

THE YELLOWSTONE RIVER WATERFOWL HUNTING CLOSURE IN EASTERN
MONTANA: EVALUATION OF PRIVATE LANDOWNER ATTITUDES

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The Yellowstone River Waterfowl Hunting Closure in Eastern Montana:
Evaluation of Private Landowner Attitudes

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North Dakota State University's regulations and meets the accepted standards
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ABSTRACT

Wildlife managers now hypothesize the limiting factor regarding waterfowl hunting opportunity and goose harvest in the lower Yellowstone River Valley is hunter access rather than waterfowl abundance. This study used a questionnaire to ascertain landowner attitudes towards the Yellowstone River waterfowl hunting closure (YRC) and determine the level of receptiveness towards changes to the waterfowl management policy. Landowners within the closure area indicated they valued and would disagree with a policy change. Landowners located outside of the closure area did not demonstrate an affinity towards the YRC and would be unlikely to disagree with a policy change.

Engaging Inside landowners and other key stakeholders such as sportsmen, in the decision making process regarding the direction of the YRC policy will be essential in minimizing conflict. The results of this study will assist wildlife managers and other stakeholders to make informed decisions regarding waterfowl management in the lower Yellowstone River Valley.

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LIST OF ABBREVIATIONS

YRC.....	Yellowstone River waterfowl hunting closure
FWP.....	Montana Fish, Wildlife and Parks
HDW.....	Human dimension of wildlife management
NAWMP.....	North American Waterfowl Management Plan
Flyway.....	Central Flyway
Inside landowners.....	Private landowners wither greater or equal to 65 contiguous hectares within 3.2 kilometer on either side of the Yellowstone River inside of the waterfowl hunting closure area
Outside landowners.....	Private landowners wither greater or equal to 65 contiguous hectares within 3.2 kilometer on either side of the Yellowstone River outside of the waterfowl hunting closure area

INTRODUCTION

In Aldo Leopold's landmark book *Game Management*, he defined game management as "the art of making land produce sustained annual crops of wild game for recreational use." In subsequent years it has become more and more evident that a significant portion of the "art" of wildlife management lies within the component of human dimensions. Wildlife resource managers have recognized that effective resource management involves not only the application of sound biological principles, but also a consideration must be made to incorporate social and ethical aspects (Peterson & Rodriguez, 2012; Humburg, Koneff, Raedeke, & Graber, 2008; Mangun, 1992). A common example of this is the use of waterfowl hunting closures. Often hunting closures are political or socially motivated, rather than ecologically driven (Rasmussen, 2007). Such is the case with this study on waterfowl hunting in the Yellowstone River Valley in eastern Montana. Stakeholders have created social and economic attitudes, processes, and behaviors in relation to the management of waterfowl hunting along the Yellowstone River. As a result, there are opposing viewpoints between and amongst different interest groups.

Yellowstone River Waterfowl Hunting Closure Background

Under the Montana Stream Access Law, the public may use rivers and streams for recreational purposes up to the ordinary high-water mark regardless of streambed ownership (Montana Fish, Wildlife and Parks Hunting Regulations, 2012). In compliance with Montana Stream Access Law, it is legal to hunt waterfowl between the ordinary high-water marks without gaining permission of adjacent private landowners. However, per Montana Fish, Wildlife and Parks (FWP) Commission action, specific areas statewide are closed to waterfowl hunting. In

2012, there were 11 waterfowl hunting closures on public waterways in the State of Montana. In general, waterfowl hunting closures in Montana consist of hunting restrictions imposed on specific reservoirs or short stretches of rivers that have been urbanized (Montana Fish, Wildlife and Parks Hunting Regulations, 2012).

In 1959, the Montana Fish and Game Commission instituted a waterfowl hunting closure on the Yellowstone River from the confluence of the Bighorn and Yellowstone Rivers, eastward to the Custer and Rosebud County line (Figure 1). The Yellowstone River waterfowl hunting closure (YRC) was enacted in response to local concerns regarding perceived low waterfowl numbers in the Yellowstone Valley. The original intent of the YRC was to create a safe haven for migrating waterfowl, specifically Canada geese (*Branta canadensis*), with the goal of retaining waterfowl in the area to provide increased hunting opportunity (N. Martin, Retired Wildlife Manager Montana Fish, Wildlife and Parks, personal communication). As described in the 2012 Montana Hunting Regulations, the Yellowstone River waterfowl hunting closure “shall be within the confines of the normal stream flow and shall include all islands, backwaters and sandbars.” The YRC extends 140 river kilometers and encompasses approximately 6,000 linear hectares.

The waterfowl hunting closure remained in effect until 1975. In 1975, FWP opened a portion of Treasure County to waterfowl hunting with the intent of working towards abandoning the closure entirely in 1976 (N. Martin, Retired Wildlife Manager Montana Fish, Wildlife and Parks, personal communication). The termination of the waterfowl hunting closure never came to fruition as three Rosebud County landowners filed and won a class action lawsuit against FWP in the District Court of the 16th Judicial District in Forsyth, Montana. The district court judge concluded that the Fish and Game Commission did go through adequate public process and was

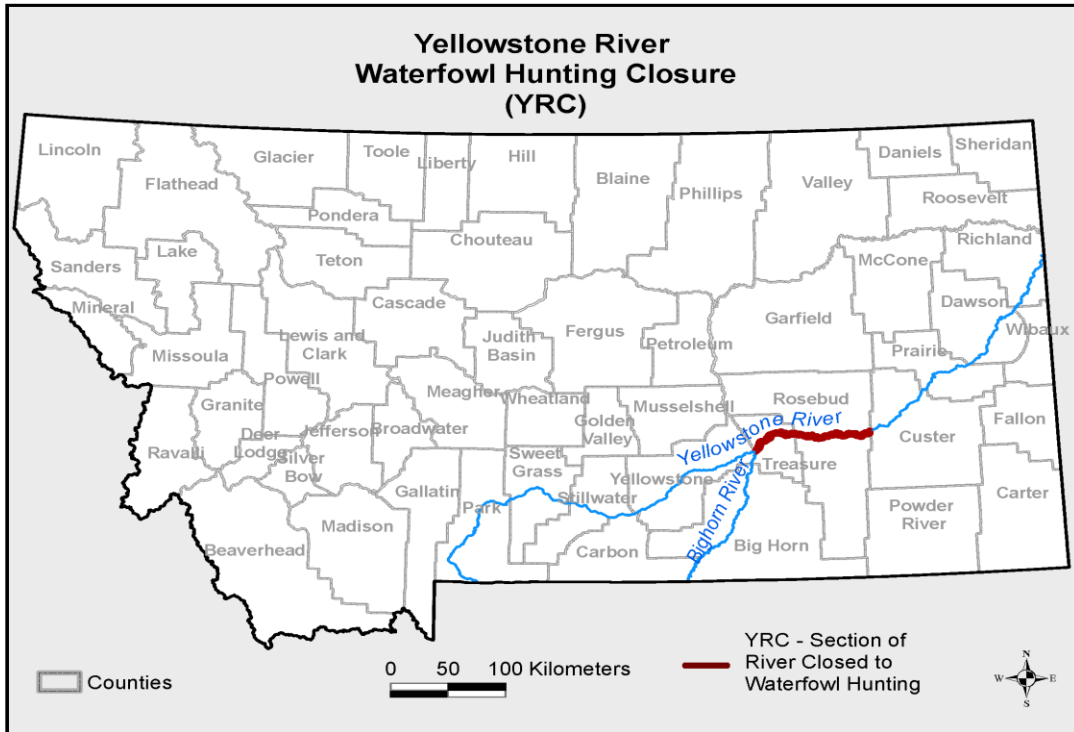
negligent in notifying the public of the proposed abandonment (Dr. James Cope, Ivan Dahlman, and John H. Smith vs. Wesley Woodgerd, Director of the Fish and Game Department of the State of Montana, 1976). The 140-kilometer section of Yellowstone River across Rosebud and Treasure Counties has remained closed to waterfowl hunting since 1975. The rest of the river has remained open to waterfowl hunting.

Although dormant from formal action for more than five decades, the YRC remains a contentious and polarizing issue; one in which Montana Fish, Wildlife and Parks has been challenged by constituents. In recent years, FWP has received an increasing amount of comments related to the YRC; there is still a difference of public opinion as to whether the closure is a positive or negative management practice. Typically supporters of the YRC maintain there is a direct cause and effect relationship between the waterfowl hunting restriction and the abundance of waterfowl and the resultant high quality field-based waterfowl hunting along the Yellowstone River Valley corridor in Rosebud and Treasure Counties. Conversely, opponents of the YRC contend the waterfowl hunting closure arbitrarily restricts public hunting opportunity and opening the river would not severely diminish the waterfowl in the area (N. Martin, Retired Wildlife Manager Montana Fish, Wildlife and Parks, personal communication).

The goal of this study was to gain a better understanding of identified stakeholders' sentiments towards the Yellowstone River waterfowl hunting closure and determine their level of receptiveness towards potential policy changes to the YRC. Landowners inside and in proximity to the closure area were identified as a key stakeholder group for this study. By evaluating the attitudes, behaviors and values of landowners, the research objective was focused on the social characteristics of the YRC as they pertain to identified landowners. The results of this study will

provide insight and understanding of the YRC policy, its effects on identified landowners and may aide future waterfowl management decisions on the Yellowstone River.

Figure 1. Map of the Yellowstone River waterfowl hunting closure. The part of the Yellowstone River that is closed is in red.

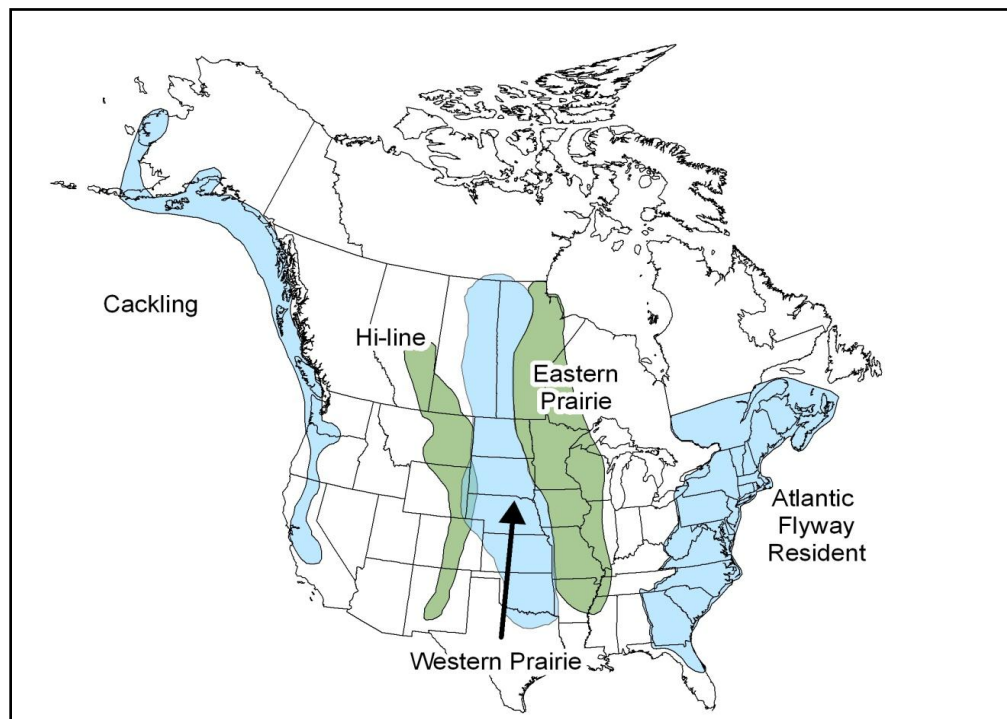


Study Species

In Montana, Canada geese (*Branta canadensis*) are the dominant winter waterfowl species and most of the wintering Canada geese in the Yellowstone and Bighorn River valleys are part of Hi-Line population of the Central Flyway (Flyway) (Figure 2). In recent years Canada geese have outnumbered mallards (*Anas platyrhynchos*), the second most abundant waterfowl species wintering in the study area, by approximately four to one. The 2011 Central Flyway Report indicated the six-year average of Canada geese observed in the Flyway portion of Montana during the January Mid-Winter Waterfowl survey was 84,809 birds, while the

wintering mallard population was estimated to be 19,994 birds. In 1974-75, the year an attempt was made to close the YRC, the estimate for the Hi-Line Canada goose population was 41,200; in 2011 the estimate increased over six times to 273,025 (Kruse, 2011). Canada geese are the most abundant wintering waterfowl species in the study area as well as the most pursued by sportsmen in Montana. Therefore, this study focused on landowner sentiment towards the YRC in respect to the dominant waterfowl species, Canada geese.

Figure 2. Map of North American Canada goose populations (U.S Fish and Wildlife Service, 2012).



Intent of Research

The North American Model of Wildlife Management directs that wildlife is a public resource and managed for the benefit of the public by state agencies. Peterson & Rodriguez (2012) surmises that the professional imperative to consider human dimension of wildlife management (HDW) originates from the need for state agencies to manage the wildlife resource

for the public benefit. That is the foundation of this study, the need for wildlife managers to know what the public considers beneficial. Traditionally, the professional opinion of wildlife managers determined what was best for the public and its wildlife resource. However, public acceptance of professional wildlife experts as the sole determinant of wildlife policy has diminished. Public involvement in the wildlife management decision making process is continuing to increase (Organ, Decker, Riley, McDonald, & Mahoney, 2012). FWP utilizes adaptive management as the decision process in managing the resources. Stakeholder involvement is an essential component of the adaptive management decision-making process. According to Organ et al. (2012) a “stakeholder in the context of adaptive management is any person who affects or is affected by, the wildlife issue or management approach under consideration.” Key stakeholders in this wildlife management policy issue of the Yellowstone River waterfowl hunting closure are landowners, sportsmen and local businesses.

The intent of this study was to focus on the HDW element of the YRC and evaluate the attitudes of important stakeholders. This research was not designed to substantiate or dispute survey participant feedback. More so, it was designed to inform policy. Specifically, the reason for this research was to ascertain landowner sentiment towards the Yellowstone River waterfowl hunting closure and determine the level of receptiveness towards potential changes to that waterfowl hunting closure. By engaging the landowner stakeholder group two things are hoped to be accomplished: 1) capture local knowledge of the policy in the decision-making process, and 2) ensure transparency and participatory engagement in the decision-making process. Through the survey instrument, both quantitative and qualitative data was collected and synthesized to gain a better understanding of the wildlife management policy that is the Yellowstone River waterfowl hunting closure.

LITERATURE REVIEW

This literature review concentrates on the three aspects of waterfowl management in respect to the Yellowstone River waterfowl hunting closure in eastern Montana. The first section is a review of the history of waterfowl conservation in North America and the Central Flyway which encompasses the study area. The second segment is an examination of human disturbances on waterfowl. The third review focuses on the role human dimensions of wildlife management play in shaping future waterfowl management decisions. It is important to examine these three key aspects in order to better understand the characteristics of the waterfowl management policy that is the Yellowstone River waterfowl hunting closure.

History of Waterfowl Conservation and Management

Dating back over one hundred years, conservationists have worked to promote abundant waterfowl populations. In fact many efforts, now thought of as wildlife management, were focused on waterfowl. For example, even before market hunting was declared unlawful in 1918 by the passing of the Migratory Bird Treaty Act, President Theodore Roosevelt set aside the first federal bird reservation in 1903. This Executive Order was the precursor to the national wildlife refuge system. President Theodore Roosevelt would go on to set aside nearly 40 more wildlife refuges. For approximately two decades following the Theodore Roosevelt administration, the acquisition of new refuges was erratic as a result of congress approving funding on a refuge-by-refuge basis. In an effort to create a consistent funding source for America's developing federal refuges, Congress approved the Migratory Bird Conservation Act (MBCA) in 1929 (Bolen, 2000). Within months of the establishment of the MBCA, the stock market crashed and the economic challenges of the Great Depression stymied funding for waterfowl conservation. At

the prompting of hunters, in 1934, the U.S. Fish and Wildlife Service created the Federal Migratory Bird Hunting and Conservation Stamp (“Duck Stamp”) with the intent of creating a stable funding mechanism to be used for the acquisition and protection of waterfowl habitat. Through conservation efforts such as the Duck Stamp, over 590 national wildlife refuges and wetland management districts have been established. The creation of these areas has protected more than 60 million hectares of habitat critical to waterfowl and other wildlife species (Anderson, et al., 2012).

Following years of drought, poor habitat conditions, and declining waterfowl populations in the 1980s, another milestone in waterfowl management was established. In 1986 Canada and the United States partnered in the North American Waterfowl Management Plan (NAWMP). Mexico later joined the agreement in 1994 (Anderson, et al., 2012). The overriding goal of the NAWMP was to restore waterfowl populations in North America to levels observed in the 1970s. This was to be accomplished by broad-based public-private partnerships with a focus on habitat conservation (Williams, 1999). Decades later, in addition to preserving nearly 6 million hectares of waterfowl habitat, NAWMP partners have helped to shape land use, agricultural practices, and public policies relevant to the goal of sustainable and abundant waterfowl populations (Anderson, et al., 2012).

From the inception of the 1986 NAWMP, most waterfowl populations have recovered. In comparison to the 1980’s, the 2012 population estimates were higher for most species of waterfowl. Similarly, most waterfowl species population estimates were close to the numbers observed in the 1970s, which again serves as the baseline for the desired population objective (U.S. Fish and Wildlife Service, 2012). Along with waterfowl habitat conservation, other factors were likely to contribute to the increase in waterfowl numbers since the 1980s such as increased

precipitation on nesting grounds, conservative restrictions on waterfowl harvest, changes in agricultural practices and policy changes (Williams, 1999). Perhaps the most notable policy was the advent of the Conservation Reserve Program which transformed marginal cropland into wildlife habitat.

The Central Flyway was established in 1948 and serves as the administrative unit for migratory game bird management. It encompasses ten states (including Montana), two Canadian Provinces, the Northwest Territories and Nunavut. A primary focus of the Flyway has been goose management including population estimates and distribution, habitat assessment and restoration, and hunting guidelines. Relevant to this study, the Flyway manages five populations of Canada geese: the Hi-Line, Western Prairie, Great Plains, Short Grass Prairie, and Tall Grass Prairie populations. Of note, the Short Grass Prairie, and Tall Grass Prairie populations are small races of Canada geese and are not the focus of this study. The Hi-Line population is most applicable to this study as it is the predominant Canada goose population that migrates through or winters in eastern Montana.

When the Flyway was established, Canada goose populations were not as robust as they are today. In the 1920's it was predicted that the goose would be extinct a quarter of a century later and in 1954 it was reported that the Canada goose was in fact extinct (Gabig, 2000). By the 1960's, Canada goose restoration was a high priority in the Flyway as transplants were ongoing in several states including Montana. At this same time, the YRC was established to provide a rest area for migrating Canada geese. Five decades later, the Canada goose population has more than recovered and is continuing to increase. The current Hi-Line population objective is 80,000, and the mean population size between 2002 and 2011 is 266,600 (Kruse, 2011). In some

instances, goose numbers in the Flyway have reached nuisance levels (Gabig, 2000; Ankney, 1996). Therefore, the impetus has shifted from population recovery to population management.

Human Disturbances of Waterfowl

Human-wildlife conflict occurs in two contexts: 1) Wildlife impeding human safety and/or well-being or 2) human behavior impeding wildlife safety and/or well-being. Ultimately, human behavior and decisions made regarding human and wildlife interactions determine the outcome for both humans and wildlife (Cline, Sexton, & Stewart, 2007). For this review, the focus is on the impacts human disturbances can have on waterfowl.

