



# Roads, Land, and Big Game Harvest

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*HJ13 Study – Environmental Quality Council*  
*Prepared by Joe Kolman, Environmental Analyst*



## Introduction

The Environmental Quality Council study pursuant to House Joint Resolution No. 13 focuses on road management on federal lands, parcels of public land surrounded by private land that may be inaccessible to the general public, and the effect of diminished access on recreational opportunities, specifically hunting.<sup>1</sup>

The study resolution requests *“an assessment of trends in permits and licenses being issued by the Department of Fish, Wildlife, and Parks in each area for elk and deer hunting over a 15-year period, with a specific emphasis on identifying reduced hunter opportunity in areas where roads have been closed on federal land or where there are large landlocked areas.”*<sup>2</sup>

In September 2015, the EQC reviewed information on roads and public land parcels without access.<sup>3</sup> This paper and the accompanying online maps examine available elk and deer harvest information, inaccessible lands, and road distribution.<sup>4</sup>

The Department of Fish, Wildlife, and Parks manages wildlife in the state. Since most elk and deer habitat is owned by federal and private entities, this means the agency works with federal land managers to implement statutory requirements and management recommendations.

State management plans for elk and deer as well as management plans for national forests and lands managed by the Bureau of Land Management rely on studies that generally conclude elk and deer mortality increases in connection with higher road densities and less hiding cover. A team of elk researchers in Oregon summarized knowledge learned over a half century of studies on the direct impacts of roads and traffic on elk.<sup>5</sup>

- Elk die in collisions with vehicles;
- Elk avoid areas near open roads, resulting in temporary or permanent reduction in effective habitat;
- As open road density increases, elk are more vulnerable to legal and illegal harvest. Closing roads may reduce hunter density because some legal hunters are unwilling to hunt without vehicles. And poachers may be less reluctant to commit crimes without getaway access; and
- Elk exhibit higher stress levels and increased movement in response to road density and traffic, though elk may conserve energy by traveling on closed roads.

In more recent discussions, state and federal officials acknowledge that other factors influence elk distribution and mortality, including forage, distance from roads, and migration between public and private lands, some of which may not be accessible to the general hunting public.

<sup>1</sup> [House Joint Resolution No. 13](#), 2015

<sup>2</sup> Ibid

<sup>3</sup> Sept. 9-10 [meeting](#) documents.

<sup>4</sup> Rep. Kerry White, the sponsor of HJ13 and a member of EQC, said the resolution should have said to examine harvest data, not permit and license data. Without objection from the EQC, that is what is presented here.

<sup>5</sup> M. M. Rowland, M. J. Wisdom, B. K. Johnson, and M. A. Penninger. 2005. [Effects of Roads on Elk: Implications for Management in Forested Ecosystems](#)

# Elk

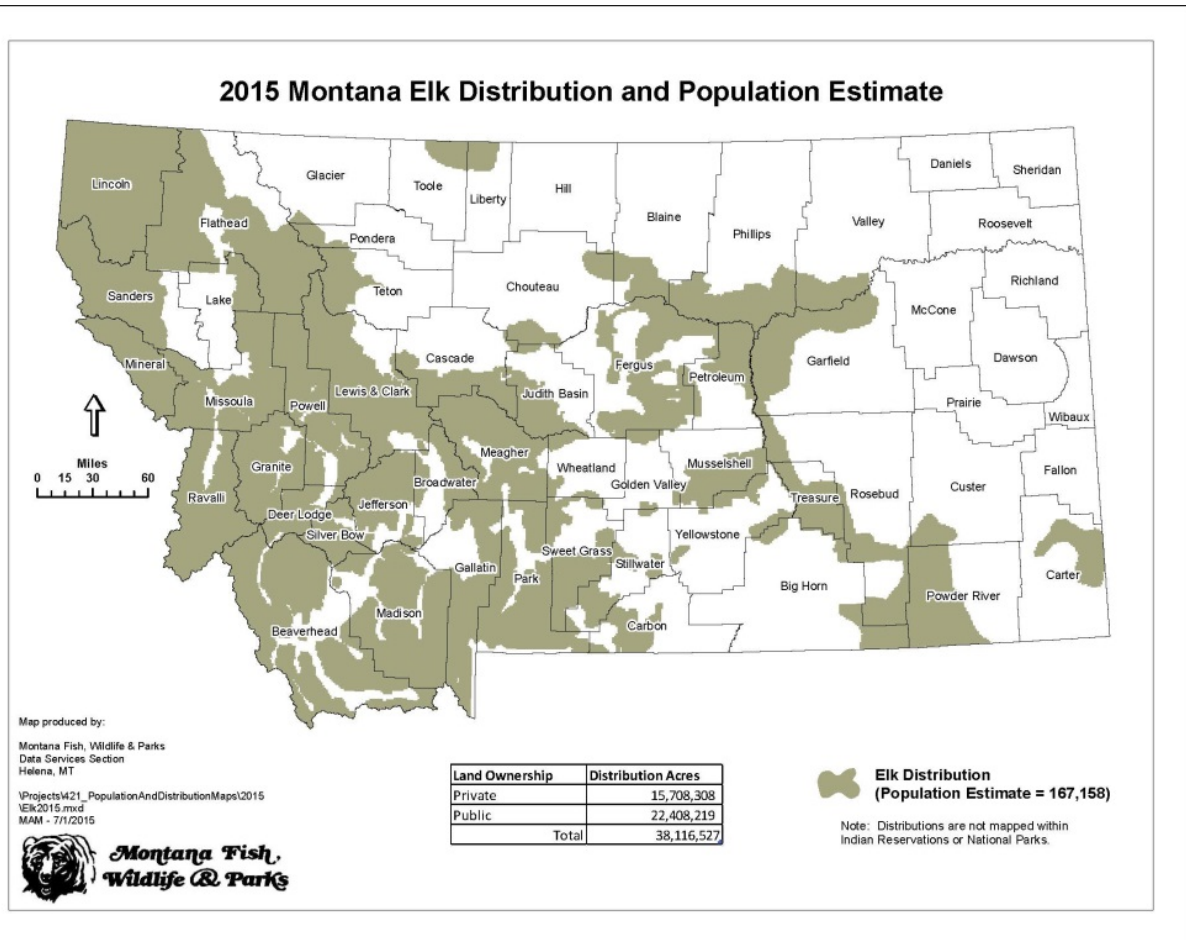
## Statewide Perspective

### Population and Distribution

In 1978 an estimated 55,000 elk called Montana home.<sup>6</sup> Today, FWP estimates there are more than 167,000 elk in the state.

With that higher population has come a wider distribution, but also an increased movement onto private land. Elk distribution in this context means the overall range of elk. Elk may move seasonally or even more frequently within a distribution area. Elk distribution acres on private land increased 17%, or more than 2 million acres, between 2004 and 2015.<sup>7</sup>

State law directs the agency to “maintain elk population numbers at levels producing a healthy and productive condition of elk, vegetation, soil, and water and that also reduces elk conflicts on private and



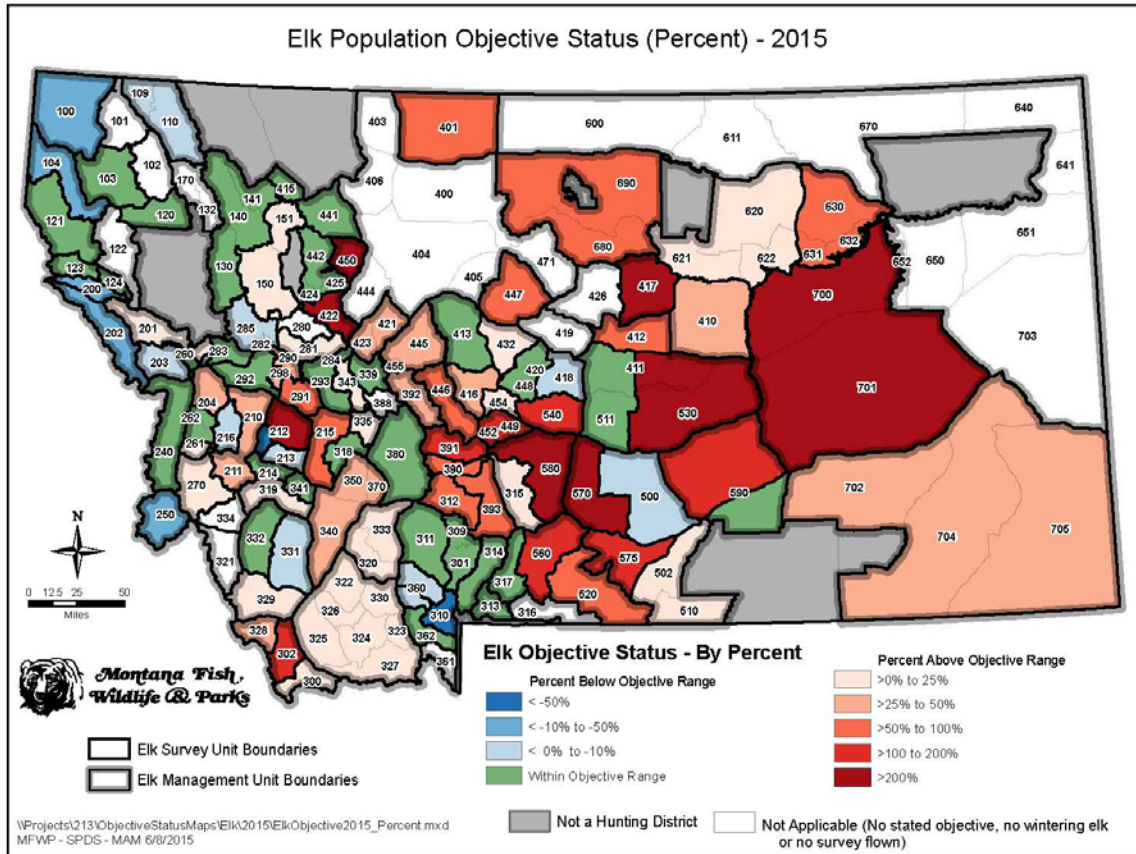
<sup>6</sup> [Statewide Elk Management Plan](#)

