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***BIG GAME MIGRATION CONSERVATION  
FOR  
LOLO AND BITTERROOT NATIONAL FOREST PLAN  
REVISIONS***

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Photo credit: Mike Thompson

## INTRODUCTION

The Lolo and Bitterroot National Forests stretch across approximately 3.5 million acres in western Montana and provide important wildlife habitat, coldwater fisheries, and recreational opportunities, supporting thousands of jobs in local communities. The land-use plans that guide the U.S. Forest Service's management of these vast public lands were written 35 years ago. At that time, the local human population was much smaller, commercial timber harvest was a primary management focus, and there was far less data on how wildlife moved across the landscape.

Now, a seemingly limitless demand for outdoor recreation opportunities, the growing presence of noxious weeds, and the impacts of decades of fire suppression combined with warming conditions are putting greater pressures on wildlife and habitat in western Montana. Simultaneously, incessant exurban development continues to fragment winter and transitional ranges for elk and deer on neighboring private lands.

To conserve the wildlife values of these public lands, the Lolo and Bitterroot National Forests' land-use plans must be updated to address modern challenges and opportunities. New information about wildlife migrations has been collected through years of research and should be used by the agency to set objectives, standards, and guidelines in the forest plans in order to conserve and enhance these important habitats for future decades. Both the Lolo and Bitterroot National Forests are identified as Tier 1 priorities for plan revision by the U.S. Forest Service, and pre-planning efforts for the Lolo NF plan revision are expected to begin in fiscal year 2022. The Bitterroot NF plan revision is expected to follow shortly thereafter, with pre-planning efforts beginning in the next one to two years.

The following pages describe several important big game migrations and winter ranges on the Lolo and Bitterroot National Forests and provide policy recommendations to be considered as part of the forest plan revisions to ensure the conservation of these migration routes, winter ranges, and Montana's renowned big game populations.

## LOLO NATIONAL FOREST

The Lolo National Forest encompasses approximately 2 million acres in Mineral, Missoula, and Sanders Counties, and provides habitat for widely celebrated elk, bighorn sheep, and mule deer populations. These public lands provide excellent hunting and fishing opportunities and generate significant economic activity, supporting rural businesses and communities as well as contributing to Montana's \$7.1-billion outdoor recreation industry.<sup>1</sup>

The forest contains documented and known migration routes used by elk and mule deer as they move between summer and winter ranges, as well as non-migratory habitats utilized by bighorn sheep populations. Below are descriptions of the more notable big game herds within and across the Lolo NF, their movement patterns, as well as the threats facing these herds.

### **Elk**

1. *Blackfoot/Clearwater Herds*: Upwards of 2,000 elk inhabit an area that includes Montana Fish, Wildlife and Parks Hunting Districts 201, 285, and 292, which are popular HDs for both resident

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<sup>1</sup> Montana Office of Outdoor Recreation, "Outdoor Recreation & Montana's Economy," Sept. 2018. <https://headwaterseconomics.org/wp-content/uploads/montana-outdoor-recreation-economy-report.pdf>.

and non-resident hunters in western Montana. In addition, HDs 280, 281, 282, 290 and 298 provide critical elk winter range. These winter ranges are comprised of a mixture of intermountain sagebrush grasslands, agricultural fields, aspen, and cottonwood stands surrounded by mixed-conifer timberlands. Some of these hunting districts provide other seasonal or transitional habitats as well. For example, HD 280 also provides transitional and summer habitat due to its higher elevations. Large numbers of elk calve and summer in the adjacent Bob Marshall and Scapegoat Wilderness areas located in the Flathead National Forest, as well as on the northernmost extent of the Lolo NF. Of particular importance to these herds are the North Hills located on the Lolo NF's Seeley Ranger District just north of the Blackfoot Clearwater Game Range. These former corporate timber lands provide connectivity between summer and winter ranges. As winter snow accumulates, elk move south out of the high-elevation habitats found in the Lolo NF and adjacent Flathead NF, to lower-elevation, mixed-grassland sagebrush steppe habitats. These winter ranges are located largely on state and private lands in the Blackfoot River and Swan Valleys. Along Highway 200 in the upper Blackfoot Valley, wintering elk often cross the roadway to graze on both the north and south side of the highway. The quality of habitat on which these elk herds rely has been diminished over time by the spread of noxious weeds such as leafy spurge, spotted knapweed, and Dalmatian toadflax.<sup>2</sup> At the same time, habitat disturbance and loss due to unauthorized OHV use in places like Blanchard Flat and Lost Prairie,<sup>3</sup> and the fragmentation and development of low-elevation winter ranges in Findley Creek, Placid Creek, and other areas along the west side of the Swan Valley can disrupt seasonal movement.

Significant blocks of land on both sides of the Swan Valley as well as in the Gold Creek and Belmont Creek areas in the lower Blackfoot watershed were historically owned and operated by commercial timber companies, resulting in high-density road networks and a significant presence of noxious weeds. Many of these lands have been acquired by conservation interests and sold to the state of Montana, U.S. Forest Service, and Bureau of Land Management. Additional tracts will likely be transferred to the federal agencies in the future.

