STATE OF MONTANA

Survey & Inventory Protocols for Big Game in Montana

White-tailed Deer

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Abstract

There are 41 white-tailed deer (wtd) survey areas in the state of Montana that are usually surveyed on an annual basis. Objectives for the surveys vary, with 16 of the survey areas having the objective of getting a total count and recruitment information, 21 with the objective of getting only recruitment information, 4 with the objective of getting a total count only and 5 with the objective of getting buck:doe and fawn:doe ratios in the post season and total numbers and recruitment in the spring. Four of the survey areas are surveyed both post-season and in the spring, 31 are surveyed in the spring only and 6 are usually surveyed in the winter. Currently 26 of the 41 survey areas are surveyed from the ground, 13 are surveyed with a fixed-wing aircraft and 2 are surveyed with a helicopter Almost all of the biologists conduct surveys of wtd in the evening on clear, calm days in order to get the best data. S&I data are primarily used for season setting, however biologists described many other uses for S&I data including; 1) informing sportsmen, FWP personnel, landowners and others in the general public about population trends, 2) descriptions of populations in land access and easement proposals, 3) in comments on proposed state and federal land exchange projects, 4) in comments on subdivisions, 5) for newspaper articles, 6) in comments on state land uses such as grazing changes or timber harvests, timber sales on forest service lands and 7) to inform comments on oil and gas leases and oil and gas drilling. Biologists also stressed the importance of having long-term trend data available for informed comment on unforeseen developments into the future.

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INTRODUCTION

Montana Fish, Wildlife and Parks (FWP) has the authority and responsibility to manage wildlife in the state of Montana. There are over 500 species of mammals, birds, reptiles and amphibians and FWP regulates harvest of 55 of those species that are valued for their meat, fur or as "trophies" (Montana Fish, Wildlife and Parks, 2006). In addition, FWP has the responsibility to manage other nongame wildlife for human enjoyment, scientific purposes and to ensure their survival into perpetuity. FWP personnel survey and inventory (S&I) many species of wildlife, and the data collected provide the scientific basis for management of those species and their habitat. Data collected are used to inform decisions by the Legislature, FWP Commission, other organizations with wildlife interests and governmental agencies. S&I allows FWP to monitor trends in wildlife populations in order to inform management decisions that affect 1) population abundance, 2) wildlife conflicts, 3) hunting and harvest opportunity, 4) habitat management and land use decisions and 5) other recreational opportunities for diverse user groups. S&I is an important part of FWP's mission which states that FWP, through its employees and citizen commission, provides for stewardship of the fish, wildlife, parks and recreational resources of Montana while contributing to the quality of life for present and future generations.

FWP has worked towards becoming more consistent with S&I protocols and has produced several documents that address protocols for individual species. The Montana Bighorn Sheep Conservation Strategy (Montana Fish, Wildlife and Parks, 2010); Management Plan and Conservation Strategies for Sage Grouse in Montana (Montana Sage Grouse Work Group, 2005); Montana Final Elk Management Plan (Montana Fish, Wildlife and Parks, 2005) and Adaptive Harvest Management (Montana Fish, Wildlife and Parks, 2001) address S&I protocols for bighorn sheep, sage-grouse, elk and deer, respectively.

In order to further improve our S&I protocols the 2004 Montana Legislature approved a new S&I specialist position for FWP which was not filled until December of 2010. The primary focus of this new position was to be on decision/operations analysis, wildlife monitoring protocols, and evaluation of data at local, regional, and statewide scales. In addition, the position was created to review existing survey protocols and provide recommendations that may modify those protocols to better meet program needs.

As a first step, this position was directed to catalog and summarize the current S&I programs for pronghorn antelope (antelope), elk and deer across the 7 FWP Regions of Montana. This effort was to focus on documenting the differences and similarities of protocols used in those surveys, and articulating how S&I data fit into wildlife management and conservation actions. Besides cataloging S&I protocols, this analysis may be used by FWP to increase efficiency and distribution of S&I dollars.

Since FWP is not centralized in its organizational structure, protocols for surveys have evolved over time and in some cases differ by Region or even within a Region by hunting district (HD). In most cases, exceptions to general S&I protocols were born out of necessity, such as requests for additional information from sportsmen or FWP commissioners; a need for data for a specific research project, research question or environmental impact statement; and/or a change in budgets or manpower availability. Often the changes in protocols involved how male animals were classified or where surveys were conducted. In many cases, once the change in protocol was made, over time, the "new protocol" became the "standard" for that area. On occasion, the reason(s) that changes were made to a "standard" protocol were lost or forgotten, however because long-term datasets collected in a specific format existed, new biologists often carried on the revised tradition of data collection.

FWP's S&I program addresses a broad and complex array of subjects that vary from surveys that collect data on a statewide basis to surveys that are done on a local level by biologists in a specific area for a specific reason. Some very important aspects of the S&I program that will not be discussed in detail in this document are hunter harvest surveys and hunter preference surveys, which are conducted in a centralized fashion from the FWP headquarters office. FWP's vegetation monitoring program for conservation easements and lands owned by the Department will not be discussed. Non-game monitoring by our native species biologists and wolf monitoring protocols will not be discussed. In addition, this document will not discuss in detail S&I efforts for game species other than antelope, deer and elk.

INFORMATION COLLECTION AND ASSEMBLY METHODS

To collect the necessary information on S&I protocols, interviews were conducted with most of the wildlife biologists responsible for game species management across the state. Each biologist was asked a series of questions about their S&I protocols. Biologists were asked to describe which species they surveyed, time-period for the survey, where the survey area was located, type of vehicle utilized, periodicity of the survey, and how the survey was done including time of day and flight patterns. Biologists were asked to classify their surveys to a specific type such as trend area counts, complete coverage surveys, or production counts which will all be discussed in more detail later in this document. Biologists were also asked to describe the classification data they collected, how the data were stored, and for what purposes the data were used. The primary emphasis of this undertaking was to gather information about FWP S&I protocols for deer, elk and antelope, although additional information on surveys of other species, including bighorn sheep, black bears, moose, mountain goats, furbearers, migratory game birds such as waterfowl, sandhill cranes and mourning doves, and upland game birds including sage-grouse, pheasants, and sharp-tailed grouse was gathered and may be summarized at a later date. Biologists were also asked whether or not they conducted hunter check stations, to describe what information was gathered at those check stations and how those data were stored. I also reviewed existing papers, conservation strategies, and management plans addressing S&I protocols in Montana, including but not limited to elk, mule deer, sage grouse and bighorn sheep.

In addition, each biologist was provided with a list of 20 questions that asked their opinions on the effectiveness of current survey protocols, needs they might have to improve S&I protocols and data analysis, opinions on which surveys might be eliminated, which species needed more S&I dollars for monitoring, and training needs for biologists and pilots.

The following report on white-tailed deer (wtd) is one of five separate reports covering survey and inventory protocols for 1) antelope, 2) elk, 3) mule deer 4) wtd and 5) a summary of the answers to the 20 questions biologists were asked.

WHITE-TAILED DEER

White-tailed Deer Survey Methods

Wtd surveys are conducted in all 7 Regions in Montana. The number of surveys conducted varies by Region (R) with R-1 having over 50% of the wtd survey areas in the state. In 2010 a majority of the wtd harvest in Montana occurred in R-1, R-3 and R-4, while R-3 and R-4 had the greatest number of deer hunters (Table 1).

Table 1. Number of HDs, survey areas, deer hunters, and wtd harvested by FWP Region, 2010.

Region	No. HDs	No. Survey Areas	No. of Deer Hunters 2010[1]	No. Harvested, 2010
1	19	21[2]	24,185	9,236
2	28	5	20,420	6,073
3	45	2	30,676	9,447
4	36	1	29,618	9,060
5	12	4[2]	18,599	5,845
6	16	5	18,193	5,107
7	6	3	22,638	5,951
Total	162	41	152,139	50,753

[1]Includes both mule and wtd hunters.
[2]Hd 109, 130 and 590 have survey areas made up of 3, 6, and 6 subunits, respectively.

Our current mule deer S&I protocols originate from and are well described in the Adaptive Harvest Management document (Montana Fish, Wildlife and Parks, 2001). In a precursor to the Adaptive Harvest

Management document, wtd survey protocols, population objectives and hunting strategies were discussed and described (Montana Fish, Wildlife and Parks, 1998). The document, which was adopted by the Fish, Wildlife and Parks Commission on October 2, 1998, stated that monitoring guidelines for wtd had not yet been developed, however as information was collected, survey protocols similar to those developed for mule deer would be developed for wtd.

Unlike most surveys for mule deer, antelope and elk; wtd survey areas often span multiple HDs. This happens because wtd deer concentrations are often near creeks or rivers that may serve as HD boundaries and many surveys are conducted from roads that also may serve as HD boundaries. For wtd there are a total 41 survey areas in the state (Figure 1). HDs 109, 140 and 590 each have a survey area with multiple subunits and each group of subunits is considered one survey area in their respective HDs.