<sup>7</sup> FWP [Distribution Maps and Population Charts](#). Distribution areas represent land that elk may inhabit. Given that elk may roam in response to a variety of factors, it cannot be inferred that elk inhabit all lands in the distribution map equally or at all times.



public lands.”<sup>8</sup>

As of 2015, more than half of the hunting districts were over objective. Another 29% were at objective, and 17% were below objective.<sup>9</sup> The area containing Districts 411E and 530 in the Big Snowy and Bull Mountains is nearly 10 times over objective with an estimated 5,082 elk in the area.



The next highest, at about five times over objective with 547 elk, is District 450 which lies between the Teton and Sun Rivers.

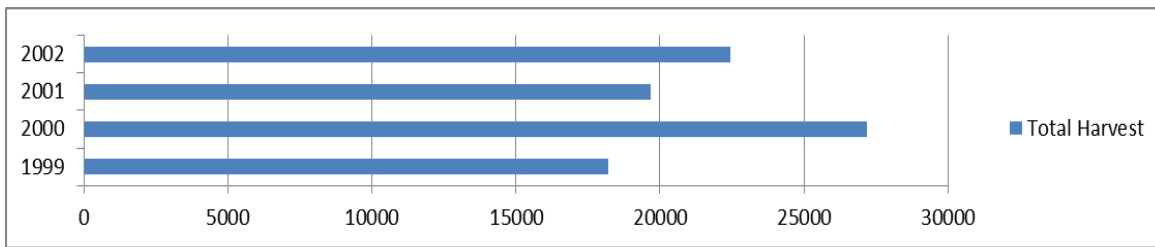
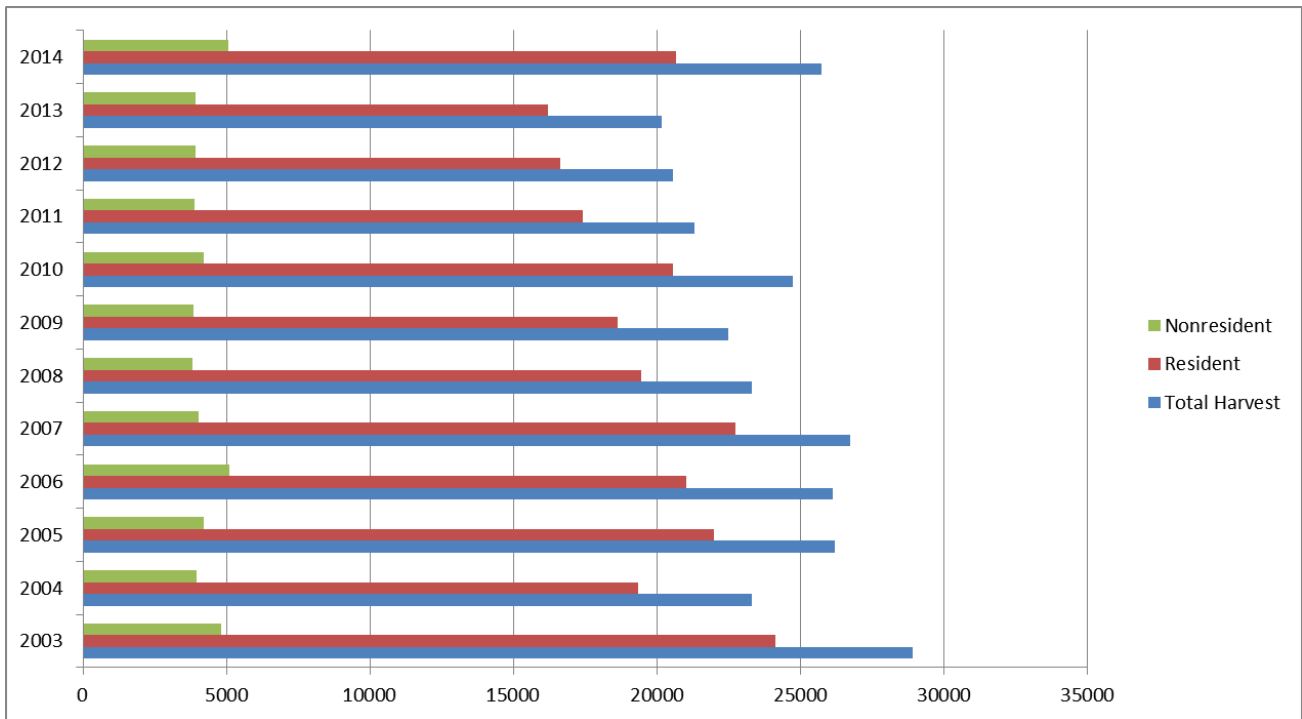
### Harvest<sup>10</sup>

Over the last 16 years, the number of elk killed in Montana ranged from a low of 18,209 in 1999 to a high of almost 29,000 in 2003.

<sup>8</sup> [Statewide Elk Management Plan](#)

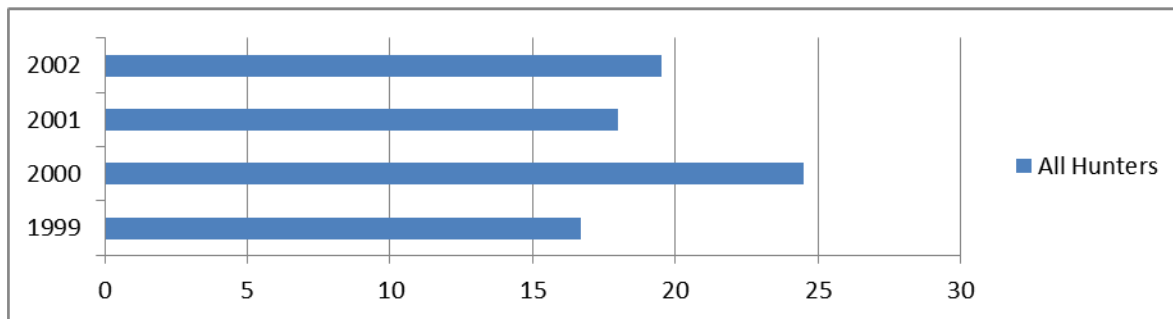
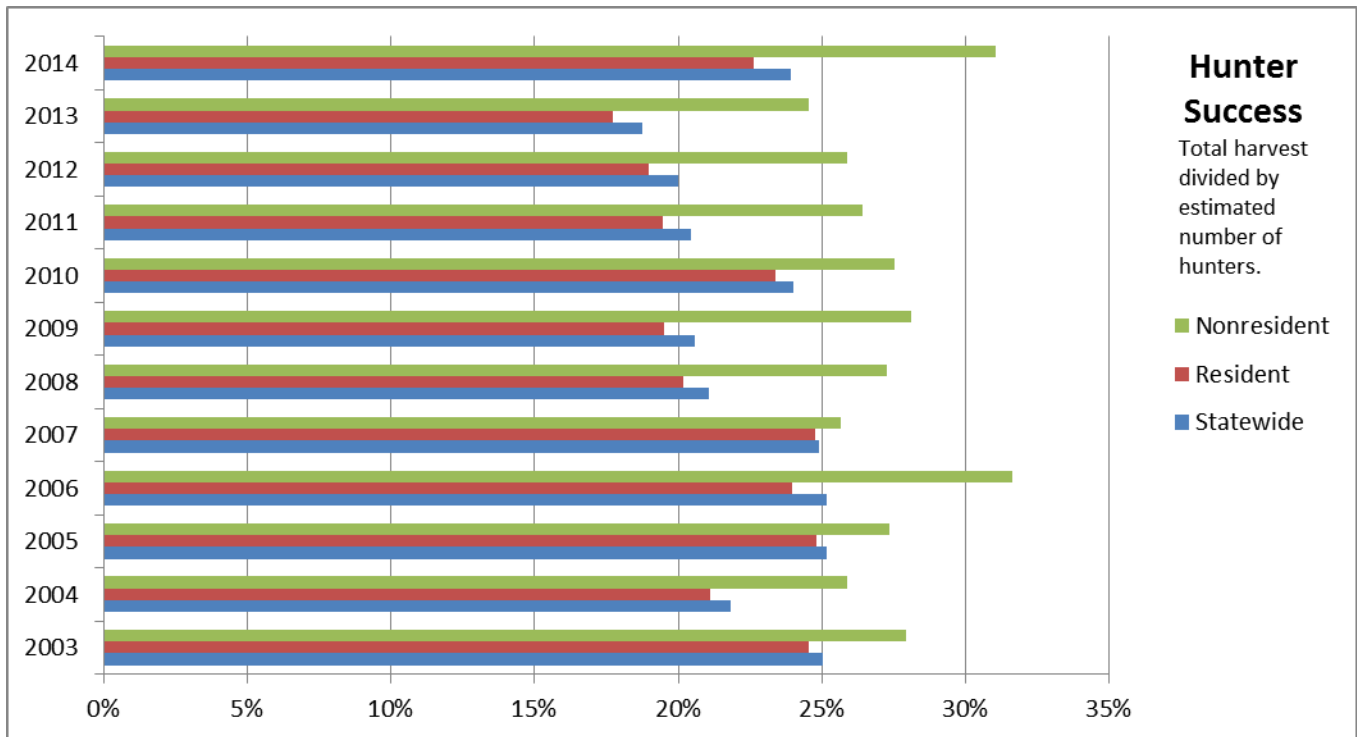
<sup>9</sup> [2015 Population Status Chart](#)

