

by attracting attention and financial support to conservation goals (Leader-Williams and Dublin 2000, Walpole and Leader-Williams 2002). This distinction between flagship species and other conservation surrogates is critical to alleviating misconceptions over the term. Further, recent research by Verissimo et al. (2011) expands the definition of a flagship species to include a marketing aspect, and describes a flagship as “a species used as the focus of a broader conservation marketing campaign based on its possession of one or more traits that appeal to the target audience.” Often, flagships are charismatic megafauna, large vertebrates such as bears, big cats, whales and elephants, but research has also demonstrated that lesser-known, smaller species, such as chameleons (*Calumma tarzan*) (Gehring et al. 2010) and the axolotl (*Ambystoma maxicanum*) (Bride et al. 2008) can also serve as successful flagships.

The potential to increase participation in support and fundraising (Leader-Williams and Dublin 2002) as well as affect citizen pro-conservation intentions (Smith and Sutton 2008) and behavior (Skibins et al. 2012) makes the flagship approach valuable to conservation. Further, flagships can serve a multitude of roles such as increasing conservation awareness, fundraising, promoting ecotourism, protection of species/habitat, and influencing policy (Barua et al. 2010). The flagship approach is especially important given the current rate of biodiversity loss (SCBD [Secretariat of the Convention on Biological Diversity] 2008), and what researchers indicate as the wide-scale reliance on charismatic megafauna (Kontoleon and Swanson 2003) (e.g., In the United States  $\geq 50\%$  of wildlife funding is used for conservation of  $\leq 2\%$  of those species listed as endangered [Metrick and Weitzman 1996]). Specifically, the most well-known conservation flagships of the United States, including the Florida panther (*Felis concolor coryi*), California condor (*Gymnogyps californianus*) and the northern spotted owl (*Strix occidentalis caurina*), are in the top 10 species by total spending on endangered species (Metric and Weitzman 1996).

Research has indicated a variety of characteristics and criteria that make a flagship successful depending on the organization’s intended conservation outcome (e.g., local vs. global conservation awareness, fundraising, influencing policy). Generally, a species should be well-liked, recognizable, viewable, and associated with a particular habitat (Bowen-Jones and Entwistle 2002). Other factors that have been hypothesized as important in selecting a flagship species include body size (Ward

et al. 1998), conservation status (Gunnthorsdottir 2001), and biological group (e.g., part of an ecological guild; Krüger 2005) (see Barua et al. 2010 for overview of specific criteria depending on context and purpose). Selecting the most effective flagship for a conservation campaign involves understanding the target audience and certain contexts (e.g., social, cultural, political, economic), that affect their knowledge and attitudes and shape their interactions with the species (Kellert 1985, Hills 1993, Schlegel and Rupf 2010). Assessing attitudes, perceptions and preferences in regard to wildlife can be elucidated via a variety of tools such as workshops, focus groups, surveys and interviews (Jacobson 1999) and understanding the target audience’s perception of and attitudes towards a species is critical when assessing the species’ potential as a flagship for a particular region (Stevens 2011).

The objective of this study is to assess the potential of the river otter (*Lontra canadensis*) to serve as an aquatic flagship species for the Greater Yellowstone Ecosystem (GYE). The river otter, a semi-aquatic mammal has a variety of characteristics that endear them to the general public, such as being described as playful (e.g., Park 1971) and charismatic. The obligate use of aquatic habitats by river otters (Kruuk 2006) may lead to the species being associated with locally important habitats, a component of a successful flagship species.

Two different surveys were conducted during summer 2014 at 3 locations within Grand Teton (GRTE) and Yellowstone National Parks (YELL). The first survey (hereafter referred to as the “Guided-raft Trip Wildlife Viewing Survey”) was designed specifically to investigate the opinions and preferences regarding GRTE and its wildlife among participants on guided Snake River trips in GRTE. Place-based surveys were conducted among these participants to assess aquatic recreation frequency in GRTE, priority of participating in specific activities on the river trip, knowledge, and motivations on several potential flagship species, including the river otter.

