbodies as indicated by the 100th Meridian boater database.

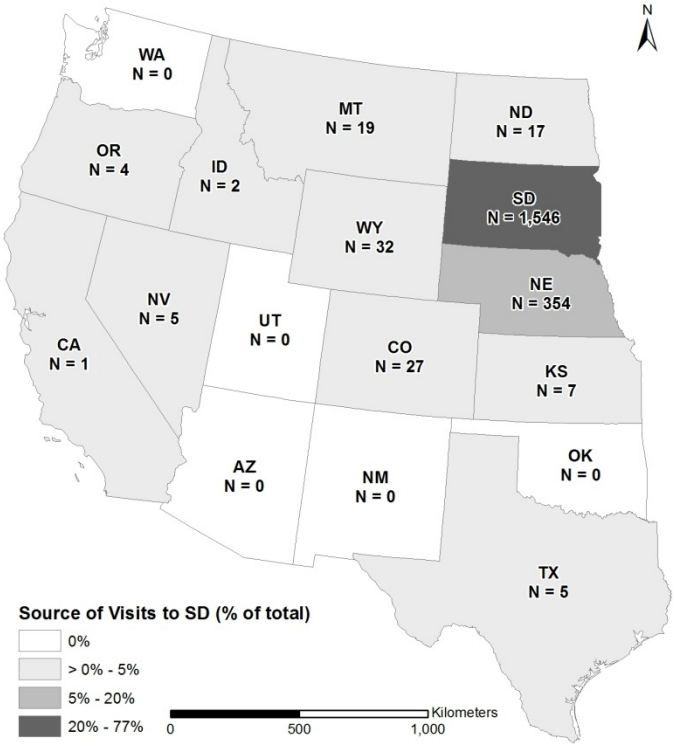


Figure 45. State originations of South Dakota recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in South Dakota

14. Texas

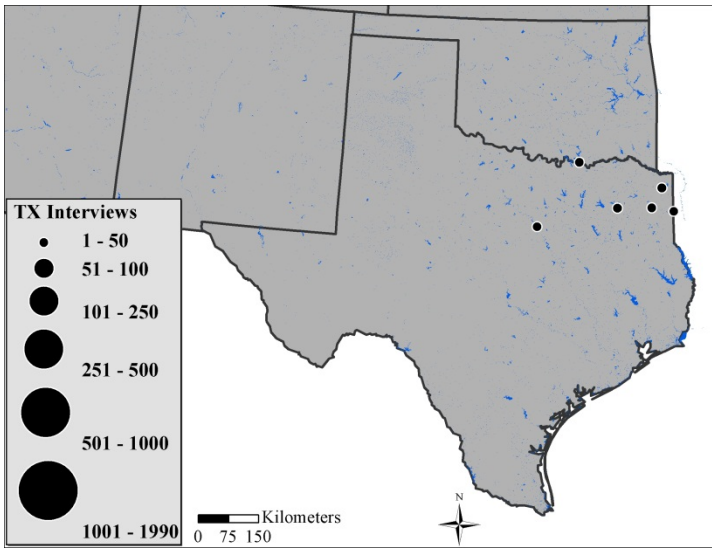


Figure 46. 100th Meridian interview locations in Texas, N = 47 interviews collected.

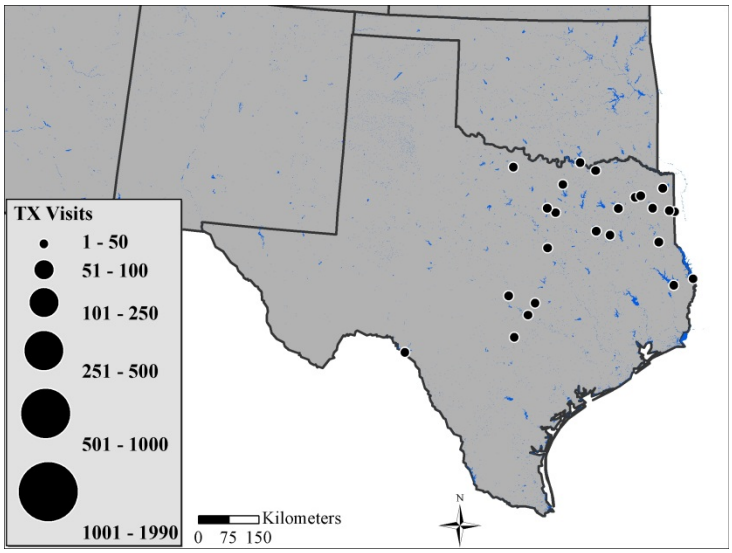


Figure 47. Visits (N = 87) to Texas waterbodies as indicated by the 100th Meridian boater database

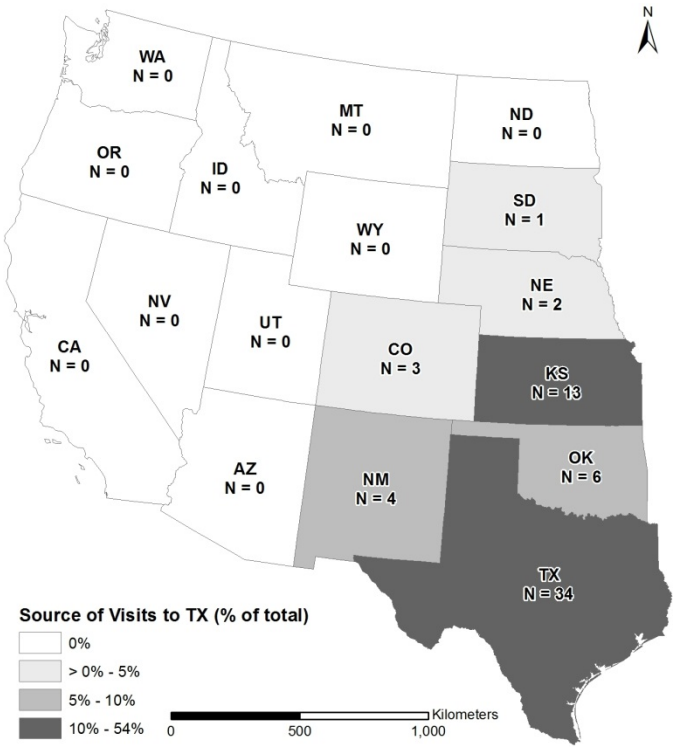


Figure 48. State originations of Texas recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in Texas

15. Utah

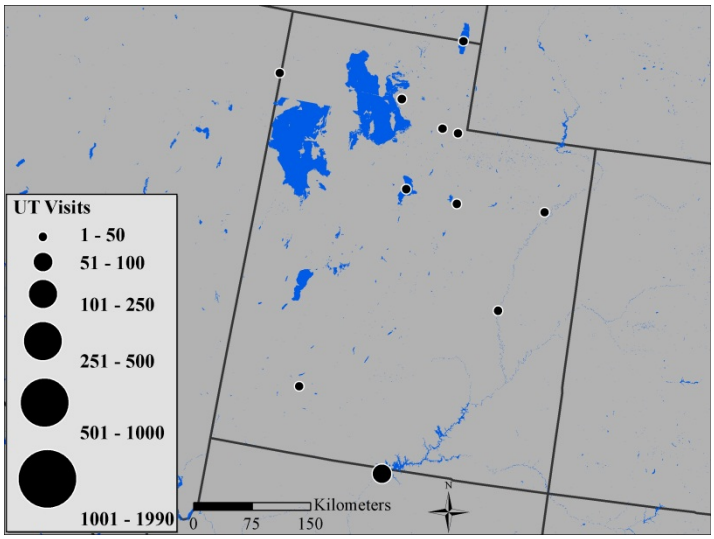


Figure 49. Visits (N = 131) to Utah waterbodies as indicated by the 100th Meridian boater database[1]

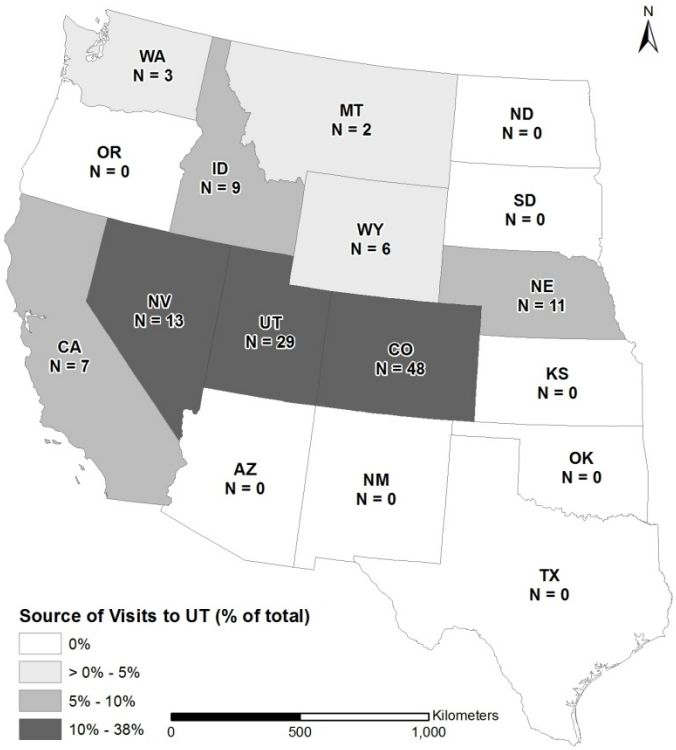


Figure 50. State originations of Utah recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in Utah

[1] Note: there are no interviews conducted in Utah that have been represented in the 100th Meridian Initiative Boater Database.

16. Washington

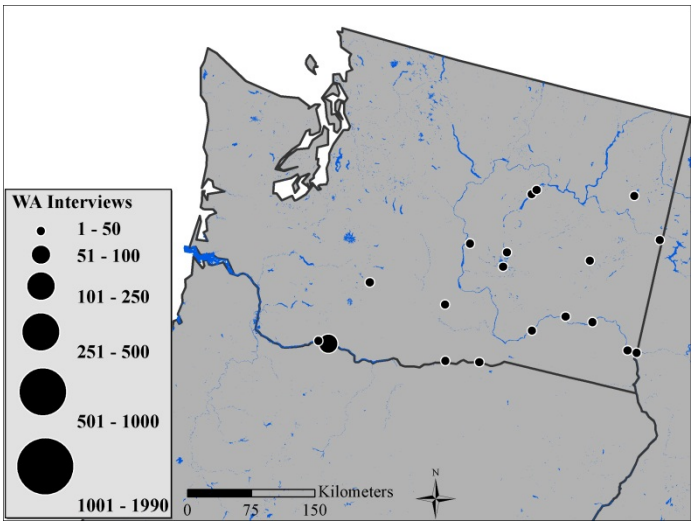


Figure 51. 100th Meridian interview locations in Washington, N = 430 interviews collected.