<sup>10</sup> These statistics are derived from Fish, Wildlife, and Parks [harvest reports](#). For the years 1999-2002, numbers were not broken out between residents and nonresidents.



In terms of success rates, the low was again in 1999, when 16% of hunters filled a tag.<sup>11</sup> For the rest of the period examined, in most years at least one out of every five hunters shot an elk. Nonresident hunters, at least some of whom likely hired guides and hunted on private land, fared better than residents.

<sup>11</sup> For this analysis, the success percentage is the number of elk divided by the number of hunters.

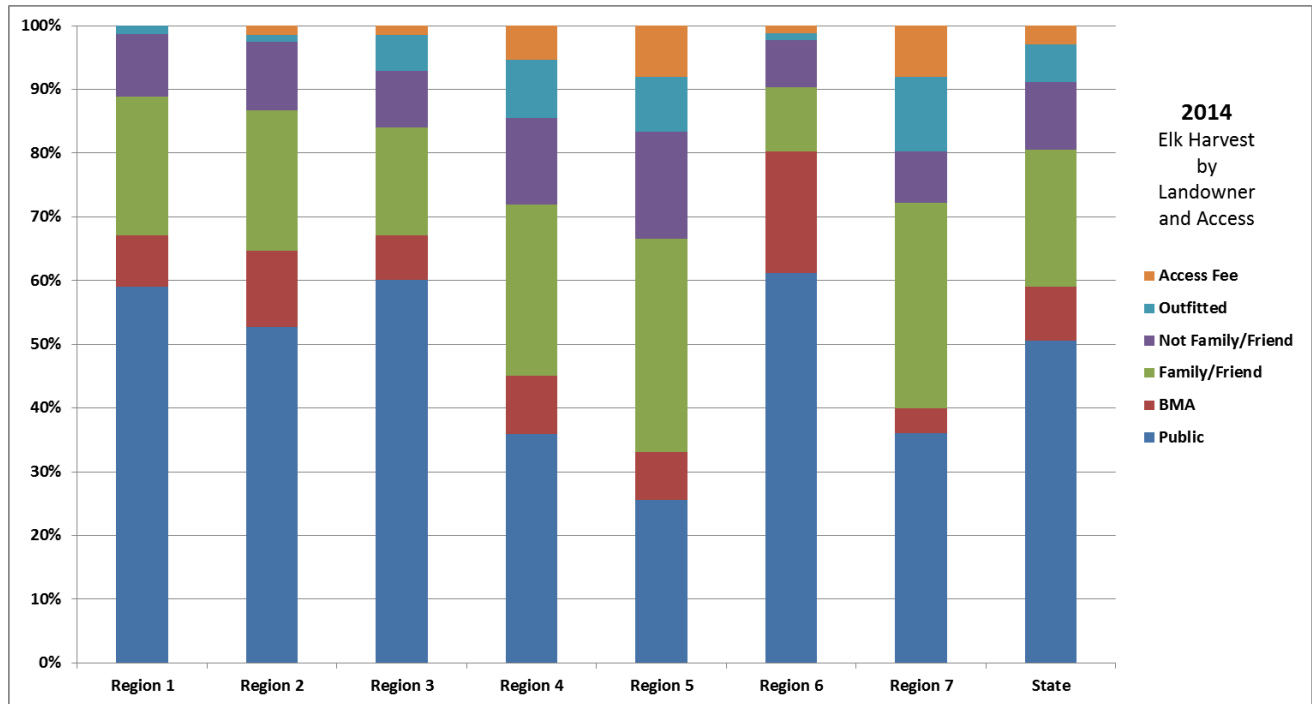


Of the more than 25,000 elk killed in 2014, about half of the died on public land. Another 19% were either killed on private land in the block management program or by hunters who did not have a relationship with the landowner. The remaining 31% were harvested on private land by outfitted hunters, family and friends of the landowner, or those who paid an access fee.

Regions 4, 5, and 7, which have less land in elk habitat than the three westernmost regions, had the lowest percentages of harvest on public land.

While most elk were killed on public or block management lands, hunters on those lands in 2014 had much lower success rates than those on private land. Fourteen percent of elk hunters on public land had success. Of those who hunted on private block management land, 8% got their elk. The success rates rose on private land and were highest on private land that was either outfitted or subject to access fees.<sup>12</sup>

<sup>12</sup> FWP, [HD Unit Research Summary No. 38](#), September 2014

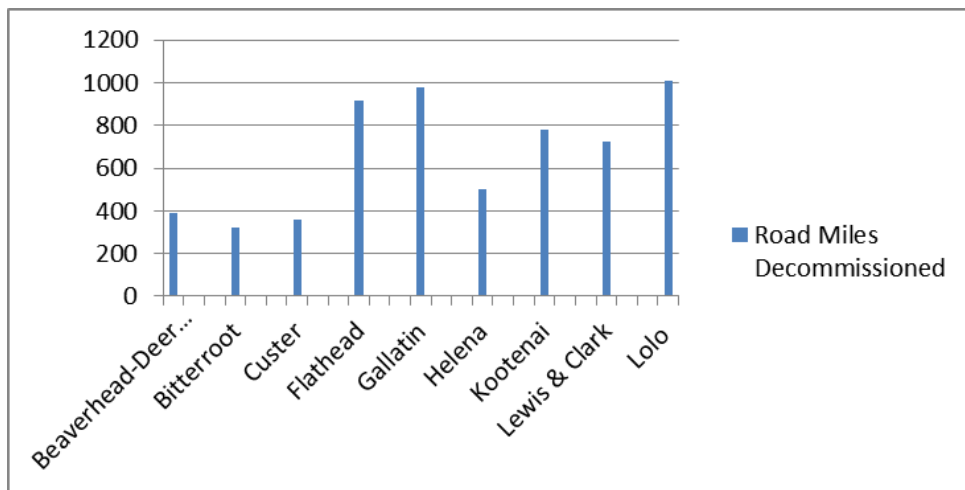


## Roads

Hunting districts may contain roads managed by many entities. The study resolution focuses on roads managed by the federal entities, mostly the Forest Service and the BLM.

In general, national forests that lie mainly west of the Continental Divide contain more roads, both those open and closed by the Forest Service to motorized use. The Kootenai National Forest has more than 4,000 miles of roads closed to all but administrative uses, but also has almost 4,000 miles of open roads.

Of the 1,671 miles of road in the Gallatin National Forest, 6 miles are closed to motorized use. About half of the





2,000 miles of roads in the Helena National Forest are closed. About 13% of all roads in the Lewis and Clark National Forest are closed to motorized use.<sup>13</sup>

Besides forest system roads, there are thousands of miles of road in the forests that are either unauthorized, user-created roads, and therefore closed, or have been decommissioned. In 2001, the Forest Service declared that the national forest road system was mostly complete and shifted its focus from new road development to managing access according to the capability of the land and decommissioning unneeded roads.<sup>14</sup>

## Public Lands

As reported to the EQC in September 2015, an analysis by the FWP found there are about 4,870 square miles of public land that cannot be accessed by the general public legally by a road or waterway. More than 4,000 square miles of that land is owned by the state of Montana and the BLM, and much of it lies in Eastern Montana.