Open road densities have been shown to impact nutritional resources on elk summer range and elk also select areas away from motorized routes.<sup>4</sup> Poor security can lead to a decrease in hunter opportunity and the inability of wildlife managers to meet sex and age structure objectives in elk herds.<sup>5</sup> A critical and necessary component for defining functional security habitat for elk is the distance from the nearest road or trail that may displace elk and impact habitat use.<sup>6</sup> Based on known observed displacement distances for elk from motorized and non-motorized routes, security patches should be greater than 1,000 meters from the nearest

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<sup>2</sup> Blackfoot Challenge, Vegetation Report, <https://blackfootchallenge.org/vegetation/>

<sup>3</sup> Southwest Land Office Manager, Clearwater Unit DNRC, Greenough, MT, March 2022.

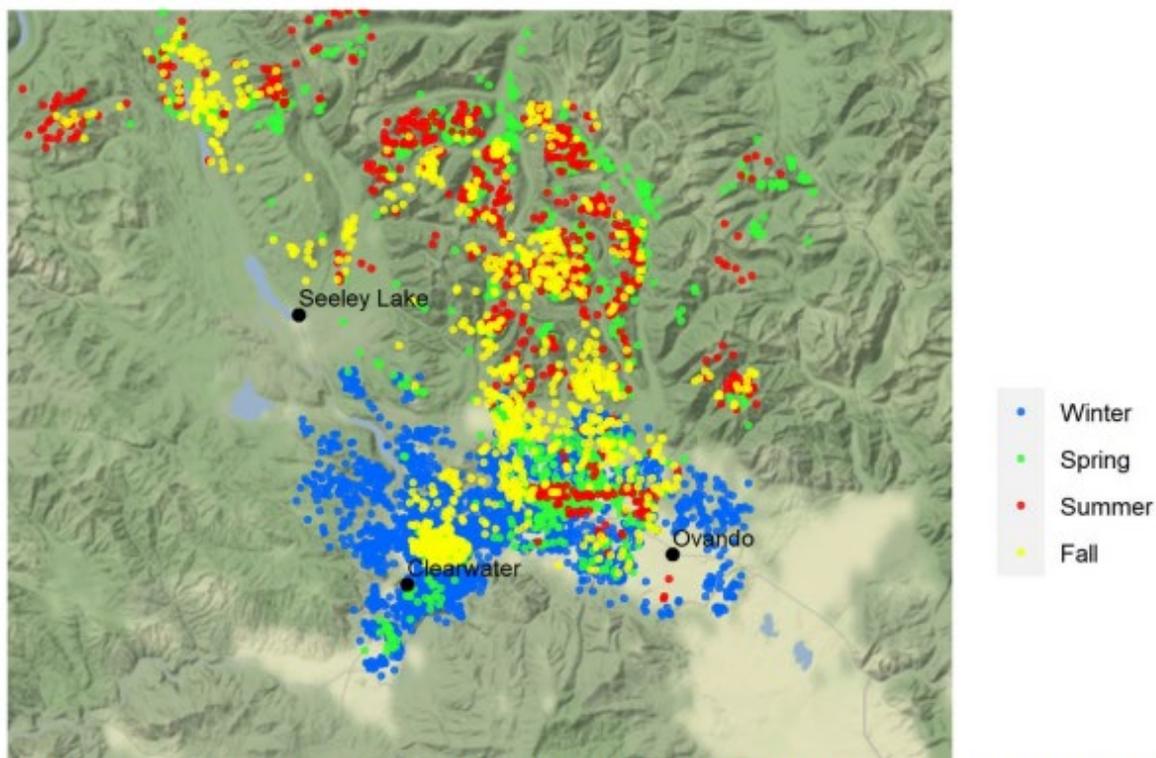
<sup>4</sup> McCorquodale, Scott M., Review of Literature on elk, roads, and Traffic, WDFW, March 2013.

<sup>5</sup> Lonner, T.N., and J.D. Cada 1982. Some effects of forest management on elk hunting opportunity. Pages 119- 128 *in*: T. L. Britt and D. P. Theobald (eds.). Proceedings of the Western States Elk Workshop. 22-24 February 1982, Flagstaff, Arizona. Arizona Fish and Game Department, Phoenix, Arizona.

<sup>6</sup> Hillis, J. M., M. J. Thompson, J. E. Canfield, L. J. Lyon, and T. N. Lonner. 1991. Defining elk security: The Hillis paradigm. In Proceedings elk vulnerability symposium, eds. A. G. Christensen, L. J. Lyon, and T. N. Lonner, 3 8-43. Bozeman, Montana: Montana State University.

motorized route and greater than 660 meters from the nearest non-motorized route (excluding administrative access only routes).<sup>7</sup>

Another significant factor for the quality of habitat in this area is wildfire. In 2017, the Rice Ridge Fire burned more than 160,000 acres of elk summer range primarily in the Lolo National Forest. The next year, a study by the University of Montana, USFS, and Montana Fish, Wildlife and Parks examined the fire's effect on vegetation quality as it related to elk nutrition.<sup>8</sup> The findings showed that burned areas produced a net gain in forage quality on elk summer range from the



**Figure 1. Seasonal locations of collared adult female elk in the Blackfoot-Clearwater study area in west-central Montana between December 2018 and May 2020. Seasons are defined as winter (December-February), spring (March-May), summer (June-August), and fall (September-November).**

months of May to August as compared to non-burned summer habitat during these same months. As the frequency and size of fires increase on both elk summer and winter ranges, the vegetative response to these fires will significantly impact elk and other big game populations.