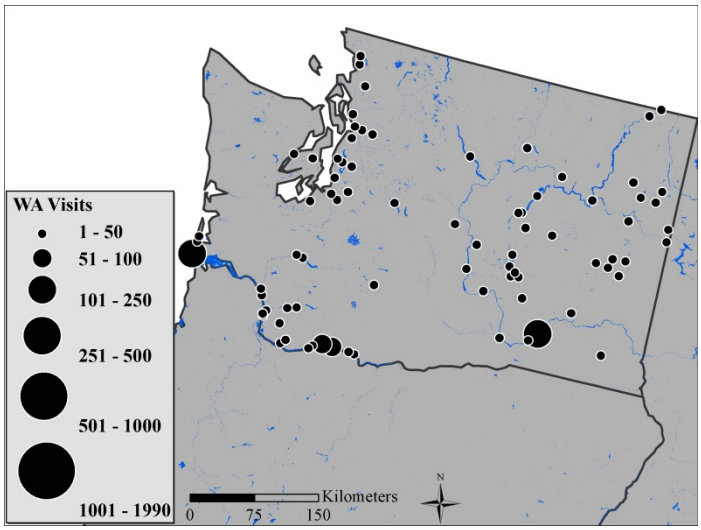


Figure 52. Visits (N = 956) to Washington waterbodies as indicated by the 100th Meridian boater database

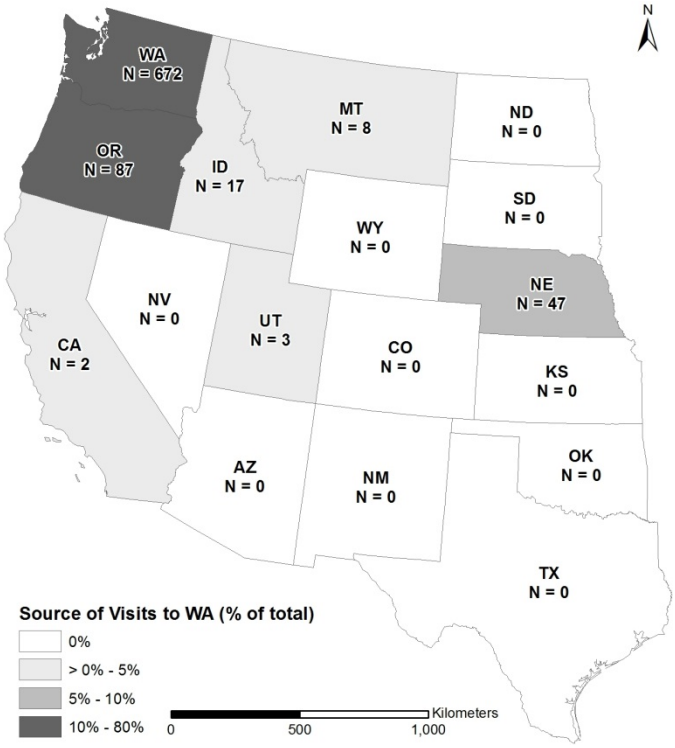


Figure 53. State originations of Washington recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in Washington

17. Wyoming

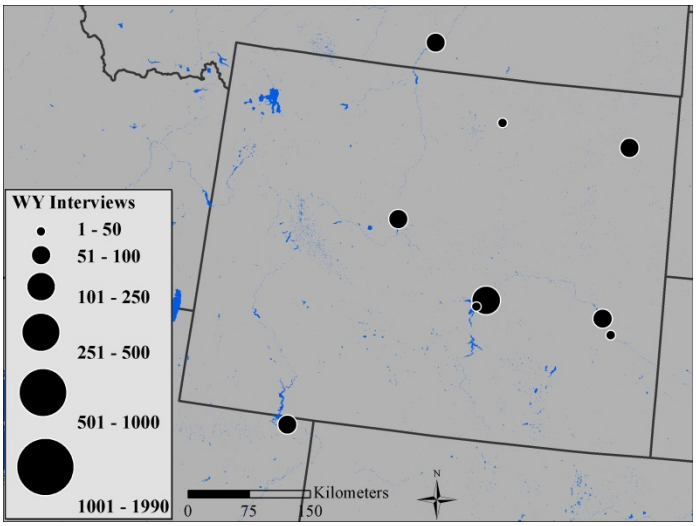


Figure 54. 100th Meridian interview locations in Wyoming, N = 505 interviews collected.

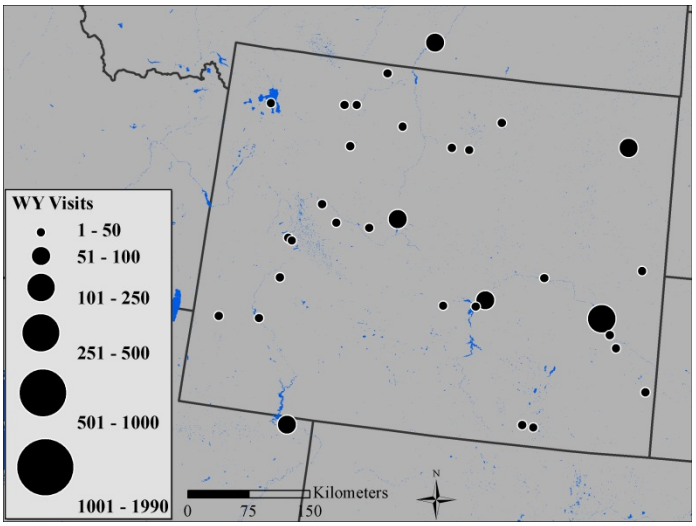


Figure 55. Visits (N = 670) to Wyoming waterbodies as indicated by the 100th Meridian boater database

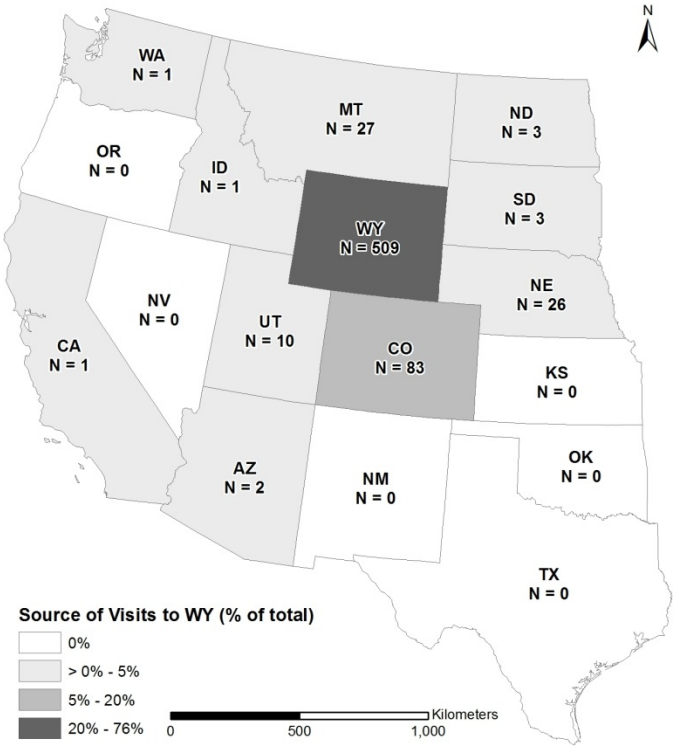


Figure 56. State originations of Wyoming recreational boat visitors as indicated by the 100th Meridian boater database. The number indicates the number of boaters and the shading indicates the percentage of the total number with a destination in Wyoming

C. Dreissenid mussel observations and recreational boating visitation

The following section shows the relationship between visitation to major waterways represented in the 100th Meridian Initiative Recreational Boater database and the current distribution of dreissenid mussel establishment by state (USGS NAS database, Accessed 2011; Figure 57). Visitation to waterways has been converted to a proportional representation of visitation by state to address the issue of low number of records for some states. Thus, the following figures represent relative visitation which are sometimes based on a very low sample size and do not indicate a comprehensive record of visitation to all sites per state. This section is intended to explore whether there is a relationship between the magnitude of propagule pressure represented in the database and known establishments of dreissenid mussels.

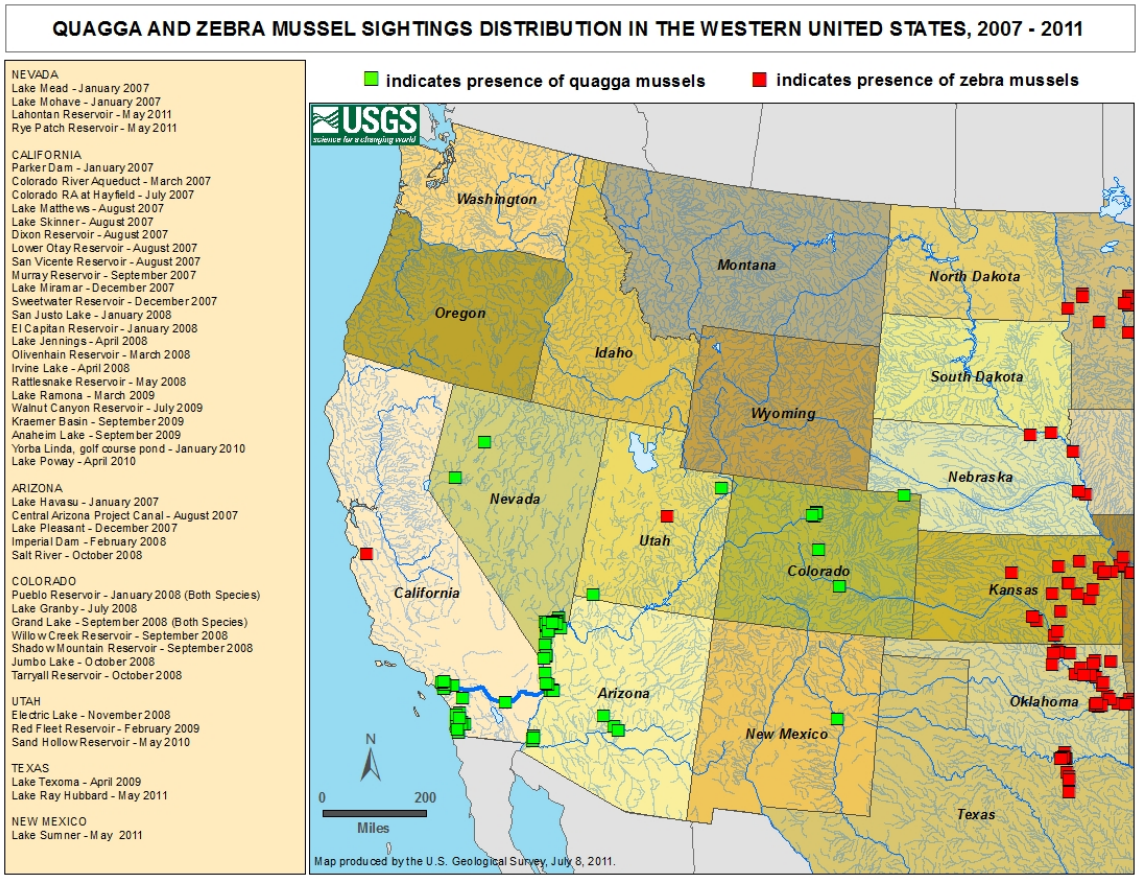


Figure 57. Quagga and zebra mussel sighting and distribution in the western United States, 2007 - 2011. USGS Nonindigenous species database.

Arizona

Despite having some of the largest boatable reservoirs in the southwestern U.S. Arizona had very few records (N = 82) of visitation.

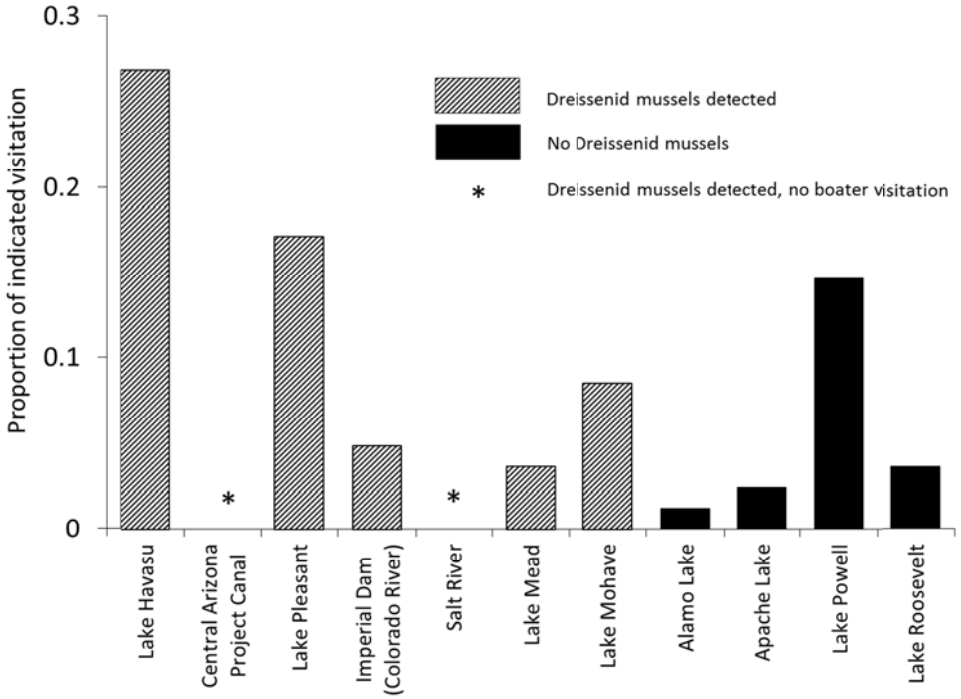


Figure 58. Proportion of Arizona recreational boater visitation (N = 82), as indicated by 100th Meridian boater database, by water body) with indication of dreissenid mussel detection.