Of those 3.1 million acres of inaccessible public land, just less than a third of the acreage lies within elk distribution areas. In general, hunting districts west of the Continental Divide where most of the public land is owned by the Forest Service had the lowest percentages of inaccessible public land.

## District Perspectives

### Harvest<sup>15</sup>

The districts with some of the highest success rates were those east of Helena and in the Missouri River Breaks. Most successful over the 10-year period was District 455, which is in the Devil's Kitchen management unit of the Big Belt Mountains northeast of Helena. Two out of every five hunters killed an elk there during the decade. Also in the same area with about a 35% success rate are districts 445, 446, and 421. All of those districts are above the population management objective.

In District 622 in Phillips County, 36% of hunters went home with elk meat. Next door to the south, District 700 was at 33%. The adjoining District 631 was at 32%. All those districts also are over objective.

The districts where most elk hunters found meat at the grocery store were those in the northwest corner of the state. Six districts north of the Flathead Indian Reservation and west of Highway 93 to the Idaho border had success rates of less than 10% and as low as 4%. Those districts are at or below the population objectives.

Another way to look at elk harvest over the decade is the number of elk harvested per square mile of the district, or the density of the harvest. Again, District 455 in the Devil's Kitchen management unit came out on top with 28 elk harvested for each of the 64 square miles in the district. Two districts in southern Park County had high elk harvest densities. District 313 north of Yellowstone National Park saw

<sup>13</sup> [Summary](#) of Road Information for Montana's National Forest System, September 2015

<sup>14</sup> Ibid

<sup>15</sup> The district level analysis includes harvest years 2004-2012 and 2014. Hunter estimates by district were not done in 2013. Estimates from prior to 2004 are in another format and not easily combined.

26 elk killed per square mile in the 251-square mile district. Next door to the west, District 314 was at 25 elk harvested per square mile.

## Roads

Many entities may manage roads in a hunting district from the Forest Service and the BLM, to counties and cities, as well as private landowners. This analysis uses roads managed by the Forest Service.<sup>16</sup>

With the exception of two districts with less than 10 miles of roads, the District 130 has the highest percentage of closed roads. It is split by Highway 83 in Missoula and Flathead counties. More than three over every four miles of road in the district are closed. Almost 200 miles of road remain open. The success rate for elk was 5%, mule deer 1%, and whitetail deer 27%.

About two of every three miles of Forest Service roads are closed in District 343 west of Helena in the Marysville area, District 100 in Lincoln County, and District 132, which is north of District 130 in the north Swan Valley area.

Of districts with at least 10 miles of Forest Service roads, 45 districts have a closure percentage of less than 10%.

## Public Lands

The percentage of public land varies widely between hunting districts.

District 262 in the Bitterroot Valley is more than 98% privately owned, the highest percentage in the state, but one of 15 districts where more than 90% of the land is privately owned. Over the period examined, District 262 had an elk success rate of 30%.

Three districts in the Bob Marshall Wilderness Complex are almost completely public. District 150 had an elk success rate of 24%, District 151 was at 22%, and District 280 was 17% .

The elk distribution area with the most acres of inaccessible public land is in southeastern Montana. The area is about 3.7 million acres, including District 590 in the Bull Mountains, District 701 in the Missouri River Breaks, and Districts 702 and 704 in the Custer National Forest management unit. Inaccessible public lands compose about 7% of the area. The hunter success rate in those areas is between 20% and 25%.

The single district with the highest percentage of inaccessible public lands is District 370 in the Elkhorn Mountains north of Whitehall. Of the 118,000 acres of public and private land, 11% is inaccessible public land. The success rate between 2004 and 2014 in the District is 16%.

Devil's Kitchen District 445 includes 9% inaccessible public land with a success rate of 39%. The most successful district for hunters over the decade, District 455, has no inaccessible public lands. That district is also within the Devil's Kitchen area.

<sup>16</sup> BLM road data exist in different formats for each field office and are not complete.

The least successful elk harvest districts in northwestern Montana have mostly low percentages of inaccessible public land. Districts 102, 103, 120, and 122 all are around 5% inaccessible public lands.

## Statewide Elk Management

For at least the last 44 years, state wildlife officials have been concerned about the connection between roads and hiding cover in wildlife habitat and the effect those landscape features have on big game, mostly elk and to some extent deer.

Prior to 1970, logging was generally considered beneficial to elk because it created new foraging areas. In places where elk populations were high and harvest low, logging roads provided access.<sup>17</sup>

However, state wildlife managers in the 1970s became concerned about conserving elk. Limits were put on antlerless elk harvest, increasing hunting pressure on bull elk. Road building increased with timber harvesting.<sup>18</sup>

In 1970, in response to a proposed timber sale in the Little Belt Mountains, a study began examining the effects of logging and associated roads on elk and how to coordinate wildlife and timber management. The wide-ranging study spanned 15 years and eventually included representatives of the Forest Service, BLM, FWP, the University of Montana School of Forestry, and Plum Creek Timber Co. The study examined habitat security and redistribution of elk in relation to logging operations, road design and management, hunting season closures, and winter ranges.

Among other things, the final report found that elk were more likely to be displaced farther from large timber projects than smaller ones and that displacement was limited in areas where traffic not related to logging was controlled. The recommendations are cited in forest plans and BLM management plans from the era.<sup>19</sup>

In 1982, the Fish, Wildlife, and Parks Commission adopted a road management policy to make recommendations to land management agencies, including the Forest Service and the Bureau of Land Management. The commission adopted specific road densities and hiding cover percentages in an effort to keep bull harvest during the first week of the elk season to 40% or less of the total expected harvest.<sup>20</sup>

The elk management plan adopted in 2004 notes that many recommendations by the agency on habitat don't affect permanent productivity of the land, but may affect the likelihood of hunter harvest. The plan cites studies from the 1990s and early 2000s that found that limited cover and higher road densities increase hunter harvest. The plan notes the long tradition in Montana of the 5-week general

<sup>17</sup> Lyon, L.J. 1985. Coordinating elk and timber management. Final report of the Montana Cooperative elk logging study 1970-1985. Montana Department of Fish, Wildlife, and Parks. Bozeman, Montana. 53 pp.

<sup>18</sup> [Statewide Elk Management Plan](#)

<sup>19</sup> [Recommendations](#) from the Final Report of the Montana Cooperative Elk-Logging Study 1970-1985.

<sup>20</sup> Montana Fish & Game Commission Road Policy, 1982.

bull hunting season but adds that reductions in cover, an increase in roads and trails, or both, would increase elk mortality to the point that the season may need to be reduced.<sup>21</sup>

“Thus, to continue a 5-week general bull elk season popular among the hunting public, FWP biologists have generally recommended against or asked for mitigating actions or modifications to habitat management projects that substantially or cumulatively reduce hiding cover or increase access to previously secure areas,” the plan said.”<sup>22</sup>

The 2004 plan discussed elk on inaccessible land in addition to road density and cover, but a 2013 article in the *Journal of Wildlife Management*, authored by FWP employees, adds access as a major challenge.

“Rather than focusing management actions on creating habitat security on public lands to increase elk populations, many elk managers are now faced with the task of reducing elk populations and providing hunting opportunities on a landscape where elk occupy a matrix of public and private lands with differing amounts of public access,” FWP researchers wrote. “Hunter access to elk is requisite for hunting to be an effective tool to stabilize or reduce elk populations, and management strategies to manage elk associated with these private land refuges need to be defined.

“Thus, traditional concepts of elk security habitat which consisted of large tracts of heavily timbered and low road density public lands may need to be refined to include private lands that prohibit or restrict hunter access.”<sup>23</sup>

The conclusions are based on data collected from cow elk herds in the East Madison Valley herd and the West Paradise Valley. About 50 animals were collared in each herd. Other findings include:

- Elk were less likely to occupy areas that permitted public hunting access.
- East Madison elk selected areas with fewer open roads, especially during archery season. While the elk selected areas that permitted access during archery season, they left those areas during rifle season. Little evidence was found that security habitat played a role in selection.
- Results were similar for the West Paradise Valley cows, but those cows were most likely to avoid roads during the rifle season.

It isn't known if the migration habits observed were flexible behaviors in reaction to hunting pressure, or are passed between generations.