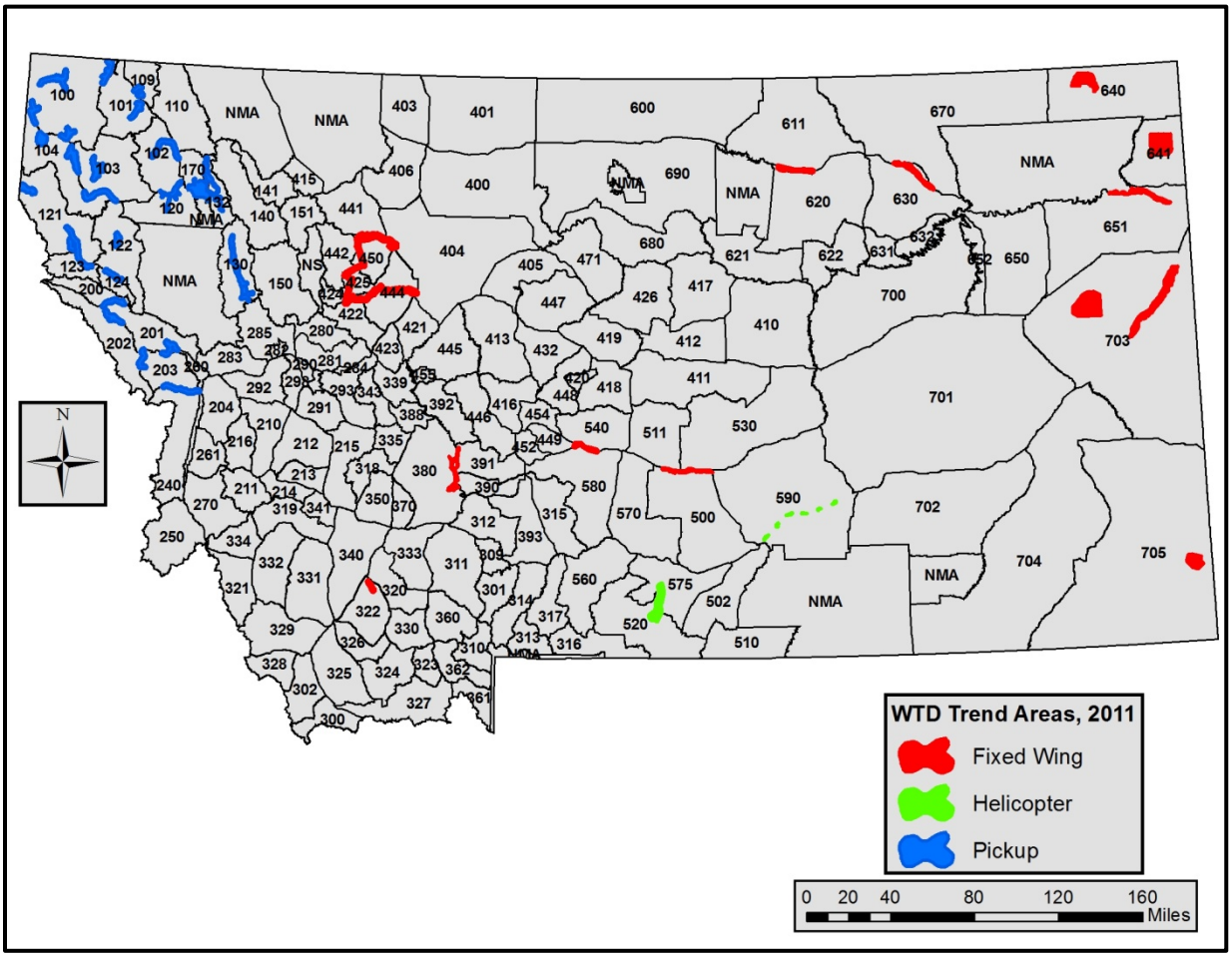

Figure 1. Location of wtd surveys, 2010-2011.

For WTD there are 3 different survey types; recruitment, post season and total (trend) counts. The primary objective in a recruitment survey is to get a measure of the number of fawns per 100 adults surviving the winter. Post season surveys are done immediately following the hunting season and are designed to determine the number of bucks and fawns per 100 does. A third survey type is the total count (trend area) survey. In the trend area count biologists attempt to enumerate all the deer observed in a specific area. The assumption is made that the area surveyed is representative of the entire HD or multiple HDs, and that changes observed in the population within the trend area reflects what is happening to wtd populations outside of this area. Total count surveys are flown in the spring or winter. Eleven of the survey areas have the objective of getting a total count and recruitment information, 21

have the objective of getting only recruitment information, 4 have the objective of getting a total count only and 5 have the objective of getting buck:doe and fawn:doe ratios in the post season and total numbers and recruitment in the spring (Figure 2). Five of the survey areas are surveyed both post-season and in the spring, 31 are surveyed in the spring and 5 are usually surveyed in the winter (Figure 3).

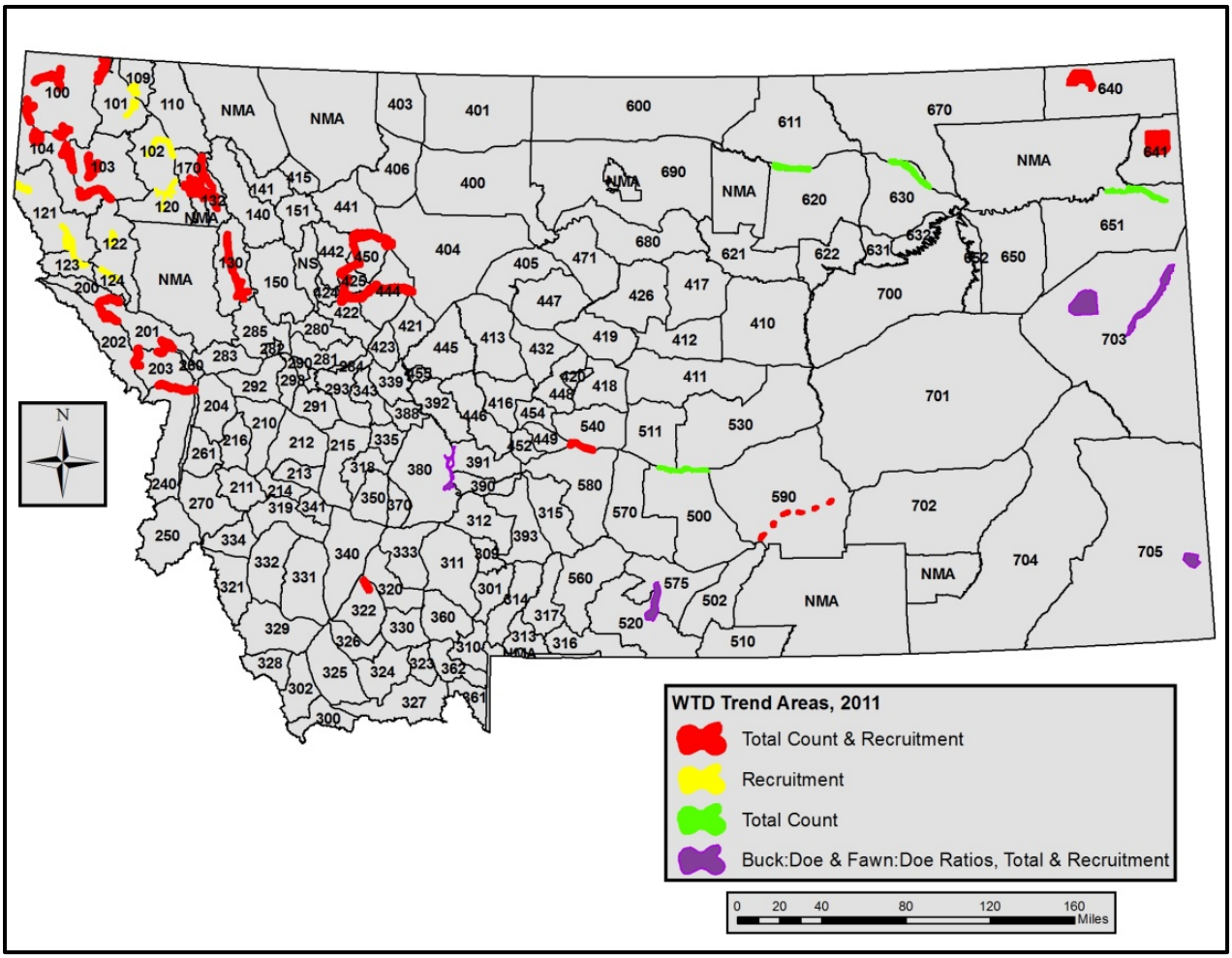

Figure 2. Wtd survey objectives, 2010-11.

Currently 26 of the 41 survey areas are surveyed from the ground, 13 are surveyed with a fixed-wing aircraft and 2 are surveyed with a helicopter (Figure 4). Airplanes used for surveys generally have 2 seats, where the observer sits behind the pilot, and the wings are above the cockpit to facilitate wildlife observations.

All of the surveys are scheduled to be flown annually, although this does not always happen since in most Regions elk and mule deer surveys are a higher priority than wtd deer surveys. Often, if managers have shortfalls in the survey budget, they will eliminate wtd surveys rather than elk or mule deer surveys.

Almost all of the biologists conduct surveys of wtd in the evening on clear, calm days in order to get the best data.

