

Summary of Research



Statewide Estimates of the Number of Recreational Watercraft Owned by Households in Montana

Michael S. Lewis (Human Dimensions Unit Supervisor, FWP)

November 2018

Abstract: *In 2018, Montana Fish, Wildlife & Parks (FWP) cooperated with the Montana Department of Natural Resources Conservation (DNRC) to conduct a survey of Montana households. Among other things, the survey was designed to provide statewide estimates of watercraft ownership in Montana. A generalized linear model was used to estimate the number of watercraft (by type) owned by households in Montana. Table 2 on the reverse side of this research summary provides detailed statewide estimates for the numbers of sailboats; motorized ballast, inboard, and outboard boats; personal watercraft (e.g., jet skis, wave runners); canoes; kayaks; stand up paddle boards; rowboats; rafts; drift boats; paddle boats; and, personal pontoons or float tubes owned by households in Montana. To our knowledge, this is the first time detailed watercraft estimates of this type have been provided for Montana.*

BACKGROUND INFORMATION

In the spring of 2018, Montana Fish, Wildlife & Parks (FWP) teamed up with the Montana Department of Natural Resources Conservation (DNRC) to conduct a survey of Montana households regarding the topic of aquatic invasive species and boating/fishing use in Montana. Among other things, the survey was designed to assist with providing statewide estimates of the number of watercraft in Montana for each of the following types of watercraft: sailboats; motorized ballast, outboard, and inboard boats; personal watercraft (e.g., jet skis, wave runners); canoes; kayaks; stand-up paddle boards; rowboats; rafts; drift boats; paddle boats; and, personal pontoons or float tubes.

To conduct the survey, FWP purchased a random sample of N=3,000 Montana households from Survey Sampling, Inc. for this effort. Two separate mailings of the survey were sent out to the study participants: (1) an initial mailing of the survey and (2) a replacement mailing of the survey sent out to all non-respondents approximately one month after the initial mailing. Surveys were successfully delivered to 2,274 households and a nearly 30 percent survey response rate was achieved.

A generalized linear model¹ was used to estimate the number of watercraft (by type) owned by households in Montana. The model provides an estimate of the mean number of watercraft (by type) owned by each household in the state as well as upper and lower bound means (e.g., a confidence interval). The estimated means multiplied times the number of households in Montana equals the estimated number of watercraft (by type) found in Montana. Table 1 on the following page provides the overall estimates of watercraft owned by households in Montana.

In addition to providing statewide estimates of watercraft ownership in Montana, the survey was also designed to provide estimates of the...

- Number of watercraft (by type) used this past year.
- Number watercraft (by type) used for fishing this past year.

-and-

- Number of watercraft (by type) taken out of state this past year.

The same generalized linear model was used to provide estimates for the above. Results of this analysis are provided in Table 2 on the next page.



¹ **Generalized Linear Model (Negative Binomial with Log Link).** Specifies negative binomial (with a value of 1 for the ancillary parameter) as the distribution and log as the link function. To have the procedure estimate the value of the ancillary parameter, a custom model with negative binomial distribution and selection of estimate value in the parameter group was used. Wald confidence intervals were used to identify upper/low bound estimates.

Table 1. Watercraft Estimates in Montana from the 2018 Survey of Montana Households Regarding the Topic of Aquatic Invasive Species and Boating/Fishing Use in Montana.

| Type of Watercraft | Estimate of the Number of Watercraft Owned by Households in Montana | <i>95% Confidence Interval</i> | |
|--|--|--------------------------------|-----------------------------|
| | | Lower Bound Estimate | Upper Bound Estimate |
| Sailboats | 2564 | 962 | 6832 |
| Motorized Ballast Boats | 5133 | 2556 | 10315 |
| Motorized Outboard Boats | 54795 | 44195 | 67939 |
| Motorized Inboard Boats | 23280 | 16804 | 32285 |
| Personal Watercraft (e.g., jet skis, wave runners) | 12276 | 7773 | 19368 |
| Canoes | 45861 | 35538 | 59181 |
| Kayaks | 111900 | 94406 | 132503 |
| Standup Paddle Boards (SUPs) | 27129 | 19858 | 37063 |
| Rowboats | 5787 | 2997 | 11174 |
| Rafts | 33469 | 24819 | 45088 |
| Drift Boats | 9637 | 5810 | 16000 |
| Paddle Boats | 4493 | 2142 | 9427 |
| Personal Pontoons or Float Tubes | 85765 | 71137 | 103504 |

**Based on 5-year estimate of the number of households in Montana (N=412,653 households) from Montana Census data.*

Table 2. Estimates of the number of watercraft owned by households in Montana that were used during the past year, that were used for fishing during the past year, and were taken out of the state during the past year.

| Type of Watercraft | Estimate of the number of watercraft owned by households in Montana that were... | | |
|--|---|---|---|
| | ...used during the past year | ...used for fishing during the past year | ...taken out of state during the past year |
| Sailboats | 1922 | less than 25 | 642 |
| Motorized Ballast Boats | 4498 | 4498 | less than 50 |
| Motorized Outboard Boats | 39080 | 35716 | 5299 |
| Motorized Inboard Boats | 20058 | 8370 | 2574 |
| Personal Watercraft (e.g., jet skis, wave runners) | 7118 | 655 | 1940 |
| Canoes | 26406 | 11889 | 656 |
| Kayaks | 84742 | 21298 | 6610 |
| Standup Paddle Boards (SUPs) | 22034 | 650 | less than 50 |
| Rowboats | 3856 | 1928 | less than 50 |
| Rafts | 25093 | 20300 | 650 |
| Drift Boats | 7061 | 7061 | 1284 |
| Paddle Boats | 3208 | none | none |
| Personal Pontoons or Float Tubes | 60801 | 13730 | 1959 |

**Based on 5-year estimate of the number of households in Montana (N=412,653 households) from Montana Census data.*

TO OBTAIN COPIES OF THIS SUMMARY

Contact the Human Dimensions Unit of FWP by phone (406) 444-4308 or visit FWP's website at fwp.mt.gov (and click on the following links..."Doing Business", "Reference Information", "Surveys", Social & Economic Surveys").