“If animals learn migratory and movement patterns as calves, over time this could result in the loss of the public land herd segment and limited private land hunts will not be effective in rebuilding the public lands segment of the herd over the short term,” the FWP researchers wrote. “To rebuild the public segment of the herd over time, public lands hunting pressure may need to be reduced or eliminated

<sup>21</sup> [Statewide Elk Management Plan](#)

<sup>22</sup> Ibid

<sup>23</sup> Proffitt, K. M., J. A. Gude, K. L. Hamlin, and M. A. Messer. 2013. Effects of hunter access and habitat security on elk habitat selection in landscapes with a public and private land matrix. *Journal of Wildlife Management* 77:514–524

while hunting pressure on private lands is increased, to affect differential mortality rates in different herd segments.

“Conversely, if elk selection for lands inaccessible to hunters represents a flexible behavioral strategy, elk re-distribution onto public lands may be achievable in the short term via elk avoidance of hunters, with only limited hunter access onto lands that currently are not open to hunting.”

Ongoing FWP elk research includes:<sup>24</sup>

- An elk mortality study in the Bitterroot found mountain lion predation is a key factor in adult and calf survival. Researchers plan to return to the area in the next 2 years to evaluate changes that were made in mountain lion harvest.
- In the Missouri River Breaks, researchers are looking at hunter access and other factors affecting elk distribution in an area that is over its population objective. Findings will help management decisions on seasons, quotas, public access, road use, and habitat.
- FWP, the Forest Service, and the BLM are working to quantify elk summer range forage. Understanding the quality of elk summer habitat and how they use it would be used by the agencies for land and harvest management decisions. Private landowners could also use the information for management decisions.
- Collared elk in the North Sapphire Mountains are being tracked for movement between public and private land, the use of habitat, and forage quality.
- The effects of the mountain pine beetle infestation on habitat and elk movement are being studied in the Elkhorn Mountains with collared elk. FWP is doing the study with the Elkhorn Working Group, the Helena National Forest, Montana State University, and the Montana Department of Military Affairs.

## National Forest Plans

### Kootenai

Adopted in 2015, the forestwide objective is to add one planning subunit that provides at least 30% elk security and add another planning subunit that provides at least 50% elk security. The term “elk security” is defined as:

*Generally timbered stands on NFS lands at least 250 acres in size greater than 0.5 mile away from open motorized routes during the hunting season. Security is calculated for individual planning subunits. Roads not open to the public for motorized use during the hunting season are not included in this calculation. The effects of non-motorized use and/or administrative motorized use of closed or temporary roads during the hunting season are not included in this calculation and would instead be analyzed separately at the project level.<sup>25</sup>*

<sup>24</sup> [FWP Elk Research](#)

<sup>25</sup> [Kootenai National Forest Land Management Plan, 2015](#)

## Beaverhead-Deer Lodge

The 2009 plan seeks to “provide quality elk habitat, provide a variety of recreational hunting opportunities, and provide support for Montana’s fair chase emphasis.” The plan sets desired open motorized road and trail densities by hunting district between zero miles of road per square mile up to 1.8 miles of road per square mile.<sup>26</sup>

## Bitterroot

The 1987 forest plan for the Bitterroot National Forest seeks to attain or maintain at least 50% elk habitat effectiveness where more than 25% of planned roads are in place and 60% in areas where less than 25% of roads have been built. The term “elk habitat effectiveness” is defined as “An Index of the capability of an area to provide security for elk. It is based on hiding and thermal cover present and roads open to public motorized use.”<sup>27</sup>

The plan also includes definitions for other terms related to elk management:

- Elk hiding cover: Vegetation, primarily trees, capable of hiding 90% of an elk seen from a distance of 200 feet or less.
- Elk security area: Security is a function of space, topography and hiding cover, influenced by human access. The size of the area necessary to provide security will vary with the degree of access and hiding cover characteristics. In this analysis, areas of 5,000 to 8,000 acres below 7,000 feet elevation that provide high-use fall habitat for elk are security areas.
- Elk security cover: Elk hiding cover modified by open roads. The greater the density of open roads within an area, the less effective is the hiding cover in providing security for elk.

A 1994 review of the plan found that big game habitat standards and guidelines for winter range and security were not consistent with the actual conditions in the area. It pointed to research in the early 1990s that looked at elk mortality during hunting season and ways to address that as opposed to forestwide standards year round.<sup>28</sup>

## Flathead

The proposed 2015 plan includes road densities by geographic unit, but similar to the Kootenai plan manages for elk security in conjunction with FWP to balance elk population and hunter access.

Security habitat means:

*the forested stands on National Forest Service lands at least 250 acres in size greater than 0.5 mile away from open motorized routes during the hunting season. Elk security habitat is calculated at the project level. Roads that are not open to the public for motorized use during the hunting season are not included in this calculation. The effects of non-motorized use and/or administrative*

<sup>26</sup> [Beaverhead-Deer Lodge National Forest Plan](#)

<sup>27</sup> [Bitterroot National Forest plan](#)

<sup>28</sup> [Five year review of Bitterroot National Forest plan, 1994](#)



*motorized use of closed or temporary roads during the hunting season are not included in this calculation and would instead be analyzed separately at the project level.*<sup>29</sup>

## **Lolo**

The 1986 plan calls for management designed to increase big game populations, particularly elk. Elk habitat productivity and elk populations were projected to increase by 25%. The plan envisioned burning forage areas to improve habitat and coordinating timber sales. The final report of the Montana Cooperative Elk-Logging Study, 1970-1985, is used as a basic tool for assessing the effect of timber harvest on elk habitat and for making decisions that affect the overall big game resource.<sup>30</sup>

## **Custer-Gallatin**

The 1986 Custer National Forest plan aims to protect areas through mineral leasing stipulations and resource management objectives to emphasize elk, big horn sheep, mule deer, and prairie grouse management.<sup>31</sup>

The 1987 Gallatin National Forest Plan, with updates through 2014, calls for habitat management for deer and elk to provide for slight increases in population. The plan notes that about half of elk winter range is on private land in or near the forest.

“This ownership situation poses real problems for elk management because most private owners will not change their management to accommodate more elk. In fact, elk capacity on private winter range will mostly decrease. Where winter range and private livestock winter pastures coincide, there is definite competition for forage. If elk populations increase, there will be more pressure on private lands,” the plan states.

“Another significant consideration is that management activities on both National Forest and private lands can change big game habitat. This includes the removal of security cover by timber harvest, grazing competition with domestic livestock, or road construction in security areas and winter ranges. Changing habitats will precipitate changes in big game species population size and composition.”

The Gallatin plan defines elk hiding cover as vegetation, primarily trees, capable of hiding 90% of an elk seen from a distance of 200 feet or less. It also says, “The greater the density of open roads within an area, the less effective is the hiding cover in providing security for elk.”<sup>32</sup>

## **Helena-Lewis & Clark**

Both forests are in the early stages of updating forest plans.<sup>33</sup>

The 1986 Helena plan calls for enhancement of elk habitat with an annual program of habitat improvement and a road management program to decrease human disturbance. It calls for elk summer range to be at 35% or greater hiding cover and winter range be maintained at 25% or greater. Hiding

<sup>29</sup> [Proposed Flathead Forest Plan](#)

<sup>30</sup> [Lolo National Forest Plan, 1986](#)

<sup>31</sup> [1986 Custer National Forest Plan](#)

<sup>32</sup> [Gallatin National Forest Plan, 1987-2014](#)

<sup>33</sup> [Forest Plan Revision](#)

cover is a timber stand that covers 90% or more of a standing elk at a distance of 200 feet. It also references the 1982 FWP Commission guidelines for cover and road density.<sup>34</sup>

The 1986 Lewis & Clark plan calls for maintaining current elk populations. It calls for prescribed burning and road management. Summer and fall elk range would be maintained at 30% or greater hiding cover.<sup>35</sup>

### **Custer-Gallatin, Helena, Lewis & Clark Professional Guidelines, 2013**

In 2013, officials from the Forest Service and FWP issued a paper examining recent science regarding elk management and produced an overview and recommendations for management on the Custer-Gallatin, Helena, and Lewis and Clark national forests. The paper notes that all the forest plans date to the 1980s and substantial changes have occurred since then.<sup>36</sup>

In addition to increased elk populations and a decline in road building and timber harvesting, many timber stands harvested 30 or more years ago are grown back, providing cover for elk.<sup>37</sup>

Recommendations include:<sup>38</sup>

- Minimize human disturbance on winter range. Both motorized and non-motorized routes should be examined for the potential to disturb or displace elk
- To foster higher quality forage, some situations may warrant timber harvest and fire
- Forest management activities involving access management should provide adequate security to allow elk to remain on forest service lands during the archery and rifle hunting seasons. Strategies may include seasonal road closures, managing for a higher percentage of security cover in a particular area, or increasing the minimum distance of security areas from open motorized routes
- For simplicity, the agencies will examine road density to gauge habitat effectiveness. However, factors other than motorized use may influence effectiveness and should be considered at the project level. "The agency participants also acknowledged that travel management decisions often have to strike a balance between resource protection, public recreation opportunities, and other multiple use considerations."