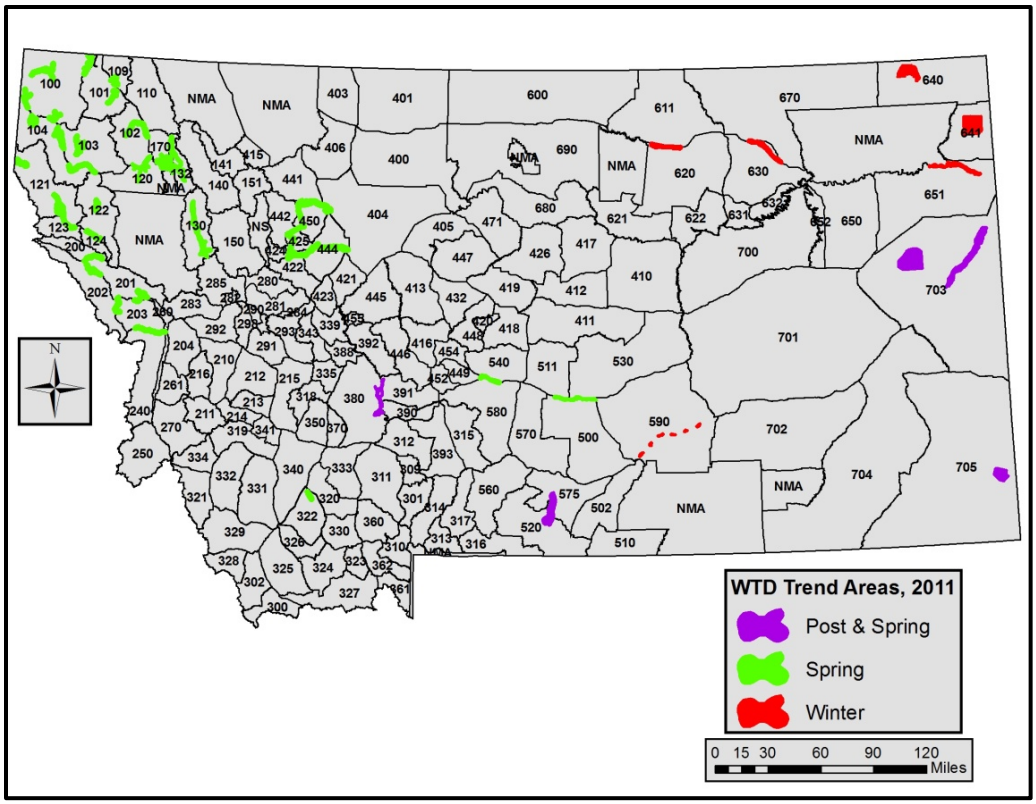

Figure 3. Timing of wtd surveys, 2011 deer HD boundaries.

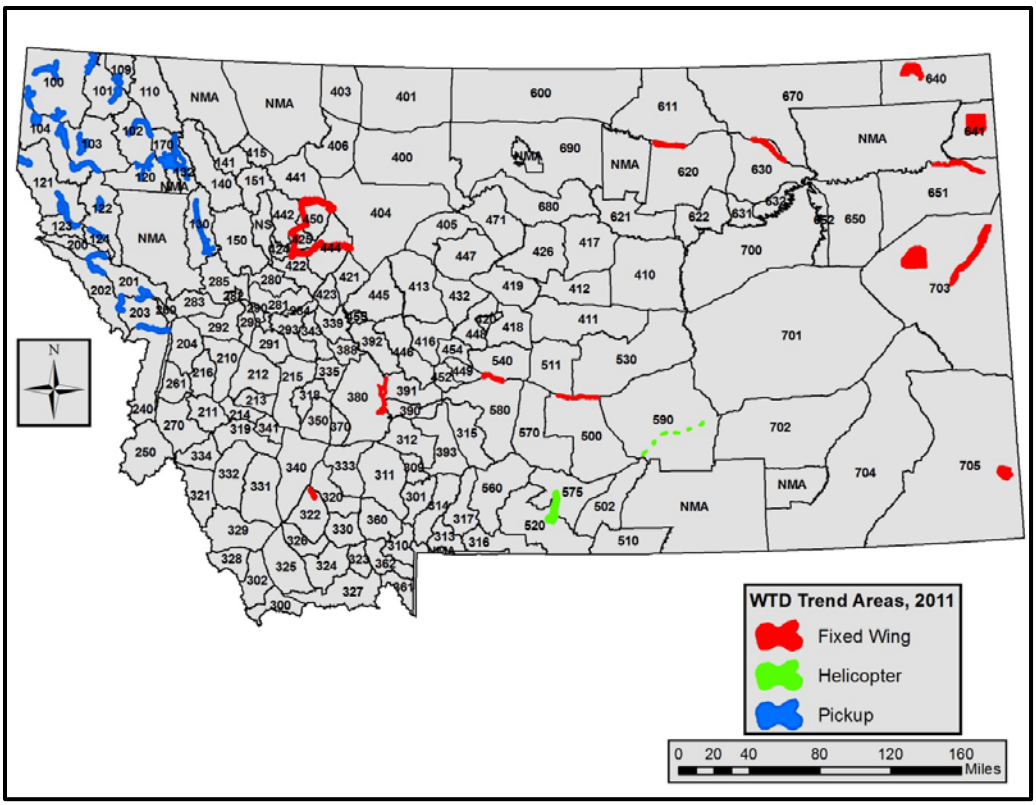

Figure 4. Vehicles used to complete wtd surveys.

Deer Check Station Data

Check stations are run in all 7 Regions during the big game hunting seasons. Big game check stations are designed to collect information on all big game animals harvested, however the location of a check station determines whether more information will be gathered on elk, antelope or deer. In addition, the locations of some check stations, such as the Gallatin, were selected because nearly all hunters hunting a specific HD or group of HDs had to pass by the check station in route to their homes. Data collected at check stations vary somewhat by Region and within Regions, depending upon specific needs. Check station data can be broken into four broad categories; data collected describing the check station, the animal, the location of the kill, and the hunter and/or the hunting party. Data collected describing the check station include information such as check station name, weather conditions and dates the check station was open. Data collected on the animal is the most consistent across the Regions with all Regions collecting information on species, sex, age and number of antler points (Table 2). Age is determined by tooth eruption and wear for wtd (Serveringhaus 1949), mule deer (Robinette et al. 1957), and elk (Quimby and Gaab 1957), or by collecting an incisor which is sent to Matson's Laboratory, Milltown, Montana where age is determined by cementum analysis (Hamlin et. al. 2000). The number of points on an antler is recorded differently, with R-5 and R-7 differentiating brow tines from the other points on wtd and mule deer. Several check stations in R-3 and one in R-4 also differentiate the brow-tine from regular points on one or both species. In R-6 brow-tines are differentiated for mule deer only. Five of 7 Regions measure the main beam on one or both antlers, and 4 of 7 measure an inside spread. R-5 measures only the main beam on yearling animals of elk, mule and wtd, but measures inside spread on all age classes of those same species. One Region measures antler circumference of all antlered animals, and measures diastema and weight of animals that are young of the year or yearlings. In the past, more check stations collected weights and diastema lengths, but over time most dropped the measurements in part because of the amount of time it took to move hunters through the check stations.

Location of kill data are collected at all check stations. All but one Region collect the HD of kill, with R-7 recording the Region of kill for R-7 animals only. All Regions, except for R-6, narrow down the area of kill to a drainage, landowner or in some cases Township, Range and Section (TRS). R-1 and R-2 do not collect data on land status, but the other Regions do record land ownership status. R-5 and one check station in each of R-3 and R-4 breaks land ownership status into eight categories; private (non-block management), private land enrolled in the Block Management Area (BMAs) program, Bureau of Land Management (BLM), United States Forest Service (USFS), US Fish and Wildlife Service (USFWS), state Wildlife Management Areas (WMAs), other state land, and unknown ownership. R-7 keeps track of 7 categories of land ownership status, including all of the categories listed above except they specify Custer National Forest instead of (USFS), and they don't have a WMA category, but sometimes they designate land as only public or private. R-6 keeps track of only the kills on BMAs, and the remaining Regions and check stations differentiate land status only as public or private.

The greatest variations in data collected are associated with describing the hunter and hunting party. All Regions collect information on the number of hunters in a party while 6 of 7 Regions collect information on the origin of the hunter or hunting party. Five of 7 Regions keep track of the number in the party that are successful and information about the license or permit type (LPT) that was placed on the animal following the kill. Three of 7 Regions assign each hunting party a group number, record a date of kill, and whether the hunting party had an off-road vehicle (ORV). Two of seven Regions keep track of the number of days hunted. R-2 and R-3 record whether or not the party had a horse trailer. The other parameters found in Table 2 are collected either by only one Region or in some cases one check station.

In addition to the previously described data collected, check stations have been used as a place to collect samples to be tested for Chronic Wasting Disease, to gather other biological samples, to interview hunters about specific issues, and by game wardens to check for regulation compliance. Most Regions have an electronic database or databases that hold the check station data. Most Regions keep track of unsuccessful hunters at the check stations; however data associated with unsuccessful hunters are not always entered into the electronic check station databases.

Table 2. Check station data collected, relative to white-tailed and mule deer[1].