Human activity can cause intended or unintended waterfowl disturbances (Demaso, Hernandez, & Brennan, 2012; Cline, Sexton, & Stewart, 2007). As a result, it is common for managers to establish spatial and temporal closures that restrict anthropogenic activities in an effort to reduce disturbances; thereby increasing waterfowl usage in a desired area (Dooley, Sanders, & Doherty, 2010; Dahlgren & Korschgen, 1992). An examination of reference material indicated that most disturbances are caused by water users; primarily boaters, anglers and hunters (Korschgen & Dahlgren, 1992). Previous research has demonstrated that, although typically less significant than hunting, non-hunting related disturbances can also affect waterfowl (Dooley, Sanders, & Doherty, 2010; Hestbeck, Nichols, & Malecki, 1991; Cline, Sexton, & Stewart, 2007). It is acknowledged that, in addition to direct hunting mortality, human disturbances can have detrimental physiological impacts to waterfowl (Bélanger & Bédard, 1990; Frederick, Clark, & Klaas, 1987; Gates, Caithamer, Moritz, & Tacha, 2001; Cline, Sexton, & Stewart, 2007). Subsequently, one of the primary reasons for hunting closures is to provide secure areas close to food sources for migrating waterfowl (Nelson, 2008). For example, Bechet, Giroux, & Gauthier, (2004), observed that disturbances reduced the ability of geese to meet metabolic

energy demands required for migration. However, because the current population of the target species for this research (Canada geese) is robust in the study area, rather than expounding upon the biological impacts of human disturbance, this study placed more of an emphasis on the behavioral perspective of human disturbance on waterfowl.

Sustained human disturbances to waterfowl can alter activities and behavior. For example, disturbances can cause a shift from normal activities such as diurnal to nocturnal feeding patterns (Madsen, 1998; Dooley, Sanders, & Doherty, 2010). Disturbances can also cause a disruption of cohesive family groups. A study that evaluated the effects of disturbances on Canada geese suggested that disturbances on roosting sites may result in less cohesive family groups thereby increasing susceptibility of geese to hunting causing increased mortality (Bartelt, 1987). Additional studies have observed an inverse correlation between waterfowl usage of a site and the level of hunting pressure (Madsen, 1998; Bregnballe & Madsen, 2004; Bechet, Giroux, & Gauthier, 2004; Pease, Rose, & Butler, 2005; Dooley, Sanders, & Doherty, 2010).

Dooley et al. (2010) surmised that most research focused on hunting disturbance has been site specific and typically evaluates the abundance of waterfowl groups. As a result Dooley, Sander and Doherty designed their research along the South Platte River in northeastern Colorado to assess individual waterfowl response to disturbances. Their study concluded that mallards exposed to shooting disturbances have a greater mean flight distance after the disturbance than mallards exposed to walk-in disturbances. This finding is consistent with other works where they also observed a high number of disturbed mallards returning to the area where the disturbance occurred. This finding suggests that waterfowl display site fidelity to an area and may not completely abandon the area due to disturbance (Dooley, Sanders, & Doherty, 2010). This finding is also consistent with other research where factors such as habitat composition,

distance from similarly attractive habitat, hunting intensity, species and size of the body of water are some elements that may determine the level of waterfowl tolerance towards disturbances (Fox & Madsen, 1997; Bregnballe & Madsen, 2004; Dooley, Sanders, & Doherty, 2010).

Through his work, Nelson (2008) provided further evidence that the efficacy of a closed area is site specific as he observed waterfowl numbers increased in some newly closed areas and did not observe such a change in other newly closed areas on the Upper Mississippi River National Wildlife and Fish Refuge.

The research conducted by Dooley et al. (2010) on mallards on the South Platte River using two disturbance treatments, walk-in and shooting, found that the rate of return for the mallards was similar for both treatments. This is important as it demonstrates the need for all disturbance activities to be considered if the management objective is to establish a waterfowl refuge void of human disturbances. Fox and Madsen (1997) state there is “little point in establishing hunting free-areas that are subject to disturbances from other activities”. In order to mitigate human disturbance of waterfowl, it has been suggested that buffer zones be established that are at least three times the escape flight distance of the most sensitive species (Fox & Madsen, 1997). Bregnballe et al. (2004) concluded that zones of 500 meters were adequate to buffer against shooting disturbances to waterfowl.

Spatial closures are not the only method managers employ to reduce human disturbance of waterfowl. Waterfowl managers often use temporal closures with the goal of increasing waterfowl usage of an area. For example an area may be closed to waterfowl hunting for a portion of a day (e.g. area closed to hunting after 1 pm), during certain days of the week (e.g. area closed Tuesday-Thursday) or certain weeks of a month (e.g. area closed every two weeks) (Dooley, Sanders, & Doherty, 2010). Previous works synthesized for this review, concluded

spatial closures to be more effective than temporal closures and if temporal closures are implemented the rest period between hunting should be in increments of weeks rather than days (Fox & Madsen, 1997; Bregnballe & Madsen, 2004; Dooley, Sanders, & Doherty, 2010).

Wildlife managers are most often charged with the difficult task of managing for multiple, competing uses. This is especially true for public wildlife management areas where bird-watching, deer hunting, hiking, and duck hunting may all be occurring concurrently. Dooley et al. (2010) concluded that both temporal and spatial hunting regulations should be judiciously implemented to coincide with management objective as well as site specific conditions. This is imperative, as it would be without cause to impose a restriction on one activity if another activity has a similar impact. It is apparent that empirical data, designed to assess the efficacy of temporal and spatial closures is deficient. A clearer understanding of the effects of human disturbances on waterfowl would lead to more informed waterfowl policy thereby increasing the likelihood of reaching optimal public waterfowl hunting opportunities.

The Role of Human Dimensions in Waterfowl Management

As indicated in the first section of this literature review, waterfowl managers have extensive biological information to aide in their management decision making process. Historically, waterfowl managers have taken the traditional management approach and have focused almost exclusively on biological processes with less emphasis on the relationship between management and social outcomes (Humburg, Koneff, Raedeke, & Graber, 2008). The integration of biological and social characteristics is the essence of human dimensions of wildlife management (HDW). According to Peterson & Rodriguez (2012), HDW is “the portions of wildlife management that focus on the interactions between people and wildlife or between people regarding wildlife.” Within recent decades, those responsible for establishing wildlife

policy acknowledge that stakeholders increasingly are demanding to be a part of the decision-making process. Fortunately, the development and evolution of the human dimension discipline and the field of wildlife management have progressed so that human characteristics such as hunter satisfaction and biological elements such as population estimates can be integrated in a comprehensive management model (Decker, et al., 1992).

The study of human values, attitudes and behaviors has gained momentum within the HDW discipline. These types of studies are popular because they are simple to conduct and synthesize and can be helpful to predict and provide insight into wildlife-related behavior (Peterson & Rodriguez, 2012). This is especially true in waterfowl management as managers strive for hunter retention and recruitment. In the past, duck stamp sales and breeding population estimates of ducks were closely matched; however in the 1990's when waterfowl populations increased dramatically, the number of hunters did not proportionately increase (Anderson, et al., 2012). As a result waterfowl managers have actively engaged in human dimensions research to try to assess public attitudes and behaviors with the intent of elucidating the decline in hunter participation (Adams, Leifester, & Herron, 1997). Peterson & Rodriguez (2012) stated, "the most important reasons for including HDW perspectives in wildlife management is that HDW is necessary to achieve sustainable wildlife conservation solutions." This summarizes the essentiality of HDW, as people are often the central problem to a specific wildlife or natural resource issue.

Summary

Waterfowl management in North America, the Central Flyway and eastern Montana has changed dramatically since the establishment of the YRC over four decades ago. This literature review elucidates three aspects of waterfowl management relative to the YRC. First, decades of

waterfowl conservation efforts have led to increased Canada goose numbers that continue to expand well beyond the population objective. Second, previous research on human disturbance concludes that there are many variables to examine when considering the impacts on waterfowl. Therefore, disturbance restrictions should be implemented on a case-by-case basis depending on site characteristics and management objectives. Finally, human dimensions are an important aspect of wildlife management that should be integrated with biological data to assure sound wildlife management policies.

METHODS

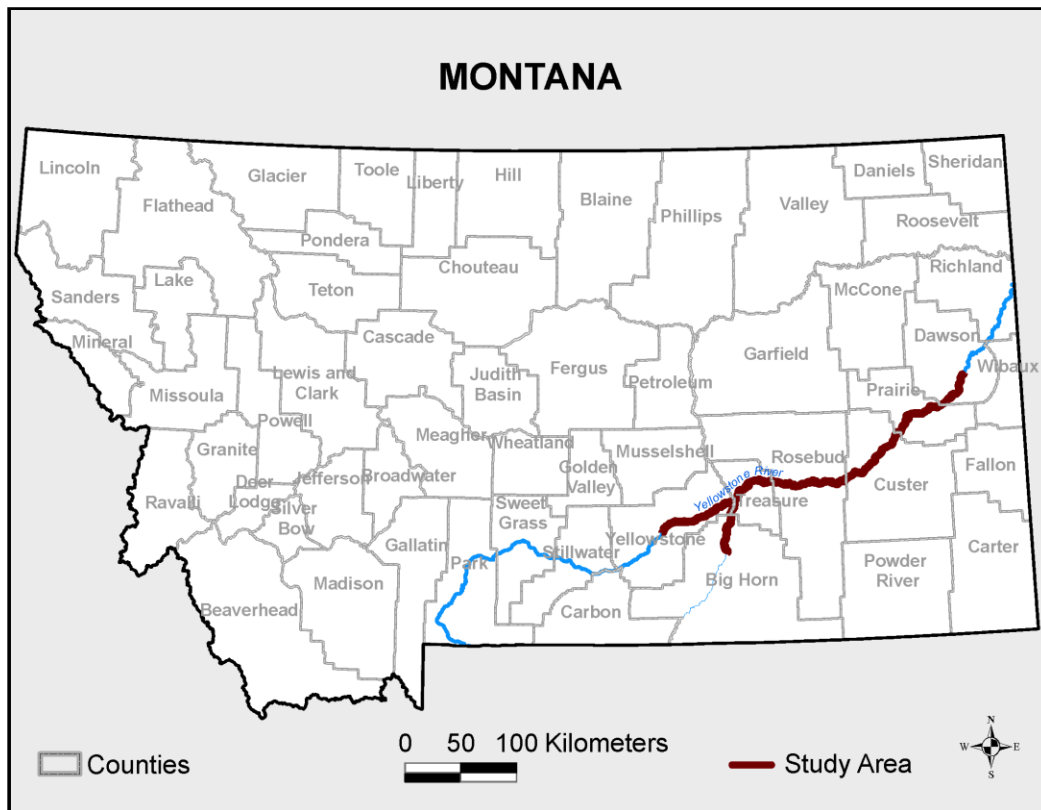
Study Area

The Yellowstone River, originating in northern Wyoming, flows 885 kilometers eastward through southern Montana before joining the Missouri River near the Montana and North Dakota border northeast of Sidney, MT (Figure 3). Major tributaries of the Yellowstone River in eastern Montana include the Bighorn River which joins at Bighorn, MT; the Tongue River which joins at Miles City, MT; and the Powder River which joins near Terry, MT. In addition to these three rivers in the study area, there are smaller perennial streams and many ephemeral and intermittent streams that flow into the Yellowstone River. The average precipitation for the study area is 31.6 centimeters with May and June being the wettest months. The average minimum temperature is 0.89° C and the average maximum temperature is 14.7°C. The Yellowstone River is the longest undammed river in the lower 48 states and provides significant riparian habitat crucial for supporting a variety of wildlife species. Vegetation along the Yellowstone River watershed is typically short grass prairie when not converted to farmland and irrigated fields.

The study area was defined as the portion of the river valley inside the YRC as well as sections outside of the YRC. The inside section of the study area consisted of the Yellowstone River corridor within the 140 kilometer section of the YRC from the mouth of the Bighorn River to Hathaway, Montana. The outside section of the study area was made up of two components, an east section and a west section. The outside section located east of the YRC was defined as 177 kilometers of the Yellowstone River Valley from Hathaway, MT to Glendive, MT. The Outside section located west of the YRC was composed of 87 kilometers of the Yellowstone

River valley from the mouth of the Bighorn River west to Huntley, MT and 68 kilometers of the Bighorn River valley from the mouth of the Bighorn to Hardin, MT. The width of the study area consisted of 3.2 kilometers on either side of the river from the midpoint of the primary channel.

Figure 3. Map of the Yellowstone River closure study area.



Survey Methods

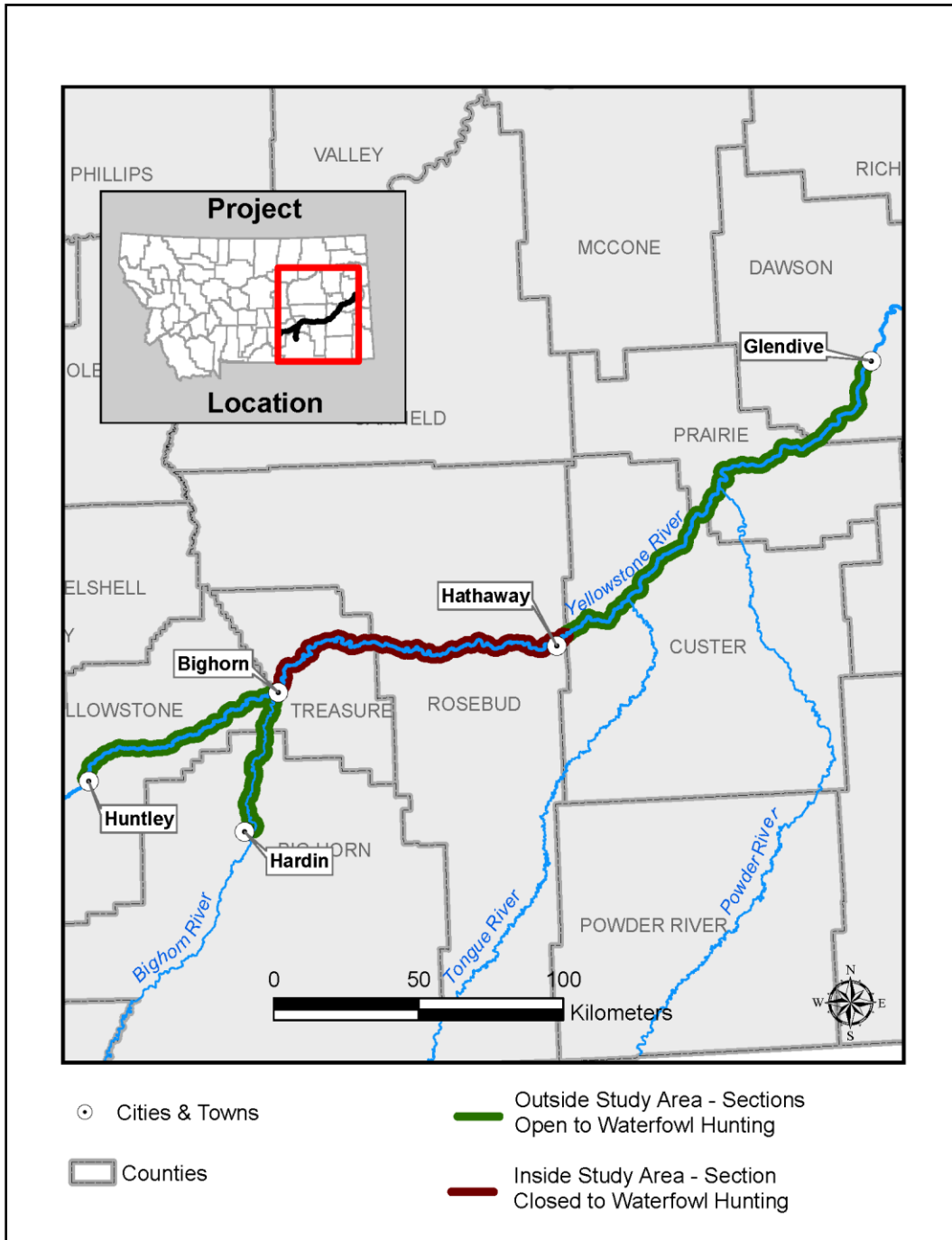
The study of human values, attitudes, and behavior are prevalent in human dimensions of wildlife research (Peterson & Rodriguez, 2012). This study used a mail-in survey instrument to gain insight on the values, attitudes and behavior of landowners along the Yellowstone River in respect to the waterfowl hunting closure. The survey instrument was developed with guidance from FWP's Responsive Management Unit. The questions were drafted based upon my experience working with landowners and hunters as FWP's regional hunting access coordinator.

The survey instrument was evaluated cooperatively with NDSU faculty and FWP staff prior survey execution.

Values are difficult to observe or explicitly measure. To indicate what values people hold, wildlife researchers and managers use surveys to elucidate behaviors and attitudes (Peterson & Rodriguez, 2012). Descriptive research methods such as “what percent of” and “do you support” questions were employed to assess the opinions of landowners affected by the YRC. To acquire insight into landowner explicit attitudes, closed-ended, fixed-format questions using Likert scales were constructed to solicit landowner agreement or disagreement with statements regarding the YRC.

The target population of landowners was derived from selecting private landowners with greater or equal to 65 contiguous hectares within 3.2 kilometers on either side of the Yellowstone and Bighorn Rivers from the towns of Huntley to Glendive and Bighorn to Hardin respectively (Figure 4). These sections were selected for comparable habitat characteristics, length of river kilometers and waterfowl hunting regulations. Landowners east and west of the YRC were aggregated. Thus the landowner population was dichotomized into two groups: Inside landowners and Outside landowners. It is important to note that not all landowners surveyed own riverfront property.

Figure 4. Map of survey sample sections for the Yellowstone River closure study.



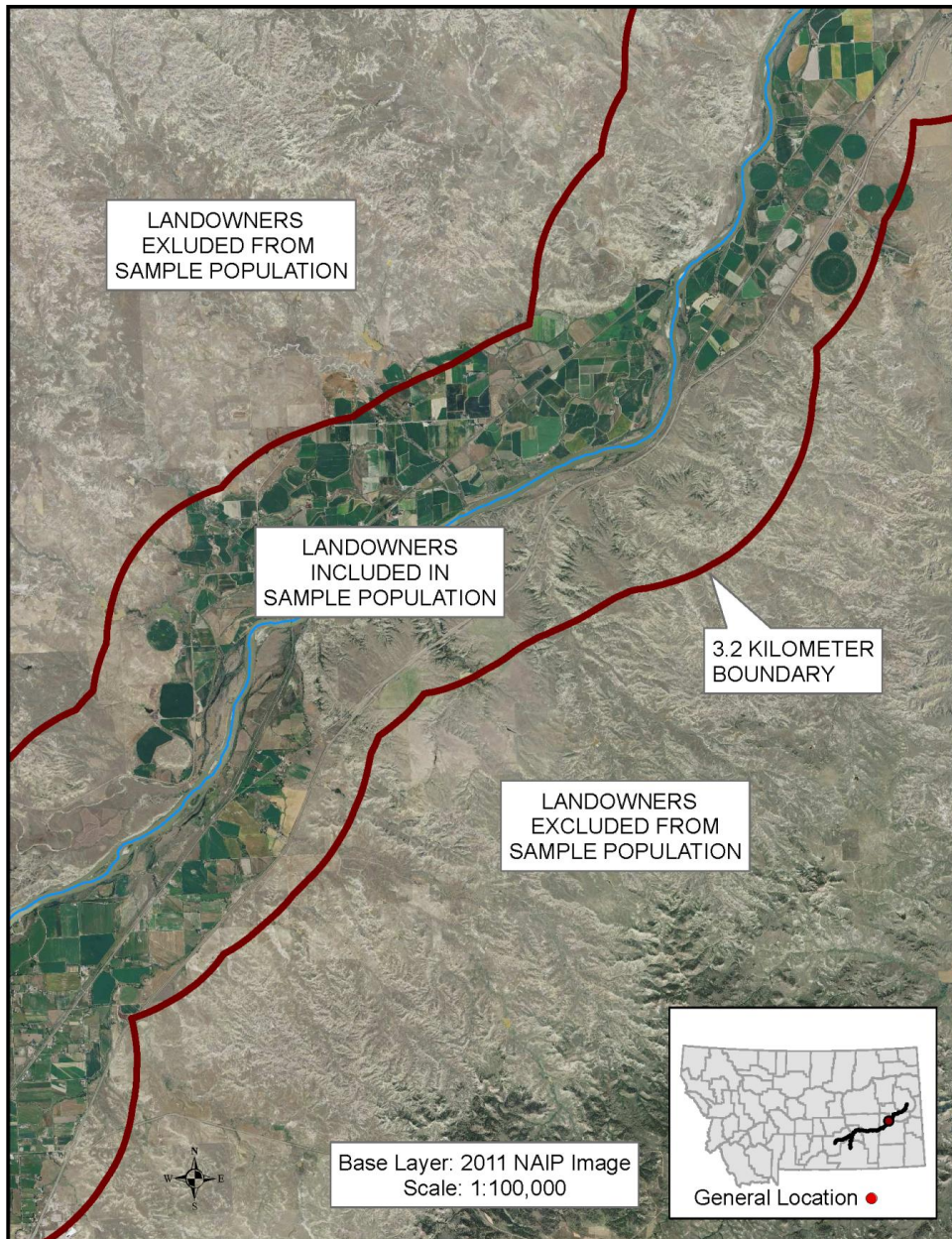
The 6.4 kilometer (3.2 kilometers on either side of the river’s mid-point) cross section of landowners adjacent to the rivers coincides with agricultural practices that yield food sources attractive to waterfowl. Within 3.2 kilometers of the river, land use consists of approximately

30% fields of cereal grains as opposed to 4% outside of the 3.2 kilometers. Greater than 3.2 kilometers on either side of the rivers, the land composition is primarily (87%) grassland that is less desirable to wintering waterfowl (Table 1.) These agriculture practices are easily identified through viewing aerial images (Figure 5). The 3.2 kilometer cross section is consistent with previous research that identified feeding distances flown by geese on the Lower Yellowstone River (Hinz, 1974). Because of the land use composition and feeding distances of geese, landowners located greater than 3.2 kilometers from the river were assumed to have less geese usage on their property and be less vested in waterfowl management policies associated with the river. It is acknowledged that Canada geese may occasionally feed in fields or use reservoirs outside of the 3.2 kilometer buffer.