The second survey (hereafter referred to as the “River Otter Viewing Survey”) was conducted at Oxbow Bend in GRTE and Trout Lake in YELL. These locations are popular wildlife viewing areas, specifically for the otter because of the aquatic components of each site (i.e., Oxbow Bend is a large bend in the Snake River, an ideal area for river otters, and Trout Lake is a lake connected to smaller streams, with populations of both cutthroat and rainbow trout). The goal of the Oxbow Bend and Trout Lake surveys

was to assess visitors' intent for visiting those sites, determine if they knew the river otter could be viewed at the site, and if so, determine if the potential to view the river otter was the primary reason for visiting the site on that day, and finally, assess frequency of visitation to primarily view the river otter.

## ♦ METHODS

To determine attitudes and preferences of the target audience (visitors and residents of the GYE) we conducted place-based social surveys with visitors to GRTE and YELL from 3<sup>rd</sup> June- 17<sup>th</sup> July 2014. A non-random intercept sampling method was used for survey collection (Davis 2012) at all three survey locations. Although this was a non-probabilistic sampling method, efforts were made to ask every visitor (over the age of 18) encountered to take the survey. In approaching every visitor, we increased the chances of a true representative sample because every member of the population had an equal chance of being selected.

### Guided-raft trip wildlife viewing survey

Surveys were conducted with visitors who participated in guided-raft trips on the Snake River ( $n = 768$ ) at the commercial boat pick-up location in Moose, WY. Participants were asked to complete the survey prior to participating on the river raft trip. The survey consisted of 15 questions (14 closed and 1 open-ended). A mixed-method approach was applied for the raft trip surveys, using both paper-and-pencil and electronic tablet (e-tablets) for survey administration. A response rate of 72% was attained. The surveys were designed to assess familiarity, knowledge and motivation to see 9 wild animal species while participating on a guided-raft trip in the Snake River in GRTE.

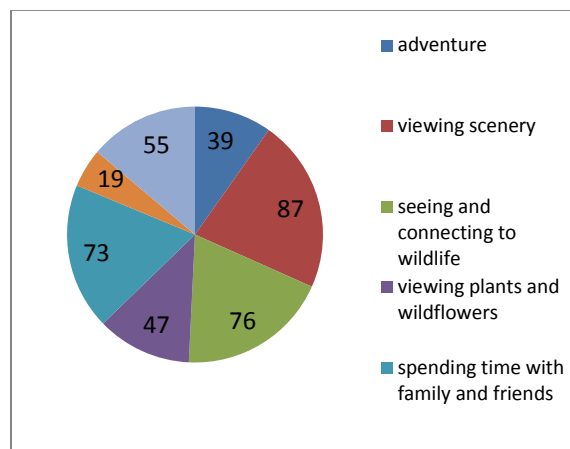
### River otter viewing survey

Paper-and-pencil surveys were administered in the parking lot of Oxbow Bend ( $n = 254$ ), and Trout Lake ( $n = 298$ ). Participants were asked to complete the survey prior to their trip to Trout Lake. The survey consisted of 12 closed-ended questions.

## ♦ PRELIMINARY RESULTS

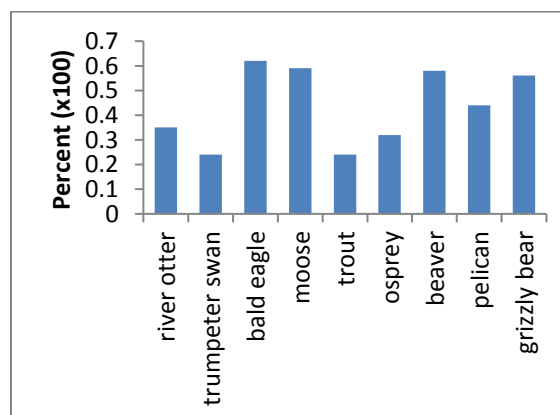
### Guided-raft trip wildlife viewing survey

The majority of respondents (76%;  $n = 580$ ) indicated that seeing and connecting to wildlife was a priority on the day's raft trip (Figure 1). Eighty-five