Parameter	R-1	R-2	R-3	R- 4	R- 5	R-6	R-7
Check Station Description							
Check Station Name	X	X	X	X	X	X	X
Date of Check Station	X	X	X	X	X	X	X
Animal Description							
Species	X	X	X	X	X	X	X
Sex	X	X	X	X	X	X	X
Age	X	X	X	X	X	X	X
Number of Antler Points	X	X	X	X	X	X	X
Differentiate Brow-tines			X[2]	X[2]	X	X[3]	X
Length of Main Beam 1 or 2 Sides			X	X[2]	X[2]	X	X
Inside Spread			X[2]	X[2]	X	X	
Horn Circumference				X[2]			
Diastema				X[2]			
Weight	X[4]			X[2]			
Location of Kill							
Hunting District	X	X	X	X	X	X	
Landowner/Location/Drainage/ TRS	X	X	X	X	X		X
Land Status[5]			X[2]	X[2]	X	X	X
Hunter & Hunting Party							
Number in Party	X	X	X	X	X	X	X
Vehicle License/Origin of Hunter		X	X	X[2]	X	X	X
Number in Party Successful		X	X	X		X	X
LPT			X	X[2]	X	X[6]	X
Hunter Name	X	X	X	X			
ALS Number	X	X	X	X			
Group Number		X				X	X
ORV		X	X	X			
Date of Kill	X	X	X	X			
Days Hunted			X	X[2]			
Horse Trailer		X	X				
Resident/Nonresident/Youth		X					
Fee Charged							X
Packer				X[2]			
Comments	X	X	X	X	X	X	X

[1] Some questions on the check station forms were relevant to only antelope and are discussed in the chapter on antelope.
[2] Varies by check station within the Region.
[3] Differentiates brow-tines on mule deer only.
[4] Up until recently some biologists in R-1 took weights of fawns and yearlings at check stations.
[5] Varies by Region, see text.
[6] R-6 keeps track of whether the license was valid for either-sex or for antlerless. The other Regions collect an actual LPT number off the license used to harvest an animal.

Deer Classification

During deer surveys biologists categorize deer into sex and age classes. Classification categories that are common across Regional and HD boundaries are for does, fawns, adults, unclassified antlerless deer (does and fawns), and unclassified deer-all (bucks, does and fawns). When it comes to buck classification there is a wide variety of classes used. Yearling bucks are usually synonymous with spikes and small two points with a small body size; however there are biologists that classify yearling bucks into two categories, spikes and ≥2x2 yearlings. Adult bucks are bucks older than 2.5 and are bucks that usually have more than two points on each antler and a larger body size than yearling bucks. Some

biologists classify adult bucks into antler classes such as 2x2, 3x3 and ≥4x4.

White-tailed Deer Harvest

Because managers don't have many wtd aerial or ground survey areas that measure changes in trends, they tend to rely on harvest information to monitor changes in population trends more than with many other species of big game. In most cases biologists agree that in those areas where a hunter can harvest either sex or any buck with the general license that buck harvest is probably an adequate substitute for monitoring changes in actual populations of wtd. In other words as buck harvest changes over time that change is related to availability of, and populations of those animals.

Region-Specific Survey Methods Summaries

Region 1

R-1 has 19 deer HDs. In part, because of the limited visibility from the air, all wtd deer surveys are conducted from the ground. There are a total of 21 survey areas, however the HD 130 survey area is made up of 6 subunits, and the Deep and Grave Survey area in HD 109 is made up of three subunits. (Figure 5, Table 3). Biologists in the Region obtain useful information on fawn:adult ratios and in some cases trends in total numbers on the survey areas. Survey routes generally follow major county roads or state highways, and for display purposes a 1-mile buffer was established along the routes (Figure 5). All R-1 surveys are scheduled to be completed on an annual basis in the spring.

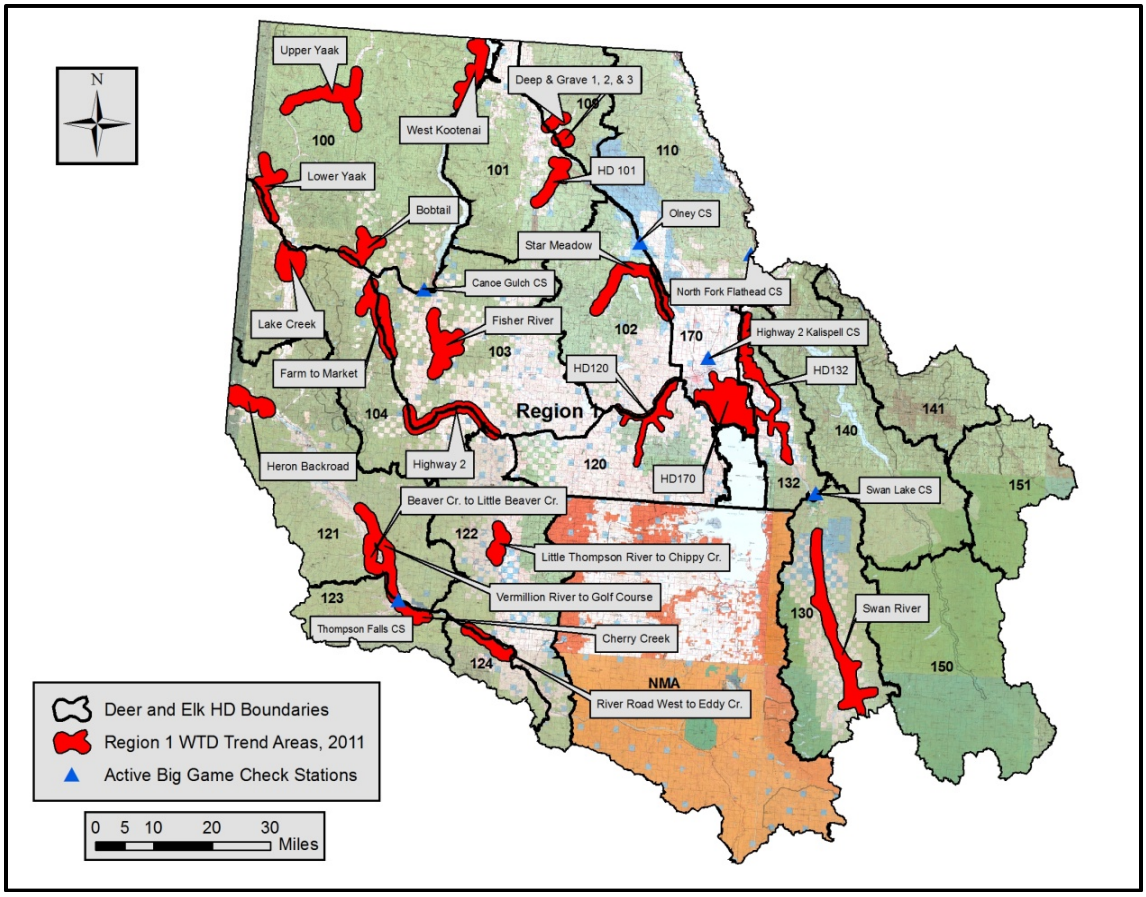

Figure 5. Location of wtd survey areas and check stations R-1, 2011 hunting season.

Biologists in R-1 classify wtd either as adults or fawns in the spring of the year. In most survey areas location data are not collected for individual deer groups however one biologist in the Region has started a project where he takes exact locations of wtd groups on his survey routes and then measures distances to buildings in order to estimate impacts of urban development.

Because it is so difficult to survey animals in R-1 biologists rely heavily on harvest information to monitor big game populations. R-1 has 6 check stations scattered across the Region which are all open both weekend days throughout the deer and elk hunting season, resulting in 72 check-station days.

Table 3. Region 1 wtd deer survey areas and season types in 2011.

Survey Area Name	Season Flown	Survey Objective	General License, Rifle-2011
Beaver Cr. to Little Beaver Creek	Spring	Recruitment	Buck Only
Bobtail	Spring	Total Count & Recruitment	Buck Only
Cherry Creek	Spring	Recruitment	Buck Only
Deep & Grave Creeks[1]	Spring	Recruitment	Buck Only
Farm to Market	Spring	Total Count & Recruitment	Buck Only
Fisher River	Spring	Total Count & Recruitment	Buck Only
Heron Back Roads	Spring	Recruitment	Buck Only
HD 101	Spring	Recruitment	Buck Only
HD 120	Spring	Recruitment	Buck Only
HD 132	Spring	Total Count & Recruitment	Buck Only
HD 170	Spring	Total Count & Recruitment	Either Sex
Highway 2	Spring	Total Count & Recruitment	Buck Only
Lake Creek	Spring	Total Count & Recruitment	Buck Only
Little Thompson River to Chippy Creek	Spring	Recruitment	Buck Only
Lower Yaak	Spring	Total Count & Recruitment	Buck Only
River Road West to Eddy Creek	Spring	Recruitment	Buck Only
Star Meadow	Spring	Recruitment	Buck Only
Swan[2]	Spring	Total Count & Recruitment	Buck Only
Vermillion River to Golf Course	Spring	Recruitment	Buck Only
Upper Yaak	Spring	Total Count & Recruitment	Buck Only
West Kootenai	Spring	Total Count & Recruitment	Buck Only

[1] Three subunits. [2] Six subunits.

Region 2

R-2 has 28 deer HDs. There are 4 biologists with responsibilities for surveying wtd in R-2. A total of 5 survey areas are surveyed from the ground annually (Figure 6, Table 4). Survey routes generally follow major county roads or state highways, and for display purposes a 1-mile buffer was established along the routes (Figure 6). There are additional areas where biologists classify wtd, however the surveys are not conducted on a regular basis or in a specific area annually. Biologists that conduct spring surveys in R-2 classify wtd to adults and fawns.

There are 3 check stations open in R-2 during the deer and elk hunting season (Figure 6). The Darby check station is open every day of the deer and elk season (37 days) while the Anaconda and Bonner check stations are each open for 12 days resulting in a total of 61 check station-days for the Region.