Table 1. Typical Land use composition of the Yellowstone River Valley within the Yellowstone River closure study area.

Land Use Composition	Greater than 3.2 Kilometers from River	3.2 Kilometers or Less from River
Water	0.10%	4.73%
Deciduous Trees	0.25%	2.67%
Conifer Tree	3.01%	1.43%
Shrubland	3.33%	7.48%
Grasslands	86.83%	41.46%
Hay	0.19%	7.85%
Row Crops	0.06%	3.43%
Small Grains	3.96%	19.50%
Fallow	2.26%	9.40%
Woody Wetland	0.02%	2.05%

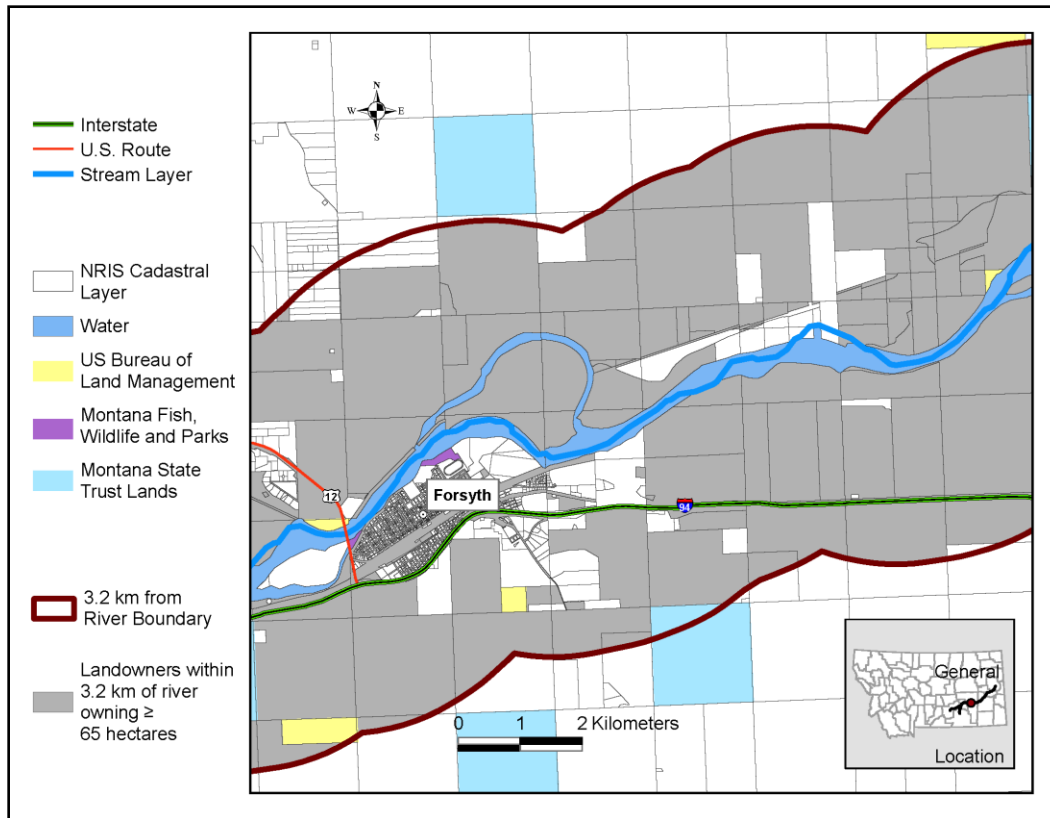
Figure 5. Example of the of the 3.2 kilometer buffer around the Yellowstone River within the Yellowstone River closure study area.



The landowner sample was derived from data obtained from the Montana State Library, Natural Resource Information System. The cadastral (State of Montana landownership data layer) and the state of Montana stream layers were geoprocessed by utilizing ArcMap version 9.3 (Copyright © 2008-2010 Environmental Systems Research Institute) to create a new layer of

private landowners owning property within 3.2 kilometers on either side of selected streams within the study area (Figure 6). Landowners with less than 65 hectares were eliminated from the sample population. This was done to reduce non-agriculture land that would typically not support waterfowl or waterfowl hunting activities such as residential areas and industrial sites from being included in the survey sample.

Figure 6. Map of property parcel polygons along the Yellowstone River within the vicinity of Forsyth, Montana. Private property owners having parcels ≥ 65 hectares within 3.2 km of the Yellowstone River are shaded in grey.



The criteria yielded 519 landowners as survey participants. To facilitate comparisons by region, the landowner population was stratified into two groups: Inside and Outside the YRC. Because landowner participation was anonymous as required by the NDSU Institute Review

Board in accordance with regulation and policy, questionnaires were assigned a color code so the stratification could be identified.

A variation of Dillmans's Tailored Design Method was used for contacting the landowner sample which included: 1) an initial mailing that contained a cover letter explaining the research (See Appendix A) and questionnaire (See Appendix B); and 2) a postcard reminder (See Appendix C) that was sent 10 days later. According to Dillman, to obtain a 95% confidence interval, 221 responses were needed (Dillman, Smyth, & Christian, 2009). Of the 519 landowners surveyed, 234 surveys were returned. Because of limited funding and an adequate response to the first mailing, a third follow up mailing of the questionnaire was not conducted.

Data were collected from landowner questionnaires returned in the mail and entered into spreadsheets. Survey questions not answered by the landowners were input as missing values. The "no response" and "I don't know" values were omitted from statistical analysis. The "I don't know" value was used in the survey to solicit an accurate response based upon the landowners' inability to answer the question (Dillman, Smyth, & Christian, 2009).

For clearer interpretation, the results of the scalar type questions were aggregated into like categories (Shrestha, Burns, Pierskalla, & Selin, 2012). "Strongly agree" and "agree" were summarized as "agree". Conversely, "Strongly disagree" and "disagree" were summarized as "disagree". "Strongly oppose" and "oppose" were summarized as "oppose". Conversely, "Strongly support" and "support" was summarized as "support." The summarization of responses into like categories was done to address the prevalent "neutral" response to scalar questions.

Landowner responses were analyzed through frequencies and means using SAS software Version 9.2 (Copyright © 2009 SAS Institute Inc.). Using PROC SURVEYFREQ, a Chi-square

analysis was used to quantify landowner attitude towards the YRC. Because the sampling fraction was greater than five percent, a finite population correction was utilized. A 0.45 sample fraction rate was used in the finite population correction. Frequencies that were statistically different in percent of landowner response was determined by comparing 95% confidence intervals. Those comparisons that did not have overlapping confidence levels were deemed to be different enough that the frequency estimates were statistically different.

Fixed sum questions in the survey instrument, such as question thirteen, were analyzed by using the PROC GLM procedure in SAS 9.2 to test if responses were different. The Tukey procedure was used to test for difference between landowner response means. Responses were considered significantly different at the $p < 0.05$ level.

It was assumed that landowner respondents would answer the questions accurately (Johnson, 2006). For example, if a landowner was opposed to the YRC they would respond that they were “opposed” and not select the “neither support nor oppose” option. Therefore, statistical analysis from this study was limited to those assumptions.

RESULTS

Respondent Characteristics

Forty-five percent (234) of the total population of landowners responded to the survey. Four landowner survey packets were returned to sender as not deliverable and unable to forward, thereby reducing the landowner population from 519 to 515. Those returned packets were to property owners with land outside of the YRC area. The landowner survey response was consistent across the stratification. Forty-five percent (156) of Outside landowners responded while 46% (78) of Inside landowners responded.

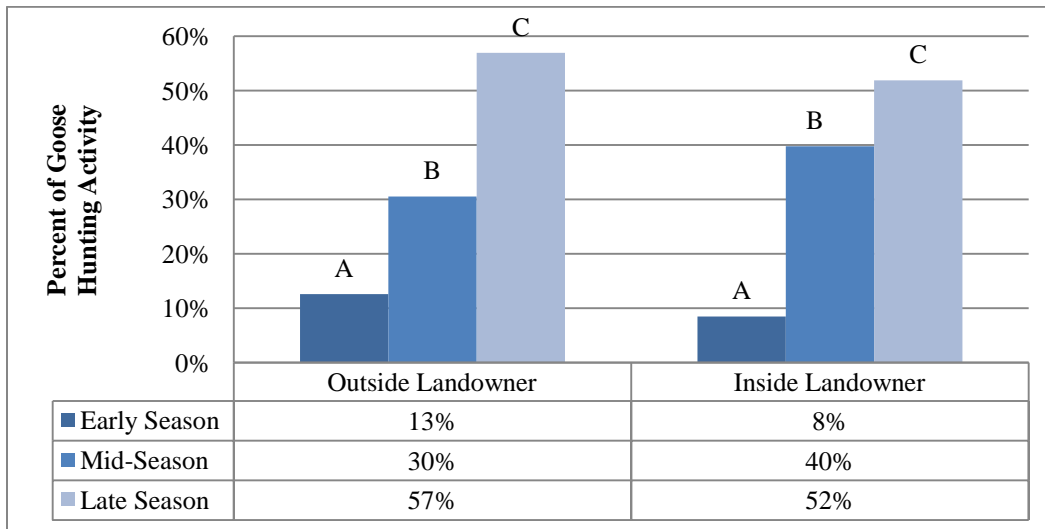
To gain further insight into the attitudes, behaviors and opinions of survey participants, the survey instrument contained six areas soliciting written feedback. A total of 197 written comments were received. Inside landowners offered 94 written comments (See Appendix D). While Outside landowners offered 103 written comments (See Appendix E). For both landowner groups, the written comment space for the last survey question asking landowners to rate their support of the YRC was the most utilized. Inside and Outside landowners submitted 47 and 53 written comments respectively.

Most (92%) landowners reported that waterfowl were present on their land during the Montana waterfowl hunting season. Of those landowners that answered positive to having waterfowl on their property, 85% reported goose hunting occurred on the land they own. On average landowners expressed they had 18 goose hunters per year and most goose hunting occurred during the late season.

The time when goose hunting occurred was divided into three periods, early season (October - between the start of waterfowl season and the general big game season), mid-season

(November - during the general big game hunting season), and late season (December & January – after the general big game season to the end of the waterfowl season) and respondents were asked to assign the percent of hunting that occurred to each time period. The early season hunting period had a statistically significant lower amount of hunting with the late hunting period having over 50% of the hunting occurrences for both the Inside and Outside landowners ($p < 0.05$) (Figure 7). The mid-season hunting period had hunting levels between the early and late period.

Figure 7. Landowner response to when goose hunting occurs on their property. Outside and Inside landowner responses with different letters were significantly different ($p > 0.05$).

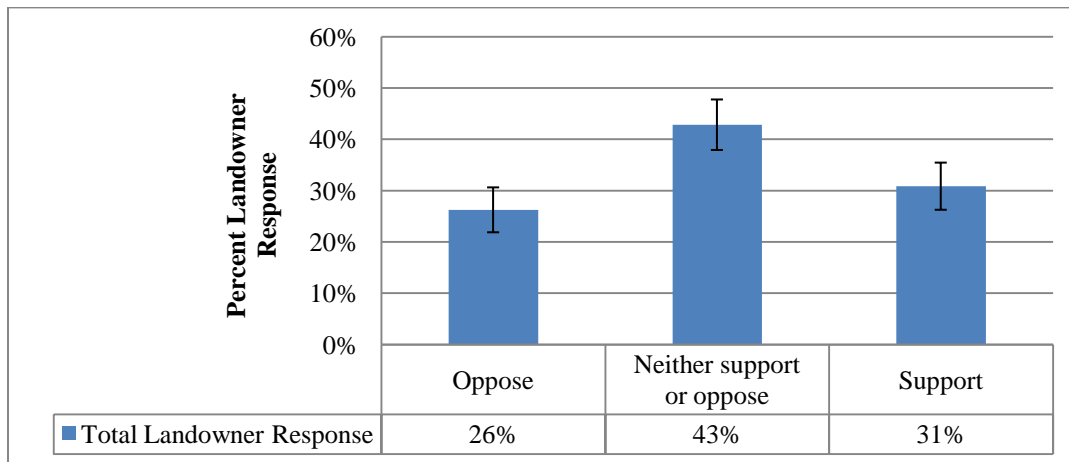


Inside landowners responded that 95% of the goose hunting occurred in a field-based setting while a statistically lower 5% occurred on a water-based setting on their property ($p < 0.05$, $SD = 15.9$). Outside landowners described 82% of the goose hunting occurred in a field-based setting while a statistically lower 18% occurred on a water-based setting on their property ($p < 0.05$, $SD = 30.07$). Because of the YRC, it is assumed Inside landowners reported water-based hunting activities that occur away from the river on such areas as livestock reservoirs or irrigation ditches.

Landowner Support of YRC Policy

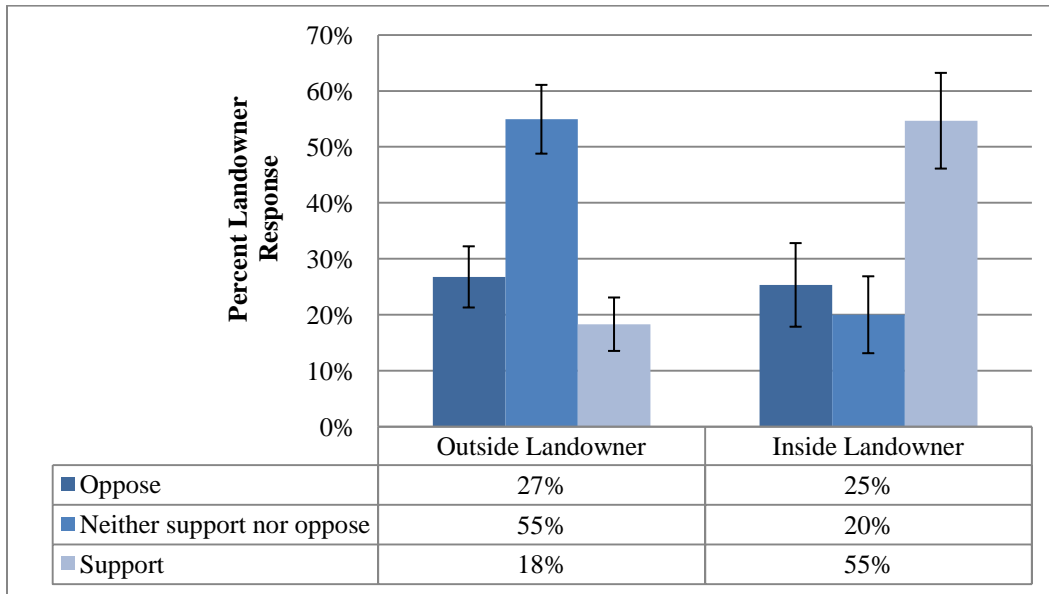
The survey found that of all landowners who responded to the survey 26% of the landowners indicated they opposed the YRC, 43% neither supported nor opposed the YRC, and 31% supported the YRC (Figure 8). The neutral responses (neither support nor oppose) were significantly different than responses for either opposition or support while there was no difference between percent of total landowner response opposing or supporting the YRC. The majority (84%) of the neutral responses were from Outside landowners.

Figure 8. Total landowner response to..."To what extent do you support or oppose this waterfowl hunting closure?" The bars represent the 95% confidence intervals.



Landowners with property located within the YRC indicated a higher level of support for the YRC than landowners with property outside of the YRC. Twenty-five percent of Inside landowners opposed the closure, 20% neither supported nor opposed, while a significant portion 55% supported the YRC. Twenty-seven percent of Outside landowners opposed the closure with a similar portion (18%) supporting the YRC, while a significant portion 55% neither supported nor opposed the YRC. Neutral responses were more common with landowners outside of the YRC area (55%) in comparison to landowners with property inside YRC (20%) (Figure 9).

Figure 9. Landowner response to..."To what extent do you support or oppose this waterfowl hunting closure?" The bars represent the 95% confidence intervals.



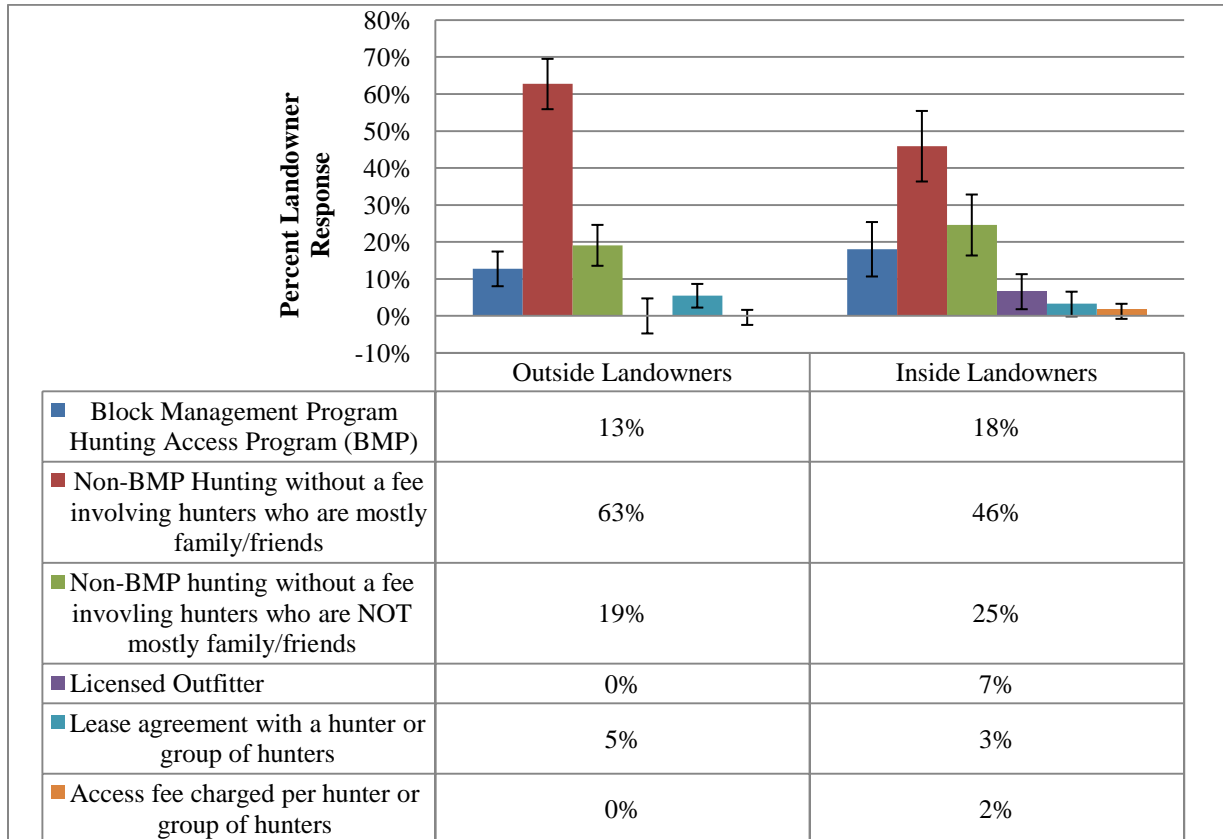
Waterfowl Hunting Management

When asked what system best represents how goose hunting is managed, most landowners indicated family and friends. Forty-six percent of Inside landowners and 63% of Outside landowners selected the Non-Block Management (FWP public hunting access program) hunting without a fee involving mostly hunters who are family or friends option (Figure 10). The family and friends management option was significantly higher in percent response by both Inside and Outside landowners than the other management options presented.