<sup>7</sup> Wisdom, M. J., H. K. Preisler, L.M. Naylor, R.G. Anthony, B.K. Johnson, M.M. Rowland. 2018. Elk response to trail-based recreation on public forests. *Forest Ecology and Management* 411 (2018) 223-233. <https://doi.org/10.1016/j.foreco.2018.01.032>

<sup>8</sup> Montana Fish, Wildlife and Parks, Montana State University, Evaluating Elk Summer Resource Selection and Application to Summer Range Habitat Management, February 2016, <https://arc.lib.montana.edu/ojs/index.php/IJS/article/view/716>

2. *Mission Mountains/Rattlesnake Herds*: Hundreds of elk calve and summer in the Rattlesnake Creek watershed and the high-elevation habitats of the Mission Mountains, which lie within the Lolo National Forest and the Flathead Indian Reservation, as well as HDs 201 and 285. As snow accumulates on the eastern and southern sides of the Mission Mountains, elk move out of the high country and migrate onto the lower-elevation open slopes and grasslands—both public and private land—of the Swan, Blackfoot, and Clark Fork River Valleys. The Rattlesnake herds move east into the Gold Creek drainage and south onto the open hillsides on the northern edge of the Missoula Valley, including slopes above Butler and Grant Creeks, Mount Jumbo, and Woody Mountain. Threats to these migration routes and winter ranges include invasive plants—especially in heavily roaded former corporate timber lands—the fragmentation and development of low-elevation winter ranges in the North Hills, and increased pressure from dispersed winter and summer recreation in the Marshall and Woody Mountain areas.
  
3. *Lower Clark Fork/I-90 Corridor Herds*: Large numbers of elk calve and summer in the higher elevations of the Lolo National Forest on both sides of the Interstate 90 highway corridor that spans 30 miles from Rock Creek west to Missoula, as well as west of Missoula to the Idaho border. In the lower stretches of the Clark Fork Valley from Missoula to Lookout Pass, wintering elk in HDs 200, 201, and 202 migrate to lower-elevation winter ranges on national forest and private lands on both sides of Interstate 90. These important winter ranges—occurring primarily east of St. Regis and including Boyd Mountain, Henderson Hill, Coal Creek, Dry Creek, Tarkio, Fish Creek, and Ninemile—all provide low-elevation movement corridors and winter habitat. Threats to these migration routes and winter ranges include declining habitat quality due to fire suppression and invasive plants, wildlife-vehicle collisions, the physical barrier presented by I-90, unauthorized motorized recreation, and the fragmentation and residential development of low-elevation winter ranges. Examples of unauthorized OHV use occur on the Superior Ranger District in Mineral County. These areas include Mudd Creek Road east of St. Regis, important elk winter range around Ball Hill, and the Packer Creek area north of Haugan.<sup>9</sup>

### ***Mule Deer***

The Lolo National Forest provides extensive habitat for mule deer in western Montana. Typical habitats in the Lolo NF consists of mixed grassland, shrub land, sagebrush steppe, ponderosa/Douglas fir canopies, mid-elevation canyons, and rock outcroppings. Populations remain stable in some areas of the forest, while other parts of the forest have seen reductions in habitat quality with accompanied reductions in populations. Overall population estimates in Montana Fish, Wildlife and Parks Region 2—which includes most of the Lolo NF—have seen a 27-percent population decline in long-term averages from 2011 to 2021, with an estimated region-wide population of just over 13,800 animals.<sup>10</sup> The cause of population decline can be complex, and there is usually more than one contributing factor. Threats to these migration routes and habitats that can also impact population numbers include poor forage conditions because of invasive plants and/or conifer encroachment, competition for limited forage, predation, and the fragmentation and development of winter ranges.<sup>11</sup>

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<sup>9</sup> Personal conversation, Acting District Ranger, Superior Ranger District, USFS, March 2022.

<sup>10</sup> Montana Fish Wildlife and Parks Region 2, Technical Bulletin, October 2021.

<sup>11</sup> Knight, Jim. Extension Wildlife Specialist, MSU, Mule Deer Management for Landowners.

According to Montana FWP's *The Economics of Big Game Hunting in Montana*, big game hunting in the three counties of the lower Clark Fork Valley (Missoula, Mineral and Sanders) generates over \$27 million annually in economic activity. Both elk and mule deer utilize migration routes to move between seasonal ranges and often inhabit overlapping winter ranges. For example, mule deer move out of the higher-elevation Rattlesnake Wilderness and National Recreation Area to lower-elevation winter ranges in the lower Rattlesnake Creek area within the NRA, and the Mount Jumbo and Woody Mountain areas. In the lower Clark Fork, deer similarly move down Deep Creek and Dry Creek to winter along the Clark Fork River. Critically important is the 35,000-acre Fish Creek Wildlife Management Area acquired by Montana FWP in 2010. Populations of mule deer that summer within the Hoodoo Roadless Area on the Lolo NF near the Idaho border utilize important grassland and shrubland winter ranges within the Fish Creek drainage, which also provides riparian habitats and connectivity between the Ninemile Valley and Bitterroot Mountains.