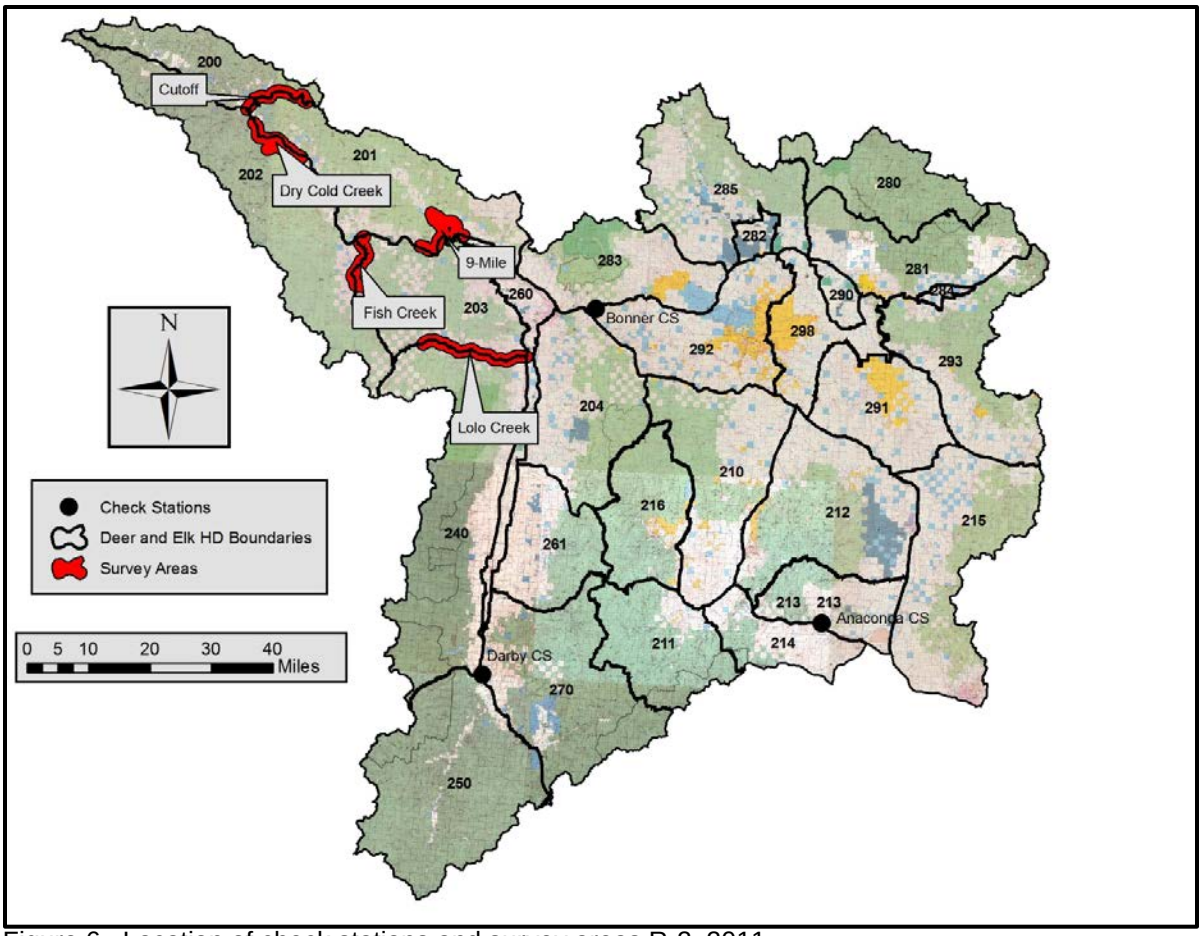

Figure 6. Location of check stations and survey areas R-2, 2011.

Table 4. Region 2 wtd deer survey areas and season types in 2011.

Survey Area Name	Season Flown	Survey Objective	General License, Rifle-2011
Cutoff	Spring	Total Count & Recruitment	Buck Only
9-Mile	Spring	Total Count & Recruitment	Buck Only
Fish Creek	Spring	Total Count & Recruitment	Buck Only
Dry Cold Cr.	Spring	Total Count & Recruitment	Buck Only
Lolo Creek	Spring	Total Count & Recruitment	Either sex

Region 3

R-3 has 45 deer HDs. There are 7 biologists in R-3 and there are two wtd trend areas scheduled to be flown annually (Figure 7, Table 5). Both survey areas are flown with a fixed-wing aircraft. The Twin Bridges survey area is flown in the spring only, while the upper Missouri survey area is flown both in the post-season and spring.

There are 5 check stations open in R-3 during the deer and elk hunting season (Figure 7). All 5 check stations are open each weekend day of the season (12 days) for a total of 60 check station-days.

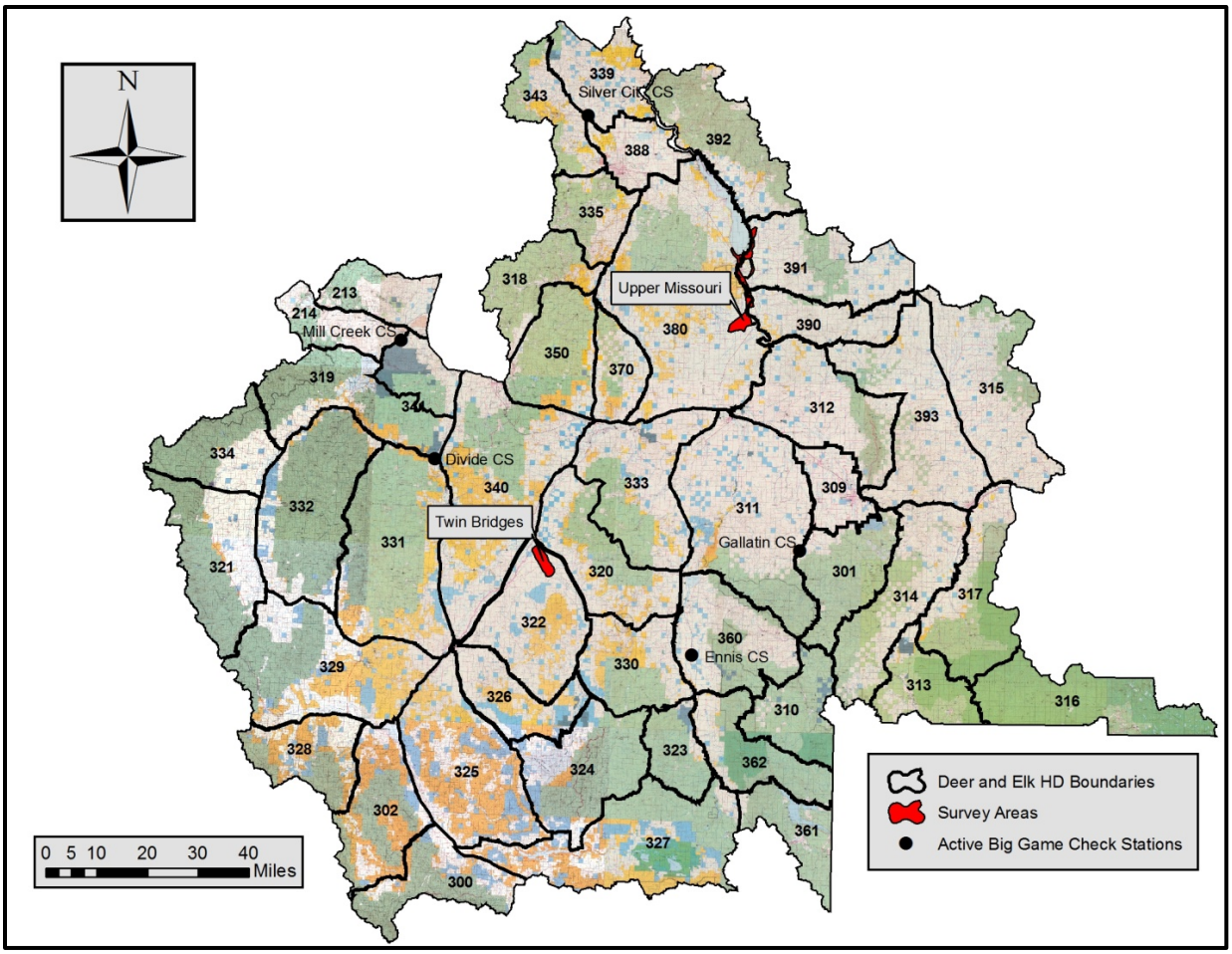

Figure 7. Location of check stations and trend areas in R-3, 2011 hunting season.

Table 5. Region 3 wtd deer surveys and season types in 2011.

Survey Area Name	Season Flown	Survey Objective	General License, Rifle-2011
Twin Bridges	Spring	Total Count & Recruitment	Either Sex
Upper Missouri	Post-Season	Buck:doe & Fawn:doe ratios	Either Sex
	Spring	Total Count & Recruitment	

Region 4

R-4 has 36 deer HDs. There are 5 biologists in R-4, and one wtd survey area is flown on an annual basis in hunting districts with an either sex general season. The survey area is called the Sun River/Teton River survey area and is flown in the spring of the year with a fixed-wing aircraft (Figure 8).

There is 1 permanent big game check station in Region 4 open during the big game hunting season (Figure 8). The check station is located in Augusta and is open every day (37 days) of the general deer and elk season. There is also a check station open in the White Sulphur Springs area; although it is not permanent and is usually open on opening weekend and occasionally one or two days during the rest of the season.