Landowners inside the closure area indicated the YRC did not affect how they managed waterfowl hunting. Eighty-six percent of Inside landowners reported they were not affected while a significantly lower (18%) indicated the YRC affects how they managed waterfowl hunting on their property. A significant amount (73%) of Inside landowners agreed with the statement that the YRC enhances waterfowl hunting opportunities. There was little evidence to believe there was much of a difference between the neutral (9%) and disagree (18%) response

among Inside landowners. In response to the statement that the YRC enhances waterfowl hunting, Outside landowner agree and disagree responses were proportional and therefore not significantly different (Figure 11).

Figure 10. Landowner response to..."Circle one system that best represents how most goose hunting is managed on the land that you own." The bars represent the 95% confidence intervals.



In response to the statement that the population of geese was too low, a significant number (55%) of all landowners disagreed, while 28% were neutral and 17% agreed that the population of geese is too low. A significant number of the Inside landowners disagreed that the population of geese in their area is too low while 24% were neutral and 23% agreed. Outside

landowners had a similar response as the Inside landowners as to whether the population of geese was too low (Figure 12).

Figure 11. Landowner response to ... "The waterfowl hunting closure enhances waterfowl hunting opportunities in the lower Yellowstone River area." The bars represent the 95% confidence intervals.

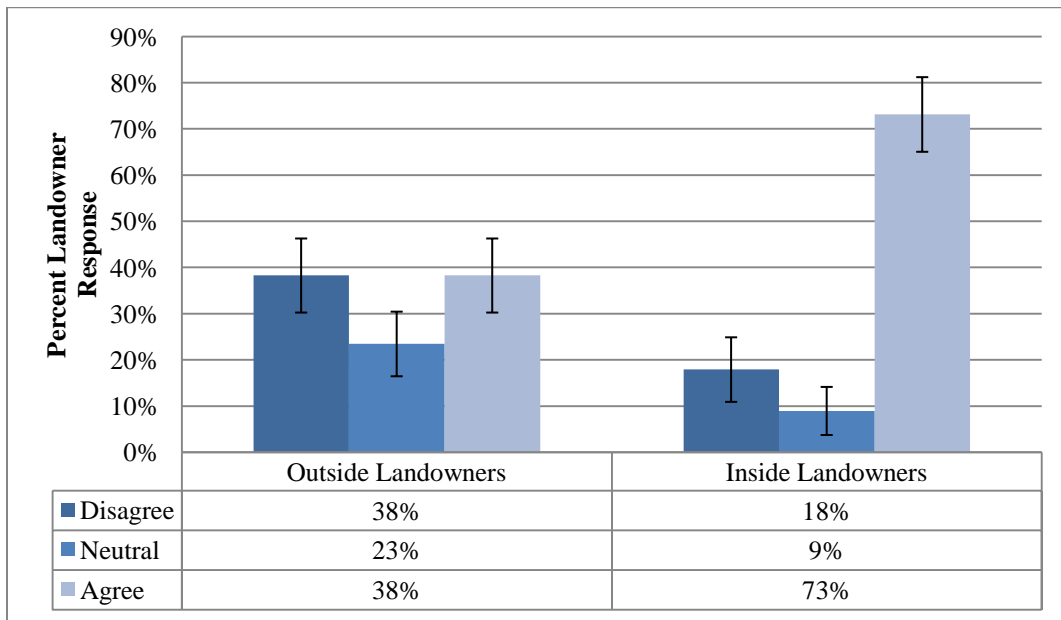
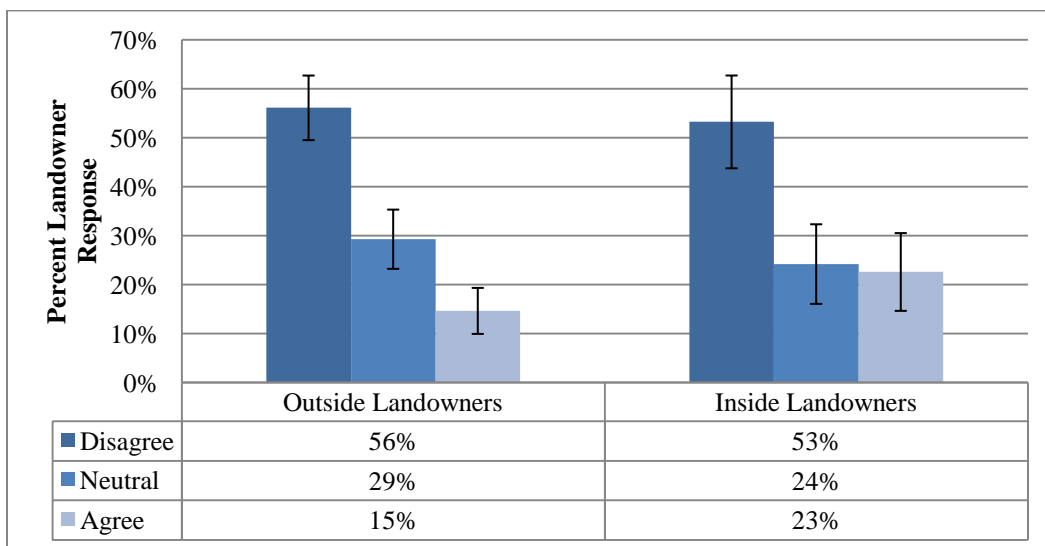
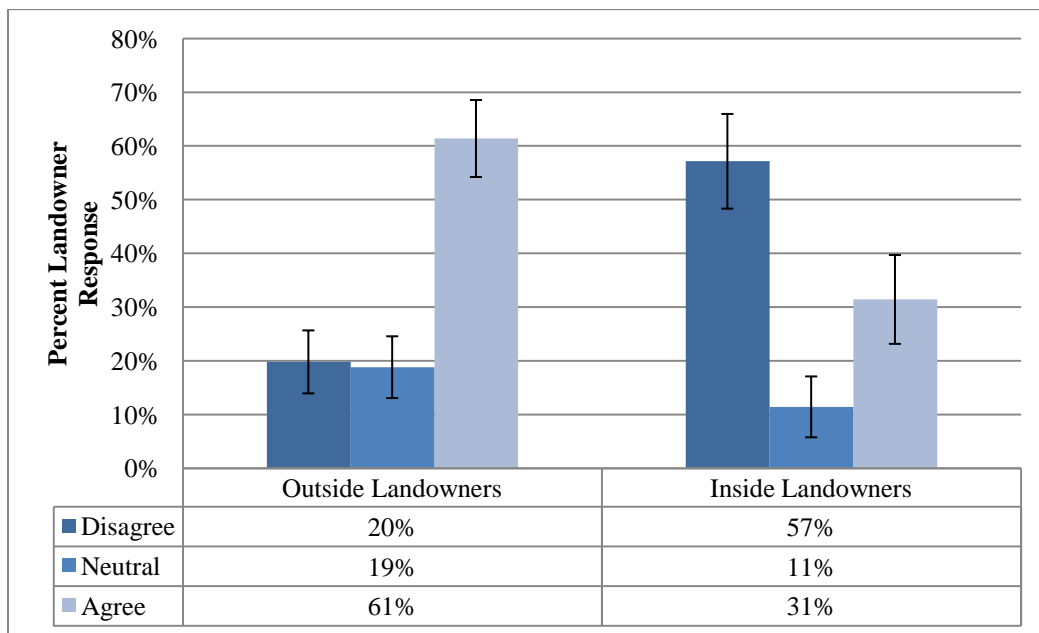


Figure 12. Landowner response to ... "The population of geese in your area is too low." The bars represent the 95% confidence intervals.



There is reason to believe there is a difference between total landowner responses to the statement that the YRC is no longer needed because of adequate goose numbers. A significant majority of all landowners (49%) indicated the waterfowl hunting closure is no longer needed because there are adequate numbers of Canada geese to support recreational opportunities. A significantly lower number (35%) disagreed compared to those who agreed with this statement though this was significantly higher than the 16% who had a neutral response. Fifty-seven percent of Inside landowners disagreed that the YRC was no longer needed because there is an adequate number of Canada geese to support recreational opportunities which was significantly higher than those who agreed (31%) and the 11% that were neutral (Figure 13). The Outside landowners had a much different response to the Inside with a significantly higher number agreeing (61%) that the YRC is no longer needed because there are an adequate number of Canada geese to support recreational opportunities (Figure 13).

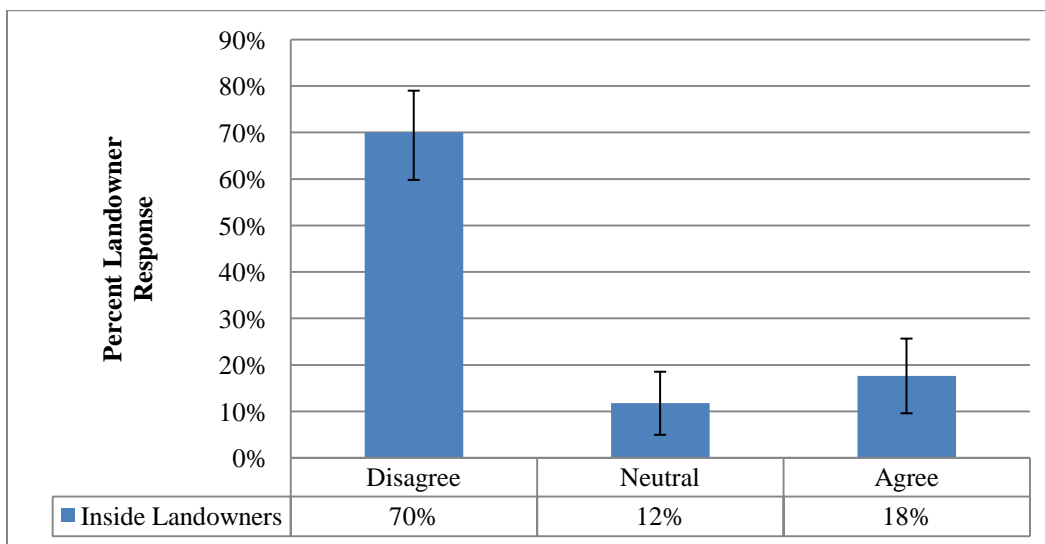
Figure 13. Landowner response to... “The waterfowl hunting closure is no longer needed because there are an adequate number of geese during the hunting season for recreational opportunities.” The bars represent the 95% confidence intervals.



Inside Landowner Response to YRC Policy Change

Inside landowners reported they would not support eliminating the YRC. The majority (70%) of Inside landowners disagreed with the statement to eliminate the current waterfowl hunting closure, this response was significantly higher than the 12% that were neutral and the 18% that agreed with eliminating the YRC (Figure 14).

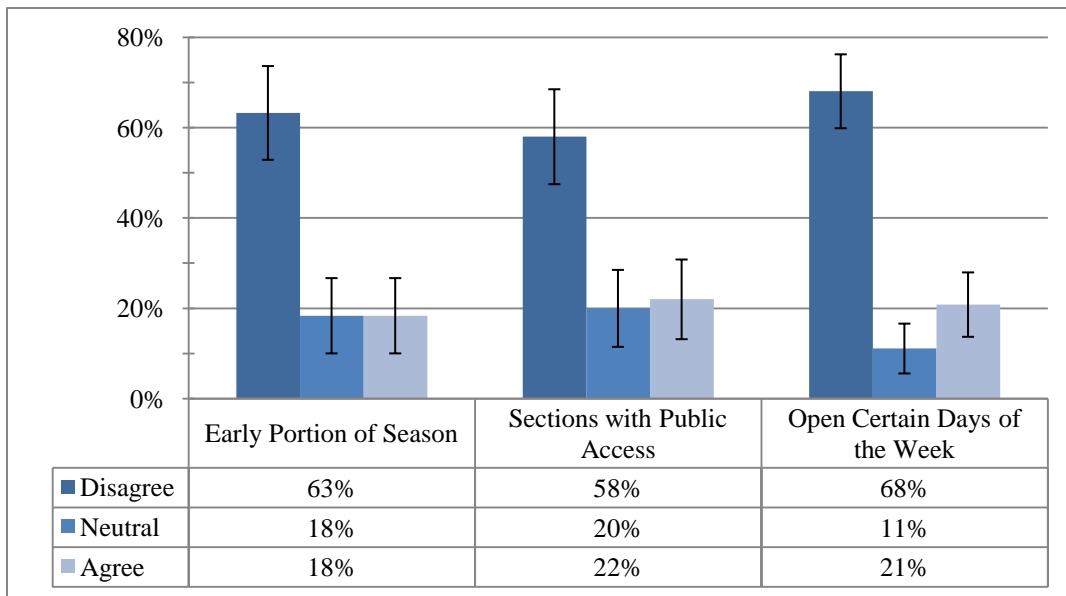
Figure 14. Inside landowner response to..."I would support eliminating the waterfowl hunting closure." The bars represent the 95% confidence intervals.



Inside landowners indicated they did not want a change or modification to the YRC with a significant majority (77%) agreeing with the statement to leave the YRC policy unchanged. Inside landowners did not support a YRC policy change of opening sections of the river, the “sections with public access” option, where public access is present (spatial modification). The (58%) that disagreed was significantly higher than 20% that were neutral and the 22% that agreed with the spatial modification of opening areas with public land (Figure 15). Inside landowners did not support a temporal modification alternative, the “open certain days of the week” option, to open the river to waterfowl hunting during certain days of the week. The 68%

that disagreed was significantly higher than the 11% that were neutral and the 21% that agreed with this temporal modification (Figure 15). Opening the river for waterfowl hunting in the early portion of the season before wintering waterfowl arrived was another temporal modification alternative that was not supported. The 63% Inside landowners that disagreed was significantly higher than the 18% that were neutral and the 18% that agreed with this temporal modification to open the river to early season waterfowl hunting (Figure 15).

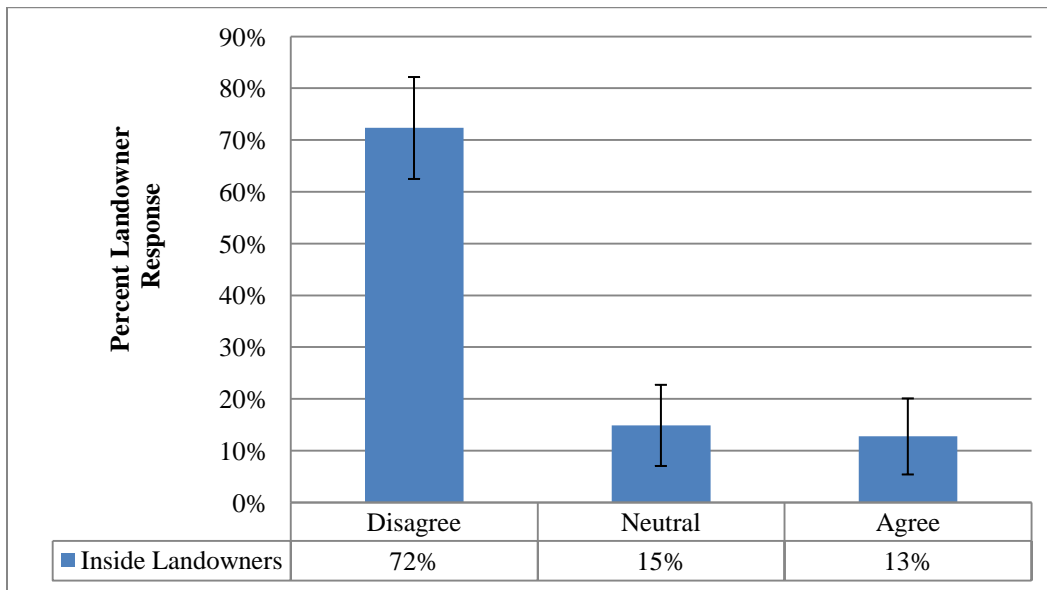
Figure 15. Inside landowner response to possible YRC modification alternatives: 1) Early Portion of Season (start of waterfowl season – start of big game season), 2) Section with Public Access (open sections of the river to waterfowl hunting where significant public access is present – eg. BLM land, wildlife management areas), 3) Open Certain Days of the Week (open the river to waterfowl hunting Friday – Monday, etc.). The bars represent the 95% confidence intervals.



When asked if landowners would allow hunters to access or cross their property to hunt geese on the river if it were open to waterfowl hunting, the majority of Inside landowners indicated they would not. The 72% that reported they would not allow hunter access to hunt

geese if the river was open to waterfowl hunting was significantly higher than the 15% that were neutral, and 13% that indicated they would allow access (Figure 16).

Figure 16. Inside landowner response to ..."I would allow hunters access on or across my property to hunt (geese or ducks) on the river if it were open to waterfowl hunting." The bars represent the 95% confidence intervals.



Inside landowners indicated that if the YRC was partially modified or lifted they would reduce the amount of waterfowl hunting privileges that they currently allow. The highest percentage (56%) of Inside landowners reported they agreed with the previous statement which was significantly higher than the 29% that disagreed and the 16% that were neutral (Figure 17). Of the Inside landowners who had indicated they support the YRC, a higher percentage (72%) agreed with the statement that they would reduce waterfowl hunting privileges on their land which was significantly higher than the 29% that disagreed and the 16% that were neutral (Figure 18).

Figure 17. Inside landowner response to ..."If the waterfowl hunting closure was partially modified or lifted I would reduce the amount of waterfowl hunting privileges that I currently allow." The bars represent the 95% confidence intervals.