All waterways in Arizona with Dreissenid mussel establishment (Figure 58) have boater visitation represented except the Central Arizona Project Canal (not accessible by boats) and the Salt River. Lake Havasu, Lake Pleasant, Lake Mead and Lake Mohave and the Imperial Dam were all represented as having some level of trailered boat visitation, indicating some level of propagule pressure to these locations, but also travel away from these destinations. Other lakes not positive for Dreissenid mussels but with indication of recreational boater visitation include Alamo Lake, Apache Lake, Lake Powell and Lake Roosevelt.

California

The state of California had one of the richest datasets with over 1600 visits to Californian waterways. Most locations in California that have dreissenid mussel establishment are along

the California Colorado aqueduct and are not accessible to recreational boaters (Figure 59). In addition, there are likely the fewest cites in California that have established populations of dreissenid mussels because of its geographic separation from main mussel sources from the east. This geographic buffer zone is no longer present however, given the proximity and magnitude of invasion in the Lake Mead NRA. The waterways with the highest amount of boater visitation in California include the Sacramento-San Joaquin Delta (multiple locations) , the Sacramento River (a tributary of the Delta), Shasta Lake, Folsom Lake, Commanche Reservoir and Clear Lake. The list of visitation to all locations in California is listed in Appendix III.

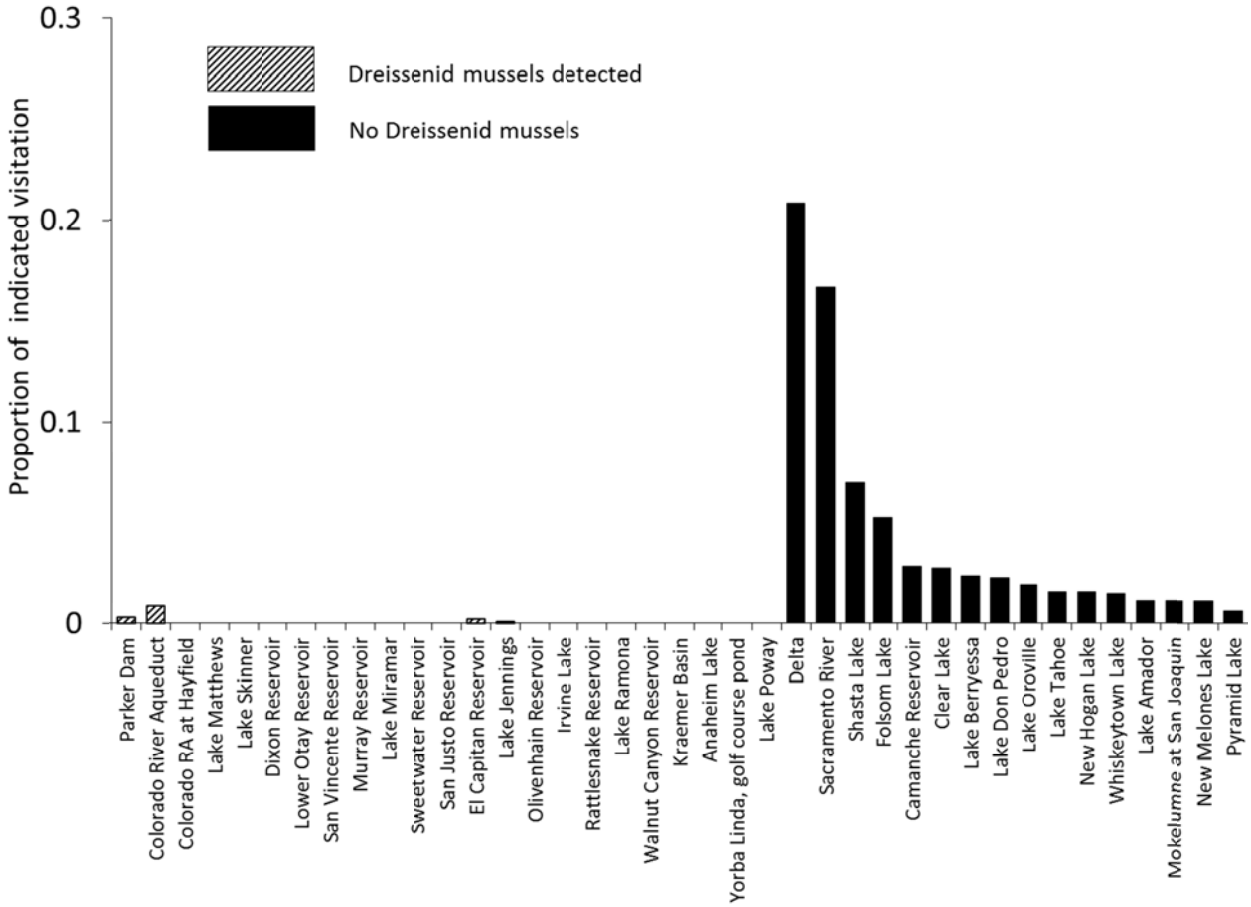


Figure 59. Proportion of California recreational boater visitation (N = 1664), as indicated by 100th Meridian boater database, by water body) with indication of dreissenid mussel detection.

Colorado

Visitation records to Colorado indicated little to some correlation between mussel presence and recreational boater presence (Figure 60). All waterways positive for dreissenid mussels except Taryall Reservoir had some visitation by recreational boaters. However, the majority of boater visitation to Colorado was to locations that are not present for dreissenid mussels, indicating potential waterways to monitor for new introductions. It is possible that habitat limitation is a major factor in many Coloradan systems due to the oligotrophic nature (i.e., low DOC, calcium concentrations) of many high elevation lakes that may be limiting to dreissenid mussel establishment (Cohen and Weinstein 2001).

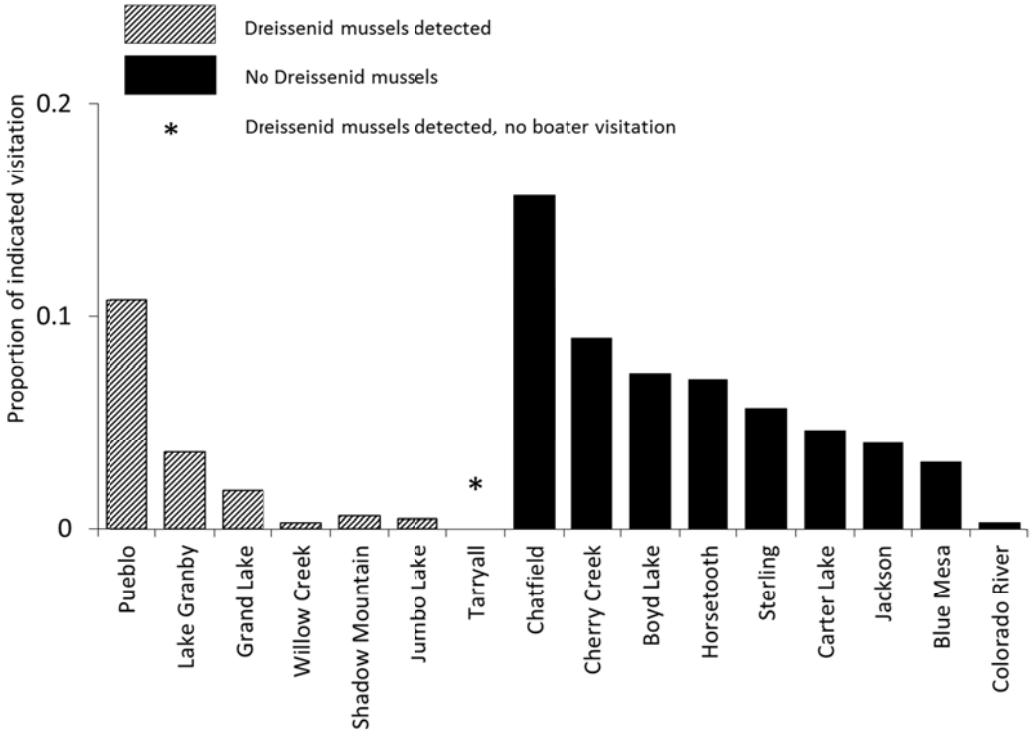


Figure 60. Proportion of Colorado recreational boater visitation (N = 672), as indicated by 100th Meridian boater database, by water body) with indication of dreissenid mussel detection.

Nevada

There are four waterways in Nevada that have dreissenid mussel detections—Lakes Mead and Mohave which have well established adult populations throughout most of the reservoir, and

Lahontan Reservoir and Rye Patch Reservoir which have tested positive for dreissenid mussels using PCR; to date no adult specimens have been found. Lake Mead, Lake Mohave, South Fork Reservoir and Pyramid Lake had the greatest amount of visitation indicated by the database (Figure 61). Nevadan records were of low sample size (N = 128) and most interviews were conducted at a single site (Lake Mead), providing an example of spatial homogeneity of the sample. The results presented in Figure 60 should only be considered as an indication of potential visitation, and not as an estimate of absolute risk for the entire state of Nevada.

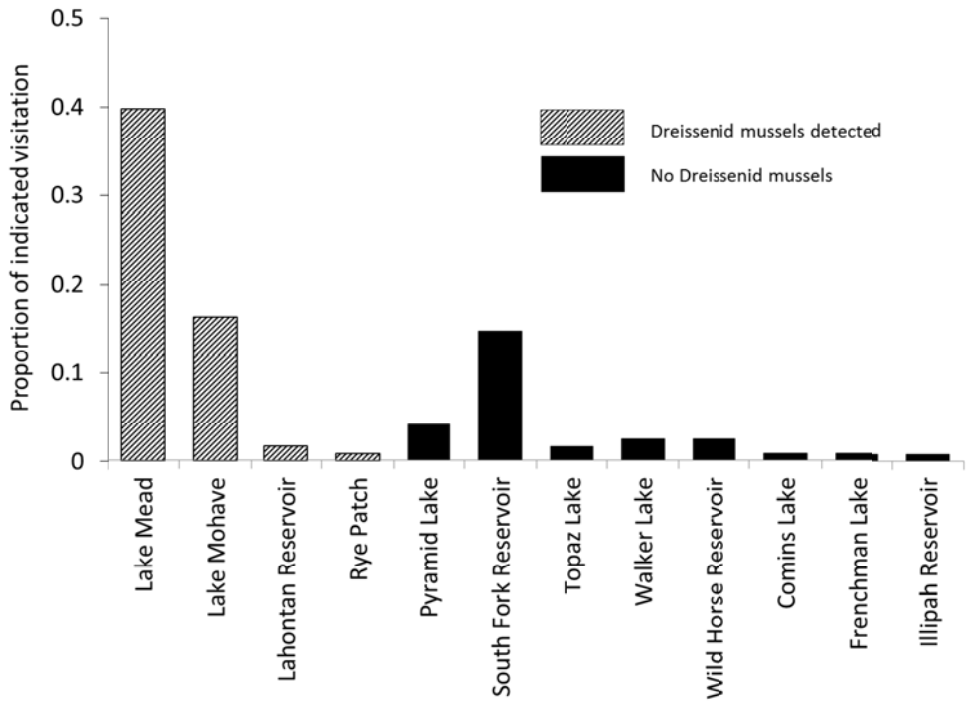


Figure 61. Proportion of Nevada recreational boater visitation (N = 128, as indicated by 100th Meridian boater database, by water body) with indication of dreissenid mussel detection.

New Mexico

To date, only one water body, Lake Sumner, in New Mexico has been observed to have dreissenid mussel presence. This water body was not represented in the 100th Meridian database, but a number of other waterways have been identified as receiving trailered recreational boating traffic, with the greatest proportions of these boaters travelling to Elephant Butte, Conchas Lake, Ute Lake, Navajo Lake and Caballo Lake (Figure 62). New Mexico

has the lowest number of records indicative of recreational boater travel to the state; these results should not be taken as a complete indication of boater travel. Further data collection is required to understand New Mexico's risk of introduction of dreissenid mussels by boaters.