## **BLM Plans**

### **Dillon Field Office**

The plan calls for no net change in open roads from the baseline of 1,342 miles of existing road when wildlife issues, such as displacement, habitat fragmentation, or road density are identified as issues

<sup>34</sup> [Helena National Forest Plan, 1986](#)

<sup>35</sup> [Lewis & Clark National Forest Plan, 1986](#)

<sup>36</sup> U.S. Forest Service and Montana Department of Fish Wildlife and Parks Collaborative [Overview and Recommendations](#) for Elk Habitat Management on the Custer, Gallatin, Helena, and Lewis and Clark National Forests

<sup>37</sup> Ibid

<sup>38</sup> Ibid

when considering new roads. In general, road densities would not exceed 1 mile per square mile if resource issues are identified. Seasonal restrictions may also be placed on roads. The plan would provide habitat and forage to support wildlife population goals as identified by FWP. Sustained vegetation treatment, including mechanical and burning, of more than 1 week would not be allowed to occur in more than two hydrologic units at the same time.<sup>39</sup>

### **Billings Field Office**

The 2015 plan calls for minimizing fragmentation of intact blocks of wildlife habitat to maintain connectivity, migrations, and security habitat for big game. In areas of limited or fragmented security habitat, vegetation treatments and road closures may be considered. Development in elk calving areas and big game winter range may not impair habitat. Oil and gas exploration and development are prohibited in crucial winter range. Road densities may not increase to more than 1 mile per square mile in big game winter habitat. Roads may be gated, closed, or reclaimed.<sup>40</sup>

### **Butte Field Office**

Blocks of security habitat of at least 250 acres will be retained in suitable condition during projects. In areas of fragmented security habitat, vegetation treatments and road closures may be considered. Road densities may not increase to more than 1 mile per square mile in big game winter and calving ranges. Restrictions may be placed on projects that disturb wildlife to minimize impacts on big game winter and spring range and calving areas.<sup>41</sup>

### **Hi-Line District Office**

The plan would ensure that land uses minimize damage to wildlife habitat, including the fragmentation of large intact blocks of wildlife habitat. The agency will also consult with FWP on vegetation treatments. For oil and gas leases in big game winter range, surface occupancy and use are prohibited from December to May 15. For operations, a plan to maintain functionality of the winter range must be approved. Within crucial winter range, no disruptive activity is allowed within 6/10 of a mile of an existing disruptive activity.<sup>42</sup>

### **Lewistown Field Office**

The office is preparing a resource management plan to replace the Headwaters and Judith plans developed in 1983 and 1994.

The 1983 Headwaters plan followed the guidelines from the Montana Cooperative Logging study.<sup>43</sup> Seasonal restrictions are required for oil and gas exploration and production in elk and mule deer winter

<sup>39</sup> Dillon [Resource Management Plan](#), 2006

<sup>40</sup> Billings [Resource Management Plan](#), 2015

<sup>41</sup> Butte [Resource Management Plan](#), 2008

<sup>42</sup> HiLine District Office [Resource Management Plan](#), 2015. This covers field offices in Havre, Malta, and Glasgow, along with the Great Falls Oil and Gas Field Office.

<sup>43</sup> [Recommendations](#) from the Final Report of the Montana Cooperative Elk-Logging Study 1970-1985.

and spring range. The existing road network remains open, but seasonal restrictions may be imposed during elk calving season.<sup>44</sup>

The 1994 Judith Resource Area plan allowed seasonal restrictions on hard-rock exploration from December through March on a site-specific basis. Off-highway vehicle use within elk habitat was restricted to designated roads and trails. The BLM will plant lure crops on BLM land where determined to be necessary and feasible to draw elk from private crop land where depredation conflicts are occurring.<sup>45</sup>

### **Miles City Field Office**

Disruptive activities are allowed in big game crucial winter range if the functionality of the habitat is maintained. Routes or areas may be closed to off-highway vehicle use if it causes adverse impacts to wildlife.<sup>46</sup>

### **Missoula Field Office**

The Garnet Area Resource Plan from 1984 follows recommendations from the Montana Cooperative Elk Logging study where applicable.<sup>47</sup> Work is under way on a new plan.

<sup>44</sup> Headwaters Resource Area [Resource Management Plan](#), 1983

<sup>45</sup> Judith Resource Area [Resource Management Plan](#), 1994

<sup>46</sup> Miles City Field Office [Resource Management Plan](#), 2015

<sup>47</sup> Garnet Resource Area [Resource Management Plan](#), 1984

## Deer Population & Harvest

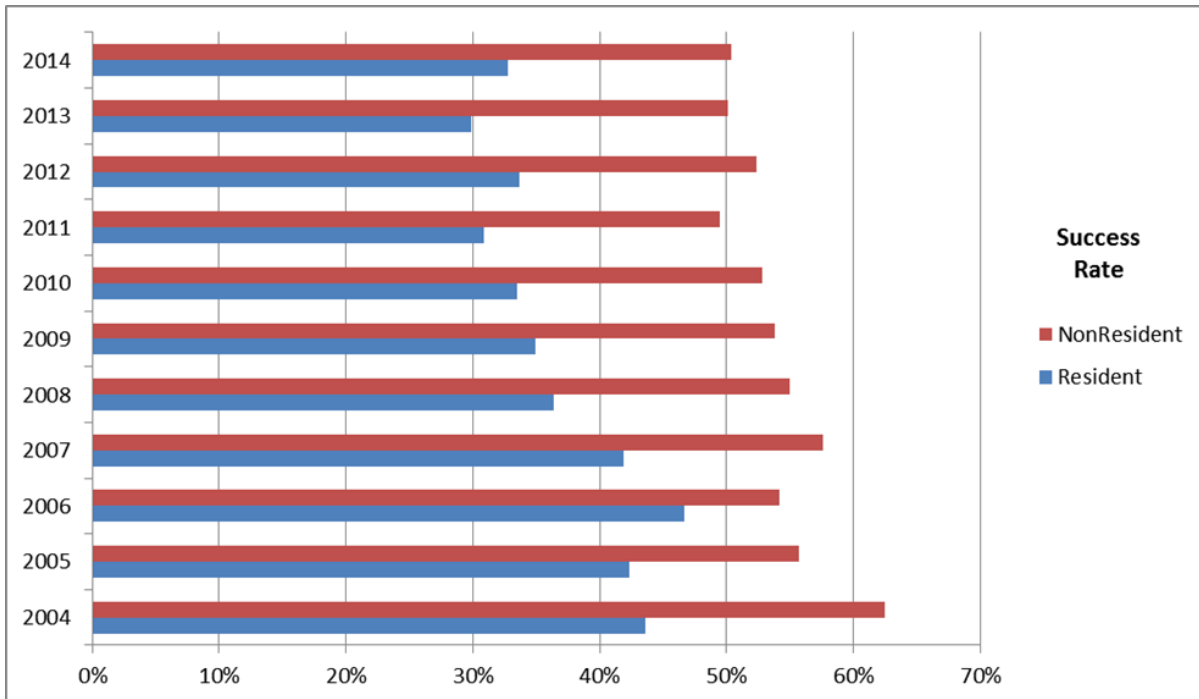
It is estimated that almost 300,000 mule deer and about 200,000 white tailed deer live in Montana. After recent rough winters and disease outbreaks, the populations are starting to rebound. The total deer harvest and success rates also declined from a high in 2006.<sup>48</sup>

2015 WHITE TAILED DEER STATUS			
	WHITE TAILED DEER POPULATION ESTIMATES	YEARS USED FOR 10-YEAR	2015 TOTAL
REGION 1	75,920	2005-2014	84,655
REGION 2	33,791	2005-2014	35,872
REGION 3	23,974	2003-2008 & 2011-2013	23,451
REGION 4	30,225	2003-2008 & 2011-2013	26,193
REGION 5	18,297	2005-2014	12,520
REGION 6	13,216	2005-2014	11,110
REGION 7	12,154	2005-2014	14,350
<b>STATEWIDE TOTAL</b>	<b>207,577</b>		<b>208,151</b>

The estimates for white tailed deer populations are based upon population modeling with survey and harvest inputs.

White tailed deer estimates are not comprehensively validated with site specific research or enhanced monitoring efforts.

White tailed deer estimates are not framed with confidence intervals and are subject to adjustment.



<sup>48</sup> Statewide success for deer harvest is the total harvest estimate divided by the number of licenses and permits issued.