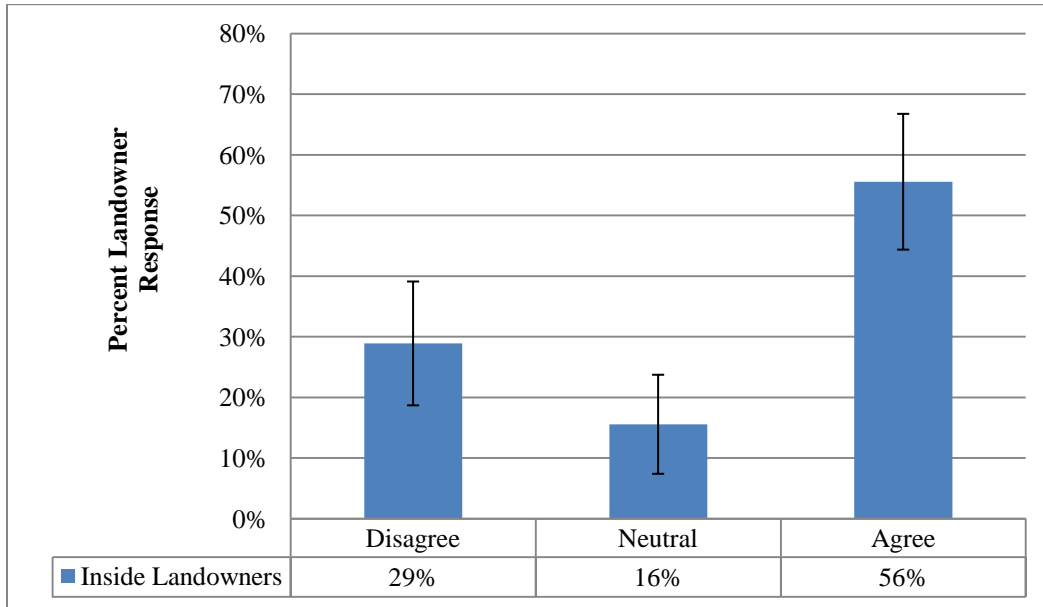
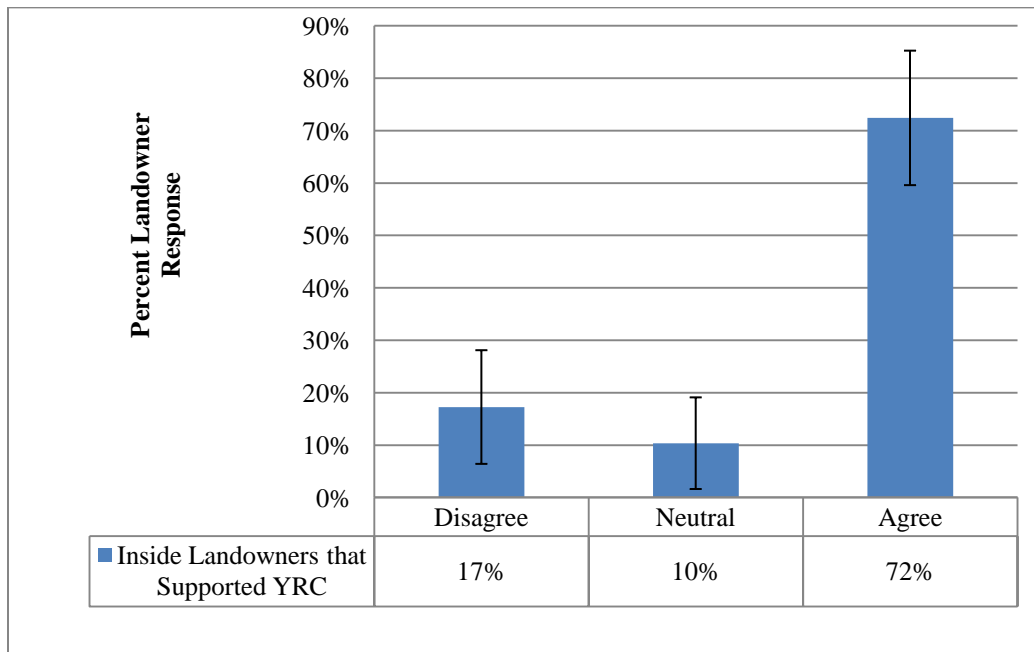


Figure 18. Inside landowners that support YRC response to ..."If the waterfowl hunting closure was partially modified or lifted I would reduce the amount of waterfowl hunting privileges that I currently allow." The bars represent the 95% confidence intervals.



DISCUSSION

Inside Landowner Attitude Towards YRC

Inside landowners have a greater connection with the closure than Outside landowners and could be directly impacted by changes to the YRC. As a result Inside landowners displayed a higher level of embeddedness. Honadle (1999) described embeddedness as the connectedness among the dimensions and the amount of systemic change required to allow a policy to be implemented. Because of the higher degree of embeddedness, more effort was applied to gain a better understanding of the attitude Inside landowners foster towards the waterfowl hunting closure.

This survey found the YRC is supported by Inside landowners and they would not support eliminating the YRC. Inside landowners generally desired it to remain unchanged and were not amenable to possible modifications to the closure such as opening portions of the river where significant public land is present (spatial modification), opening the river to waterfowl hunting during certain days of the week or opening the river in the early portion of the season before northern birds arrives (temporal-modification). One Inside landowner offered a written comment that summarizes the majority of Inside landowner perspectives, “Keep it closed – Don’t change it if it ain’t broke!” The findings opposing a YRC policy change are consistent with anecdotal and historical information, most notable the 1975 lawsuit filed to reverse the Fish and Game Commission decision to lift the closure and open the river to waterfowl hunting.

Much of the opposition Inside landowners harbor towards a YRC policy change is rooted in fear of what might happen. Honadle (1999) postulated, when people believe that something they value is being removed, fear is a natural reaction. Inside landowners demonstrated this

premise as several written comments indicated they were concerned with the implications of a YRC policy change. Notably, Inside landowners were concerned that if the YRC was lifted they would see an increase in trespassing from the river onto their property. An example of such a comment is, “I believe there would be more landowner/hunter conflict re: trespass onto private property from river hunters....Also, the river would never be an area of quiet solitude as so many more power boats would be running up and down the river....” Another Inside landowner expressed “...We do not need hunters in boats cruising this stretch of YSR hunting geese. They will not ask permission and it would be impossible to control – we need the river closed as it is now.” It is clear landowners view the YRC policy as a mechanism of control.

As described above, Inside landowners are concerned with perceived increased trespassing and lack of control if the YRC policy is modified or rescinded. One Inside landowner evaluated the concept of the YRC as a mechanism to control public access on the river, “It gives me a little help controlling the city idiots that believe they have access to any land that the river is near.” The application of private landowners using the YRC policy to control public access should be examined with respect to the North American Model of Wildlife Management. An apparent proportion of Inside landowners support the YRC because they perceive the policy gives them control over the public’s use of the Yellowstone River. With this notion in mind, wildlife managers need to ask themselves if the original intent of the YRC policy, which was to increase hunting opportunities, is being upheld. Consideration should be made to examine if the YRC policy is consistent with Montana’s public trust doctrine that dictates certain natural resources, including water and wildlife, don’t belong to a single individual but are held in trust to be managed for public benefit.

This study found that Inside landowners have the perception that the YRC enhances the waterfowl hunting opportunities in the lower Yellowstone River valley. A significant amount of Inside landowners further articulated this opinion in the form of written comments. An example of the most common written comment observed from Inside landowners was, “The closure provides a rest and roosting area for waterfowl. To eliminate the closure would drastically reduce the quality of waterfowl hunting in the areas. Birds need a place to rest. Pressured birds will change flight patterns and leave the area.” This is an example of how Inside landowners have established a dialectic position towards the YRC that is based upon their localized observations and is rationally, rather than empirically sustained (Weaver, 1997).

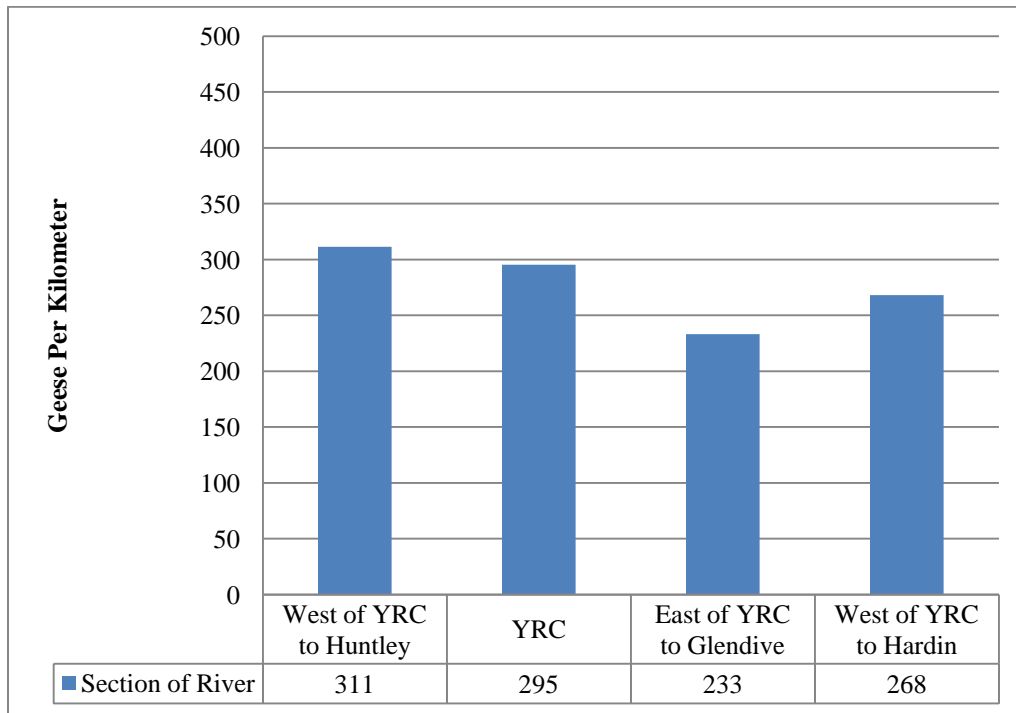
It was expected that a significant portion of Inside landowners would feel that the YRC enhances field waterfowl hunting opportunities and therefore equated it to a net gain in waterfowl hunting opportunity. This was observed as 73% of Inside landowners agreed with the statement that the YRC enhances waterfowl hunting opportunities. It was also anticipated that some landowners would consider the river closure as a loss of hunting opportunity. The latter attitude was not observed as 82% of Inside landowners reported the YRC did not affect how they manage their property. Only one landowner in a written comment indicated they would like the ability to waterfowl hunt their riverfront property within the YRC and no landowners reported they desire the ability to allow other hunters to waterfowl hunt on their property adjacent to the Yellowstone River.

It is well known that hunting closures have as much to do with politics or human dimensions as they do with wildlife ecology (Rasmussen, 2007; Van Horn & Benton, 2007; Kenow, Korschgen, Nissen, Elfessi, & Steinbach, 2003). Most (53%) of Inside YRC landowners indicated the goose population was not too low, yet 55% still support the closure. Inside

landowner opinion that goose numbers are not too low are empirically supported. The 2011 mid-winter counts of total Canada geese in the Central Flyway yielded over 1,540,000 birds, in comparison to average count of 159,000 between 1948 and 1959. This results in a population about 60% above management objective levels. To put the Canada goose population increase in a more regional context, most of the wintering Canada geese in the Yellowstone and Bighorn River valleys are produced in the prairie-pothole region of northern Montana. These geese are called the Hi-Line population of the Central Flyway. In 1974-75 the estimates for the Hi-Line population was 41,200; in 2011 the estimate increased six-fold to 273,025 geese (Kruse, 2011).

Montana Fish, Wildlife and Parks's survey efforts reflect abundant Canada goose numbers and a well distributed population. In coordination with the annual Mid-Winter Waterfowl Survey, FWP staff observed in January 2013 that geese were well distributed throughout the Bighorn and Lower Yellowstone River Valleys with several high concentrations occurring in areas containing preferred habitat composition. The aerial survey results indicated above-average estimates of geese in areas open to waterfowl hunting as well as areas within the YRC. An average of 267 geese per river kilometer was estimated in the open sections of river in the study area. The YRC was estimated to have 289 geese per river kilometer (Figure 19). The highest density of geese within a section of river observed in the 2013 Mid-Winter Survey was recorded on the Bighorn River upstream from the study area between the Bighorn Fishing Access Site and the Saint Xavier bridge. Approximately 791 geese per kilometer were observed in this section of Bighorn River open to waterfowl hunting (J.L. Hansen, Central Flyway Coordinator Montana Fish, Wildlife and Parks, personal communication and B.D. Hildebrand Wildlife Biologist Montana Fish, Wildlife and Parks, personal communication).

Figure 19. 2013 Mid-Winter Waterfowl Survey of the Yellowstone River closure study area.



Interpretation of the Inside landowner survey data is that these stakeholders view the YRC as a simple cause-and-effect relationship (hunting closure = more geese). This substantiates the apparent disconnect between, or a lack of awareness of, the overall increase in abundance of Canada geese throughout the Central Flyway as well as the abundance of wintering geese outside of the YRC. The landowner response data coupled with waterfowl population estimates leads to a conclusion that supporters of the YRC regard the waterfowl hunting closure as the reason for present goose numbers in the portion of the Yellowstone River that is closed to waterfowl hunting. By not considering the rise in goose numbers along the Yellowstone and Bighorn River Valley as well as the entire Central Flyway, this central stakeholder group does not operate in a broad contextual scale. It is recommended that public outreach be conducted to inform stakeholders of the Canada goose numbers as well as preferred habitat.

Specific to the YRC, supporters may inflate the value of the YRC and overlook habitat components that waterfowl prefer. Although difficult for a stakeholder to self-diagnose, embeddedness can distort policy impact (Honandle, 1999). The morphology of the Yellowstone River is of importance to the distribution of geese. The area of the river that is off limits to waterfowl hunting has a high number of islands, a higher sinuosity and greater shore-line kilometers than many other sections of the Yellowstone River (Hinz, 1974). This section of the river also has thermal influences from the Bighorn River that infuses warmer tailrace waters. As a result the YRC section of the river is less prone to icing. It is postulated that the two aforementioned habitat qualities are as likely to augment the goose distribution as the anthropogenic action of closing the river to waterfowl hunting.

Inside landowners may have a resource dependency associated with the YRC, such as lease agreements with hunters that could increase their level of embeddedness. There was a significant difference between Inside and Outside landowners and their licensed outfitter management option. However, the two most common management options selected by Inside landowners do not have a direct monetary incentive associated with waterfowl hunting. Based upon the responses to how they manage waterfowl hunting on their property and the sample variation in the data, it cannot be concluded that the Inside landowners support of the YRC is monetarily driven. It is more likely that the majority of Inside landowners who support the policy have a psychological dependency associated with the YRC. The communities within the YRC area display a sense of group identity and ownership towards the YRC thus creating a psychological dependency that increases the level of supporter embeddedness.

The complexity of the YRC issue lies within the social context. In respect to natural resource policy change or implementation, Honandle (1999) states that social context defines the

web of economic, institutional and psychological hurdles that must be overcome in order to institute new policy. This study has established that the YRC has become highly embedded and institutionalized among Inside landowners. These stakeholders support and value the waterfowl hunting closure as a hunting enhancement and a hunter control mechanism. Whether or not Inside landowner perceptions of efficacy of the YRC are valid may be of lesser importance. Perhaps the more paramount question policy makers need to consider is not, what will happen to the distribution of geese but more so how will Inside landowners react to a change to the YRC? A significant amount (56%) of inside landowners responded that they would reduce the amount of waterfowl hunting they currently allow, if the closure was lifted or modified. Several landowners took this concept further in the written comment sections of the survey indicating they would reduce not just waterfowl but all hunting privileges on their property.

The difficulty for policy makers lies in assessing the risk-to-reward ratio involved in a management change. The potential gain is waterfowl hunting opportunity on the 140 kilometers of the Yellowstone River corridor. This would include not only the ability to hunt the water, islands, backwaters and sandbars of the river proper but also public land adjacent to the river such as Bureau of Land Management land and State owned wildlife management areas, and private land adjacent to the river. The negative fallout could be the loss of hunting access on private land from landowners restricting hunting privileges in protest to a change in policy. In terms of whether or not landowners will reduce the amount of waterfowl hunting privileges they currently allow, it is acknowledged that what respondents say they do is often different than what they actually do (Peterson & Rodriguez, 2012).

Outside Landowner Attitude Towards YRC

Historically, the perceptions and attitudes of Outside landowners towards the YRC have been largely unknown to wildlife policy makers. Although the YRC policy may not influence how they manage waterfowl hunting on their property, Outside landowners are key stakeholders as they may be impacted as Canada geese are a highly mobile species. It was unknown whether or not Outside landowners view the YRC as a positive or negative policy. For instance, it was undetermined if Outside landowners foster the perception that the YRC harbors too many geese which leads to crop damage. Conversely, it was unclear if Outside landowners value the YRC and would prefer the section of river in their area closed to waterfowl hunting. One of the goals of this study was to ascertain the attitude Outside landowners have toward the YRC.

This survey found that Outside landowners are less connected or embedded to the YRC than Inside landowners. A significant portion of Outside landowners (55%) neither support nor oppose the waterfowl hunting closure. This result was anticipated and observed in informal conversations with landowners. Although not significantly different given the sampling variability of the data, a higher percent of response was observed from Outside landowners who oppose rather than support the closure (27% and 18% respectively). The highest portion (45%), of Outside landowners reported that the Canada goose population is too high and the majority (61%) felt the YRC is no longer needed because goose numbers were adequate to support recreational opportunities. Support of eliminating the YRC was much greater among Outside landowners in comparison to Inside landowners (54% and 18% respectively). A common written response provided by Outside landowners indicated that geese are a nuisance and the population could support increased hunting including opportunities on the river.

The support and desirability of the waterfowl hunting closure to Outside landowners is an important indicator of policy need and public benefit. A fortuitous observation was gathered from the Outside landowner survey that is of significance. Only one Outside landowner commented that they would like the section of river, in which they own property, closed to waterfowl hunting. This post hoc observation is telling. It is my discernment, that if Outside landowners believed the policy was a positive management action they would have supported the YRC (18% supported YRC) and articulated that they prefer their section of the river closed to waterfowl hunting. In the written comment portions of the survey, Outside landowners did not indicate negative impacts associated with the portion of the river being open to hunting such as: 1) the population of geese in their area was too low, 2) re-distribution of geese, and 3) trespassing. The aforementioned possible negative impacts of river waterfowl hunting could be viewed as indicators of the value of the YRC. However, these indicators were not reported by Outside landowners. In hindsight, a valuable question to include in the survey instrument would have been to specifically ask Outside landowners if they would prefer the river to be closed to waterfowl hunting in their area.

As previously stated, it was anticipated that some Inside landowners would display a level of resentment towards the YRC for restriction of ability to manage their property. This type of comment was more prevalent among Outside landowners. Several Outside landowners commented that they oppose the YRC because it decreases the ability of private landowners to manage their property. For example, one Outside landowner reported, "There is too much government control over privately owned land." Another Outside landowner noted, "Many Montana landowners in that area limit the number of waterfowl hunters already so let them exercise their good sense and don't restrict them from hunting their own land." This type of

rhetoric was not anticipated amongst Outside landowners, but was observed. However, this same rhetoric was anticipated amongst Inside landowners but was not observed. The lack of association Inside landowners have between the YRC and a property owners ability to manage their private property is a testament to how embedded the YRC is among Inside landowners.

Although trespassing has been identified as a common violation occurring on private land (Johnson, 2006), trespassing issues associated with hunting geese on the river was not reported by Outside landowners. No Outside landowner indicated they have had a problem with waterfowl hunters trespassing on their property via the river. The only Outside landowner written comment that addressed river hunters was, “my land is east of the closed area and we have very few that hunt below the high-water mark.” Not only did Outside landowners not indicate control issues, but they expressed a heightened altruistic perspective regarding waterfowl hunting. For example, one landowner wrote “The reason I would oppose this waterfowl hunting closure is it limits hunting for “all” hunters who desire hunting waterfowl.”

Stakeholder Involvement

It is believed that Inside landowners would be the stakeholder group that would likely generate the most opposition to an YRC policy change. With this in mind, if a policy change is considered it will be imperative that Inside landowners are involved in the decision making process. Communication researchers have identified a mistake resource managers commonly make in the designs of their messages. Rather than acknowledging other predispositions that influence an individual’s attitudes and behaviors, managers present messages that contain only factual information (Jacobson, 2012). Therefore, incorporating Inside landowner’s attitudes and behaviors analyzed in this study are critical to an effective outreach effort. It is recommended that managers focus on outreach efforts that employ a value component to the Inside landowners

in relaying a potential YRC policy change. Offering Inside landowners a benefit they desire, such as less restrictive land management options, may cause landowners to consider the positive results of a YRC policy change.

Landowners are not the only stakeholders affected by the YRC policy and basing management decisions solely on landowner input would be too narrow of a stakeholder base and would likely result in failed policy. Therefore, in following adaptive management procedure, a more comprehensive stakeholder engagement is required. Public involvement should include the sporting public both consumptive (hunters) and nonconsumptive (e.g. wildlife watchers).

Waterfowl hunters have strong opinions regarding the YRC and there is a polarizing component to this policy; some waterfowl hunters support the closure and other hunters do not.

Subsequently, it is important to gain a better understanding of hunter attitudes towards the YRC.