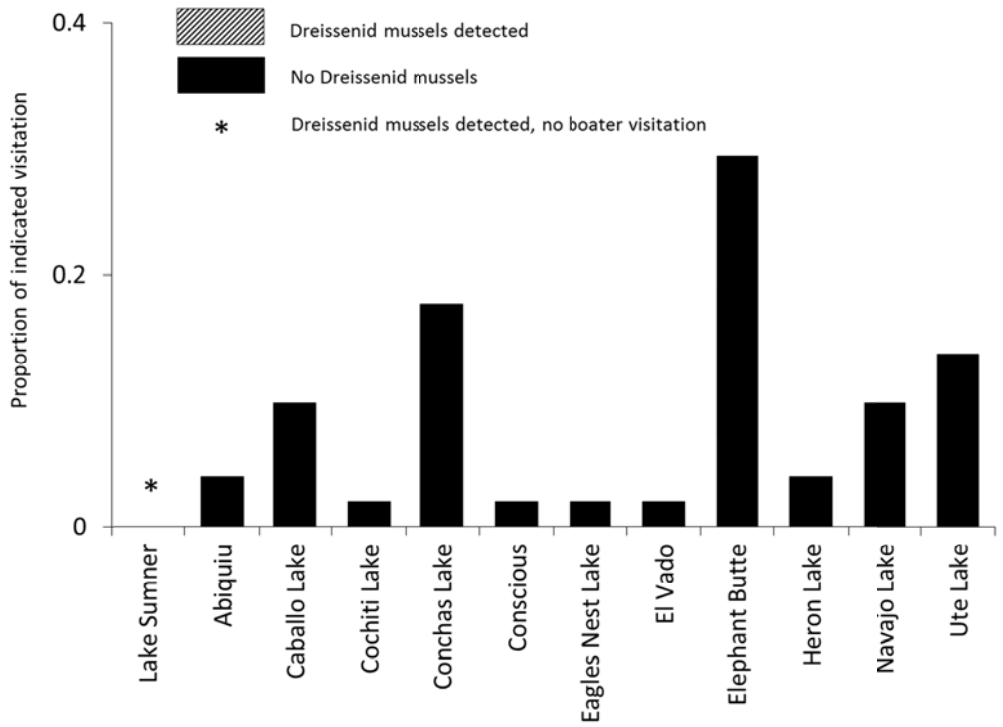


Figure 62. Proportion of New Mexico recreational boater visitation (N = 51, as indicated by 100th Meridian boater database, by water body) with indication of dreissenid mussel detection.

Texas

Two sites in Texas have established dreissenid mussel populations, Lake Texoma, which received the greatest amount of boater visitation and Lake Ray Hubbard which was not represented in the 100th Meridian database (Figure 63). Another state with a very low sample size, the estimation of risk for dreissenid mussels using the 100th Meridian database is not likely to be accurate. Other lakes that have some visitation indicated include Lake Fork, Lake Sam Rayburn, Lewisville Lake, Ray Roberts Lake and Toledo Bend. Further survey collection is

needed in Texan regions to more accurately define waterways at risk for dreissenid introduction.

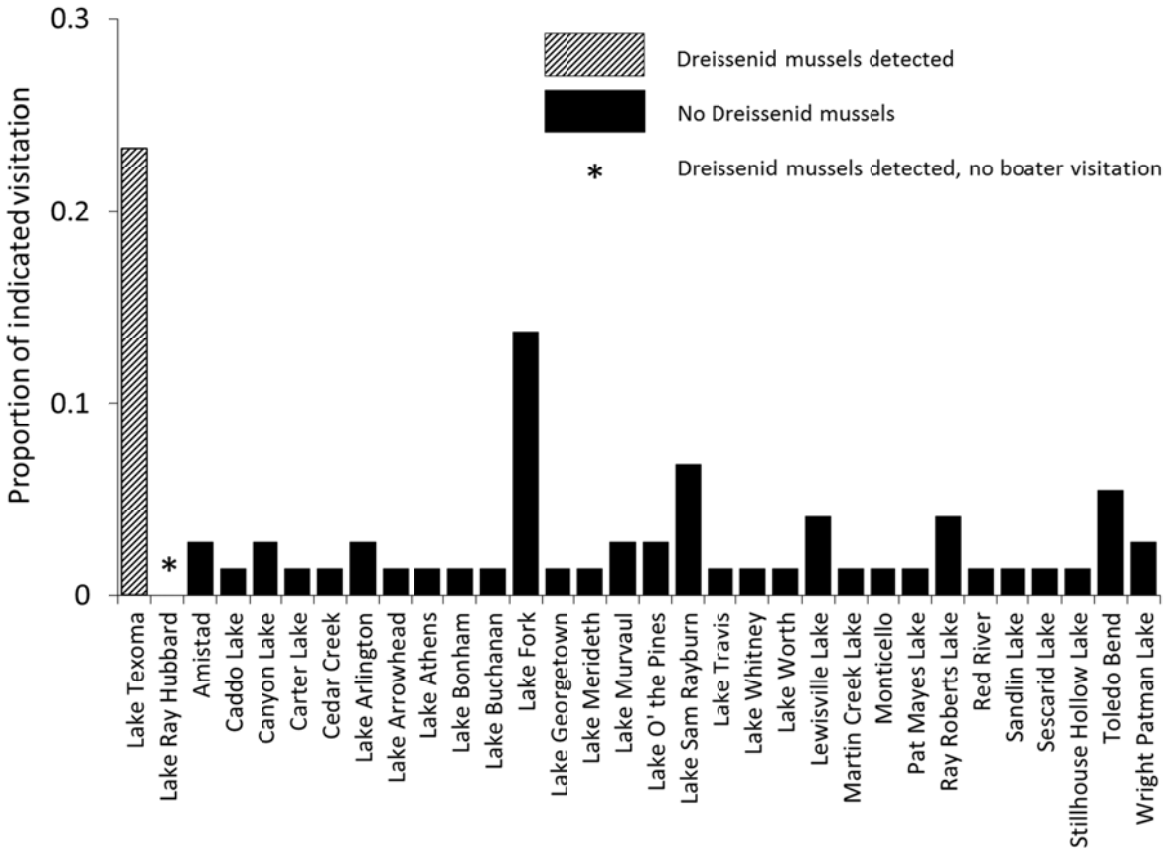


Figure 63. Proportion of Texas recreational boater visitation (N = 73, as indicated by 100th Meridian boater database, by water body) with indication of dreissenid mussel detection.

Utah

Utah was the only state in the western region with no contributed interviews to the 100th Meridian database. As a result, all indications of visitation to Utah are based on data collected in other states (Figure 64). As a result, major Utah waterways are not well represented, and using these data to estimate risk for this state is not advised. That said, Lake Powell received a bulk of the visitation per the database, which is an indicator for a great deal of interstate travel to this reservoir. Similar to Nevada, Texas and New Mexico, further data collection is required to provide an accurate risk assessment for Utah waters.

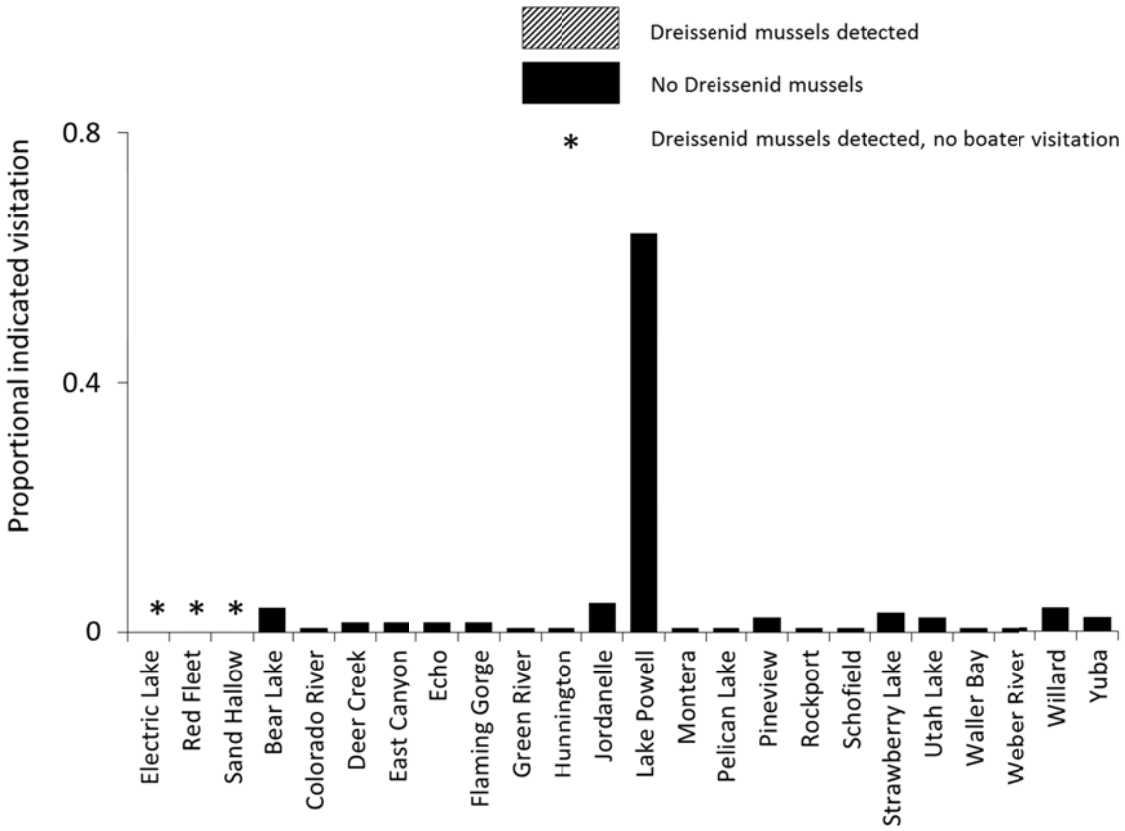


Figure 64. Proportion of Utah recreational boater visitation (N = 128, as indicated by 100th Meridian boater database, by water body) with indication of dreissenid mussel detection.

V. Conclusions and Recommendations

The range expansion of aquatic nonindigenous species (ANS) in North America is more rapid now than ever. ANS that have become naturalized in the Laurentian Great Lakes, the southeast and other regions have cost North Americans millions of dollars in control, maintenance and mitigation costs. The continued spread of these nonindigenous species is exacerbated by human and natural pressures such as climate change, the eutrophication of freshwater systems, and increased dispersal mechanisms through water conveyance, overland dispersal through boater movement and organisms in trade. The most cost effective mechanism for the control of ANS is through the prevention of their introduction (Leung et al. 2006).

Dreissenid mussels have been known to cause millions of dollars in damage to the Laurentian Great Lakes, the Mississippi River Basin and numerous inland freshwater sites in the northeastern U.S. Since the establishment of these mussels at a number of sites in the Western U.S., such as Lakes Mead and Havasu and a number of other locations along the Colorado aqueduct, numerous costs have been incurred and their spread within systems has been rapid and aggressive. Because some of the first observations of Dreissenid mussels west of the 100th Meridian, their spread must have been a function of some form of overland dispersal, most likely through un-knowing recreational boaters towing their vessels between waterways. As the western U.S. is mostly uninvaded by dreissenid mussels, scientists and managers have an opportunity to use recreational boating movement data to prevent the further spread and introduction of these harmful species.

With over 23,000 interviews, the 100th Meridian Initiative boater survey is the most comprehensive database of its kind that is open and accessible to the public. The database is an excellent resource to estimate risk of introduction for particular regions and waterbodies of the country, and can help guide resource managers in the creation of site specific watch lists, and in some cases, understand which inland waterways are connected. The 100th Meridian database concept is the greatest source of information in the western United States with which to estimate the risk and connectivity of waterways at risk.

At present, the 100th Meridian Initiative boater survey has a heterogeneous distribution of effort which makes risk assessment for the western region as a whole less precise. The concentration of interview sites in California (N = 1452), Kansas (N = 2081), Montana (N = 1685), Nebraska (N = 1570), North Dakota (N = 2283), and South Dakota (N = 1731) suggests that accurate risk assessments specific to those states are possible. However, it is also important to look at the spatial distribution of interview sites within those states as visitation to one lake is autocorrelated with the particular region the lake is in. While there are a great number of interviews collected in North Dakota (N = 2283), most of them occur at few sites. This is to say, that the more waterbodies are represented in the interview location, than a more accurate risk assessment by state can occur. Interview collection over a widely distributed spatial configuration would benefit the database.