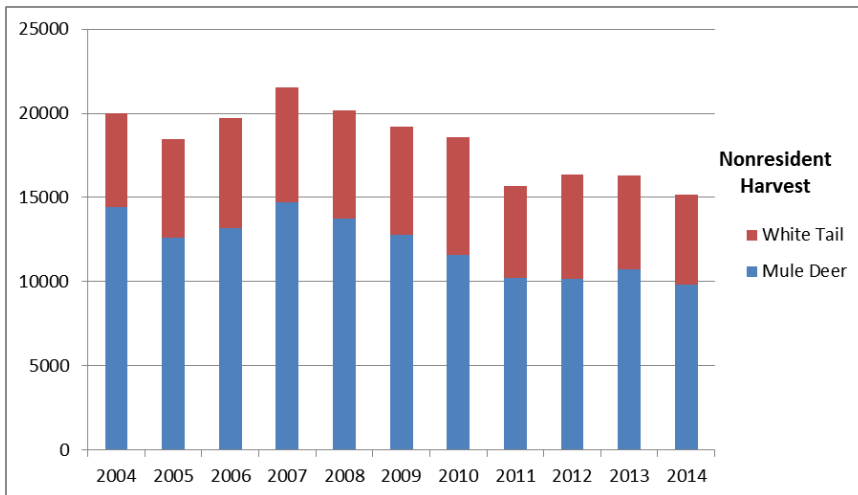
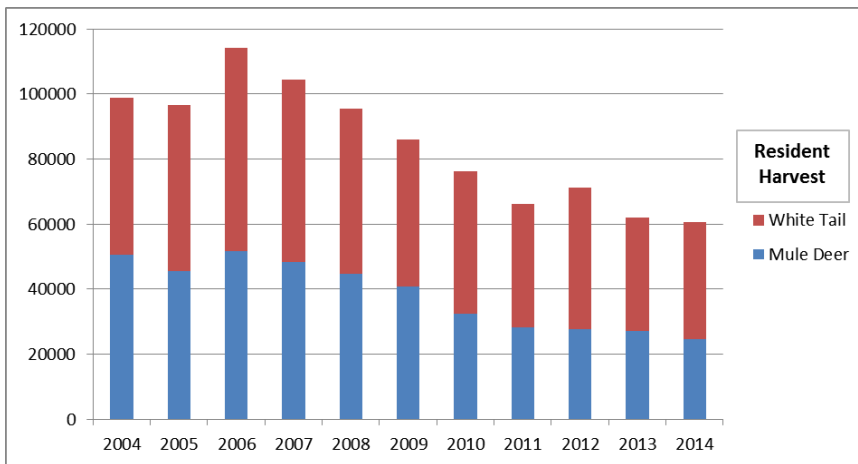
**2015 MULE DEER STATUS**

Region	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	AVERAGE
<b>1</b>	15,260	16,722	13,915	11,722	9,296	8,983	13,095	6,226	7,590	10,782	8,008	11,359
<b>2</b>	18,599	21,209	24,837	16,188	13,229	11,486	14,226	11,472	12,754	12,267	14,267	15,627
<b>3</b>	51,116	52,477	62,759	46,594	40,747	33,624	33,293	33,204	34,172	35,482	38,912	42,347
<b>4</b>	76,408	68,337	70,262	65,826	59,589	50,096	46,384	46,216	49,210	56,133	56,629	58,846
<b>5</b>	43,139	38,434	41,765	41,791	39,813	38,334	34,720	33,836	37,977	32,185	32,042	38,199
<b>6</b>	35,305	48,902	39,683	51,428	45,056	35,488	42,053	32,983	36,674	37,487	43,561	40,506
<b>7</b>	74,714	98,061	93,650	101,169	93,167	69,213	65,549	47,424	53,934	79,287	103,812	77,617
<b>TOTAL</b>	314,541	344,142	346,870	334,717	300,895	247,224	249,320	211,361	232,312	263,623	297,231	284,501

Mule deer estimates are not comprehensively validated with site specific research or enhanced monitoring efforts.

Mule deer estimates are not framed with confidence intervals and are subject to adjustment.

The method used to make mule deer population estimates was changed in 2015. The estimates above are based on the new methodology.





In 2013, more than three out of every five hunters shot a mule deer in District 680, which is bordered on the south by the Missouri River and includes portions of Chouteau and Blaine Counties. The area is 40% public land with 3% of the district as inaccessible public land.

Half of the hunters in Districts 405, 510, 302, and 690 also shot a mule deer in 2013. Less than 5% of the land in each of the district is inaccessible public land. Almost half of the Forest Service Roads are closed in District 510. None are closed in the other three.

For whitetails, the long skinny District 260 in the Bitterroot Valley was a hunter's haven in 2013. Three of every five hunters shot a whitetail there. Almost 90% of the land is privately owned. None of the public land is inaccessible. There are no Forest Service roads in the district.

In a 2014 survey of hunters, nearly three out of every four respondents said they hunted deer on public land. A third also said they hunted on block management land, but a higher percentage said they hunted on private land at the pleasure of landowners who are family or friends. Very few were willing to pay a guide or access fees to hunt on private land.<sup>49</sup>

Those with family or friends who owned land fared best; one out of every two of those hunters reported a deer kill. About a quarter of those hunting public land shot a deer.<sup>50</sup>

## Deer Management

The 2001 Adaptive Harvest Management document for FWP says the most influential factors for deer populations are weather, habitat condition, predation and other natural mortality, and hunting.<sup>51</sup>

Habitat recommendations and findings from a 1998 FWP paper include:<sup>52</sup>

- In mule deer ranges east of the Continental Divide, housing densities of less than two homes per square mile caused little conflict other than occasional damage complaints. However, higher housing densities create much more conflict and may preclude use by deer.
- Timber management in winter habitat should retain conifer forest stands that aid deer in conserving energy by offsetting temperature extremes and reducing wind velocity and radiant heat loss.
- In areas where mule deer and elk distribution overlap, much road building was done without regard to game security. If maximum deer harvest is desired, an extensive open road network will help achieve that goal. However, too much access on public land increases buck mortality during hunting season.

The most recent FWP deer study is a 2006 examination of white tailed deer in the Salish Mountains of northwestern Montana. Findings and recommendations include:<sup>53</sup>

<sup>49</sup> Selected Results from Surveys of Resident Deer, Elk, Antelope & Upland Game Bird Hunters Regarding Hunting Access in Montana, [HD Unit Research Summary No. 38](#)

<sup>50</sup> Ibid

<sup>51</sup> [Adaptive Harvest Management](#), 2001

<sup>52</sup> [Ecology and Management of Mule Deer and White-tailed Deer in Montana](#), 1998

- Increasing harvests from the mid-1970s through the mid-1990s could be attributed to mild winters and habitat changes associated with timber harvests and road constructions. However, the effects of logging and hunter access on deer distribution, habitat selection, and population are not well understood.
- In an area of summer habitat, a study found roads appeared to play a minor role in habitat selection, except that deer avoided areas less than 100 meters from a road.
- Closing or limiting access to roads could be beneficial to deer in the immediate vicinity; the effect on deer over a wider area appeared limited. Also, closing roads could prohibit distribution of hunters and lead to heavier deer harvests in areas with greater access.

## District Statistics

District	Mule Deer Success	Whitetail Success	Elk Success	Public Land	Inaccessible Public Land	Miles of Open FS Roads	Miles of Closed FS Roads	FS Roads Closed
100	4%	29%	6%	89%	0%	1070	2088	66%
101	3%	34%	6%	80%	0%	885	460	34%
102	3%	24%	4%	63%	2%	479	396	45%
103	6%	20%	5%	40%	5%	640	456	42%
104	4%	24%	7%	77%	1%	465	567	55%
109	5%	30%	10%	80%	0%	124	107	46%
110	4%	19%	6%	83%	0%	246	264	52%
120	2%	25%	4%	26%	7%	194	243	56%
121	3%	33%	14%	83%	0%	524	476	48%
122	5%	24%	5%	54%	4%	730	193	21%
123	4%	19%	11%	89%	0%	348	51	13%
124	6%	36%	9%	64%	1%	133	26	16%
130	1%	27%	5%	90%	0%	197	685	78%
132	3%	31%	6%	54%	0%	62	114	65%
140	4%	14%	9%	93%	0%	297	387	57%
141	5%	9%	12%	98%	0%	36	38	51%
150	13%	10%	24%	100%	0%	0	0	0%
151	5%	5%	22%	100%	0%	0	0	0%
170	0%	57%	7%	7%	0%	1	0	0%
200	3%	17%	9%	89%	0%	369	44	11%
201	4%	21%	8%	79%	1%	787	149	16%
202	6%	25%	8%	95%	0%	990	155	14%
203	5%	16%	7%	73%	1%	450	69	13%
204	9%	17%	11%	62%	2%	396	70	15%
210	6%	17%	19%	41%	4%	274	38	12%
211	7%	6%	19%	88%	0%	185	6	3%
212	19%	19%	19%	59%	1%	399	13	3%
213	31%	6%	25%	49%	1%	98	3	3%
214	5%	6%	13%	55%	1%	72	5	7%
215	13%	12%	19%	50%	1%	294	125	30%
216	15%	6%	15%	90%	0%	103	11	10%
240	5%	31%	12%	80%	0%	559	125	18%
250	12%	32%	14%	97%	0%	762	447	37%
260	1%	60%	11%	12%	0%	0	0	0%
261	6%	30%	15%	60%	1%	189	55	23%
262	0%	0%	30%	2%	0%	0	0	0%
270	5%	18%	16%	85%	0%	1243	549	31%
280	5%	1%	17%	100%	0%	0	0	0%
281	4%	17%	11%	75%	1%	137	137	50%
282	2%	16%	16%	88%	0%	2	0	0%
283	3%	16%	10%	53%	1%	132	30	19%
284	2%	7%	7%	15%	0%	1	0	0%
285	1%	22%	8%	71%	2%	499	87	15%