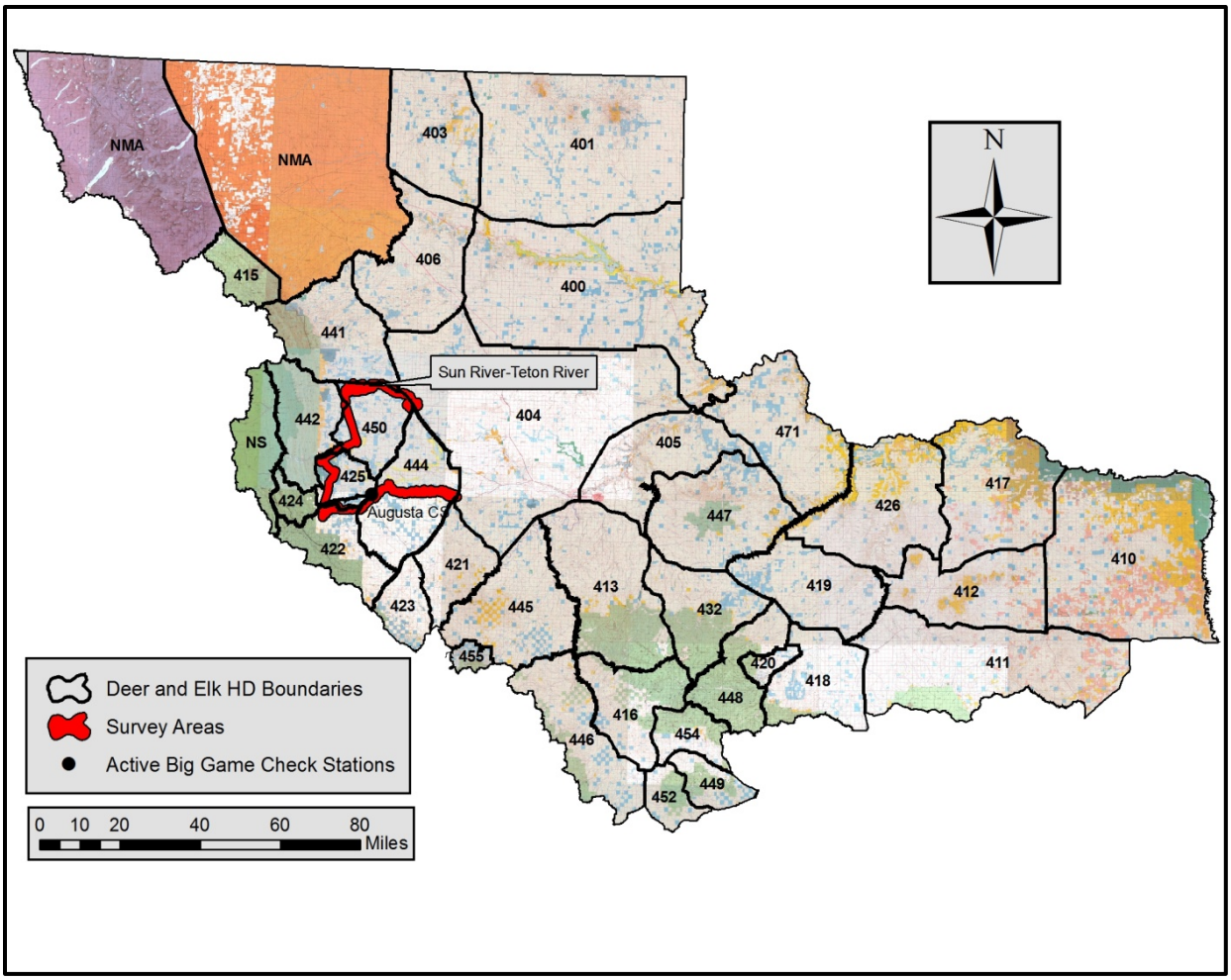

Figure 8. Location of permanent check station and wtd survey area in R-4, 2011 hunting season.

Region 5

R-5 has 12 deer HDs. There are 3 biologists in R-5 and there are a total of 4 survey areas for wtd (Figure 9, Table 6). All 4 trend areas are primarily set up to monitor total numbers of deer. Three of the four survey areas are flown with a fixed-wing aircraft and 1 is flown with a helicopter.

There are 4 permanent big game check stations open in R-5 during the deer and elk hunting season (Figure 9). The Big Timber, Columbus, Laurel and Lavina check stations are open 8, 12, 6 and 8 days, respectively for a total of 34 check station-days during the deer and elk hunting season

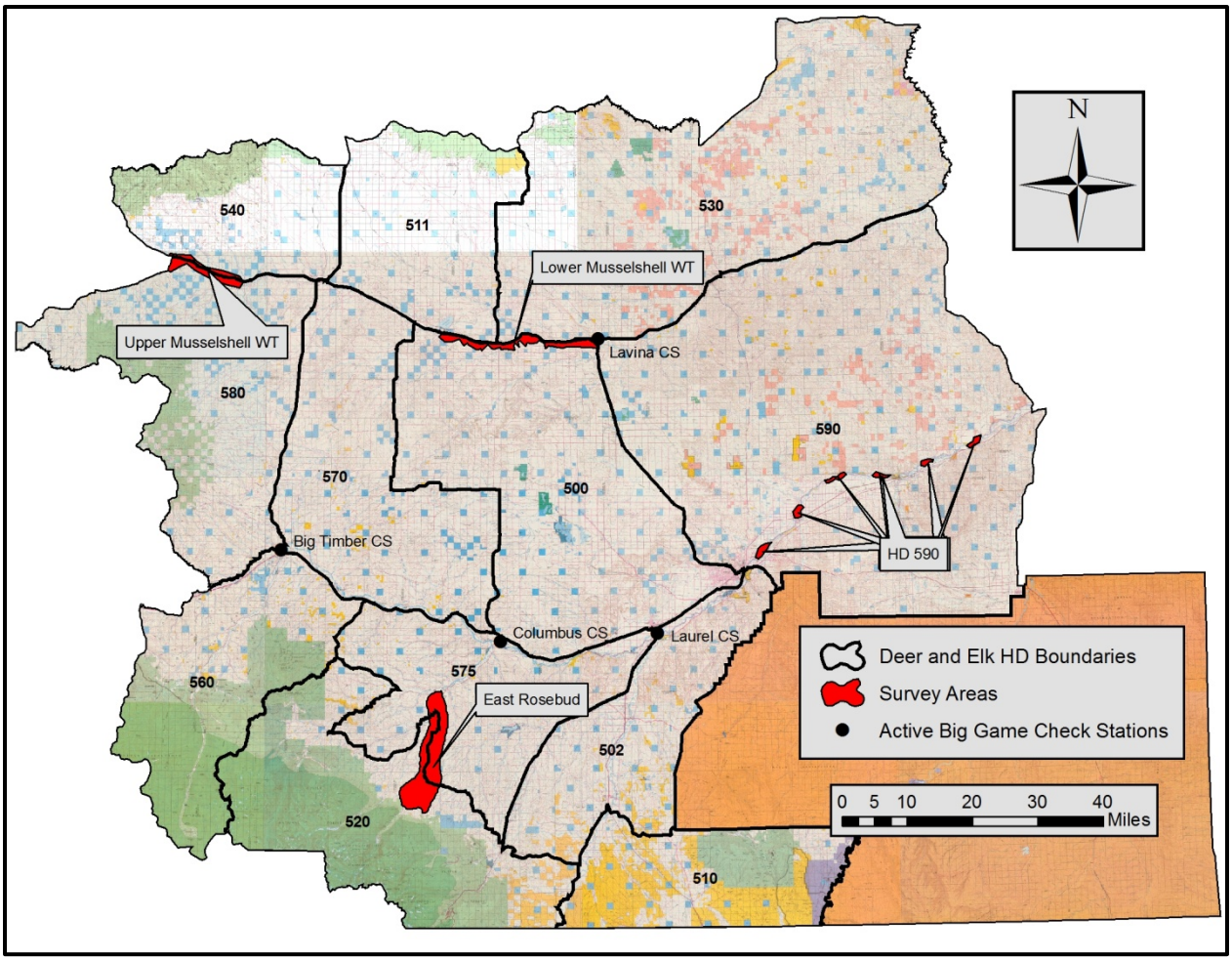

Figure 9. Location of check stations and wtd survey areas R-5, 2011 hunting season.

Table 6. Region 5 wtd deer surveys and season types in 2011.

Survey Area Name	Season Flown	Survey Objective	General License, Rifle-2011
Lower Musselshell	Spring	Total Count	Either sex
Upper Musselshell	Spring	Total Count & Recruitment	Either sex
Yellowstone[1]	Winter	Total Count & Recruitment	Either sex
	Post Season	Buck:doe and Fawn:doe Ratios	
East Rosebud			Either sex
	Spring	Total Count & Recruitment	

[1]Consists of 6 subunits, occasionally collect buck:doe ratios when flown in early winter.

Region 6

R-6 has 16 HDs. There are 4 biologists in R-6 and they monitor wtd on 4 survey areas (Figure 10, Table 7). The survey areas are flown in the winter and are primarily set up to monitor trends in total numbers of deer.