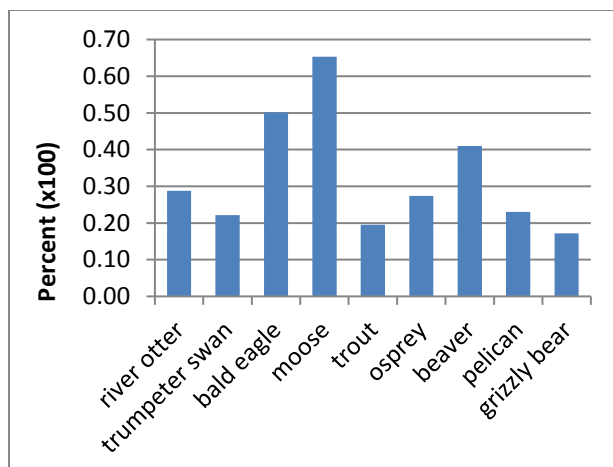


**Figure 1.** Percent of respondents to the question “How would you rate the priority of participating in the following activities on your guided river trip today?” recorded on a 1-7 scale in our 2014 survey of aquatic recreationists in GRTE. Responses that were reported as 6 and 7 are displayed.

percent ( $n = 638$ ) of the participants knew what the river otter looked like, 35% ( $n = 271$ ) considered themselves somewhat or very knowledgeable about the river otter (Figure 2), and 29% ( $n = 221$ ) were motivated to participate in the rafting trip to see the river otter (Figure 3). Against other species, the river otter ranked 4<sup>th</sup> to other species (moose [*Alces alces*], bald eagle [*Haliaeetus leucocephalus*], and beaver [*Castor canadensis*] which ranked 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> respectively) in motivation to participate in the raft trip. The species that ranked high in motivation (moose, bald eagle, beaver) also ranked high in “knowledge of” (bald eagle, moose and beaver were ranked 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> respectively).



**Figure 2.** Percent of respondents to the question “How knowledgeable are you about each of the animals listed below?” in our 2014 survey of aquatic recreationists in GRTE. Responses that were reported as “somewhat” or “very” are displayed.

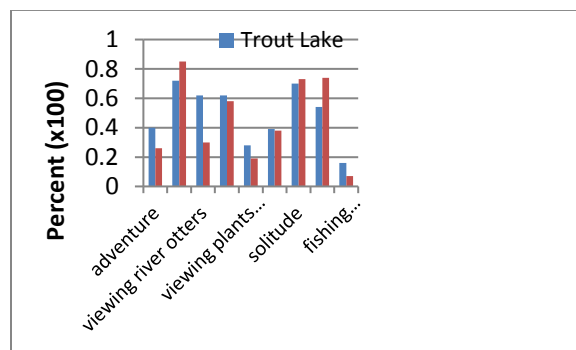


**Figure 3.** Percent of respondents to the question “How did the possibility to see the following animals motivate you to participate in today’s river trip?” in our 2014 survey of aquatic recreationists in GRTE. Responses that were reported as “very much” and “extremely” are displayed.

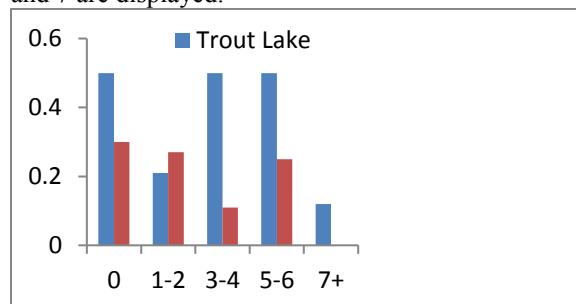
#### River otter viewing survey

A total of 289 Trout Lake visitors agreed to participate in the survey with a response rate of 87%. Most of the respondents (52 %,  $n = 157$ ) indicated this was not their first time visiting YELL, and 22% ( $n = 64$ ), indicated this was not their first time visiting Trout Lake. On average, repeat visitors to Trout Lake visited 9.1 times ( $SD \pm 17.78$ ). The majority of people indicated viewing scenery was their highest priority (72%,  $n = 209$ ), followed by solitude (70%,  $n = 203$ ), and viewing river otters (62%,  $n = 151$ ) (Figure 4).