In addition, the high temperature and high calcium waters of the major reservoirs in the southwest have already proven to be an optimal site for the establishment and population growth of Dreissenid mussels in the west. Understanding recreational boater travel both to and from these locations are key in terms of preventing the secondary spread from locations such as Lake Mead or Lake Havasu. There are very few interviews conducted at these locations or in states that border these locations, showing a significant paucity in information for this region (Figure 4). Increasing the interview effort at these sites can allow for the scientist or manager to ask specifically how the Lake Mead or Lake Havasu boating population behaves. Because these are some of the most highly utilized recreational boating areas, and because the level of dreissenid mussel infestation, including abundance of pelagic veligers (juveniles) is high (Wittmann et al. 2011)—understanding the connectivity provided by recreational boaters from these sites is key to the prevention of future invasion.

As stated above, there are a number of western region states for which the 100th Meridian Initiative Recreational boater database can be used for an accurate risk assessment. Regions of the pacific northwest, California, Montana and a number of the 100th Meridian states have built moderate to high sample sizes with a wide spatial distribution of interview sites with which to build meaningful watch lists (some of which can be generated using Appendix III herein). We

would like to recommend georeferencing each lake site represented in the database for ease when creating maps using a GIS. These georeferenced entries can then be merged with the database for use with a visualization software such as Google Maps. Figure 65 shows an example where the origination location for all Lake Powell users is shown.

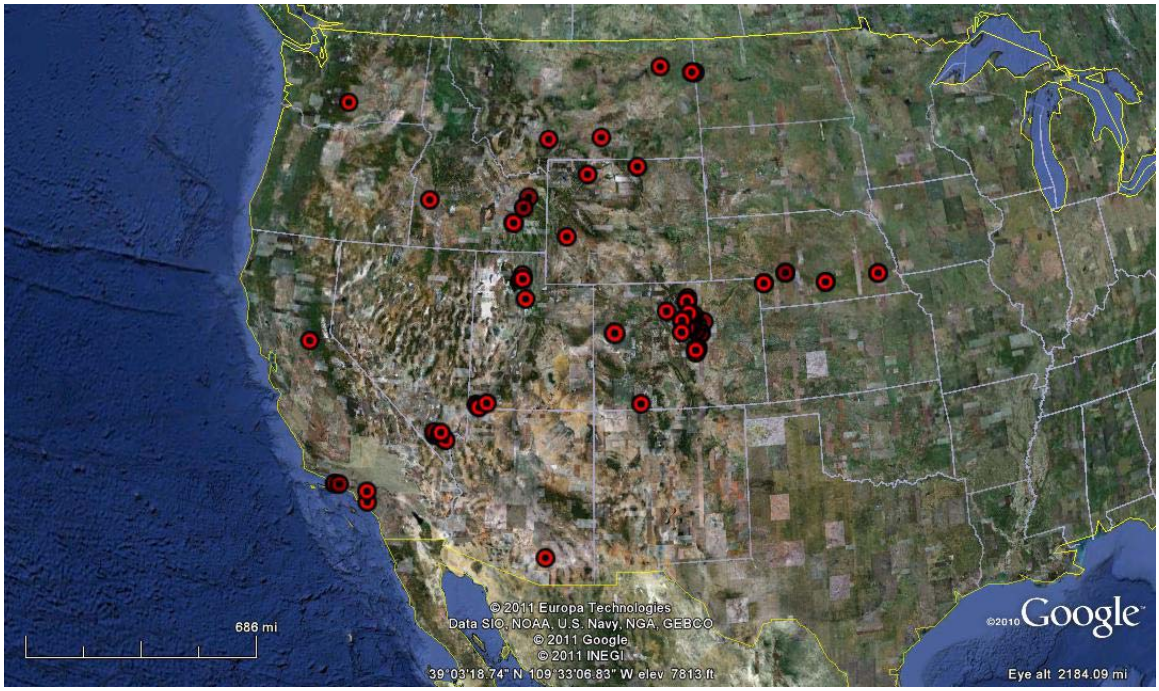


Figure 65. Origination locations for Lake Powell users, Google Earth Map visualization of a lake specific realization of travel distance.

The ability to visualize these data, and especially if each origination location is linked with knowledge of the presence or absence of known establishments of dreissenid mussels will allow for managers to quickly understand the connectivity of water bodies with infected, or potentially infected sites. Annual decision making in terms of resources allocated for boater inspection or boat washing programs, quarantine, or other ANS prevention strategies can be made with the ability to understand the real-time increase or decrease in risk that is associated with new waterbodies becoming invaded with Dreissenid mussels.

In short, the three main recommendations for improving the 100th Meridian Recreational Boater database include:

1. Greater distribution of interview locations across the western region in order to increase the number of waterways represented, but also the ability to estimate the magnitude of the connectivity between them

2. Greater representation of interviews from water bodies and states in the southwestern region. Here are sites that have high density infestations of dreissenid mussels, knowledge of the boating behavior to and from these locations will greatly assist in the reduction of spread from these locations.

3. The ability for increased use and visualization of the 100th Meridian Initiative Recreational Boater database by scientists and managers to understand the change in connectivity with a water body of interest and the rest of the aquatic landscape and its invasive pattern. This may aid in annual decision making in terms of the amount of resource utilized to protect or quarantine particular locations.

VI. Acknowledgements

The authors would like to thank the Western Regional Panel and the U.S. Fish and Wildlife Service for funding this research. We would also like to thank David Britton of the U.S. Fish and Wildlife Service, Elizabeth Brown of the Colorado Division of Wildlife and Rich Haskins of the Nevada Department of Wildlife, our project partners that have supported this work. We would also like to thank Patrick Jantz with the Woods Hole Oceanographic Institution for his work on producing maps and spatial analysis, and Laurel Saito of the University of Nevada Reno and Robert McMahon of the University of Texas at Arlington in the development of this project. In addition, we also would like to acknowledge the University of California Davis and the University of Nevada Reno in support of the completion of this research.

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Appendix I. Interview/Inspection Form for Trailered Boats

STOP AQUATIC HITCHHIKERS!

100th Meridian Initiative

Interview/Inspection Form for Trailered Boats
and Aquatic Invasive Species

100th Meridian Initiative

Site Information

Interviewer: | Date: | Time:

Water Body: | State: | Survey Type: O Contact O Observation

Specific Location:

Boater Information

Home State: | Zip:

Was the boat commercially hauled? O Yes O No

Do you always launch in the same water body? O Yes O No

How many times have you launched this year?

How often do you clean your boat?
- O After every launch
- O After a few launches
- O Ocassionally
- O Never

Boat cleaning method:
- O Car wash/High pressure
- O Home/Hand Wash
- O Professional Cleaning
- O Not Applicable

Do you keep your boat moored or in a slip? O Yes O No

If so, where?

Boat direction (coming or going):

Boat Type:
- O Angling
- O Pleasure
- O Pontoon
- O Jetski/PWC
- O Canoe/Kayak
- O Houseboat
- O Other

Boat/Trailer Condition:
- O Clean & Dry
- O Dirty or Wet

Knowledge/Action Information

Have you heard of zebra/quagga mussels? O Yes O No How?

Have zebra/quagga mussels impacted you? O Yes O No How?

Have you heard of other aquatic invasives? O Yes O No How?

Have any AIS affected you? O Yes O No How?

Did you inspect your boat for AIS today? O Yes O No How?

Would you wash your boat if a public washing facility was available nearby? O Yes O No

Has anyone asked you about zebra/quagga mussels before? O Yes O No

If so, who? | If so, when?

Have you ever considered changing destinations to avoid AIS issues? O Yes O No

Destination Information

Where else do you take the boat that you are using today?

Water Body: State: O Been There O Going There

Water Body: State: O Been There O Going There

Water Body: State: O Been There O Going There

Water Body: State: O Been There O Going There

Boat Inspection

AIS Found? O Yes O No | If yes, what species?

If yes, where was it found?

Comments

Please send copies of all completed forms to: David Britton, UT Arlington - Biology, UTA Box 19498, Arlington, TX 76019

Appendix II. 100th Meridian Initiative Boater Database metadata

Datafields

ID	Current, official ID number for the record	Long Integer	4
originalID	Original ID from the system where the data was captured	Text	20
fakerecord	If "Yes", the record is bogus and should be deleted	Yes/No	1
interviewer	Who recorded the data for this record?	Text	25
interviewdate	When (what date) was the data recorded?	Text	15
interviewtime	When (what time) was the data recorded?	Text	8
ampm	Provide am or pm if appropriate	Text	2
Interviewstate	In what state did was the data collected?	Text	2
Surveytype	What type of survey was this (observation, interview, etc.)	Text	15
Waterbody	From which water body was the data collected?	Text	25
Launchsite	From which specific location was the data collected?	Text	25
Latitude	Approximate latitude, if known, of data collection	Text	10
Longitude	Approximate longitude, if known, of data collection	Text	10
Transport	Was the transport for recreation, commerce, or other	Text	15
Transportother	Comment if transport was not commercial or recreational	Text	50
Homestate	The boater's home state	Text	2
Launches	The approx. number of times the boater had launched this year	Text	5
Zipcode	The boater's home zip code	Text	7
Alwayssame	Does the boater always launch in the same water body?	Text	3
Boattype	Type of boat (pleasurecraft, angling boat, canoe, etc.)	Text	20
Vesselother	Comment if necessary on boat type	Text	25
Cleansboat	Does the boater regularly clean the boat?	Text	3
Keepsboat	Where does the boater keep the boat (on land or in water)?	Text	10
Keepsboatwhere	Where exactly is the boat kept (if in water)?	Text	25
Keepstate	What state is the boat kept?	Text	2
Information	Did the boater receive information (printed materials)?	Text	25
Askedquestions	Did the boater ask questions?	Text	3
Awarezms	Was the boater already aware of zebra/quagga mussels?	Text	3
Awareans	Was the boater already aware of any aquatic nuisance species?	Text	3
Educatedby	Where did the boater learn of ANS?	Text	25
Inspectionby	Who inspected the boat for ANS?	Text	25
Found	What was found during the inspection?	Text	25
Foundwhere	Where was the ANS found (if applicable)?	Text	25
Species	What species of ANS was found?	Text	25
ed_magazine	Yes if boater heard of ANS from a magazine	Yes/No	1
ed_radio	Yes if boater heard of ANS from a radio	Yes/No	1
ed_work	Yes if boater heard of ANS from his/her work	Yes/No	1
ed_sign	Yes if boater heard of ANS from a sign	Yes/No	1
ed_angling	Yes if boater heard of ANS from an angling group	Yes/No	1
ed_tv	Yes if boater heard of ANS from television	Yes/No	1
ed_web	Yes if boater heard of ANS from the world wide web	Yes/No	1
ed_school	Yes if boater heard of ANS from a school	Yes/No	1
ed_tis	Yes if boater heard of ANS from a Traveler Info System	Yes/No	1
ed_newspaper	Yes if boater heard of ANS from a newspaper	Yes/No	1
ed_wildlifedept	Yes if boater heard of ANS from a wildlife agency	Yes/No	1
ed_other	Yes if boater heard of ANS from some other place	Yes/No	1
ed_people	Yes if boater heard of ANS from a person	Yes/No	1
ed_where	Where did the boater hear about ANS?	Text	25
flag	(for maintenance; disregard this field	Text	20

direction	Was the boat coming or going (entering or exiting the water)?	Text	25
condition	Was the boat clean or dirty during the inspection	Text	25
zmshow	How did the boater hear of zebra/quagga mussels?	Text	50
anshow	How did the boater hear of aquatic nuisance species?	Text	50
changedbehavior	Has the boater changed behavior because of ANS?	Text	3
cbhow	How has the boater changed behavior?	Text	50
imphow	How has the boater been impacted by ANS?	Text	50
selfinspected	Did the boater inspect the boat her/himself?	Text	3
sihow	How did the boater inspect the boat?	Text	50
wouldwash	Would the boater wash the boat if a station were available?	Text	3
askedbefore	Has the boater been asked these questions before?	Text	3
comments	Any comments may be here.	Text	255
submissiondate	When was the data entered into the database	Date/Time	8
impacted	Was the boater impacted by ANS?	Text	3
whoasked	Who asked the questions before?	Text	50
whenasked	When was the boater asked questions before?	Text	25
avoidance	Does the boater avoid waters because of ANS or restrictions?	Text	3