In speaking with FWP staff, preliminary efforts have been conducted to ascertain hunter attitude toward the YRC through hunter check stations. It is projected that more hunters are in favor of eliminating the YRC than those who support the closure (H.S. Denson, Wildlife Manager Montana Fish, Wildlife and Parks, personal communication). Those hunters who support the YRC are likely to have been successful at obtaining waterfowl hunting access on adjacent private land within the YRC area. Waterfowl hunting method preference influences hunter attitude towards the YRC and may dictate whether or not the individual supports the policy. The dichotomy seems to lie within whether or not the individual prefers to hunt waterfowl over agriculture fields or water. With this field vs. water preference in mind, spatial context in stakeholder engagement is critical. For example, hunters that setup field decoy spreads in the area of the YRC are likely to have a much different attitude than hunters who use floating

decoy spreads on the Bighorn River. Again, this study focused on landowners and further management decisions should include sportsmen as central stakeholders.

Disturbances

Numerous studies have been conducted world-wide on human disturbance of waterfowl (Korschgen & Dahlgren, 1992). Previous works have demonstrated that waterfowl hunting is a major cause of waterfowl disturbance (Rasmussen, 2007; Dahlgren & Korschgen, 1992). Most research has been conducted in areas of high human disturbance, subsequently researchers quite often advocate for an establishment of a refuge.

Throughout this research effort, it has been observed that the term “refuge” has been frequently applied to the YRC. The Yellowstone River waterfowl hunting closure is not a refuge but instead a restriction on one specific activity, waterfowl hunting below the high-water mark of the River. Disturbances such as deer and upland game bird hunting still occur on islands and land adjacent to the river. It is legal to hunt waterfowl from the bank of the River, as long as one is above the high water mark and they can successfully retrieve their downed game without crossing the high/low water mark (Warden Sargent J.R. Austin, Montana Fish, Wildlife and Parks, personal communication).

There are other anthropogenic activities that cause disturbances to waterfowl such as fishing, boating, wood gathering and livestock feeding in close proximity to the river. One study reported there was minimal difference observed between mallards flushed from a person walking only versus mallards flushed from a person walking and shooting in respect to waterfowl returning to the site after the disturbance (Dooley, Sanders, & Doherty, 2010). Dooley et al. (2010) suggests a buffer zone of 600 m may be needed to prevent anthropogenic disturbance. It is estimated the main channel of the Yellowstone River in the YRC area is

between 60-80 meters between the high-water marks (K.M. Backes, Fisheries Manager Montana Fish, Wildlife and Parks, personal communication). Subsequently, the approximate average width of the YRC is not adequate according to previous research on waterfowl disturbance. Fox and Madsen (1997) concluded that there is little value in establishing no-hunting areas if waterfowl are still susceptible to other disturbances. If the objective is to establish a waterfowl refuge, non-waterfowl hunting activities that may cause disturbances should be prohibited.

Habitat qualities (river sinuosity, available agricultural food sources, and open water) influence distribution of geese. Previous studies have demonstrated that waterfowl usage of an area post disturbance is site specific (Fox & Madsen, 1997; Bregnballe & Madsen, 2004; Dooley, Sanders, & Doherty, 2010). This notion is supported by empirical data collected by FWP staff. Biologists have observed high densities of geese inside and outside of the YRC.

Waterfowl Hunting Closures as Management Prescription

Many states implement various forms of temporal and spatial closures with the intent of increasing hunter success and waterfowl usage. Waterfowl hunting closures are common on small bodies of water or portions of a larger body of water. For example the North Dakota Fish and Game restricts waterfowl hunting on the 339 acre North Golden Lake in Steele County, North Dakota (North Dakota Game and Fish Department, 2012). Several state wildlife agencies regulate anthropogenic activities on river corridors. Another typical example of policy to maximize waterfowl hunting opportunity is the Wyoming Fish and Game Commission's restriction on approximately eight kilometers of the North Platte River in Goshen County Wyoming. The North Platte closed area is open for duck, merganser, and coot hunting from approximately September 25th to November 14th. Dark geese are not allowed to be hunted within

275 meters on each side of the North Platte River bank (Wyoming Game and Fish Department, 2012).

The Upper Mississippi River National Wildlife and Fish Refuge (UMRR) extends 420 kilometers from Wabasha, Minnesota to Rock Island, Illinois and encompasses 97,000 hectares of Mississippi River floodplain. The UMRR uses a series of “stepping stones” to provide relatively secure areas of feeding and resting for migrating waterfowl and to disperse waterfowl hunting opportunities throughout the refuge (Nelson, 2008). In 2007, refuge managers implemented new management actions as prescribed in the 2006 Comprehensive Conservation Plan. As a result seven new closed areas were created on the refuge. The total amount of closed areas increased from 15 to 24 but the area decreased from 18,026 to 17,678 hectares.

Approximately 18% of the UMRR is closed to waterfowl hunting. In addition to closed areas, the UMRR also utilized voluntary waterfowl avoidance areas (VWAA) to reduced boating disturbance (U.S. Fish and Wildlife Service, 2006). Refuge monitoring efforts concluded that waterfowl responded quickly to the closed area and VWAA's and numbers of waterfowl use-days increased dramatically (Nelson, 2008).

Waterfowl managers use waterfowl hunting closure areas to increase wintering waterfowl and hunter satisfaction. The National Duck Hunter Survey 2005 indicated a perception of decreased waterfowl numbers by hunters, poor harvest success, over-crowding, and overall unsatisfactory waterfowl hunter experience (National Flyway Council and Wildlife Management Institute, 2006). As a result several managing agencies have recently taken efforts towards assessing the efficacy of their waterfowl management controls from both a waterfowl usage and a hunter satisfaction perspective. For example, UMRR refuge managers continue to monitor how waterfowl and the public response to changes in management of closed areas. The Colorado

Division of Parks and Wildlife (CPW) has an ongoing study to determine how more restrictive regulations (include temporal and spatial closures) influence duck hunter success, hunter activities, hunter satisfaction and duck distribution compared to less restrictive waterfowl hunting regulations.

There are many restrictive waterfowl hunting policies in place that are similar to the YRC. As previously noted, typically the goal of such policies is to increase wintering populations of waterfowl and hunter satisfaction. The YRC policy was established decades ago because of low Canada goose numbers and not because of overcrowding by waterfowlers. Historically, overcrowding by waterfowl hunters in the lower Yellowstone River Valley has not been documented and does not appear to be an issue at this time (H.S. Denson, Wildlife Manager Montana Fish, Wildlife and Parks, personal communication; Hinz, 1974). The nonissue of overhunting is supported by other efforts to assess the efficacy of the YRC policy. Aerial surveys were conducted by FWP staff to observe the level of waterfowl hunter use of the Lower Yellowstone River. In 2008 and 2009, observations were made on the Yellowstone River from Billings to Sidney, MT (555 river kilometers) on alternating weekends throughout the waterfowl hunting season (approximately October 1 to January 15). These surveys yielded a total of 16 waterfowl hunting parties on the 413 kilometers of the Lower Yellowstone River open to waterfowl hunting. Of note, one party was observed hunting waterfowl illegally in the closure area (S.J. Atwood, Wildlife Biologist Montana Fish Wildlife and Parks, personal observation).

The level of waterfowl hunter usage on the Yellowstone is low in comparison to other states that utilized closure areas. As part of the research being conducted on the South Platte River by CPW, during the 2008, 2009 and 2010 seasons, an average of 530 duck hunting parties per season were observed on two State Wildlife Areas. The size of the two SWAs is 709

hectares. The highest observed usage by waterfowl hunters on 413 kilometers of the Lower Yellowstone open to waterfowl hunting was four parties in 2009 on the same 11.5 mile section of River between Worden and Pompey's Pillar, MT (S.J. Atwood, Wildlife Biologist Montana Fish Wildlife and Parks personal observation). The YRC appears to be unique from other areas where restrictive policies are implemented in that there are high numbers of wintering waterfowl and low numbers of observed waterfowl hunters.

Management Recommendations

The intent of this study was to elucidate landowner attitude towards the YRC. Through the survey instrument Inside landowners made it clear they valued the YRC and preferred the policy remain unchanged. Landowners within the YRC area are highly embedded in the policy and have the attitude that the YRC is the primary reason for the abundance of geese in their respective areas. Conversely, landowners outside the YRC area were not embedded in the policy and reported the YRC is not necessary as there is an abundance of geese irrespective of the YRC. Outside landowners did not articulate problems associated with the River being open to waterfowl hunting. The results of this study revealed a need for a structured decision making process if wildlife policy makers want to pursue a change to the YRC policy. It is recommended that adaptive impact management (AIP) be applied.

Adaptive impact management would incorporate the philosophy and values of key stakeholders, such as landowners and hunters. In following the AIP process monitoring of a policy change is essential. There are several recent and ongoing waterfowl hunting closure evaluation and monitoring efforts that FWP can refer to as guidance for monitoring defined impacts associated with an YRC policy change. A focus on defined impacts and stakeholder involvement will increase credibility of the wildlife policy makers by facilitating shared learning

among wildlife professionals and stakeholders. The implementation of AIP would be beneficial as the process would provide a means to more effective decision making and enhanced benefits among stakeholders (Organ, Decker, Riley, McDonald, & Mahoney, 2012).

CONCLUSION

The Yellowstone River waterfowl hunting closure was enacted over five decades ago in response to local concerns regarding perceived low waterfowl numbers in the lower Yellowstone Valley. The original intent of this specific policy was to create a rest area primarily for migrating Canada geese and thereby retaining geese in the area to provide increased hunting opportunity (N. Martin, Retired Wildlife Manager Montana Fish, Wildlife and Parks, personal communication). Currently, all Canada goose populations in the Central Flyway are well over management objectives (U.S. Fish and Wildlife Service, 2012). It is now thought by wildlife managers that the limiting factor regarding waterfowl hunting opportunity in the lower Yellowstone River Valley may not be waterfowl abundance but hunter access. With the human dimension component of this policy evident, managers would be in error to overlook the social fabric of the YRC policy. As a result, there is a need for a feedback mechanism to make a potential management decision informed, dynamic and responsive. It has been unknown to wildlife managers and policy makers what attitudes, behaviors and values private landowners foster towards the waterfowl hunting closure. That is the impetus of this research.

This study is not a full evaluation of the Yellowstone River waterfowl hunting closure; it is a survey that elucidates the attitudes of private landowners within the YRC area and landowners outside of the YRC area in respect to the waterfowl hunting closure. This study found a significant difference between Inside and Outside landowners in terms of their support of the YRC policy. Fifty-five percent of the landowners with property inside the closure area supported the closure. Outside landowners were not as embedded in the policy and 55% of Outside landowners neither supported nor opposed the waterfowl hunting closure. Although

64% of the Inside landowners indicated they supported the YRC to remain unchanged, the highest portion (53%) of those same landowners disagreed with the statement that the goose population was too low. This landowner response coupled with empirical waterfowl survey data reaffirms the social context of the of the YRC policy.

It is imperative for wildlife managers to consider the implications of policy and how it affects natural resources as well a variety of stakeholders. Inside landowners articulated that they value the YRC policy as a positive management action and in their opinion, the closure enhances waterfowl hunting on adjacent private land. In addition, Inside landowners indicated they would reduce the amount of waterfowl hunting privileges they currently allow on their property if the YRC was modified or lifted. This sentiment indicates that a change in the YRC policy may jeopardize hunting access on private land even though a policy change would indisputably increase waterfowl hunting access on the public domain of the Yellowstone River and associated backwaters, islands and sand bars. This feedback from the Inside landowners is important for wildlife policy makers to consider when faced with the decision to terminate, modify or leave the YRC intact.

Inside landowners were concerned about potential trespass and hunter control issues if the YRC was modified or rescinded, while Outside landowners did not report trespass issues associated with waterfowl hunters via the river. It is imperative that managers understand that a number of Inside landowners regard the YRC is a hunter management control tool. Therefore, wildlife managers should evaluate whether the intent of the policy has shifted. As with all policy, wildlife managers need to ensure the YRC is consistent with Montana's public trust doctrine and the North American Model of Wildlife Management.

The intent of this study was to inform policy and provide useful information to further develop waterfowl management decisions in the lower Yellowstone River Valley. This was achieved as the research concluded that Outside landowners would not resist a modification to the YRC. Conversely, Inside landowners are still highly embedded to the YRC policy and would likely be competing stakeholders to the YRC policy change. Engaging Inside landowners, as well as other key stakeholders such as sportsmen, in the decision making process is essential in minimizing potential conflict. The results of this study will assist wildlife managers and other stakeholders to make informed decisions regarding the future of the Yellowstone River waterfowl hunting closure.

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**APPENDIX A: COVER LETTER ACCOMPANYING
LANDOWNER SURVEY**

NDSU

North Dakota State University

Department of Natural Resources
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NDSU Dept. 7650
PO Box 6050
Fargo, ND 58108-6050
701.231.8180

**EVALUATION OF THE YELLOWSTONE RIVER WATERFOWL
HUNTING CLOSURE**

Dear Landowner:

North Dakota State University, in cooperation with Montana Department of Fish, Wildlife & Parks (FWP), is conducting a research project to evaluate waterfowl hunting opportunities along the lower Yellowstone River Valley with special focus directed toward the Yellowstone River waterfowl hunting closure area. This study will evaluate the effects the waterfowl hunting closure has on the distribution and abundance of waterfowl along the lower Yellowstone River in southeastern Montana. In addition, the research project will assess the social characteristics of current waterfowl hunting activities along the lower Yellowstone River Valley with the intent of providing FWP and the public with information to develop and support future waterfowl management decisions.

You have been selected to participate in this evaluation through a random selection process of landowners along the lower Yellowstone River and Bighorn River Valleys. A questionnaire is enclosed with this packet of information and has been designed to take only 15 minutes of your time.

The questionnaire is voluntary, and your responses will remain anonymous. The information you provide as a landowner is a very important part of this analysis. Please complete the questionnaire and mail it back to us as soon as possible. A self-addressed stamped envelope has been included to aid you in this process.

If you have any questions about this project, please contact me at 406.234.0929 or steven.atwood@ndsu.edu or contact my advisor, Jack Norland, at 701.231.9428 or jack.norland@ndsu.edu. If you wish to receive a copy of the research results, please email or call me through my contact information listed above.

Thank you for your time.

Sincerely,



Steve Atwood
Graduate Student
North Dakota State University

APPENDIX B: LANDOWNER SURVEY INSTRUMENT



1. During the Montana waterfowl hunting season, are waterfowl (ducks and geese) present on the land you own?

- NO.....Go to question 15
- YES

2. Does waterfowl hunting occur on the land you own?

- NO → If no, please articulate below:
- YES

(Please Print Legibly....Go to question 15 when done)

DUCK HUNTING

3. Does duck hunting occur on the land you own?

- NO.....Go to question 9
- YES

4. Each year, about how many duck hunters hunt on the land you own? _____

5. Below is a list of different management systems that landowners in Montana use to manage hunting on their land. Using this list, please respond as follows:

- (a) First, **check all systems** that apply to how duck hunting is managed on the land you own.
- (b) Second, **CIRCLE ONLY ONE LETTER** corresponding to the ONE SYSTEM that best represents how MOST duck hunting is managed on the land you own.

- A. Block Management Hunting Access Program
- B. Non-Block Management hunting without a fee involving mostly hunters who are family/friends
- C. Non-Block Management hunting without a fee involving mostly hunters who are NOT family/friends
- D. Outfitting by you as the landowner
- E. Outfitting by a licensed outfitter other than yourself
- F. Lease agreement with a non-outfitting business that markets hunting opportunities
- G. Lease agreement with a hunter or group of hunters
- H. Access fees (non-lease) charged per hunter or group of hunters

6. During the past 5 years, have you changed how you manage duck hunting on the land you own?

- NO
- YES..... If yes, please articulate below:

7. When do duck hunters typically hunt on your property? More specifically, what percent of the duck hunters on your property each year hunt during the early, middle, and late parts of the Montana waterfowl season? **For each time period below, record the percent of duck hunters who hunt on your property...the total for a, b & c below should add to 100%.**

- a. Early season (October—between the start of waterfowl season and the general big game season).... _____ %
- b. Mid-season (November—during the general big game hunting season)..... _____ %
- c. Late season (December & January--after the general big game season)..... _____ %

TOTAL = 100%

8. Where do duck hunters typically hunt on your property? More specifically, what percent of the duck hunters on your property each year hunt water-based settings versus field-based settings? **For each setting below, record the percent of duck hunters who hunt on your property...the total for a & b below should add to 100%.**

- a. Water-based settings on your property such as rivers, lakes, ponds, and sloughs..... _____ %
- b. Field-based settings on your property such as agricultural fields or bluffs..... _____ %

TOTAL = 100%

GOOSE HUNTING

9. Does goose hunting occur on the land you own?

- NO.....Go to question 15
- YES

10. Each year, about how many goose hunters hunt on the land you own? _____

11. Below is a list of different management systems that landowners in Montana use to manage hunting on their land. Using this list, please respond as follows:

- (a) First, **check all systems** that apply to how goose hunting is managed on the land you own.
- (b) Second, **CIRCLE ONLY ONE LETTER** corresponding to the ONE SYSTEM that best represents how MOST goose hunting is managed on the land you own.

- A. Block Management Hunting Access Program
- B. Non-Block Management hunting without a fee involving mostly hunters who are family/friends
- C. Non-Block Management hunting without a fee involving mostly hunters who are NOT family/friends
- D. Outfitting by you as the landowner
- E. Outfitting by a licensed outfitter other than yourself
- F. Lease agreement with a non-outfitting business that markets hunting opportunities
- G. Lease agreement with a hunter or group of hunters
- H. Access fees (non-lease) charged per hunter or group of hunters

12. During the past 5 years, have you changed how you manage goose hunting on the land you own?

- NO
- YES..... If yes, please articulate below:

13. When do goose hunters typically hunt on your property? More specifically, what percent of the goose hunters on your property each year hunt during the early, middle, and late parts of the Montana waterfowl season. **For each time period below, record the percent of goose hunters who hunt on your property...the total for a, b & c below should add to 100%.**
- a. Early season (October—between the start of waterfowl season and the general big game season)..... _____ %
 - b. Mid-season (November—during the general big game hunting season)..... _____ %
 - c. Late season (December & January--after the general big game season)..... _____ %
- TOTAL = 100%**

14. Where do goose hunters typically hunt on your property? More specifically, what percent of the goose hunters on your property each year hunt water-based settings versus field-based settings? **For each setting below, record the percent of goose hunters who hunt on your property...the total for a & b below should add to 100%.**
- a. Water-based settings on your property such as rivers, lakes, ponds, and sloughs..... _____ %
 - b. Field-based settings on your property such as agricultural fields or bluffs..... _____ %
- TOTAL = 100%**

15. On a scale from 1 (strongly disagree) to 5 (strongly agree), to what extent do you agree or disagree with the following statements regarding waterfowl and waterfowl hunting in your area? **Circle only one number for each statement below or check the “I don’t know” box if you don’t know.**

<u>Statement:</u>	<u>Strongly Disagree</u>					<u>Strongly Agree</u>	<u>I Don't Know</u>
The population of ducks in your area is <u>too high</u> (e.g., there are too many ducks)	1	2	3	4	5	[]	[]
The population of ducks in your area is <u>too low</u> (e.g., there are not enough ducks)	1	2	3	4	5	[]	[]
The population of geese in your area is <u>too high</u>	1	2	3	4	5	[]	[]
The population of geese in your area is <u>too low</u>	1	2	3	4	5	[]	[]
Ducks and geese are causing damage to croplands in your part of the state	1	2	3	4	5	[]	[]
It is <u>easy</u> to obtain access to hunt waterfowl in your part of the state	1	2	3	4	5	[]	[]
It is <u>difficult</u> to obtain access to hunt waterfowl in your part of the state	1	2	3	4	5	[]	[]
It is <u>easy</u> to obtain access to hunt waterfowl without a paying fee or being a close friend or family member of a landowner in your part of the state	1	2	3	4	5	[]	[]
It is <u>difficult</u> to obtain access to hunt waterfowl without a paying fee or being a close friend or family member of a landowner in your part of the state	1	2	3	4	5	[]	[]

The 87-mile section of the Lower Yellowstone River beginning at the junction of the Bighorn and Yellowstone Rivers, then east down the Yellowstone River to the Rosebud-Custer County line east of Hathaway, Montana is CLOSED TO ALL WATERFOWL HUNTING. This closure is within the confines of the normal stream flow (e.g., waterfowl hunting is NOT allowed on the river below the high water mark and this includes all islands, backwaters and sandbars). This closure was originally established in 1959 to enhance Canada geese numbers in this part of the state. Of note, this closure applies only to waterfowl hunting...other river recreation pursuits (e.g., fishing, boating, upland bird hunting, deer hunting, etc.) are allowed.