Prescribed fire and other vegetation treatment activities have been shown to increase both forage quality and quantity for mule deer. During 2020 and 2021, the Forest Service and numerous non-profit organizations funded vegetation management projects to improve mule deer habitat and other big game winter ranges. Prescribed fires were used to treat 1,500 acres on the Ninemile and Superior Ranger Districts to reduce conifer encroachment and stimulate the growth of browse and native grasses. These projects also included installing wildlife-friendly drop-down fencing to enhance deer and elk movement between private and public lands in the Frenchtown-Huson area west of Missoula.

### ***Bighorn Sheep***

Huntable populations of bighorn sheep provide some of the most coveted permits available, and the Lolo National Forest includes habitat for both stable and recovering bighorn sheep populations. In 2018, over 19,000 Montana residents applied for a ram license; only 111 of those applicants were successful.

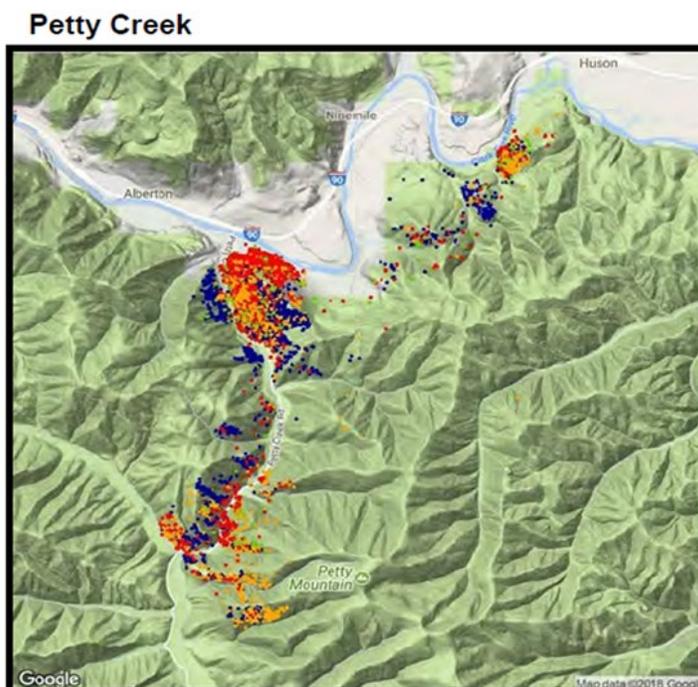
Huntable populations of bighorn sheep in the Lolo NF occur in the Rock Creek, Paradise-Thompson Falls, and Petty Creek areas, while a recovering herd is found near Bonner Mountain. The Bonner herd, while considered non-migratory, moves between nearby seasonal ranges on Sheep Mountain, Wisherd Ridge, and Woody Mountain. They also cross Highway 200 to Bonner Mountain.

Two separate herds inhabit the Rock Creek drainage. The lower Rock Creek herd (HD 210) numbers around 150 animals. This population remains within the lower stretches of Rock Creek and will winter in the lower elevations near the creek bottom and move up into the timbered slopes and open grasslands in the summer. The upper Rock Creek herd numbers around 300 animals and inhabits the east side of upper Rock Creek, with some sheep moving east into upper Willow Creek in the winter months.

The Petty Creek Herd is considered non-migratory and is estimated to be 130 to 150 animals (map below). As of 2022, three either-sex licenses were available annually. One-hundred percent of these tags are typically filled each year, and many of the rams harvested are trophy-class. While the seasonal movements of bighorn sheep in these areas are not as extensive as elk or mule deer, they similarly utilize specific seasonal habitats to complete their lifecycle. Threats to bighorn sheep and their habitats include successional changes in vegetation, human development and disturbance, vehicle collisions, disease transmission from domestic livestock, and genetic bottlenecks.<sup>12</sup>

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<sup>12</sup> Montana Big Horn Sheep Conservation Strategy, January 2010.



**Figure 2. Spring, summer, fall, and winter locations of collared ewes in the Petty Creek herd.**

One of the more notable examples of bighorn sheep mortality in Montana is the risk of motor vehicle collisions, including along the Montana Highway 200 corridor near Thompson Falls. The Paradise-Thompson Falls herd numbers around 150 to 200 animals, and they spend the winter months in the lower elevations along the Clark Fork River valley and move to higher elevations above the valley in the summer months.

Between 1985 to 2019, wildlife managers documented approximately 500 sheep killed by automobiles and trains, mostly within a two-mile stretch.<sup>13</sup> In 2013, the Montana Department of Transportation approved a project to construct fencing and crossing structures to reduce vehicle-wildlife collisions along Highway 200, east of Thompson Falls. The project resulted in significant reductions of vehicle-wildlife collisions.