Most of the visitors (59%,  $n = 174$ ) did not know that river otters could be viewed at Trout Lake. Of the 41% ( $n = 115$ ) who did know river otters could be viewed, 62% ( $n = 71$ ) agreed or strongly agreed that the possibility of viewing the river otter was the primary reason for visiting Trout Lake. When asked how they learned the river otter could be viewed from Trout Lake, most visitors (22%,  $n = 25$ ) indicated the internet/website and 19% ( $n = 22$ ) indicated friend/family member. Of the respondents who knew that river otters could be viewed at Trout Lake, most visitors (50%,  $n = 60$ ) indicated they had never been to Trout Lake to view river otters in the past and 21% ( $n = 25$ ) respondents indicated they had been there 1-2 times, 6% ( $n = 6$ ) (Figure 5).



**Figure 4.** Percent of respondents to the question “How would you rate the priority of participating in the following activities on your trip to {site name} today?” in our 2014 survey of visitors to Trout Lake and Oxbow Bend. Responses that were reported as 6 and 7 are displayed.



**Figure 5.** Percent (x100) of respondents to the question “Not including today, how frequently have you visited {site name} to view river otters in the past?” in our 2014 survey of visitors to Trout Lake and Oxbow Bend.

A total of 254 Oxbow Bend visitors agreed to participate in the survey with a response rate of 75%. Most of the respondents (40%,  $n = 103$ ) indicated this was not their first time visiting GRTE, and 35% ( $n = 91$ ), indicated this was not their first time visiting Oxbow Bend. On average, repeat visitors to Oxbow Bend visited 25.4 times ( $SD \pm 109.5$ ). The majority of people indicated viewing scenery was their highest priority (85%,  $n = 218$ ), followed by photography (74%,  $n = 191$ ), and solitude (73%,  $n = 187$ ) (Figure 4).

Most of the visitors (79%,  $n = 199$ ) did not know that river otters could be viewed at Oxbow Bend. Of the 20% ( $n = 53$ ) who did know river otters could be viewed, 11% ( $n = 6$ ) agreed or strongly agreed that the possibility of viewing the river otter was the primary reason for visiting Oxbow Bend. When asked how they learned the river otter could be viewed from Oxbow Bend, 15% ( $n = 8$ ) indicated other park visitors and 15% ( $n = 8$ ) indicated park employees (Figure 6). Most respondents (30%,  $n = 16$ ) indicated they had

never been to Oxbow Bend to specifically view river otters in the past, and some (26%,  $n = 14$ ) respondents indicated 1-2 times (Figure 5).

#### ◆ MANAGEMENT IMPLICATIONS

Flagship species have the potential to raise public awareness and financial support for conservation activities. To be a successful flagship, a species should be well-liked, identifiable, viewable, and associated with a particular habitat (Bowen-Jones and Entwistle 2002). Against other species, the river otter ranked 4<sup>th</sup> (moose, bald eagle, and beaver ranked 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> respectively) in motivation to participate in a raft trip. The species that ranked high in motivation (moose, bald eagle, beaver) also ranked high in “knowledge of” (bald eagle, moose and beaver were ranked 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> respectively). Many “well-known” species (moose, bald eagle, beaver) either “very much” or “extremely” motivated respondents to participate in the river raft trip. This could be because these animals have an intrinsic quality that appeals to tourists, or the species appeals to tourist because they consider themselves “very” or “extremely” knowledgeable about these species (Stevens 2011).

The results of the Oxbow Bend and Trout Lake surveys indicate that after people learn that river otters can be viewed there, many return to those sites for a chance to view river otters. This indicates that the river otter appears to be a popular species among tourists. Further, Trout Lake is a more popular viewing area for the river otter than Oxbow Bend. This is likely because Oxbow Bend is well-known for its view of the Snake River and Mt. Moran, and thus is more popular for viewing scenery and photography than Trout Lake.

The results from the first year of our study initially support the idea that the river otter could serve as aquatic flagship for the GYE. Overall, initial outcomes suggest that aquatic recreationists and visitors of aquatic habitats in GYE would support the river otter as a flagship. However, educational efforts are needed to enhance the familiarity of visitors to the region about the ecological function of the river otters and where they are most likely to be viewed.

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