16. Prior to receiving this survey, were you aware that this 87-mile section of the Lower Yellowstone River is closed to all waterfowl hunting?

NO
 YES.....If yes, on a scale from 1 (a little) to 5 (a lot), how much do you know about this waterfowl closure? (**circle only one number below**)

(a little) 1 2 3 4 5 (a lot)

17. On a scale from 1 (strongly disagree) to 5 (strongly agree), to what extent do you agree or disagree with the following statements regarding the waterfowl hunting closure on this part of the Lower Yellowstone River? **Circle only one number for each statement below or check the “I don’t know” box if you don’t know.**

<u>Statement:</u>	<u>Strongly Disagree</u>				<u>Strongly Agree</u>	<u>I Don't Know</u>
The waterfowl closure is needed to help maintain an adequate number of ducks during the hunting season for recreational opportunities	1	2	3	4	5	[]
The waterfowl closure is needed to help maintain an adequate number of geese during the hunting season for recreational opportunities	1	2	3	4	5	[]
The waterfowl closure is no longer needed because there is an adequate number of ducks during the hunting season for recreational opportunities	1	2	3	4	5	[]
The waterfowl closure is no longer needed because there is an adequate number of geese during the hunting season for recreational opportunities	1	2	3	4	5	[]
The waterfowl closure is no longer needed because there are too many waterfowl (ducks and geese) damaging area croplands	1	2	3	4	5	[]
The waterfowl closure enhances waterfowl hunting Opportunities in the Lower Yellowstone River area	1	2	3	4	5	[]
The waterfowl closure has led to increased difficulty for hunters to find access to hunt waterfowl in this part of the Lower Yellowstone River	1	2	3	4	5	[]
The waterfowl closure has led to reduced waterfowl Hunting opportunities on the Lower Yellowstone River	1	2	3	4	5	[]

18. Does this waterfowl closure affect how you manage waterfowl hunting access on the land you own?

NO..... **Go to question 21**

YES..... If yes, please articulate below.

19. On a scale from 1 (strongly disagree) to 5 (strongly agree), to what extent do you agree or disagree with the following statements regarding the modification of the waterfowl hunting closure on this part of the Lower Yellowstone River? **Circle only one number for each statement below or check the “I don’t know” box if you don’t know.**

<u>Statement:</u>	<u>Strongly Disagree</u>				<u>Strongly Agree</u>	<u>I Don't Know</u>
I would support the waterfowl hunting closure to remain unchanged	1	2	3	4	5	[]
I would allow duck hunters access on or across my property to hunt ducks on the river if it were open to waterfowl hunting	1	2	3	4	5	[]
I would allow goose hunters access on or across my property to hunt geese on the river if it were open to waterfowl hunting	1	2	3	4	5	[]
I would support modifying a portion of the 87-mile long waterfowl hunting closure to open sections of the river where significant public access is present (fishing access sites, wildlife management areas, etc...)	1	2	3	4	5	[]
I would support modifying the waterfowl hunting closure to allow for waterfowl hunting to occur earlier in the hunting season (October)	1	2	3	4	5	[]
I would support modifying the waterfowl hunting closure to allow for waterfowl hunting to occur during certain days of the week	1	2	3	4	5	[]
If the waterfowl hunting closure was partially modified or lifted I would reduce the amount of waterfowl hunting privileges that I currently allow	1	2	3	4	5	[]
I would support eliminating the waterfowl hunting closure	1	2	3	4	5	[]

20. If the waterfowl hunting closure were to be eliminated, would this affect how you manage waterfowl hunting on the land that you own? (**check only one**)

- Very unlikely
- Unlikely
- Neither likely nor unlikely
- Likely
- Very likely
- Unknown

If you selected likely or very likely, how would waterfowl hunting be managed differently?

21. To what extent do you support or oppose this waterfowl hunting closure? (**check only one**)

- Strongly oppose
- Oppose
- Neither support nor oppose
- Support
- Strongly support

Please articulate why you support or oppose this closure:

THANK YOU FOR YOUR HELP!

Please return your completed survey using the postage paid, self-addressed envelope provided.

APPENDIX C: FOLLOW UP POSTCARD REMINDER

Dear Landowner:

A week ago you should have received a survey questionnaire from North Dakota State University and Montana Fish, Wildlife & Parks (FWP) regarding waterfowl hunting and the Yellowstone River waterfowl hunting closure. If you have completed this survey and returned it to us, ***THANK YOU*** for your cooperation!

If you have not had the opportunity to complete this survey, please do so as soon as possible. Your participation is crucial to the success of this project and it should take no more than 10 minutes to complete the survey. This survey is voluntary and your responses will remain anonymous.

If you have any questions about this survey, please feel free to contact Steve Atwood by phone (406) 234-0929 or email Steven.Atwood@ndsu.edu .

Thank you for your help!

Sincerely,

Steve Atwood
Graduate Student
North Dakota State University

APPENDIX D: INSIDE LANDOWNER WRITTEN COMMENTS

Landowner Survey, Question 2: Does waterfowl hunting occur on the land you own? If no, why not?

1. CAN'T HUNT WITH OUR PERMISSION
2. LIMITED BY LOCATION & CROPS
3. YELLOWSTONE RIVER WATERFOWL REFUGE
4. NO ONE ASKED
5. DUE TO PASSAGE OF I-161 ALL RESIDENT HUNTING IS NOW CLOSED ON MY LAND
6. WE BRING CATTLE HOME AT THAT TIME. WE DON'T WANT HUNTERS WALKING & SHOOTING IN THE CATTLE.
7. LAND IS POSTED AS "NO HUNTING"
8. NOT ENOUGH OF THEM TO REALLY HUNT. HAVE ALLOWED VERY LITTLE GOOSE HUNTING OVER PAST YEARS. ALMOST NO DUCKS.
9. MOST OF IT IS ON ISLANDS OR WATER WAYS CONNECTED TO THE YELLOWSTONE RIVER
10. LIVESTOCK IN THE AREA

Landowner Survey, Question 12: During the past 5 years, have you changed how you manage goose hunting on the land you own? If yes, how so?

1. LEASE TO A GROUP OF HUNTERS
2. RESTRICTED # OF HUNTERS ALLOWED ON OUR LAND
3. USED BLOCK MANAGEMENT BRIEFLY TO GET THE WORD OUT THAT THEY ARE ABLE TO HUNT HERE BUT DROPPED IT DUE TO BAD ATTITUDE IN HUNTERS.
4. TAKE HUNTER NAME, CHECK FIELD FOR TRASH & RUTS IN FIELD
5. I UTILIZE FARMING PRACTICES THAT ENHANCE WATERFOWL FOOD AND HABITAT.

Landowner Survey, Question 18: Does the waterfowl closure affect how you manage waterfowl hunting access on the land you own? If yes, how so?

1. NO HUNTING ON LAND E OF THE CONFLUENCE OF THE BIGHORN RIVER & THE YELLOWSTONE
2. BY HAVING THE RIVER CLOSED-I HAVE VERY LITTLE ILLEGAL TRESPASS TO MY RANCH-TO OPEN THE RIVER-IT WILL PUSH THE WATERFOWL TO GRAZING FIELDS MUCH FARTHER AWAY-MAKING HUNTING HARDER.

3. AT TIMES, 100S TO 1000S OF GEESE ROOST ADJACENT TO MY PROPERTY. UNDER UNDISTURBED CONDITIONS (NOW) THE GEESE ARE ALWAYS HERE & USUALLY LOTS OF THEM-THEREFORE 'NO BIG DEAL' TO HUNT THEM ON MY PROPERTY. IF THEY ARE NOT AROUND, ESPECIALLY FROM RIVER DISTURBANCE OR IN FEWER #S-I'D BE MORE RELUCTANT TO ALLOW HUNTING. (MAYBE)
4. IF YOU CHANGE THE CLOSURE TO OPEN I WOULD BE LESS LIKELY TO ALLOW AS MUCH HUNTING!!
5. I DO NOT ALLOW HUNTING NEAR THE RIVER OR STREAM
6. WITHOUT A GOOD NUMBER OF BIRDS WE WOULDN'T LET FRIENDS ON TO HUNT
7. I ALLOW HUNTING ON MY PROPERTY BECAUSE THE BIRDS HAVE A CLOSED AREA THEY CAN GO TO. WITHOUT THE RIVER CLOSURE I WOULD ELIMINATE HUNTING ON MY PROPERTY TO ONLY FAMILY
8. NO RIVER HUNTING ALLOWED. NO HUNTING ALLOWED IN FIELDS BORDERING THE RIVER. MORE PEOPLE CAN HUNT BECAUSE MORE GEESE AVAILABLE!
9. I LIKE TO KNOW WHERE & WHO ARE HUNTING THE LAND - WHEN PEOPLE ACCESS FROM THE RIVER THEY CONTINUALLY TRESPASS & PUSH THE LIMITS
10. THERE WAY TOO MANY GEESE BUT IF YOU OPEN IT, IT WILL INCREASE BOAT PRESSURE AND MANY PROBLEMS

Landowner Survey, Question 20: If the waterfowl closure were to be eliminated, would this affect how you manage waterfowl hunting access on the land you own? If likely or very unlikely, how would waterfowl hunting be managed differently?

1. IF RIVER IS OPENED I WILL "STOP ALL HUNTING"
2. IF THE BIRDS DON'T FIND SAFETY ON THE RIVER - THEN I WOULD NOT ALLOW HUNTING ON MY LAND. THEY WOULD BE SAFE HERE
3. DEPENDS ON THE BIRD AVAILABILITY. WHY CHANGE SOMETHING THAT ISN'T BROKEN & WHY WASTE MONEY JUST TO SPEND MONEY FOR OPENINGS & CLOSURES INQUIRIES. JUSTIFY YOUR JOB OTHER WAYS.
4. I WOULD CLOSE IT COMPLETELY
5. ON A VERY LIMITED SCALE-I'D ALLOW ACCESS TO THE RIVER-NOW THERE IS NONE (ACCESS)
6. I THINK IT WOULD REDUCE GOOSE HUNTING FIELD SET OPPORTUNITIES
7. I WOULD CURTAIL ACCESS!
8. NO HUNTING
9. NO HUNTING

10. THERE WOULD BE NO HUNTING OR ACCESS TO RIVER FROM OUR PROPERTY
11. I WOULD REDUCE THE NUMBER OF HUNTERS ON MY LAND. THE BIRDS NEED A REST AREA.
12. I WOULD NOT ALLOW TRESPASS ACROSS MY LAND TO THE RIVER.
13. GOOSE POPULATION IN THE AREA WOULD DROP SIGNIFICANTLY. WOULD CUT BACK ON NUMBER OF HUNTERS ACCORDINGLY!
14. NOT REALLY IN FAVOR OF BOAT HUNTING. ALL BOAT HUNTING ON RIVER SHOULD BE ILLEGAL. ESPECIALLY DURING DEER SEASON.
15. WE WOULD HAVE TO BE VERY CAREFUL-IF RIVER ACCESS IS ALLOWED-HOW WOULD WE KNOW WHO WAS HUNTING FROM THE RIVER & WHO HAD LAND ACCESS. WE DON'T WANT A WAR WITH HUNTERS SHOOTING AT EACH OTHER!! HOW WOULD WE CONTROL RIVER ACCESS?
16. WON'T ALLOW HUNTING
17. WE WOULD HUNT THE RIVER MORE & PUSH OUT THE MIGRATES

Landowner Survey, Question 21: To what extent do you support or oppose this waterfowl hunting closure? Why do you support or oppose this closure?

1. WE BELIEVE THAT PEOPLE WHO HAVE TOO MANY GEESE SHOULD ALLOW HUNTING IN THAT LAND. WE DO NOT NEED HUNTERS IN BOAT CRUISING THIS STRETCH OF YSR HUNTING GEESE THEY WILL NOT ASK PERMISSION AND IT WOULD BE IMPOSSIBLE TO CONTROL- WE NEED THE RIVER CLOSED AS IT IS NOW.
2. DOESN'T MATTER TO ME
3. I BELIEVED THAT AFTER THAT AFTER 50+ YEARS THE WATERFOWL SHOULD HAVE RECOVERED & ALL AREAS COULD BE MANAGED THE SAME
4. KEEPS MORE WATERFOWL IN AREA - KEEP THE AREA CLOSED
5. I BELIEVE THERE ARE WAY TOO MANY GEESE LOCALLY AND NATIONALLY... ASK PILOT SCULLY
6. WE NOW HAVE MORE BIRDS THAN BEFORE. THIS IS GREAT! I CAN REMEMBER THE SLAUGHTER OF THE BIRDS ON THE RIVER
7. I REMEMBER WHEN THERE WASN'T MANY GEESE BUT NOW THERE IS A LOT OF THEM
8. I SUPPORT IT BECAUSE IT PROVIDES A SANCTUARY FOR THE WATERFOWL
9. GIVES GEESE A SAFE HAVEN IN THE WINTER AND THE WINTER GEESE DON'T DAMAGE VERY MUCH CROP

10. GIVES AN UNDISTURBED SANCTUARY TO WATERFOWL. WITH NO SAFE LANDING PLACE BIRD NUMBERS WILL LIKELY DECREASE IN ALL AREAS ALONG THE RIVER.
11. TOO MANY GEESE AND DUCKS IN THIS AREA.
12. THERE IS PLENTY OF WATERFOWL
13. JUST ANOTHER WORTHLESS LEGISLATION.
14. THE INFLUX OF HUNTERS TO THE AREA MIGHT BE HARD TO MANAGE.
15. I PERSONALLY OWN & OPERATE A GUEST HOUSE & FOR SELFISH REASONS I WANT LOTS OF GEESE & DUCKS. THE WHOLE ECONOMY OF THE FORSYTH REGION BENEFITS FROM HUNTERS, SO WHY SCREW WITH SOMETHING THAT IS WORKING. THEY HAVE ALREADY MESSED WITH THE ECONOMY WITH THE CHANGING OF THE BIG GAME LICENSE FEES. ACCESS TO DUCK & GEESE PROPERTY IS NOT AN ISSUE. I HAVE CHECKED WITH PEOPLE FROM HYSHAM TO ALMOST HATHAWAY! CALL 406-356-2619. HOW MANY MT BUSINESSES CAN WE AFFORD TO LOOSE!
16. WHY CHANGE SOMETHING THAT SEEMS TO WORK.
17. BEFORE THE RIVER WAS CLOSED WE HAD FAIR DUCK HUNTING BUT HARDLY ANY GOOSE HUNTING. THE CLOSURE IS NEEDED TO MAINTAIN WHAT IS NOW EXCELLENT GOOSE HUNTING
18. TOO MANY GEESE.
19. DUCKS AND GEESE REQUIRE A SAFE PLACE TO SPEND EVENINGS AND NONFEEDING PERIODS.
20. IT GIVES ME A LITTLE HELP IN CONTROLLING THE CITY IDIOTS THAT BELIEVE THEY HAVE ACCESS TO ANY LAND THAT THE RIVER NEAR!
21. THE WATERFOWL POPULATION HAS INCREASED IN NUMBERS TO SUPPORT HUNTING.
22. I BELIEVE THERE WOULD BE MORE LANDOWNER/HUNTER CONFLICT RE: TRESPASS ONTO PRIVATE PROPERTY FROM RIVER HUNTERS. THE DEER HUNTERS ALREADY DO! ALSO, THE RIVER WOULD NEVER BE AN AREA OF QUIET SOLITUDE AS SO MANY MORE POWER BOATS WOULD BE RUNNING UP AND DOWN THE RIVER. ACCESS \$ SOLITUDE WOULD BE A PROBLEM.
23. I'D LIKE TO SEE THE RIVER OPEN TO SOME EXTENT. PROBABLY WOULDN'T REALLY IMPACT GOOSE HUNTING AS THE RIVER ICE FORMS ABOUT TIME THE NORTHERN BIRDS MOVE IN & EVEN THE CONSIDERABLE BOAT TRAFFIC (BIG GAME SEASON) DOESN'T SEEM TO BOTHER THEM MUCH-OF COURSE THE BIRDS AREN'T GETTING SHOT AT. I THINK THE THING THAT BOTHERS ME THE MOST IS THE CHANCE THAT OUTFITTERS & JET BOATS WOULD INCREASE TO THE POINT OF CONCERN. WE LIVE ON THE RIVER & REALLY ENJOY THE SOLITUDE-WE LET LOTS OF PEOPLE HUNT-(BIG GAME-GEESE). I'D REALLY BE UPSET IF EVERY OTHER DAY SOME OUTFITTER IS

- SET UP BELOW THE HOUSE BANGING AWAY-UNLESS OF COURSE- IT IS ME HAVING THE GOOD HUNTING. DIFFICULT CHOICE TO MAKE. GOOD LUCK.
24. DUCKS USED TO BE THICK IN THE FALL HERE. NOW THEY ARE LESS & GEESE ARE VERY PLENTIFUL. GEESE USED TO HARDLY BE HERE AT ALL. I BELIEVE THE ABILITY FOR WATERFOWL ESPECIALLY GEESE TO REST ON THE RIVER GREATLY INCREASES FIELD SET HUNTING OPPORTUNITY.
 25. ACCESS IS EASY IF YOU ASK & GAME IS PLENTIFUL-GIVES THE BIRDS A SAFE PLACE TO REST EAT & GET WATER!!
 26. TOO MANY GEESE STAY AROUND AND DAMAGE YOUNG SEEDLING CROPS!
 27. BY GIVING WATERFOWL A SAFE ROOSTING HABITAT A SUBSTANTIAL INCREASE IN BIRD NUMBERS AND THE LENGTH OF TIME THEY STAY IN THE AREA HAS OCCURRED. THIS HAS INCREASED OPPORTUNITY FOR SPORTSMEN AND ENHANCED THE LOCAL ECONOMY BY INCREASED NUMBER OF HUNTERS IN THE AREA. SASK. CANADA HAS KNOWN THIS & HAD NO HUNTING OVER WATER FOR DECADES!
 28. THE WATERFOWL NEED AN AREA THAT ALLOWS THEM TO REST DURING THEIR MIGRATION WITH OUT THE THREAT OF HUNTING
 29. I'M 49 YR OLD WHEN I WAS YOUNG THERE WERE VERY FEW GEESE ON OUR LAND. THIS WINTER I HAVE SEEN 5,000-20,000 GEESE ON OUR FEED GROUNDS & FARMLAND.
 30. IMPROVES MANAGEMENT & POPULATION OF BIRDS
 31. IT GIVES HUNTERS ANOTHER WAY TO ACCESS PRIVATE LAND. I HAVE BEEN A HUNTER FOR OVER 45 YEARS AND THE RIVER GIVES PEOPLE A ROAD ACCESS TO PRIVATE LAND. WE DEAL WITH THIS AND DEER HUNTERS ALL SEASON LONG. SHOOT FROM A BOOT ON TO PRIVATE GRAB THE ANIMAL AND RUN.
 32. HUNTERS ARE NOT ALWAYS CONSIDERATE OF FARMERS OR HARVEST OPERATIONS. HUNTING SEASONS FALL @ A TIME WHEN LEAST CROPS ARE COMING IN & LIVESTOCK IS NEAR RIVERS. NOISE IS STRESSFUL TO LIVESTOCK & HUMANS.
 33. ANIMALS NEED A SAFE PLACE TO BE ABLE TO GO TO
 34. THE CLOSURE PROVIDES A REST AND ROOSTING AREA FOR WATERFOWL. TO ELIMINATE THE CLOSURE WOULD DRASTICALLY REDUCE THE QUALITY OF WATERFOWL HUNTING IN THE AREA. BIRDS NEED A PLACE TO REST. PRESSURED BIRDS WILL CHANGE FLIGHT PATTERNS AND LEAVE THE AREA.
 35. WHEN GEESE HAVE A SAFE HAVEN TO REST AND HAVE WATER THEY WILL STAY IN THE AREA AND FEED ON SURROUNDING FIELD DURING THE DAY. THE POOREST HUNTING IN MY TIME WAS THE LAST YEAR THE RIVER WAS OPEN TO HUNTING IN TWO WEEKS THE GEESE WERE MOSTLY GONE.