The example of the U.S. 93 corridor, as it crosses the Flathead Indian Reservation, demonstrates the effectiveness of efforts to mitigate the threat of wildlife-vehicle collisions. At the time of its reconstruction, which began in 2010, this stretch of highway became one of the most extensive wildlife-friendly highway designs in North America.<sup>14</sup> Follow-up studies showed that the installation of over- and underpasses, road signs, and fences that funnel wildlife to safe crossings reduced wildlife-vehicle collisions by approximately 70 percent.<sup>15</sup>

<sup>13</sup> Long, Ben. Outdoor Life Magazine, August 2019.

<sup>14</sup> Montana Department of Transportation US-93, 2015 <https://www.mdt.mt.gov/pubinvolve/us93info/wildlife-crossings.aspx>

<sup>15</sup> Montana Department of Transportation, Review of Proposal Bighorn Sheep Mitigation Measures Along Highway 200, Thompson Falls, MT, May 2013.

**Appendix A and B** show important big game migration routes, critical winter ranges, and priority watersheds in the Lolo National Forest.

### BITTERROOT NATIONAL FOREST

The Bitterroot National Forest encompasses 1.6 million acres of public land, half of which lies within the largest complex of federally designated Wilderness in the lower 48 states: the Selway-Bitterroot and the Frank Church-River of No Return Wilderness areas. The Bitterroot NF is generally located along Montana's western border with Idaho, stretching from U.S. Route 12 on the forest's northern boundary to the south at the highest reaches of the Bitterroot watershed. The Bitterroot Mountain Range runs north and south on the west side of the Bitterroot Valley, while the Sapphire Range runs north and south on the east side of the valley, connecting with the Anaconda-Pintler Range to the southeast. The Bitterroot Valley bottom has and is experiencing considerable human development pressure and resulting fragmentation.

Like the Lolo National Forest, the Bitterroot National Forest provides habitat for significant populations of elk, mule deer, and bighorn sheep. Most of these populations rely on migration corridors and specific winter ranges to complete their lifecycles by moving between seasonal ranges. Below are descriptions of the more significant populations and seasonal movements of big game animals within and across the Bitterroot NF, as well as the threats facing these populations.

#### ***Elk***

1. *Sapphire herds*: Elk that calve and summer in the Sapphire Mountains migrate west to winter on the grassland/sagebrush slopes on the eastern benches of the Bitterroot Valley throughout Hunting Districts 204, 216, and 261, and the northern portions of Hunting District 240, which is located on the western side of the valley. This stretch of winter range runs along U.S. Route 93 between the communities of Lolo to the north and Darby to the south. The largest number of elk generally winter on the east side of the highway but will cross the roadway to utilize habitat on the west side as well. Larger wintering populations tend to congregate around Davis Creek, Eight-Mile (MPG Ranch), Burnt Fork, and Lower Willow Creek. These winter ranges include both public lands within the Lolo National Forest and adjacent state lands and private ranches. Threats to these migration routes and winter ranges include invasive plants, conifer encroachment, roadway barriers, vehicle collisions, and the fragmentation and development of open hillsides. Residential development and associated winter range fragmentation are of particular concern in the foothills and valleys east of the communities of Florence, Stevensville, and Hamilton along the base of the Sapphire Mountains.
2. *East Fork herds*: The East and West Forks of the Bitterroot River are the headwaters for the main stem of the Bitterroot River and provide excellent big game habitat. The East Fork herd has historically higher populations. The East Fork watershed tends to hold less snow, more open winter ranges, and more productive grass and shrub communities than the West Fork. Surveys conducted in 2021 counted 4,052 elk in Hunting District 270, which has one of the largest elk populations in western Montana. Approximately 2,000 elk winter within the CB Ranch and French Basin areas. During the 2020 general rifle season, the FWP check station

- at Darby documented more than 4,000 hunter trips, 2,500 of which were to HD 270. Many elk in the East Fork migrate up through the headwaters and over the Continental Divide to the high-elevation summer ranges of the Anaconda-Pintler Range in the Big Hole River watershed, where habitat is managed by the neighboring Beaverhead Deerlodge National Forest. Many of the elk that summer north of Highway 43, north and west of Wisdom (HD 321), will migrate back into the East Fork to winter. Threats to these big game populations, migration routes, and winter ranges include invasive plants, conifer encroachment, degraded grasslands, predation, and the fragmentation and development of private lands.
3. *West Fork herds*: Elk habitat in the steeper, wetter, and more heavily timbered West Fork of the Bitterroot watershed falls within HD 250. In 2021, surveys counted 806 elk in this area, fewer than one-quarter of the number of animals found that year in the East Fork. As with the Sapphire elk herds, these elk summer in higher elevations of the Bitterroot National Forest and then migrate down to the open slopes near the valley bottom, primarily on private ranches. Threats to these big game populations, migration routes, and winter ranges include invasive plants, conifer encroachment, a lack of disturbance, degraded grasslands, predation, and the fragmentation and development of private lands. Between 2005 and 2009, elk surveys showed severe declines in elk numbers and recruitment, particularly in the West Fork of the Bitterroot in HD 250. An ensuing study completed in 2014 showed that suboptimal habitat and predation, primarily by mountain lions, had contributed significantly to reduced adult elk survival and calf recruitment.<sup>16</sup>