Appendix III. Western region inland waterbodies visited

STATE	WATERBODY	# VISITS
AZ	Lake Havasu	25
AZ	Lake Pleasant	13
AZ	Lake Powell	12
AZ	Lake Mohave	8
AZ	Lake Mead	6
AZ	Colorado River	4
AZ	Lake Roosevelt	3
AZ	Apache Lake	2
AZ	A-1 Lake	1
AZ	Alamo Lake	1
AZ	Beaver Dam	1
AZ	Canyon Lake	1
AZ	Mockabe Lake	1
AZ	Moobe Lake	1
AZ	Patagonia Reservoir	1
AZ	Sands Lake	1
CA	Sacramento River	160
CA	San Joaquin Delta	130
CA	Shasta Lake	116
CA	Delta	95
CA	Folsom Lake	87
CA	Camanche Reservoir	47
CA	Clear Lake	46
CA	Sacramento River - Garcia Bend	42
CA	Lake Berryessa	39
CA	Lake Don Pedro	38
CA	Lake Oroville	32
CA	Lake Tahoe	26
CA	New Hogan Lake	26
CA	Whiskeytown Lake	25
CA	Sacramento River - Discovery Park	22
CA	Sacramento River - Miller Park	20
CA	Lake Amador	19
CA	Miner Slough-Delta	19
CA	New Melones Lake	19
CA	Lake McClure	17
CA	Camp Far West lake	16

STATE	WATERBODY	# VISITS
CA	Clair Engel Lake	15
CA	Colorado River	14
CA	Turner Cut	13
CA	Delta - Buckley Cove-Stockton Cha	12
CA	Sacramento River - Rio Vista	12
CA	Tulloch Lake	12
CA	B & W Resort	11
CA	Castaic Lake	10
CA	Millerton Lake	10
CA	Mokelumne River - Wimpys Marina	10
CA	Pyramid Lake	10
CA	Buena Vista Recreational Area	9
CA	Delta - Discovery Bay	9
CA	3 Mile Slough	8
CA	Bass Lake	8
CA	Eagle Lake	8
CA	Lake Elsinore	8
CA	Orwood Resort-Old River	8
CA	Suisun Bay	8
CA	Delta - Suisun Bay	7
CA	Lake Piru	7
CA	Mokelumne River	7
CA	Suisun Bay - Martinez Marina	7
CA	Big Bear Lake	6
CA	Delta - Ltl Potato Slough	6
CA	Delta - Mokelumne River	6
CA	Delta - Mossdale Crossing	6
CA	Lake McSwain	6
CA	Paradise Point	6
CA	Salt Springs Reservoir	6
CA	Anderson Reservoir	5
CA	Bethel Island- CA Delta	5
CA	Delta - Orwood Resort	5
CA	Delta - Suisun Slough	5
CA	Donner Lake	5
CA	Grant Line Canal	5
CA	Harry Englebright Lake	5
CA	Lake Almanor	5

STATE	WATERBODY	# VISITS
CA	Lake Crowley	5
CA	New Bullard Bar Reservoir	5
CA	Parker Dam	5
CA	Pittsburg Marina	5
CA	Rollins Reservoir	5
CA	Sacramento River - West	5
CA	South Fork Mokelumne	5
CA	Trinity River	5
CA	Union Valley Reservoir	5
CA	Woodward Reservoir	5
CA	Delta - Buckley Cove	4
CA	Feather River	4
CA	Frenchman Lake	4
CA	Korths Marina-N. Mokelumne	4
CA	Lake Havasu	4
CA	Lake Sonoma	4
CA	Modesto Reservoir	4
CA	Pine Flat Lake	4
CA	San Joaquin River -- Antioch Bay	4
CA	Silverwood Lake	4
CA	American River	3
CA	Coyote Lake	3
CA	Dels Harbor- Old River	3
CA	Delta - Brannan Island	3
CA	Delta - Herman & Helen's	3
CA	Delta - Morelli Park	3
CA	Delta - Whiskey Slough	3
CA	Delta - Wimpys' Marina	3
CA	Disappointment Slough	3
CA	Eastman Lake	3
CA	El Capitan Reservoir	3
CA	Lake Casitas	3
CA	Lake Havasu (Colorado River)	3
CA	Lake Kaweah	3
CA	Lake Mendocino	3
CA	Lake Nacimiento	3
CA	Lake San Pedro	3
CA	Lake Shastina	3

STATE	WATERBODY	# VISITS
CA	Lake Success	3
CA	New Hope Landing	3
CA	Paris Lake	3
CA	Sacremento River - Walnut Grove	3
CA	San Antonio Reservoir	3
CA	Scotts Flats Reservoir	3
CA	Turlock Lake	3
CA	Yuba River	3
CA	Antioch Bay	2
CA	Auburn Dam Reservoir	2
CA	Black Butte Reservoir	2
CA	Bonelli Park	2
CA	Delta	2
CA	Clarksburg	2
CA	Deep Water Channel	2
CA	Delta - 14 Mile Slough	2
CA	Delta - Broad Slough	2
CA	Delta - King Island	2
CA	Delta - Ladds Marina	2
CA	Delta - Louis Park	2
CA	Delta - Ltl Connection Slough	2
CA	East Park Reservoir	2
CA	Lake Davis	2
CA	Lake Roland	2
CA	Mokelumne at San Joaquin	2
CA	Moss Landing State Beach	2
CA	Ocean Lake	2
CA	Pardee Reservoir	2
CA	Puddingstone Reservoir	2
CA	Sacramento River - Elkhorn Boating Faci	2
CA	Sacramento River - Freeport	2
CA	Sacramento River - Knights Landing	2
CA	Sacramento River - Red Bluff	2
CA	Sacramento River - Sandy Beach	2
CA	Sacramento River - Verona	2
CA	San Joaquin River - Mossdale Marina	2
CA	San Pablo Bay	2
CA	Sly Park Lake	2

STATE	WATERBODY	# VISITS
CA	Steamboat Slough	2
CA	Stone Canyon Reservoir	2
CA	Stony Gorge Reservoir	2
CA	Ten Mile Lake	2
CA	Topaz Lake	2
CA	Antelope Lake	1
CA	Big Break Marina	1
CA	Bridgeport Reservoir	1
CA	Calaveras Reservoir	1
CA	Canyon Lake	1
CA	Caples Lake	1
CA	Cherry Lake	1
CA	Collins Lake	1
CA	Convict Lakes	1
CA	Crockett-Carquinez Strait	1
CA	Delta - Antioch	1
CA	Delta - Big Break	1
CA	Delta - County Park	1
CA	Delta - Montezuma Slough	1
CA	Delta - Mossdale Landing	1
CA	Delta - Pixie Woods	1
CA	Delta - Turner Cut Resort	1
CA	Diamond Valley Lake	1
CA	Eel River	1
CA	Forest Hill Reservoir	1
CA	Delta - Franks Tract	1
CA	Goose Lake	1
CA	Hell Hole Reservoir	1
CA	Howell	1
CA	Ice House Reservoir	1
CA	Iron Gate	1
CA	Jackson Lake	1
CA	Jenkinson Lake	1
CA	Juanita Lake	1
CA	Kern River	1
CA	Keswick Dam	1
CA	King Island	1
CA	Klamath River	1

STATE	WATERBODY	# VISITS
CA	Korth Isleon Riverboat	1
CA	Lake Alpine	1
CA	Lake Arrowhead	1
CA	Lake Beardsley	1
CA	Lake Britton	1
CA	Lake Capay West	1
CA	Lake Clementine	1
CA	Lake Del Valle	1
CA	Lake Isabella	1
CA	Lake Jennings	1
CA	Lake Siskiyou	1
CA	Lake Sterling	1
CA	Lake Verona	1
CA	Landing	1
CA	Lopez Lake	1
CA	McCloud River	1
CA	Mission Bay	1
CA	Mono County Lakes	1
CA	Napa River	1
CA	Onion Valley Reservoir	1
CA	Pleasant Lake	1
CA	Potato Slough	1
CA	Rawlins Lake	1
CA	Sacramento River - Hog Back	1
CA	Sacramento River - Wards	1
CA	Salton Sea	1
CA	San Luis Reservoir	1
CA	San Vicente Lake	1
CA	Shadow Cliff Lake	1
CA	Smith River	1
CA	Stampede Reservoir	1
CA	Stanilaus River	1
CA	Sugar Pine Lake	1
CA	Town Park	1
CA	Tracy Oasis Marina Resort	1
CA	Tule Lake	1
CA	Twin Lakes	1
CA	Wood Lake	1

STATE	WATERBODY	# VISITS
CA	Yosemite Lake	1
CO	Chatfield Reservoir	105
CO	Lake Pueblo	70
CO	Cherry Creek Reservoir	60
CO	Boyd Lake	49
CO	Horsetooth Reservoir	47
CO	Sterling Reservoir	38
CO	Carter Lake	31
CO	Jackson Reservoir	27
CO	Lake Granby	25
CO	Blue Mesa Reservoir	21
CO	Bonnie Reservoir	14
CO	John Martin Reservoir	14
CO	Standley Lake	13
CO	Grand Lake	12
CO	Eleven Mile Canyon Reservoir	11
CO	North Sterling Reservoir	9
CO	Navajo Reservoir	6
CO	Lathrop State Park	5
CO	Steamboat Lake	5
CO	Union Reservoir	5
CO	Boulder Reservoir	4
CO	Lone Tree Reservoir	4
CO	Ridgeway Reservoir	4
CO	Shadow Mountain Reservoir	4
CO	Stagecoach Reservoir	4
CO	Trinidad Reservoir	4
CO	Wolford Reservoir	4
CO	Antero Reservoir	3
CO	Aurora Reservoir	3
CO	Dillon Reservoir	3
CO	Jumbo Reservoir	3
CO	Lake Loveland	3
CO	Nee Nosha Lake	3
CO	Prewitt Reservoir	3
CO	Blue Lake	2
CO	Boedecker Reservoir	2
CO	Colorado River	2

STATE	WATERBODY	# VISITS
CO	Douglass Lake	2
CO	Green Mountain Reservoir	2
CO	Lake John	2
CO	Lon Hagler Reservoir	2
CO	Nee Grande Lake	2
CO	Pueblo State Park	2
CO	Quincy Reservoir	2
CO	Rifle Gap Lake	2
CO	Sanchez Reservoir	2
CO	Sloan Lake	2
CO	Vallecito	2
CO	Barr Lake	1
CO	Big Creek Lake	1
CO	Crawford Reservoir	1
CO	Echo Lake	1
CO	Elk Head	1
CO	Enders Reservoir	1
CO	Gore Creek	1
CO	Jefferson Lake	1
CO	Lake Meredith	1
CO	Miramonte	1
CO	Paonia Reservoir	1
CO	Paonia State Park	1
CO	Pearl Lake	1
CO	Prospect Lake	1
CO	Puissoo	1
CO	Rainbow Lake	1
CO	Rampart	1
CO	Rio Blanco Reservoir	1
CO	Ruedi Reservoir	1
CO	Spinney Reservoir	1
CO	Stalker Lake	1
CO	Sweitzer Lake State Park	1
CO	Turquoise Lake	1
CO	Twin Lakes	1
CO	Vega Reservoir	1
CO	Williams Fork Reservoir	1
CO	Willow Creek Reservoir	1

STATE	WATERBODY	# VISITS
ID	Coeur d'Alene	28
ID	Lucky Peak Lake	13
ID	Twin Lakes Reservoir	13
ID	Snake River	12
ID	American Falls Reservoir	11
ID	CJ Strike Reservoir	10
ID	Pend Oreille	9
ID	Ririe Reservoir	8
ID	Island Park Reservoir	7
ID	Palisades Reservoir	7
ID	Lake Lowell	6
ID	Anderson Lake	5
ID	Cascade Reservoir	5
ID	Hayden Lake	5
ID	Dworshak Reservoir	4
ID	Hauser Lake	4
ID	Priest Lake	4
ID	Brownlee Reservoir	3
ID	Clearwater River	3
ID	Henry's Lake	3
ID	Payette Lake	3
ID	Chesterfield Reservoir	2
ID	Salmon Falls Reservoir	2
ID	Worm Lake	2
ID	Bear Lake	1
ID	Black Canyon Reservoir	1
ID	Blacktail Lake	1
ID	Chain Lakes	1
ID	Columbia River	1
ID	Gem Lake	1
ID	Hawkins Reservoir	1
ID	Hells Canyon Reservoir	1
ID	Lower Snake	1
ID	Mona Creek Reservoir	1
ID	Moose Creek Reservoir	1
ID	Mudhole State Park	1
ID	Nelly Lake	1
ID	Oxbow Reservoir	1