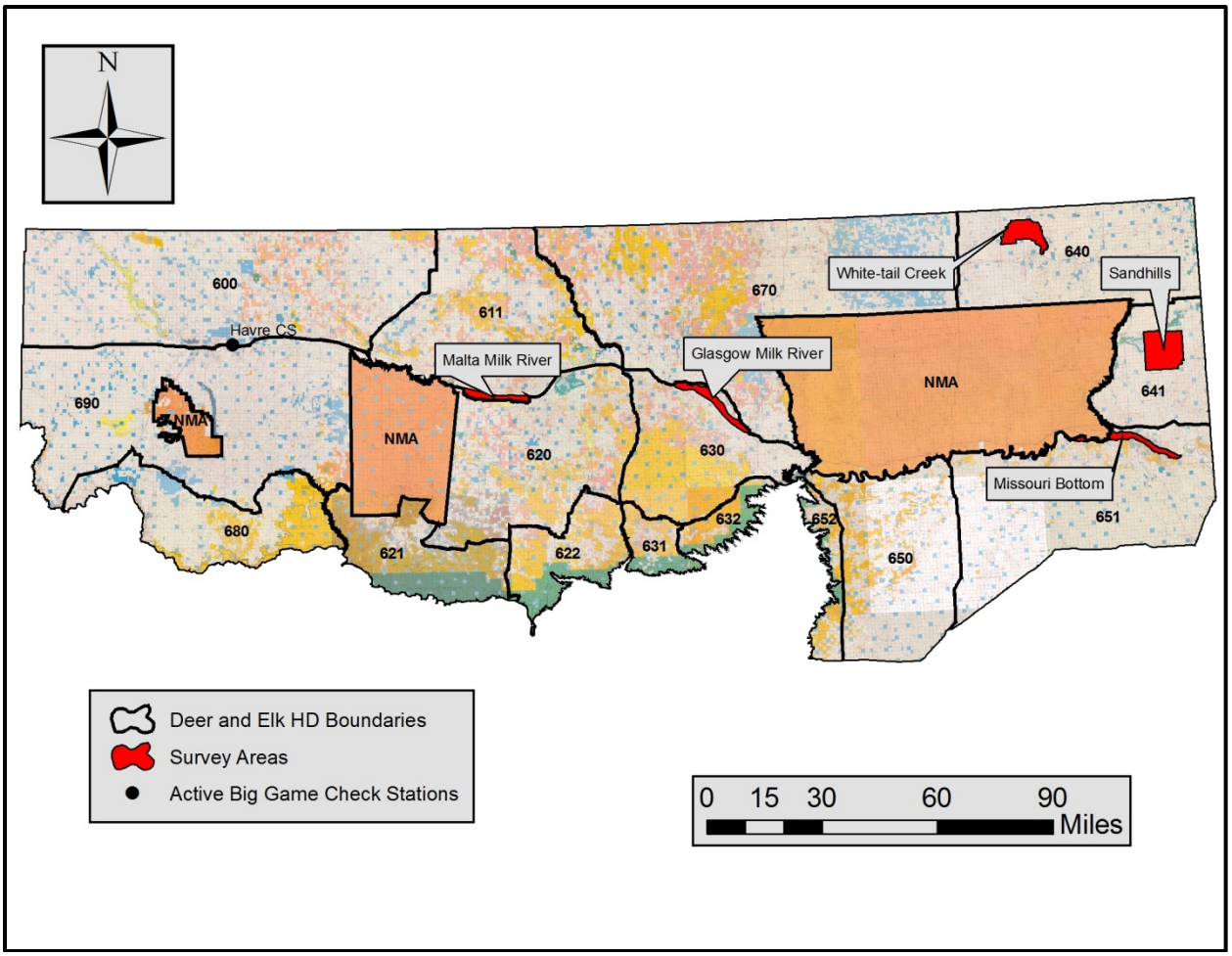

Figure 10. Location of check station and wtd survey areas R-6, 2011 hunting season.

There is one permanent big game check station open during the deer and elk hunting season (Figure 10). The check station, located near Havre, is open every weekend day of the deer and elk season for a total of 12 check station-days.

Table 7. Region 6 wtd deer surveys and season types in 2011.

Survey Area Name	Season Flown	Survey Objective	General License, Rifle-2011
Malta, Milk River	Winter	Total Count	Either sex
Glasgow, Milk River (Hinsdale)	Winter	Total Count	Either sex
Sandhills	Winter	Total Count & Recruitment	Either sex
Missouri Bottoms	Winter	Total Count	Either sex
White-tail Creek	Winter	Total Count & Recruitment	Either sex

Region 7

R-7 has 6 HDs. There are 4 biologists in R-7 and they monitor wtd on 3 survey areas (Figure 11, Table 8). Deer on these survey areas are counted in the post-season and in the spring to measure recruitment.

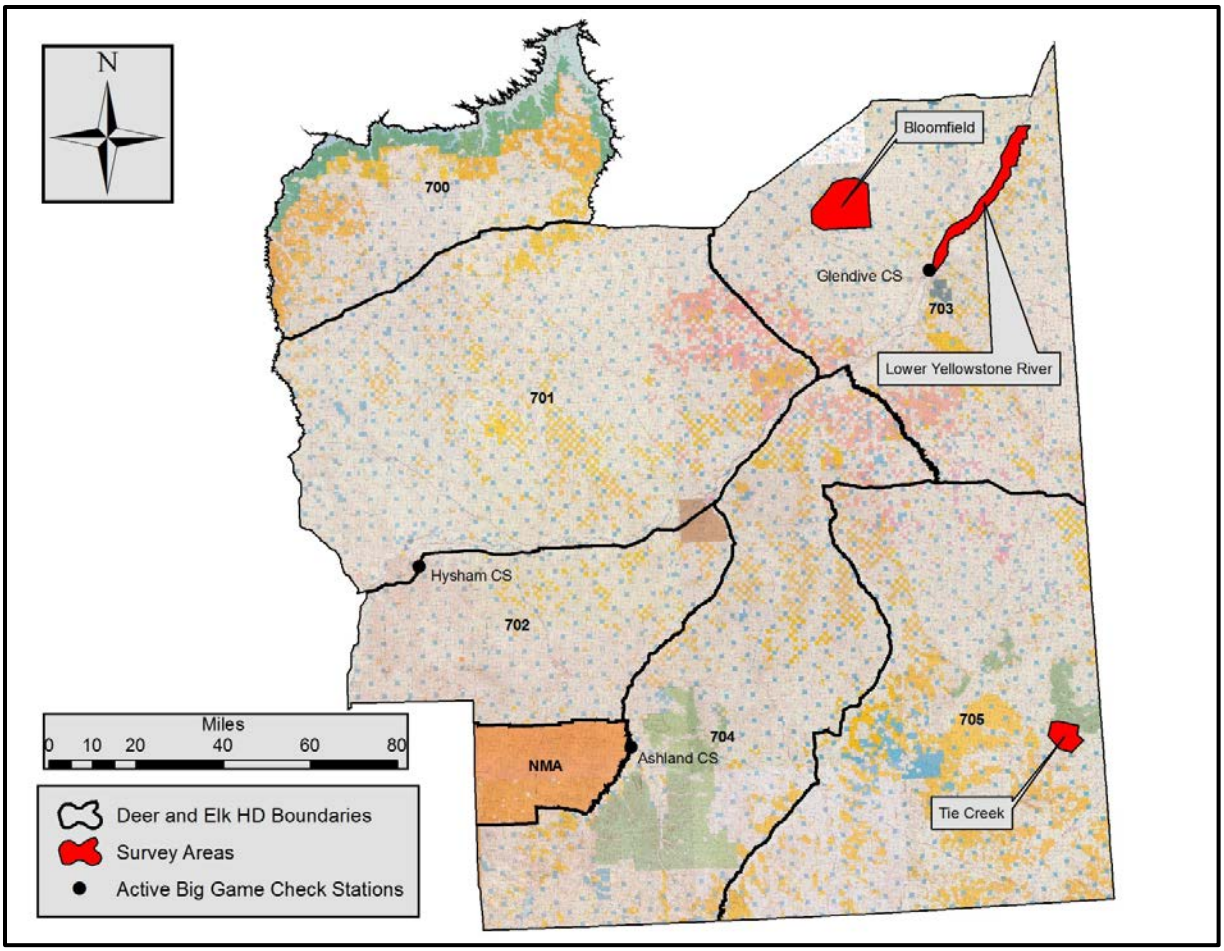

Figure 11. Location of check stations and survey areas R-7, 2011 hunting season.

Table 8. Region 7 wtd deer surveys and season types in 2011.

Survey Area Name	Season Flown	Survey Objective	General License, Rifle-2011
Lower Yellowstone	Post Season	Buck:doe and Fawn:doe Ratios	Either sex
	Spring	Total Count & Recruitment	
Bloomfield	Post Season	Buck:doe and Fawn:doe Ratios	Either sex
	Spring	Total Count & Recruitment	
Tie Creek	Post Season	Buck:doe and Fawn:doe Ratios	Either sex
	Spring	Total Count & Recruitment	

There are 3 permanent big game check stations open in R-7 located near Hysham, Glendive and Ashland during the deer and elk hunting season (Figure 11). These check stations are open a total of 18 days during the deer and elk season, 2 days at Ashland, 4 days at Glendive and 12 days at Hysham .