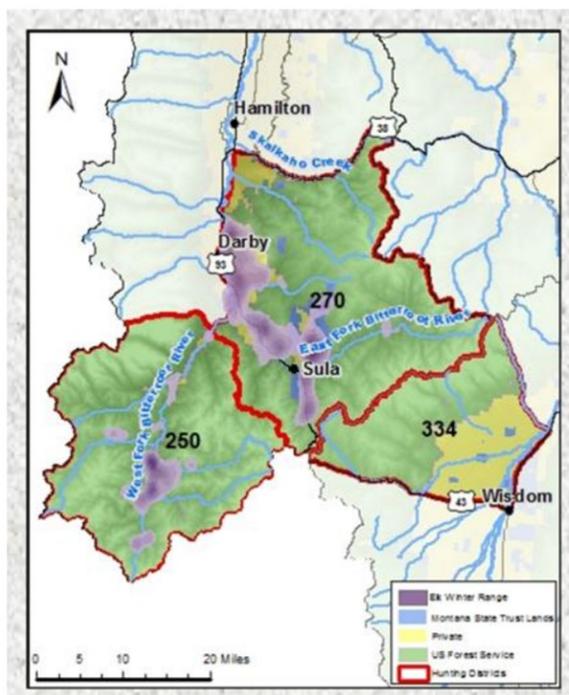


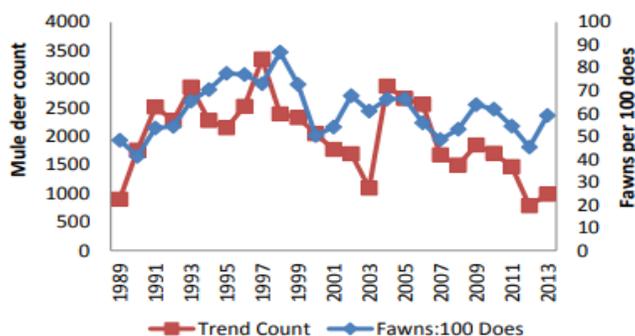
Figure 3. Elk winter ranges in the West Fork and East Fork of the Bitterroot Valley during 2011-2013.

<sup>16</sup> Montana Fish Wildlife and Parks, Bitterroot Elk Study, February 2016.

## Mule Deer

The Bitterroot National Forest provides extensive habitat for mule deer in western Montana. Populations remain stable in some areas of the forest while trending down in other areas. As mentioned previously, total population estimates in Montana FWP Region 2 have shown a decline of 27 percent over the past 10 years. Hunting Districts 204, 250, 262, 261, 270, and the southern portions of 240 are all popular mule deer hunting districts. Like elk populations in the region, mule deer provide hunting opportunities that generate economic activity in surrounding communities. According to Montana FWP's *The Economics of Big Game Hunting in Montana*, big game hunting generates \$8.9 million annually in Ravalli County. Mule deer hunting permits in HD 270 are the most highly coveted antlered buck permits in the state of Montana. Last year, 8,500 hunters applied for 45 available permits.<sup>17</sup> HDs 262 and 261 also offer highly coveted hunts. During the summer months, mule deer generally inhabit the higher-elevation timbered lands in the Sapphires and in the winter months they move down to lower-elevation grasslands on the Three Mile and Calf Creek Wildlife Management Areas as well as other winter ranges on private land around Burnt Fork of the Bitterroot River and Dry Creek. Private lands on and around the MPG Ranch in HD 204 also provide important winter range. Mule deer utilize migration routes to move between seasonal ranges and often utilize similar winter range habitats as elk. French Basin in HD 270 is of particular importance to both elk and deer. In some instances, smaller populations of mule deer may remain year-round in the same general locations, including in HD 262.

Threats to Bitterroot NF mule deer migration routes and winter ranges include invasive plants, conifer encroachment resulting in poor forage conditions, and the fragmentation and development of winter ranges. In response to recent declines in mule deer populations in the Bitterroot Valley, Montana FWP initiated a study of adult female survival to better understand the factors contributing to population declines. Early findings suggest that fawn survival may not be at the root of the problem and that the adult does that were captured and examined proved to be in generally poor physical condition, suggesting that habitat degradation and/or competition for forage with elk and/or livestock may be contributing factors to poor body condition.<sup>18</sup>



**Figure 1. The number of mule deer counted and the number of fawns per 100 does counted in the southern Bitterroot survey area (HD 270) from 1989 - 2014.**

<sup>17</sup> Mowry, Rebecca. Montana Fish Wildlife and Parks, Personal Communication, August 2021.