STATE	WATERBODY	# VISITS
ID	Priest River	1
ID	Red Fish Lake	1
ID	Rose Lake	1
ID	Salmon River	1
ID	Southfork - Palisades	1
ID	Spirit Lake	1
ID	Stanley Lake	1
ID	Williams Lake	1
KS	El Dorado Lake	479
KS	Cheney Reservoir	298
KS	Marion Reservoir	224
KS	Winfield City Lake	188
KS	Clinton Lake	136
KS	Melvern Lake	112
KS	Big Hill Lake	99
KS	Milford Lake	99
KS	Wilson Lake	94
KS	Hillsdale Lake	84
KS	Cedar Bluff Reservoir	78
KS	Perry Lake	61
KS	Waconda Lake	61
KS	Lake Afton	52
KS	Elk City Lake	48
KS	Pomona Lake	45
KS	Kanopolis Lake	44
KS	Kirwin Reservoir	43
KS	Webster Reservoir	43
KS	Council Grove Lake	38
KS	Cowley County State Lake	33
KS	Fall River Lake	32
KS	Butler State Fishing Lake and Wildlife Area	28
KS	Lovewell Reservoir	27
KS	La Cygnes Lake	26
KS	Wellington Lake	23
KS	Tuttle Creek Lake	20
KS	Norton County Lake	19
KS	Wolf Creek Reservoir	17
KS	Lake Fort Scott	16

STATE	WATERBODY	# VISITS
KS	Lake Crawford	15
KS	Toronto Lake	13
KS	Keith Sebelius Lake	12
KS	John Redmond Reservoir	9
KS	Bone Creek Lake	8
KS	Harvey County East Park Lake	8
KS	Lake Parsons	8
KS	Santa Fe Lake	8
KS	Lake Fegan	7
KS	Empire Lake	6
KS	Louisburg Middle Creek State Fishing Lake	6
KS	Lake Shawnee	5
KS	Chase County State Lake	4
KS	Clark County State Lake	4
KS	Geary County State Lake	4
KS	Herington Lake	4
KS	Kingman County State Lake	4
KS	Wyandotte County Lake	4
KS	Banner Creek Reservoir	3
KS	Lake Coldwater	3
KS	Lake Scott State Park	3
KS	Leavenworth State Fishing Lake	3
KS	Neosho State Fishing Lake	3
KS	Private Lake	3
KS	Walnut River	3
KS	Augusta City Lake	2
KS	Baxter Springs Lake	2
KS	Carbondale Lake	2
KS	Centralia Lake	2
KS	Eureka City Lake	2
KS	Lake Stockton	2
KS	McPherson County State Lake	2
KS	Mined Land Wildlife Area	2
KS	Moline City Lake	2
KS	Mound City Lake	2
KS	Osage County Lake	2
KS	Ottawa Lake	2
KS	Pleasanton City Lake	2

STATE	WATERBODY	# VISITS
KS	Polk Daniels Lake	2
KS	Pony Creek Lake	2
KS	Wichita - Sand Pit	2
KS	Yates Center Reservoir	2
KS	Anthony Municipal Lake	1
KS	Atchison State Fishing Lake and Wildlife A	1
KS	Benningtons Lake	1
KS	Chetopa Creek	1
KS	Delaware River	1
KS	Gardner Lake	1
KS	Grouse Creek	1
KS	Harvey County West Park Lake	1
KS	Hidden Valley Lake	1
KS	Idle Hour Lake	1
KS	Lake McConaughy	1
KS	Lake Meade	1
KS	Lake Olathe	1
KS	Lake Wabunsee	1
KS	Lyon County State Lake	1
KS	Miami State Fishing Lake	1
KS	Miola Lake	1
KS	Mission Lake	1
KS	Pottawatomie County State Park Number One	1
KS	Private Watershed	1
KS	Quivira National Wildlife Refuge	1
KS	Sherwood Lake	1
KS	Smithville Lake	1
KS	St Mary's Lake	1
KS	Tanglewood Lake	1
KS	Thayer City Lake	1
KS	Washington County State Lake	1
MT	Fort Peck Reservoir	445
MT	Canyon Ferry Reservoir	378
MT	Flathead Lake	150
MT	Lake Elwell	88
MT	Fresno Reservoir	87
MT	Holter Lake	77

STATE	WATERBODY	# VISITS
MT	Hauser Lake	48
MT	Tongue River Reservoir	47
MT	Cooney reservoir	40
MT	Yellowtail Reservoir	38
MT	Noxon Reservoir	32
MT	Lake Koocanusa	30
MT	Seeley Lake	29
MT	Nelson Reservoir	28
MT	Lake Frances	24
MT	Swan Lake	19
MT	Missouri River	15
MT	Whitefish Lake	15
MT	Hebgen Lake	13
MT	Flathead River	10
MT	Georgetown Lake	10
MT	Lake Mary Ronan	10
MT	Little Blackfoot River	10
MT	Hungry Horse Reservoir	9
MT	Thompson Lake	8
MT	Bighorn Lake	6
MT	Harrison Lake	6
MT	Salmon Lake	6
MT	Bitterroot Lake	5
MT	Dailey Lake	5
MT	Ennis Lake	5
MT	Yellowstone River	5
MT	Brownes Reservoir	4
MT	Ashley Lake	3
MT	Deadman's Basin	3
MT	Foys Lake	3
MT	Hyalite Reservoir	3
MT	Black Sandy Lake	2
MT	Blanchard Lake	2
MT	Bull Lake	2
MT	Clark Canyon Reservoir	2
MT	Lake Alva	2
MT	McGergor Lake	2
MT	Newlan Creek Reservoir	2

STATE	WATERBODY	# VISITS
MT	Beaver Creek Reservoir	1
MT	Buffalo Bill Reservoir	1
MT	Cabin Lake	1
MT	Carpenter Lake	1
MT	Cliff Lake	1
MT	Finley Flats	1
MT	Homestead and Medicine Lakes	1
MT	Lake Como	1
MT	Lake Helena	1
MT	Martinsdale Reservoir	1
MT	McDonald Lake	1
MT	Miller Creek	1
MT	Missoula Lake	1
MT	Quake Lake	1
MT	Ruby Reservoir	1
MT	Shannon Lake	1
MT	Silver Lake	1
MT	Talley Lake	1
ND	Lake Sakakawea	35
ND	Audubon Lake	13
ND	Devils Lake	12
ND	Northgate Dam	4
ND	Missouri River	3
ND	Blacktail Lake	2
ND	Crooked Lake	2
ND	Hiddenwood Lake	2
ND	Lake Oahe	2
ND	Lake Tschida	2
ND	Dead Colt Creek	1
ND	Indian Creek Bay Recreation Are	1
ND	Jamestown Reservoir	1
ND	Lake Darling	1
ND	Lake Metigoshe	1
ND	Lake Trenton	1
ND	McKenna Lake	1
ND	Smishek Lake	1
ND	Van Hook Arm	1
NE	Missouri River	590

STATE	WATERBODY	# VISITS
NE	Lake McConaughy	325
NE	Calamus Reservoir	187
NE	Box Butte Reservoir	154
NE	Lake Minatare	152
NE	Lewis and Clark Lake	122
NE	Sherman Reservoir	121
NE	Harlan County Reservoir	118
NE	Merritt Reservoir	103
NE	Elwood Reservoir	69
NE	Branched Oak Lake	56
NE	Johnson Lake State Recreation Are	38
NE	Davis Creek Reservoir	32
NE	Walgren Lake	23
NE	Enders Reservoir	21
NE	Willow Creek Lake	21
NE	Fremont Lake	19
NE	Red Willow Reservoir	19
NE	Lake Maloney	16
NE	Oliver Reservoir	16
NE	Carter Lake	15
NE	Medicine Creek Reservoir	12
NE	Pawnee Lake	11
NE	Wehrspann Lake	9
NE	Beaver Lake	8
NE	Winters Creek Lake	8
NE	Conestoga Lake	7
NE	Lake North	7
NE	Smith Lake	7
NE	Goose Lake	6
NE	Desoto Bend National Wildlife Are	5
NE	Harry Strunk Lake	5
NE	Swan Lake	5
NE	Swanson Lake	5
NE	Whitney Lake	5
NE	Zorinsky Lake	5
NE	Burchard Lake	4
NE	Frontier County Road Reservoir 1	4
NE	Gavins Point Dam	4

STATE	WATERBODY	# VISITS
NE	Lake Ogallala	4
NE	Plum Creek Canyon Reservoir	4
NE	Twin Lakes	4
NE	Valentine NWR Lakes	4
NE	Big Alkali Lake	3
NE	Bluestem Lake	3
NE	Cottonwood-Stevenson Lake	3
NE	Sutherland Reservoir	3
NE	Burwell-Sumter Diversion Reservoir	2
NE	Kilpatrick Lake	2
NE	Lake Hastings	2
NE	Lovewell Reservoir	2
NE	Phillips Canyon Reservoir	2
NE	Plattsmouth Reservoir 10-A	2
NE	Summit Lake	2
NE	Alma City Reservoir	1
NE	Bridgeport SRA	1
NE	Chalco Hills Recreation Area	1
NE	Cheyenne State Recreation Area	1
NE	Columbus Reservoir	1
NE	Cunningham Lake	1
NE	Czechland Lake	1
NE	Gallagher Canyon Reservoir	1
NE	Grove Lake Reservoir	1
NE	Hackberry Lake	1
NE	Jeffrey Reservoir	1
NE	Kirkmans Cove Lake	1
NE	Kirwin Reservoir	1
NE	Lazy River Acres	1
NE	Niobrara River	1
NE	Merritt Reservoir	1
NE	Offut AFB Lake	1
NE	Omaha area	1
NE	Pierce Lake	1
NE	Pony Creek	1
NE	Riverside Lake	1
NE	Rock Creek	1
NE	Rockford Lake	1

STATE	WATERBODY	# VISITS
NE	Round Lake	1
NE	Sand Hills Lake	1
NE	St. Helena Lake	1
NE	Standing Bear Lake	1
NE	Swan Creek Reservoir 5-C	1
NE	Walnut Creek	1
NE	Watts Lake	1
NE	Wildwood Lake	1
NM	Elephant Butte	15
NM	Conchas Lake	9
NM	Ute Reservoir	7
NM	Caballo Lake	5
NM	Navajo Reservoir	5
NM	Heron Lake	2
NM	Abiquiu Reservoir	1
NM	Cochiti Reservoir	1
NM	Eagles Nest Lake	1
NM	El Vado Reservoir	1
NM	Los Alamos Reservoir	1
NV	Lake Mead	52
NV	Lake Mohave	20
NV	South Fork Reservoir	18
NV	Colorado River	6
NV	Pyramid Lake	5
NV	Laughlin River	4
NV	Lake Tahoe	3
NV	Walker Lake	3
NV	Wild Horse Reservoir	3
NV	Lahontan Reservoir	2
NV	Topaz Lake	2
NV	Comins Lake	1
NV	Frenchman Lake	1
NV	Illipah Reservoir	1
NV	Lake Pleasant	1
NV	Rye Patch Reservoir	1
OK	Kaw Lake	97
OK	Grand Lake	77
OK	Skiatook Lake	54