36. TREMENDOUS OPPORTUNITY FOR QUALITY FIELD GOOSE HUNTING DUE TO THE PROTECTED ROOSTING SITES ON THE RIVER. ALLOWING RIVER HUNTING WILL RUIN THINGS FOR EVERYONE!
37. WATERFOWL NEED A SAFE RESTING AREA.
38. BEEN THAT WAY FOR OVER 50 YEARS. IT'S WORKED FINE. GO AHEAD AND OPEN IT AND YOU WON'T HAVE ANY BIRDS LEFT. JUST ANOTHER PUSH TO GET MORE PRIVATE LAND OPENED. THESE BIRDS NEED A SANCTUARY TO RESIDE ON. THEY GET ENOUGH PRESSURE ON THE FIELDS. MOST YEARS WE USUALLY DON'T LET HUNTERS ON AS THERE REALLY ISN'T ENOUGH THAT LAND ON OUR FIELDS. ANYMORE MOST OF THESE ISSUES ARE ABOUT ACCESS. THAT'S ALL I REALLY SEE HERE. IT SEEMS THAT MOST ARE DEMANDING MORE, REGARDLESS OF THE PRIVATE LANDOWNERS. JUST ONE MORE ATTEMPT TO SHOVE SOMETHING DOWN A LANDOWNERS THROAT. WHEN THE PUBLIC HUNTER LEARNS TO RESPECT LANDOWNERS PROPERTY RIGHTS THEN MAYBE THEY'LL HAVE MORE OPPORTUNITY. WITH ALL THAT GOES ON SUCH AS LIMITING ARCHERY PERMIT TO COMMISSION DECISIONS ITS NO WONDER WHY MORE LANDOWNERS LOCK GATES. WITH THE VOTING IN OF I-161- THERE WILL BE MORE GATES SHUT. SORRY FOR THE RANT BUTS THAT MY VIEWS ON ALL OF THIS I DO BELIEVE THAT THERE IS SOME CROP DAMAGE FROM GEESE. JUST CURIOUS IF THOSE LANDOWNERS ALLOW FREE AND OPEN HUNTING. THANK YOU
39. I SUPPORT IT BECAUSE I USED TO HUNT WATERFOWL A LOT. I FEEL THIS ONE OF THE BEST AREAS TO HUNT IN THE STATE BECAUSE OF THIS CLOSURE. WITHOUT IT THERE WOULD BE TO MUCH PRESSURE ON THEM BEING HUNTED IN FIELDS AND ON THE RIVER TOO.
40. KEEP IT CLOSED DON'T CHANGE IT IF IT AIN'T BROKE!
41. HUNTERS WILL BE ALL OVER ON THE RIVER WITH BOATS AND THEY WOULD NOT HARVEST NEARLY ENOUGH GEESE. ITS REALLY STUPID IDEA.
42. BECAUSE OF ACCESS PROBLEMS
43. THIS GIVES A "REST" AREA FOR WATERFOWL. THERE IS PLENTY OF "HUNTING" AREA ADJACENT TO OR IN FIELDS NEAR THE CLOSED AREA.
44. SUPPORT IT BECAUSE IT GIVES A SAFE HAVEN FOR THE WATERFOWL.
45. THIS CLOSURE HAS WORKED WELL FOR 40 YRS. THE DUCKS & GEESE NEED A RESTING PLACE. WHY CHANGE 40 YRS OF SUCCESS IN INCREASED NUMBERS OF GAME BIRDS? WE HAVE ALWAYS ALLOWED ACCESS TO BOAT, FISH, AND HUNT ISLANDS ETC. THIS WILL BE SEVERELY REDUCED IF THERE IS UNCONTROLLED RIVER ACCESS.

46. IT ALLOWS ME TO KNOW BETTER WHO IS HUNTING. PEOPLE ACCESSING FROM THE RIVER ABUSE PROPERTY RIGHTS & THEN GET AWAY BY BOAT
47. OPEN THE RIVER IN OCT FOR LOCAL BIRDS CLOSE RIVER DURING MIGRATION - 11/1 - CLOSE THIS WILL KEEP GOOD BIRD NUMBER THRU ENTIRE SEASON MODIFY SEASON

APPENDIX E: OUTSIDE LANDOWNER WRITTEN

COMMENTS

Landowner Survey, Question 2: Does waterfowl hunting occur on the land you own? If no, why not?

1. NO REQUESTS HAVE BEEN MADE
2. TOO MUCH LIVESTOCK INTERMINGLED WITH WATERFOWL
3. 5 YEARS AGO NO HUNTING TO LIMITED ACCESS BY PERMISSION, NO FEE
4. VERY LIMITED OPPORTUNITIES DUE TO LAND LOCATION AND MOST IS RANGELAND AND NOT CROPPED
5. DURING THE LAST 5 YEARS I HAVE HAD ONLY 1 MAN WHO HUNTED GEESE ON MY LAND. GEESE HAVE BEEN HERE BUT NO ONE SEEMED TO HUNT HERE.
6. BIRDS ONLY HERE OCCASIONALLY
7. NO ONE HAS ASKED TO HUNT
8. WE HAVE VERY FEW DUCKS. SOMETIMES WE HAVE GEESE & SOME TIMES NOT.
9. THE QUESTION ANSWERED PERTAINS TO THIS FARM CLOSE TO HARDIN. THE GEESE ARE LEFT ALONE TO FEED ON THE LEFTOVER CROPS WASTE. WITH JUST MY NEPHEWS COMING DURING CHRISTMAS VACATION.
10. HUNTING IS NOT ALLOWED
11. NOBODY HAS ASKED.
12. TOO MANY RESIDENCES
13. WE DO NOT HAVE QUALITY WATERFOWL HUNTING ON OUR MONTANA PROPERTIES.
14. WITH PERMISSION (YES)
15. WE ARE A GOLF COURSE
16. TOO MANY LIVESTOCK - BETTER PLACES TO HUNT NEARBY
17. HUNTERS WERE NOT RESPECTFUL OF GATES AND PROPERTY & DID NOT ASK PERMISSION I HAVE SPENT THOUSANDS OF DOLLARS TO STOP HUNTING ON MY PROPERTY. HUNTERS ARE RUDE, DISCOURTEOUS AND THINK THEY HAVE A "RIGHT" TO HUNT ON PRIVATE PROPERTY. LET THEM BUY THEIR OWN FARM TO HUNT ON.
18. NO ONE COMES TO HUNT
19. NO, NO GEESE, OR DUCKS
20. TOO CLOSE TO THE CITY SEWER SYSTEM WOULD BE MY GUESS

21. NO HUNTING. THIS PROPERTY IS USED FOR BIG GAME HUNTING. THE FARM LAND IS LEASED OUT. WHAT WATERFOWL HUNTING THAT THERE IS, IS DONE BY RIVER FLOATERS.
22. MOSTLY RESERVOIRS NOT ENOUGH RIVER BOTTOM TO HUNT ON (OR FIELDS, ALL GRAZING)
23. NO ONE HAS ASKED
24. BECAUSE WE'RE NOT BIRD HUNTERS
25. GEESE NOT HERE VERY OFTEN. NO ONE EVER ASKED.
26. PASTURE LAND - CATTLE PRESENT
27. IT SEEMED LIKE THE GEESE RETURNED MORE AFTER HUNTING, LOOKING FOR THEIR MATES
28. WE NO LONGER LIVE AT THE PROPERTY IN QUESTION - IT IS FOR SALE AT THE CURRENT TIME & WE CANNOT GIVE PERMISSION TO HUNT THERE
29. I PREFER TO PROVIDE A SAFE PLACE FOR THE BIRDS TO REST.

Landowner Survey, Question 12: During the past 5 years, have you changed how you manage goose hunting on the land you own? If yes, how so?

1. BM PROGRAM
2. WE LET MORE GOOSE HUNTING THAN WE DID IN THE PAST
3. LEASED OUT TO HUNTER
4. TOOK MANAGEMENT BACK TO OURSELVES FROM BLOCK MANAGEMENT
5. BLOCK MANAGEMENT
6. LIMITED NUMBER OF HUNTERS AND/OR MUST BE ACCOMPANIED BY ME OR MY CHARGE

Landowner Survey, Question 18: Does the waterfowl closure affect how you manage waterfowl hunting access on the land you own? If yes, how so?

1. Better Blinds
2. BM PROGRAM
3. PULLED BLOCK MANAGEMENT FROM FISH & GAME AND MANAGE OURSELVES
4. NO COWS DURING HUNTING SEASON
5. TOO MANY GEESE
6. BLOCK MANAGEMENT
7. FEWER HUNTERS ACCOMPANIED BY ME

Landowner Survey, Question 20: If the waterfowl closure were to be eliminated, would this affect how you manage waterfowl hunting access on the land you own? If likely or very unlikely, how would waterfowl hunting be managed differently?

1. I DON' T KNOW ANYTHING ABOUT THE YELLOWSTONE RIVER
2. IT DOESN'T AFFECT ME ONE WAY OR THE OTHER. THOSE BIRDS ONLY FLY OVER TWICE A YEAR.
3. TRESPASS WOULD BECOME MORE PREVALENT
4. #19 - I DON'T LIVE IN THAT AREA. I'M ABOUT 60 MILES EAST OF THERE. WHEN WE GO TO BILLINGS YOU SURE SEE THOUSANDS OF GEESE IN THAT CLOSURE AREA
5. ALLOW MORE HUNTERS ON A DAILY BASIS
6. THERE IS NO WATERFOWL OR RIVER ACCESS ON THIS LAND
7. IF GOOSE NUMBERS WERE LESS, WE WOULD LIKELY ALLOW HUNTING
8. I ALLOW PEOPLE ON FIRST COME FIRST SERVE BASIS

Landowner Survey, Question 21: To what extent do you support or oppose this waterfowl hunting closure? Why do you support or oppose this closure?

1. WE HAVE AN ABUNDANCE OF GEESE BUT I DON'T KNOW ABOUT DUCKS. COULD WE REDUCE IT TO 40(+/-) MILES AND SEE IF THE WATERFOWL POPULATION RALLY CHANGES?
2. SUPPORT BECAUSE IT HAS LED TO AN INCREASE OD GEESE & THEIR AVAILABILITY TO HUNTERS FOR LARGER PERIODS OF TIME
3. LAND ACCESS IS LIMITED AND I DO NOT FEEL THAT THERE WOULD BE ENOUGH HUNTING ON THE WATER TO DRIVE THE DUCKS AND GEESE FROM THE AREA.
4. THERE ARE WAY TOO MANY GEESE
5. THE NUMBER OF GEESE ARE EXCESSIVE, DUCKS HAVE NOT BEEN A PROBLEM FOR ME
6. I LEASE MY LAND OUT FOR FARMING AND HUNTING & I HAVE RECEIVED NO COMPLAINTS ABOVE OVER OR UNDER POPULATION OF DUCKS OR GEESE, SO I WISH REGULATIONS TO REMAIN UNCHANGED.
7. I WOULD SUPPORT OPENING HUNTING ON LIMITED DAYS OF THE WEEK AND SEE RESULTS- CAN ALWAYS CLOSE IF IT HURTS THE POPULATION
8. GOOSE POPULATIONS ARE TOO HIGH AND THERE IS A RESTRICTED AMOUNT OF HUNTERS BECAUSE OF THE CLOSURE WHO DON'T WANT TO OR CAN'T PAY ACCESS FEES FOR HUNTING ON PUBLIC SECTORS.

9. OUR LAND IS EAST OF THE CLOSURE AREA. I DO NOT KNOW ENOUGH ABOUT THE WATERFOWL POPULATION OR ANY DAMAGE TO CROPS TO OFFER AN EDUCATED OPINION.
10. I OPPOSE IT BECAUSE IN 1959 THERE WERE NOT MANY GEESE ON THE RIVER. I THOUGHT IT SHOULD BE CLOSED TO GLENDIVE, HOWEVER 20/20 HIND SIGHT IT REALLY DIDN'T MATTER, LOOK AT OUR NUMBERS NOW. SO I THINK THAT OPENING UP THAT PART OF THE RIVER IS OK FOR GEESE. IN THE EARLY 70S WE HAD 1000S OF DUCKS, NOW WE DO NOT. ARE GOOSE #S A NEGATIVE FOR THE DUCKS? MOST OUR DUCKS ARE MORE SPECIALIZED THAN GEESE. I DO NO SHOOT DUCKS ANY MORE BECAUSE OF THE NUMBERS BUT ALSO I'D RATHER HUNT DEER WITH A BOW. THANKS SO MUCH FOR THE CHANCE TO SHOOT OFF MY MOUTH & YOUR GOOD EFFORTS.
11. MY LAND IS EAST OF THE CLOSED AREA AND WE HAVE VERY FEW THAT HUNT BELOW THE HIGH WATER MARK
12. IT APPEARS TO ME THAT THIS CLOSURE HAS INCREASED WATER FOWL POPULATIONS IN THE AREA. A TEST OF THIS MAYBE TO OPEN IT UP FROM CUSTER TO HYSHAM & CLOSE FROM CUSTER TO POMPEY'S
13. NO LONGER NEEDED
14. I DON'T HAVE ENOUGH INFORMATION AVAILABLE TO ANSWER THIS.
15. FISH & GAME CANNOT MANAGE THE PROPERTIES THEY NOW CONTROL. DON'T PUT MORE BURDENS ON A BUNCH OF MORONS WHO WANT TO TAKE OVER PRIVATE PROPERTY WHEN THEY CANNOT MANAGE WHAT THEY HAVE ALREADY.
16. WE SEEDED OUR CROPLAND TO GRASS. NOW FEWER BIRDS.
17. I THINK IT'S GOOD TO HAVE SOME NATURAL AREAS WHERE WATERFOWL CAN BE WITHOUT BEING DISTURBED.
18. THE BIRDS WILL STAY IN THE AREA LONGER IT GIVES SANCTUARY
19. I LOVE TO SEE THE WILDLIFE.
20. WITH LIMITED HUNTER ACCESS BY LANDOWNERS, THERE IS ALREADY ENOUGH WATER ACCESS "CLOSED" TO HUNTING.
21. I THINK THE SEASON NEEDS TO BE LONGER TO GET THE NUMBERS DOWN.
22. PLENTY OF GEESE FOR INCREASED HUNTING. DUCKS TEND TO USE CLOSURE AS A SANCTUARY & DECREASE HUNTING OPPORTUNITIES FOR EVERYONE. LAND OWNERS ON CLOSURE SHOULD BE ABLE TO HUNT THIS AREA.
23. HUNTING KEEPS THE ANIMALS FROM MULTIPLYING TOO FAST & EATING OUR CROPS.
24. THE CLOSURE IS WHY WE HAVE THE # OF BIRDS WE DO. THEY NEED A PLACE TO REST. KEEP IT CLOSED.

25. APPROPRIATE GAME MANAGEMENT AND KEEPS HUNTERS AWAY FROM POPULATED AREAS.
26. WOULD LOVE TO HAVE MORE DUCKS AROUND BUT THE GEESE ARE BECOMING A PROBLEM.
27. I DON'T BELIEVE THAT WE HAVE A SHORTAGE OF BIRDS. I HAVE 3 PLACES THAT ARE AFFECTED BY THIS FOR A TOTAL OF 9 MILES OF RIVER AND THE GEESE HAVE BECOME ALMOST A NUISANCE.
28. SINCE THE WATERFOWL CLOSURE OF THE LOWER YELLOWSTONE THERE HAS BEEN AN ABUNDANCE OF GEESE A QUITE A FEW MORE DUCKS. MISLEADING I WOULD THINK IT WOULD BE BETTER TO LEAVE THE RIVER CLOSED TO HUNTING
29. PLENTIFUL WATERFOWL NUMBERS.
30. NOT ENOUGH DUCKS. TOO MANY GEESE.
31. THEY NEED SOME PLACE TO REST & CONGREGATE
32. WHEN THE CLOSURE WENT INTO AFFECT, IT WAS DUE TO A LOW NUMBER OF CANADA GEESE IN GENERAL. THE CANADA GOOSE POPULATION HAS REBOUNDED NICELY AND THE CLOSURE AREA CAN BE RESCINDED NOW.
33. WATERFOWL NEED A SAFE AREA TO REPRODUCE.
34. TO MANY GEESE AND A LOT WHEAT FIELD DAMAGE
35. THERE ARE A LOT OF GEESE BUT, THEY NEED SOMEWHERE TO GO
36. I WOULD LIKE TO SEE THE CLOSURE AREA EXPANDED OR ANOTHER ESTABLISHED IN CUSTER & PRAIRIE COUNTIES
37. THERE ARE WAY TOO MANY CANADIAN GEESE IN THIS AREA & ACROSS THE WHOLE YELLOWSTONE VALLEY AND THE BIG HORN VALLEY
38. I DON'T BELIEVE THE BIRDS KNOW WHERE THEY ARE GOING TO BE HUNTED AT. ALSO THERE ARE MANY GEESE UP NORTH IN CANADA.
39. WE NEED MORE DUCKS SO I SUPPORT CLOSURE HERE BUT NORMALLY WE HAVE PLENTY OF GEESE SO I THINK CLOSURE HERE WOULD BE BAD
40. THERE IS TOO MUCH GOVERNMENT CONTROL OVER PRIVATELY OWNED LAND.
41. I OPPOSE THIS CLOSURE BECAUSE THE DUCKS AND GEESE MUTILATE OUR FIELDS ALL WINTER!
42. WATERFOWL NEED TO BE MANAGED THROUGH UP/DOWN OF POPULATION CYCLES. I AM OPPOSED TO GUIDE HUNTING FOR WATERFOWL ON THE RIVER. THIS SHOULD REMAIN UNGUIDED PERSONAL ENJOYMENT
43. WE NOW HAVE WAY TOO MANY GEESE IN OUR AREA CAUSING CROP DAMAGE-
44. WE DO NOT LIVE IN THE AREA OF THE WATERFOWL HUNTING CLOSURE SO WE DO NOT KNOW HOW IT AFFECTS THAT AREA.

45. IF HUNTERS WOULD RESPECT YOUR LAND AND NOT RIDE ALL OVER WITH 4-WHEELERS AND DRIVE WITH VEHICLES, WE WOULD PROBABLY LOOK DIFFERENTLY AT THE HUNTING.
46. DON'T REALLY CARE ONE WAY OR THE OTHER
47. THE GEESE POPULATION IS WAY TOO HIGH
48. PURPOSE HAS BEEN SERVED
49. WE ARE NOT IMPACTED HERE BY THE CLOSURE. WE SURE HAVE AN ABUNDANCE OF GEESE-EVEN INTO PLANTING TIME OF GRAIN & THEY DO LIKE TO EAT IT. WE LIVE CLOSE TO POMPEY'S PILLAR.
50. NOTE: THERE ISN'T A GOOD REASON TO NOT HAVE SAND HILL CRANE HUNTING SOUTH OF I90 & I94
51. MANY MONTANA LANDOWNERS IN THAT AREA LIMIT THE NUMBER OF WATERFOWL HUNTERS ALREADY SO LET THEM EXERCISE THEIR GOOD SENSE AND DON'T RESTRICT THEM FROM HUNTING THEIR OWN LAND.
52. THIS DOESN'T EFFECT ME EITHER WAY SO I DON'T CARE WHAT HAPPENS UP STREAM
53. THE REASON I WOULD OPPOSE THIS WATERFOWL HUNTING CLOSURE IS IT LIMITS HUNTING FOR "ALL" HUNTERS WHO DESIRE HUNTING WATERFOWL