<sup>18</sup> Montana Fish Wildlife and Parks, Bitterroot Mule Deer Survival in the Bitterroot Valley Progress Report, Spring 2016, <https://fwp.mt.gov/binaries/content/assets/fwp/conservation/wildlife-reports/deer/bitterroot-mule-deer-project-progress-report---spring-2016.pdf>

## ***Bighorn Sheep***

The Bitterroot National Forest provides habitat for both stable and recovering bighorn sheep populations. Stable populations of bighorn sheep occur in locations such as Skalkaho Pass (HD 261), Painted Rocks (HD 250), and the East Fork of the Bitterroot (HD 270). The Skalkaho herd numbers around 80 animals. This unit provides sheep habitat on the state-owned Calf Creek WMA and has a high percentage of private land (>50%). The Painted Rocks/Watchtower herds utilize winter ranges in the Selway River drainage and the Painted Rocks Reservoir. These sub-herds total about 120 animals. While the movements of bighorn sheep across the landscape are typically not as extensive as those of elk or mule deer, herds in the Bitterroot utilize migration routes and seasonal ranges to complete their lifecycle. The largest and most mobile of these three herds is the East Fork herd, which numbers around 200 animals. In 2019, a collared ram in the East Fork moved 15 miles into the higher-elevation habitats near the divide before returning to its traditional ranges. Important winter ranges for this herd include the southwest facing slopes of Sula Peak, Robbins Gulch, and Spring Gulch. While many of the ewes and young rams remain in these areas for the summer, many of the mature rams move to habitats near Fish Lake Hope Lake and Charity Lake.<sup>19</sup> Threats to bighorn sheep and their habitats include successional changes in vegetation, human development and disturbance, predation in lambing areas, vehicle collisions, disease transmission from domestic livestock, and genetic bottlenecks.

**Appendix C** shows the significant big game migration routes, critical winter ranges, and priority watersheds in the Bitterroot National Forest.

**Appendix D** shows the population status of bighorn sheep in Montana and the various threats to these populations.

## **USFS PLANNING DIRECTIVES AND MIGRATION**

The 2012 National Forest System Land Management Planning Rule provides direction to the U.S. Forest Service to manage national forest system lands, provide for ecological sustainability, and contribute to economic and social sustainability. The conservation of big game migration corridors and seasonal habitats contributes to each of these goals. Intact habitat utilized by migrating big game supports multiple species and increases the resiliency of forests. Hunting of big game species within national forests contributes to the economic sustainability of many, mostly rural, communities and is important for quality of life and social sustainability in those communities.

There are a number of specific elements of the Rule that directly support the inclusion of management direction for the conservation of migrating big game. Specifically:

- The Rule sets expectations that new forest plan revisions will maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watershed within the plan area, including maintaining or restoring structure, function, composition, and connectivity (§ 219.8).
- The Rule requires taking into account how the plan area contributes to ecological conditions within the broader landscape (§ 219.8(a)(ii)), how conditions within the broader landscape may influence sustainability within the plan area (§ 219.8(a)(iii)), opportunities for landscape scale

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<sup>19</sup> Montana Big Horn Sheep Conservation Strategy, January 2010.

restoration (§ 219.8(a)(vi)), and opportunities to coordinate with neighboring landowners to link open spaces and consider joint management objectives (§ 219.10(a)(4)).

- The Rule requires that plans maintain the diversity of plant and animal communities and the persistence of native species in the plan area (§ 219.9). When the USFS cannot provide the conditions to maintain a viable population of a species of conservation concern within a plan area, the Rule requires contributing to maintaining the species within its range, in coordination with managers of other lands relevant to that population (§ 219.9(b)(2)).
- The Rule requires consideration of habitat conditions for species used by the public for hunting, fishing, trapping, gathering, observing, subsistence, and other activities (§ 219.10(a)(5)). The Rule directs the USFS to collaborate with federally recognized Tribes, Alaska Native Corporations, other federal agencies, and state and local governments when developing plan components to provide for habitat for species used and enjoyed by the public (§ 219.10(a)(5)).
- The USFS is also directed in the Rule to consider the plan area's role and contribution within a broader landscape (§ 219.7(f)(1(ii))), which is relevant for forests where migration corridors and seasonal habitats span multiple land ownerships and where the plan area plays an important role in the context of the broader landscape.

Further, a letter signed by the USFS Deputy Chief and delivered to USFS Regions 1, 2, 3, 4, 5, and 6 in October 2020 recognized “the importance of National Forest System lands to a wide array of species that depend on them for safe and key migration corridors,” and stated that “broad-scale planning should consider the impacts of agency actions on these important habitats.”

#### CONSERVATION RECOMMENDATIONS

Therefore, as the Lolo and Bitterroot National Forests work through the Assessment and Plan Revision stages of their respective planning processes, we offer the following conservation recommendations for consideration and adoption:

- Utilize GPS collar data and credible anecdotal information about big game movement across the forests—including high-priority migration routes and winter ranges—and establish management areas to provide consistent management direction and conservation for these habitats across the planning area.
- Develop standards and guidelines to manage open road and trail densities at or below determined levels, maintain habitat function, manage invasive species, and require the addition of wildlife passages or wildlife-friendly design components for existing and new infrastructure. This includes establishing seasonal restrictions on certain uses to avoid impacts on big game at key stages in their lifecycles, as well as actively managing both motorized and nonmotorized recreation.
- Collaborate with other federal and state agencies, Tribes, and local governments when developing plan components for habitat used by big game species. Specifically, the USFS should work with the Montana Fish, Wildlife and Parks and reference the agency's mule deer and sheep management plans, as well as its elk management plan currently under revision.
- Prioritize strategic land acquisitions that connect and conserve seasonal habitats, reduce habitat fragmentation, and consolidate management—in conjunction with private, county, state, and Tribal land conservation efforts—to protect important winter ranges that are threatened by development.