Uses of Deer S&I Data

The primary use for deer survey and check station data is to provide information for managers to make annual and biennial recommendations for season setting. Season setting for deer is done on a biennial

basis. Every other year, adjustments can be made to the structure of the season, such as whether or not general license holders can harvest any buck, either-sex, or antlerless deer and to the deer/elk HD boundaries. Every year adjustments, other than for emergencies, can be made to the permit and b-license numbers. As with season setting for other big game animals, biologists use a combination of survey data, check station data, harvest survey estimates and discussions with landowners, sportsmen and game wardens to support their season recommendations for Commission decisions. In some cases, not all of these sets of data are available for the decision making process. In the best-case season setting situation, biologists would have an estimate of how many animals were going to be available to harvest at the time the rifle season (when a majority of the animals will be harvested); 6-7 months after most surveys are completed. Biologists would also know how many licenses issued would result in 1 wtd being harvested, the success rates of hunters, and the number of landowners that were going to allow access to the animals and/or the numbers of deer on public lands. In addition, they would be able to accurately predict survival rates through the rest of the winter, spring and summer, emigration and immigration rates, and the number of fawns produced in the spring after surveys are completed. Biologists rarely encounter the best-case scenario for season setting, especially with wtd in which case survey data are very limited. Season setting is difficult, and biologists and game managers are charged with using their observations to predict the future for large complex systems that are under a continual state of change.

Biologists have pointed out the difficulty in estimating actual populations of big game animals (MDFWP, 2005), and for wtd they have settled on surveying trend areas to index the relative change in population numbers over long time periods or they have relied on fawn:adult ratios along with harvest estimates to predict changes. In addition, more so with wtd than many other species, biologists rely on personal anecdotal observations, harvest of bucks and rarely harvest of does or total harvest as a substitute for population trend counts, and observations of hunters and landowners. Biologists know that complete coverage surveys usually undercount the actual numbers of animals and wtd surveys have to be done under nearly ideal circumstances to get data that are comparable. Even though care is taken to reduce sampling variability, sometimes survey conditions necessitate cautious treatment of particular counts especially when surveys involve wtd. When considering season changes biologists look for trends in various population parameters that point in the same direction and they rely heavily on anecdotal information.

Wtd season setting justifications contain a variety of information, somewhat dependent upon what data are collected in the given year and the proposed change however wtd season justifications often contain less “hard” data than justifications for mule deer, elk, and antelope. Coupled with the lack of “hard” data, the fact that most wtd populations have no specific population objectives makes it difficult for biologists to make regulation changes strictly based on objective rather than subjective observations.

Consider season proposals that affected 2 individual HDs (121 and 124); and three license permit types (LPT 597-00, 598-00 and 699-00) where changes to wtd hunting seasons for the 2012 hunting season were proposed (Table 9). In all cases the manager that submitted the recommended change looked at more than 1 parameter when justifying the change in the season. However, depending upon the proposal, biologists chose to present data most applicable to the particular change. Not all HDs have trend or census areas and in those HDs where no trend areas existed the manager relied on survey data from other HDs to justify the change. In 3 of the 5 proposals managers looked at populations on the trend areas relative to the long-term average (LTA). In the proposed changes for areas where multiple trend areas existed, either all the trend areas trended in the same direction (LPT 597-00) or most of the trend areas trended in the same direction (LPT 598-00 and 699-00). For all 5 changes there was a brief discussion, in general terms, of the affect of winter on populations and how that influenced the decision making process. Each of the 5 justifications used success rate on the LPT as a parameter measured in order to justify the change. In the eastern part of Montana, Epizootic Hemorrhagic Disease (EHD) plays an important role in affecting populations and it was discussed in the justifications for LPTs 597-00, 598-00 and 699-00.

Table 9. Typical data analyzed to inform wtd hunting season change justifications for the 2012 season.

	LPT/HD				
Parameter Measured	LPT 121-00/ HD121	LPT 124-00/ HD124	LPT 597-00/HDs 500, 530, 590	LPT 598-00/HDs 511, 540, 570, 580	LPT 699-00/All R-6 HDs
Population Obj.[1]	NA	NA	LTA	LTA	LTA of 12 deer/sq.mi.
Pop Obs.[1]	NA	NA	36% to 61% below LTA	32% below to 31% above LTA, 3 of 4 trend areas below LTA	9% Below LTA
Buck Harvest Obj.[1]	NA	NA	NA	NA	NA
Buck Harvest Obs.[1]	NU	NU	Well below Avg.	Well below Avg.	NU
Spring Fawns:100 Adults Obj. [1]	LTA 32:100	LTA 34:100	NA	NA	NA
Spring Fawns:100 Adults Obs.[1]	36:100	40:100	NU	NU	NC
Buck:doe ratio Obj. [1]	NA	NA	NA	NA	NA
Buck:doe ratio Obs.[1]	NC	NC	NC	NU	NC
Winter Severity	Mild, thus increasing recruitment	Mild, thus increasing recruitment	Severe spring storms reduced recruitment in 2008, 2009	Severe spring storms reduced recruitment in 2008, 2009 & 2010	Mild, thus increasing recruitment
Hunter/Landowner Observations	Increasing	Increasing	Decreasing	Decreasing	Decreasing
Disease Outbreak	None	None	EHD	EHD	EHD
Success Rate Obj.[1]	60-75%	60-75%	5 yr-Avg.=24.7%	5 yr-Avg.=29.3%	25%-50%
Success Rate Obs.[1]	NU	NU	15.8%	26.4%	NU
Check Station Data	NU	NU	Record low # of WTD bucks checked	Record low # of WTD bucks checked	NU
Season Change Proposed	Increase B-tags from 200 to 300	Increase B-tags from 200 to 300	Reduce B-tags from 600 to 150	Reduce B-tags from 2250 to 1750	Decrease B-tags from 4000 to 1000

[1]Obs=Observed, Obj.=Objective, LTA=Long-term average
[2]NU=Not used in justification but available, NC=Not collected. NA=Not Available.

When reading through season justifications it appears that biologists tend to rely more heavily on trend counts or complete coverage surveys for antelope, elk and mule deer season justifications than they do for wtd justifications. Wtd trend count data are less likely to be available, and harvest information is used more often to justify season changes.

Check stations are also a part of the S&I program, and data are collected at check stations on an annual basis. Check station data, when sample sizes are large enough, are used to verify the accuracy of the hunter harvest survey data and to provide real-time information about harvest during the hunting season (harvest estimates are not released until several months after the rifle season closes). In addition, check stations give biologists an opportunity to interview many hunters in the field and to get their observations of population trends of wtd. In the 5 season justifications reviewed here, two used check station information to justify changes (Table 9).

Most biologists discussed how important hunter contacts were and how check stations gave them an opportunity to talk to a large number of hunters that hunt in a wide variety of habitats. Check station data also provide an alternative index to recruitment (if samples are large enough), as the data provide an index to the proportion of female yearlings in the female harvest, a general age structure of the population, and an index to hunter success. In addition, check stations are sometimes used to gather biological information that includes parameters on health. Check stations have been used as a place to survey hunters about their preferences for hunting, and other wildlife observations (e.g., wolf or moose observations). In recent years check stations in the western part of state have become a place for hunters to vent their frustrations about wolves in areas that they hunt. Many hunters are now blaming wolves for their lack of success, and many believe that they are the cause for perceived or real population declines in deer and elk.

Check station data also inform biologists on where animals are being harvested and hunter access problems; many check stations gather data on private versus public land use and/or how many hunters are hunting on BMAs.

Besides using survey and check station data, managers rely on statewide harvest survey data collected through telephone surveys to help set seasons on an annual basis. In fact harvest information is probably used more in wtd justifications than in justifications for changes to elk, antelope and mule deer. Harvest estimates are used by biologists to help confirm trends that they are observing in the field and buck harvest is often used as an index to population trends. Success rates are an important factor in season setting as they may indicate an increasing or decreasing availability of wtd or change in the numbers of wtd in the population. In the example above this parameter was used in all 5 season justifications. In some cases, success rates might indicate environmental conditions that increased or decreased harvest. Information about numbers and classes of animals harvested gives biologists additional data to estimate how many harvested animals are likely to result for each license issued, or other similar metrics of the effects of seasons implemented in previous years, which helps to inform recommendations for season changes.

Finally, season setting also has to take into consideration hunter access to the animals, hunter preferences and land-owner tolerance of both hunters and animals. Data on land-owner tolerance of both hunters and deer may be the most difficult data to gather and often there is no systematic method to collection and use of those data. Wtd can cause crop and fence damage, especially in irrigated croplands where wtd are often found in high densities. In many cases the assumption is made that data collected, such as hunter success rates, are surrogates for things such as land-owner tolerance of hunters or availability of wtd to hunters. In some cases parameters like this can mean or be interpreted in one way by one biologist and in a completely different way by another. Interpretation of these data can be difficult and is open to more criticism than other data collected.

Most biologists believed that the second most important use of the S&I data, beyond season-setting, was for informing sportsmen, FWP personnel, landowners and others in the general public about deer population trends. The public has an expectation that our management of wildlife populations is based on scientific knowledge of wildlife populations. There were many other diverse uses for the survey data collected including descriptions of wtd numbers and trends in land purchase proposals, in comments on proposed state and federal land exchange projects, in comments on subdivisions, for newspaper articles, in comments on state land uses such as grazing changes or timber harvests, timber sales on forest service lands and to inform comments on oil and gas leases and oil and gas drilling. Data collected in MFWP surveys are used to speak towards potential effects of timber harvest, open road densities, and recreation effects on wtd harvest. In some cases funding for our survey flights comes from sources such as the oil and gas industry and may be used to describe potential impacts or to inform mitigation. Finally, biologists stressed the importance of having long-term trend data available for informed comment on unforeseen developments into the future.

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