District	Mule Deer Success	Whitetail Success	Elk Success	Public Land	Inaccessible Public Land	Miles of Open FS Roads	Miles of Closed FS Roads	FS Roads Closed
290	4%	8%	18%	18%	0%	0	0	0%
291	23%	11%	19%	20%	6%	0	0	0%
292	15%	17%	15%	52%	4%	0	0	0%
293	9%	11%	13%	56%	2%	226	226	50%
298	8%	11%	23%	8%	2%	11	5	32%
300	16%	13%	27%	74%	0%	102	10	9%
301	7%	11%	12%	86%	0%	389	0	0%
302	52%	6%	26%	80%	0%	143	0	0%
309	4%	48%	17%	5%	0%	1	0	0%
310	2%	8%	14%	98%	0%	78	0	0%
311	16%	29%	24%	29%	3%	7	0	0%
312	10%	36%	23%	23%	3%	84	0	0%
313	32%	8%	23%	80%	2%	104	2	1%
314	18%	21%	30%	40%	5%	96	0	0%
315	11%	26%	26%	20%	2%	91	0	0%
316	22%	5%	16%	99%	0%	57	0	0%
317	15%	43%	24%	66%	1%	142	1	1%
318	28%	2%	15%	81%	0%	325	10	3%
319	19%	4%	16%	80%	0%	250	28	10%
320	10%	42%	20%	45%	5%	123	13	9%
321	3%	5%	19%	62%	1%	179	13	7%
322	13%	58%	20%	26%	3%	0	0	0%
323	9%	3%	18%	91%	0%	96	4	4%
324	9%	6%	22%	88%	0%	109	2	2%
325	16%	22%	21%	62%	1%	0	0	0%
326	14%	17%	17%	44%	1%	0	0	0%
327	7%	4%	23%	73%	1%	114	10	8%
328	15%	3%	25%	70%	1%	114	5	4%
329	13%	9%	22%	65%	1%	225	22	9%
330	16%	16%	17%	55%	1%	93	11	11%
331	23%	13%	15%	81%	0%	384	10	3%
332	10%	1%	19%	81%	0%	237	27	10%
333	10%	46%	15%	39%	3%	60	6	9%
334	10%	4%	14%	64%	1%	178	14	7%
335	31%	9%	16%	56%	1%	57	62	52%
339	20%	12%	19%	29%	6%	0	8	100%
340	12%	29%	17%	48%	2%	179	20	10%
341	9%	4%	14%	68%	0%	70	2	2%
343	21%	8%	13%	52%	1%	55	108	66%
350	11%	6%	13%	82%	1%	182	12	6%
360	8%	26%	24%	39%	1%	26	0	0%
361	4%	4%	14%	80%	0%	325	0	0%
362	10%	4%	25%	75%	0%	34	1	2%

District	Mule Deer Success	Whitetail Success	Elk Success	Public Land	Inaccessible Public Land	Miles of Open FS Roads	Miles of Closed FS Roads	FS Roads Closed
370	6%	5%	16%	37%	12%	24	0	0%
380	16%	21%	19%	39%	3%	170	109	39%
388	18%	22%	9%	14%	0%	0	0	0%
390	17%	18%	34%	9%	6%	5	0	0%
391	26%	23%	26%	26%	4%	107	65	38%
392	29%	12%	18%	75%	2%	194	100	34%
393	14%	13%	28%	13%	4%	112	0	0%
400	30%	9%	16%	13%	2%	0	0	0%
401	29%	15%	20%	10%	3%	0	0	0%
403	32%	6%	7%	11%	2%	0	0	0%
404	21%	21%	12%	8%	2%	0	0	0%
405	59%	7%	11%	9%	3%	0	0	0%
406	26%	14%	10%	9%	3%	0	0	0%
410	20%	6%	26%	47%	4%	0	0	0%
411	20%	35%	23%	20%	3%	17	4	17%
412	38%	17%	30%	16%	5%	0	0	0%
413	30%	22%	15%	34%	1%	109	22	17%
415	3%	3%	12%	98%	0%	17	3	14%
416	15%	15%	20%	44%	6%	193	63	25%
417	39%	4%	25%	37%	5%	0	0	0%
418	24%	24%	16%	21%	6%	12	4	26%
419	41%	7%	13%	12%	2%	0	0	0%
420	12%	7%	22%	53%	7%	22	8	27%
421	39%	10%	35%	6%	3%	0	0	0%
422	13%	16%	20%	57%	3%	8	0	4%
423	37%	14%	22%	19%	7%	0	1	100%
424	12%	13%	11%	98%	0%	32	2	6%
425	15%	7%	17%	39%	4%	1	0	0%
426	48%	4%	24%	21%	6%	0	0	0%
432	24%	8%	14%	47%	2%	100	9	8%
441	24%	15%	19%	38%	4%	6	0	0%
442	19%	16%	17%	84%	1%	57	2	3%
444	17%	32%	15%	15%	5%	0	0	0%
445	29%	35%	35%	12%	9%	0	0	0%
446	13%	22%	34%	23%	7%	73	120	62%
447	34%	14%	24%	21%	4%	13	1	5%
448	18%	8%	12%	74%	0%	180	13	7%
449	20%	11%	20%	39%	6%	54	1	1%
450	17%	32%	19%	20%	7%	0	0	0%
452	14%	7%	25%	37%	4%	21	0	0%
454	12%	10%	16%	54%	2%	155	31	17%
455	38%	35%	40%	99%	0%	2	0	0%
471	47%	3%	16%	19%	3%	0	0	0%

District	Mule Deer Success	Whitetail Success	Elk Success	Public Land	Inaccessible Public Land	Miles of Open FS Roads	Miles of Closed FS Roads	FS Roads Closed
500	30%	8%	12%	7%	3%	0	0	0%
502	28%	17%	12%	11%	4%	0	0	0%
510	55%	11%	12%	70%	1%	86	76	47%
511	18%	24%	13%	15%	3%	32	6	16%
520	17%	36%	16%	73%	1%	176	4	2%
530	38%	15%	16%	18%	5%	30	1	5%
540	18%	19%	19%	34%	4%	86	14	14%
560	25%	32%	24%	60%	2%	116	0	0%
570	25%	34%	21%	7%	5%	0	0	0%
575	26%	32%	14%	5%	2%	0	0	0%
580	27%	42%	31%	22%	7%	49	4	7%
590	29%	11%	25%	10%	4%	0	0	0%
600	34%	12%	8%	20%	3%	0	0	0%
610	0%	0%	8%	0%	0%	0	0	0%
611	42%	13%	12%	35%	2%	0	0	0%
620	30%	6%	21%	42%	4%	0	0	0%
621	27%	2%	28%	78%	1%	0	0	0%
622	18%	0%	36%	73%	1%	0	0	0%
630	33%	12%	10%	62%	1%	0	0	0%
631	14%	1%	32%	80%	1%	0	0	0%
632	23%	2%	23%	86%	0%	0	0	0%
640	37%	24%	28%	5%	1%	0	0	0%
641	17%	24%	0%	9%	1%	0	0	0%
650	31%	11%	11%	22%	5%	0	0	0%
651	30%	16%	15%	9%	4%	0	0	0%
652	49%	7%	18%	61%	4%	0	0	0%
670	47%	14%	9%	45%	2%	0	0	0%
680	63%	4%	15%	40%	3%	0	0	0%
690	50%	8%	31%	10%	4%	0	0	0%
700	38%	14%	33%	35%	3%	0	0	0%
701	32%	22%	21%	18%	9%	0	0	0%
702	40%	12%	21%	12%	7%	0	0	0%
703	31%	22%	14%	16%	5%	0	0	0%
704	44%	13%	20%	30%	10%	317	85	21%
705	42%	23%	22%	30%	8%	219	6	3%

The percentage of inaccessible public land is a percent of the entire district.

Success rates are harvest estimates divided by hunters. Elk success rates are from 2004-2012 and 2014. Hunter estimates were not done in 2013.

Mule deer and whitetail success rates are for 2013 Deer hunter estimates are not done annually.