STATE	WATERBODY	# VISITS
OK	Fort Gibson Lake	49
OK	Tenkiller Lake	43
OK	Lake Texoma	35
OK	Grand Lake O' the Cherokees	30
OK	Eufaula Lake	23
OK	Keystone Lake	21
OK	Oologah Lake	10
OK	Copan Lake	8
OK	Lake Murray	8
OK	Lake Hudson	5
OK	Sooner Lake	5
OK	Lake of the Arbuckles	4
OK	Lake Thunderbird	4
OK	Birch Lake	3
OK	Canton Lake	3
OK	Lake Arcadia	3
OK	Lake Stanley Draper	3
OK	McGee Creek	3
OK	Spavinaw Lake	3
OK	Chouteau Lock and Dam 17	2
OK	Lake Blackwell	2
OK	Lake Hefner	2
OK	Lake Lawtonka	2
OK	Lake Ponca	2
OK	Navigation Channel	2
OK	Robert S. Kerr Reservoir	2
OK	Spring River	2
OK	Verdigris River	2
OK	Waurika Lake	2
OK	Altus Reservoir	1
OK	Broken Bow Lake	1
OK	Brushy Lake	1
OK	Chickasaw Lake	1
OK	Davis Reservoir	1
OK	Dow Lake	1
OK	Fort Cobb Reservoir	1
OK	Great Salt Plains Reservoir	1
OK	Heyburn Lake	1

STATE	WATERBODY	# VISITS
OK	Hinton Lake	1
OK	Lake Eucha	1
OK	Lake Humphrey	1
OK	Lake Pawhuska	1
OK	Lake Perry	1
OK	Lake Shidler	1
OK	Okemah Lake	1
OK	Okmulgee Lake	1
OK	Pine Creek Lake	1
OK	Sardis Lake	1
OK	Skyline Lake	1
OK	Strip Pits State Management Area	1
OK	Wes Watkins Reservoir	1
OR	Columbia River	108
OR	Willamette River	29
OR	John Day River	23
OR	Brownlee Reservoir	17
OR	Lake Owyhee	14
OR	Lake Billy Chinook	10
OR	Malheur Reservoir	5
OR	Snake River	5
OR	Willamette Falls Hydroelectric Power Reservoir	5
OR	Deschutes River	4
OR	Unity Reservoir	4
OR	Clackamas River	3
OR	Cultus Lake	3
OR	Herman Creek	3
OR	Klamath Lake	3
OR	Lost Creek Lake	3
OR	Phillips Lake	3
OR	Prineville Reservoir	3
OR	Tenmile Lake	3
OR	Devils Lake	2
OR	Foster Lake	2
OR	Green Peter Lake	2
OR	Haystack Reservoir	2
OR	North Fork Reservoir	2

STATE	WATERBODY	# VISITS
OR	Willow Creek Reservoir	2
OR	Chetco River	1
OR	Clear Lake	1
OR	Cooper Creek Reservoir	1
OR	Cottage Grove Lake	1
OR	Crane Prairie Reservoir	1
OR	Detroit Lake	1
OR	Elk Lake	1
OR	Emigrant Reservoir	1
OR	Fall Creek Lake	1
OR	Gilbert River	1
OR	Hells Canyon Reservoir	1
OR	Henry Hagg Lake	1
OR	McKay Reservoir	1
OR	Prairie City Reservoir	1
OR	Rogue River	1
OR	Saddle Lake	1
OR	Salmon Lake	1
OR	Tahkenitch Lake	1
OR	Tualatin River	1
OR	Waldo Lake	1
OR	Wallowa Lake	1
OR	Welcome Lake	1
OR	Wickiup Reservoir	1
OR	Willamina Reservoir	1
OR	Wolf Creek Reservoir	1
SD	Lake Francis Case	1069
SD	Lake Sharpe	381
SD	Lake Oahe	318
SD	Lewis and Clark Lake	168
SD	Lake Thompson	104
SD	Waubay Lake	68
SD	Fort Randall Dam Tailwate	59
SD	Angostura Reservoir	43
SD	Lake Madison	40
SD	Brant Lake	39
SD	Lake Poinsett	39
SD	Lake Vermillion	32

STATE	WATERBODY	# VISITS
SD	Bitter Lake	27
SD	Missouri River	25
SD	Enemy Swim Lake	24
SD	Cattail Lake	23
SD	Bad River	15
SD	Big Stone Lake	14
SD	Roy Lake	13
SD	Belle Fourche Reservoir	12
SD	Lake Mitchell	12
SD	Pickerel Lake	10
SD	Clear Lake	9
SD	Lake Yankton	9
SD	Lake Albert	8
SD	Lake Kampeska	8
SD	Wall Lake	7
SD	Antelope Lake	6
SD	Horseshoe Lake	6
SD	McCook Lake	6
SD	Buffalo Lakes	5
SD	Lake Henry	5
SD	Lake Herman	5
SD	Pactola Reservoir	5
SD	Clay County Park Lake	4
SD	Lake Louise	4
SD	Lynn Lake	4
SD	Mina Lake	4
SD	Swan Lake	4
SD	Lake Byron	3
SD	Lake Hendricks	3
SD	Merritt Reservoir	3
SD	Sheridan Lake	3
SD	Amsden Lake	2
SD	Blue Doy Lake	2
SD	Brakke Dam	2
SD	Cheyenne River	2
SD	Cottonwood Lake	2
SD	Herman Lake	2
SD	Lake Alvin	2

STATE	WATERBODY	# VISITS
SD	Lake Sinai	2
SD	Pelican Lake	2
SD	Shadhill Reservoir	2
SD	Stockade Lake	2
SD	Wilmarth Lake	2
SD	Bullhead Lake	1
SD	Elm Lake	1
SD	Grassy Lake	1
SD	Hayes Dam	1
SD	Indian Creek Lake	1
SD	Lake Cochrane	1
SD	Lake Hurley	1
SD	Lake Oakwood	1
SD	Lakota Lake	1
SD	Marindahl Lake	1
SD	Minnewasta Lake	1
SD	Red Iron Lake	1
SD	Roosevelt Lake	1
SD	Scott's Slough	1
SD	Spirit Lake	1
SD	Stock Dam	1
SD	White Lake	1
TX	Lake Texoma	17
TX	Lake Fork Reservoir	10
TX	Lake Sam Rayburn	5
TX	Toledo Bend Reservoir	4
TX	Lewisville Lake	3
TX	Ray Roberts Lake	3
TX	Amistad Reservoir	2
TX	Canyon Lake	2
TX	Lake Arlington	2
TX	Lake Murvaul	2
TX	Lake O' the Pines	2
TX	Wright Patman Lake	2
TX	Caddo Lake	1
TX	Carter Lake	1
TX	Cedar Creek Reservoir	1
TX	Lake Arrowhead	1

STATE	WATERBODY	# VISITS
TX	Lake Athens	1
TX	Lake Bonham	1
TX	Lake Buchanan	1
TX	Lake Georgetown	1
TX	Lake Merideth	1
TX	Lake Travis	1
TX	Lake Whitney	1
TX	Lake Worth	1
TX	Martin Creek Lake	1
TX	Monticello Reservoir	1
TX	Pat Mayes Lake	1
TX	Red River	1
TX	Sandlin Lake	1
TX	Sescarid Lake	1
TX	Stillhouse Hollow Lak	1
UT	Lake Powell	84
UT	Jordanelle Reservoir	6
UT	Bear Lake	5
UT	Willard Reservoir	5
UT	Strawberry Lake	4
UT	Pineview	3
UT	Utah Lake	3
UT	Yuba Reservoir	3
UT	Deer Creek	2
UT	East Canyon	2
UT	Echo Reservoir	2
UT	Flaming Gorge	2
UT	Colorado River	1
UT	Green River	1
UT	Hunnington Reservoir	1
UT	Montera	1
UT	Pelican Lake	1
UT	Rockport	1
UT	Schofield	1
UT	Stratton	1
UT	Waller Bay	1
UT	Weber River	1
WA	Snake River	180

STATE	WATERBODY	# VISITS
WA	Columbia River	175
WA	Drano Lake	98
WA	Wind River	58
WA	Lake Roosevelt	53
WA	Diamond Lake	31
WA	Liberty Lake	31
WA	Moses Lake	29
WA	Banks Lake	27
WA	Potholes Reservoir	22
WA	Pend Oreille River	19
WA	Clear Lake	17
WA	Lake Washington	13
WA	Hood Canal	11
WA	Long Lake	10
WA	Loon Lake	10
WA	Saddle Mountain Lake	10
WA	Potholes State Park	9
WA	Rimrock Lake	9
WA	Sacheen Lake	9
WA	Big White Salmon River	7
WA	Lake Tapps	6
WA	Riffe Lake	6
WA	Sprague Lake	5
WA	American Lake	4
WA	Deer Lake	4
WA	Lake Chelan	4
WA	Scooteney Reservoir	4
WA	Blue Lake	3
WA	Buffalo Lake	3
WA	Horseshoe Lake	3
WA	Lacamas Lake	3
WA	Lake Stevens	3
WA	Newman Lake	3
WA	Silver Lake	3
WA	Spokane River	3
WA	Swift Creek Reservoir	3
WA	Wanapum Lake	3
WA	Billy Clapp Lake	2

STATE	WATERBODY	# VISITS
WA	Black Lake	2
WA	Crescent Lake	2
WA	Dalton Lake	2
WA	Eloika Lake	2
WA	Fishtrap Lake	2
WA	Kalama River	2
WA	Lake Goodwin	2
WA	Lewis River	2
WA	O'Sullivan Lake	2
WA	Sullivan Lake	2
WA	Sun Lakes State Park	2
WA	Badger Lake	1
WA	Baker Lake	1
WA	Battle Ground Lake	1
WA	Big Lake	1
WA	Bow Lake	1
WA	Cowlitz River	1
WA	Davis Lake	1
WA	Deep Lake	1
WA	Evergreen Lake	1
WA	Fort Spokane Lake	1
WA	Hamilton Island	1
WA	Kitsap Lake	1
WA	Klickitat River	1
WA	Lake Mayfield	1
WA	Lake Merwin	1
WA	Lake Roesiger	1
WA	Lake Samish	1
WA	Lake Sammamish	1
WA	Lake Sawyer	1
WA	Lake St Clare	1
WA	Lake Suquamish	1
WA	Lake Union	1
WA	Lake Whatcom	1
WA	Little Diamond Lake	1
WA	Lost Lake	1
WA	North and South Skookum Lakes	1
WA	Park Lake	1

STATE	WATERBODY	# VISITS
WA	Rock Lake	1
WA	Roesiger Lake	1
WA	Rose Lake	1
WA	Rowland Lake	1
WA	Silver Crown Lake	1
WA	Snohomish River	1
WA	Soda Lake	1
WA	Stan Coffin Lake	1
WA	Trout Lake	1
WA	Waitts Lake	1
WA	Warden Lake	1
WA	Washougal Lake	1
WA	Yakima River	1
WA	Yale Lake	1
WY	Glendo Reservoir	144
WY	Boysen Reservoir	87
WY	Alcova Reservoir	84
WY	Keyhole Reservoir	67
WY	Bighorn Lake	52
WY	Flaming Gorge Reservoir	52
WY	Pathfinder Reservoir	37
WY	Guernsey Reservoir	26
WY	Seminole Reservoir	14
WY	Buffalo Bill Reservoir	13
WY	Lake DeSmet	12
WY	Grayrocks Reservoir	11
WY	Hawk Springs Reservoir	8
WY	Fontenelle Reservoir	5
WY	Granite Reservoir	5
WY	Jackson Lake	5
WY	Sunshine Reservoir	4
WY	Yellowstone Lake	4
WY	Fremont Lake	3
WY	Lake Hattie	3
WY	Ocean Lake	3
WY	Bass Lake	2
WY	LAK Reservoir	2
WY	Lake Viva Naughton	2

STATE	WATERBODY	# VISITS
WY	Reservoir # 1	2
WY	Soda Lake	2
WY	Sulfur Ceek Reservoir	2
WY	Bull Lake	1
WY	Castlerock Reservoir	1
WY	Cheyenne River	1
WY	Cody Municipal Reservoir	1
WY	Crystal Reservoir	1
WY	Deaver Reservoir	1
WY	Dinwoody Lake	1
WY	Gillete Reservoir	1
WY	Glenrock	1
WY	Half Moon Lake	1
WY	Harrington Reservoir	1
WY	Lake Powell	1
WY	Leavitt Lake	1
WY	Meadowlark Lake	1
WY	Miracle Reservoir	1
WY	North Platte River	1
WY	Renner Reservoir	1
WY	Snake River	1
WY	Wheatland #1	1