- Prioritize vegetation treatments to improve forage quality and reduce conifer encroachment on open grassland meadows, brush fields, and winter ranges. In addition, the plan should specify that livestock grazing in known bighorn sheep ranges should be managed to prioritize maintenance of overwinter forage for bighorn sheep.
- Establish management areas for backcountry conservation to protect habitat security for big game in large blocks of summer range and transitional ranges and to provide for semi-primitive nonmotorized recreation, including hunting and fishing. Incompatible development activities should be restricted and active habitat restoration should be directed, both to restore wildlife habitat and ecosystem function and to facilitate climate resilience and adaptation.

## CONCLUSION

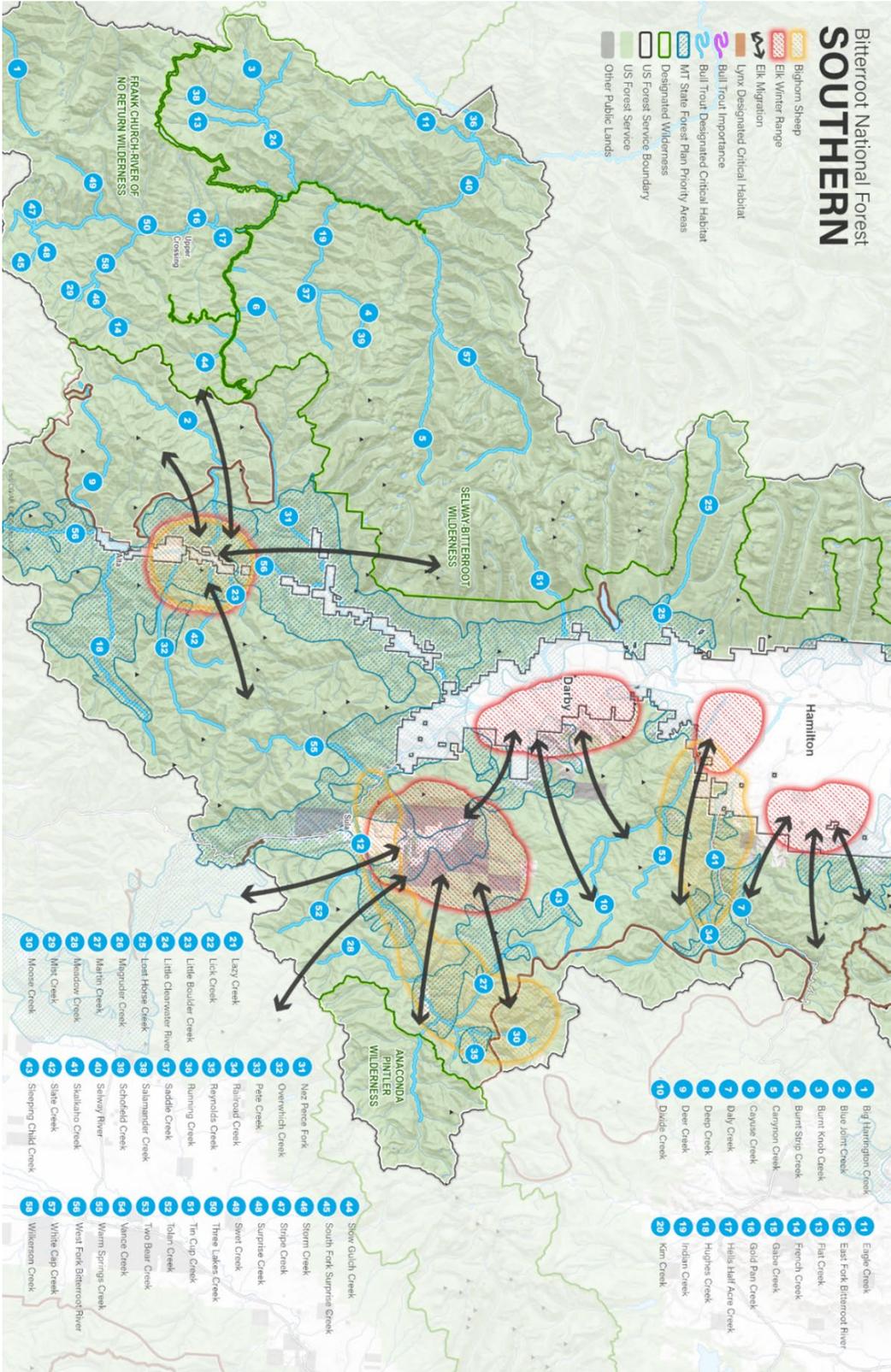
Land-use plans written 35 years ago cannot adequately provide for the conservation of big game habitats on the rapidly changing landscape of western Montana. A seemingly limitless demand for outdoor recreation opportunities, the growing presence of noxious weeds, and the impact of decades of fire suppression and warming conditions on forest health are putting new pressures on wildlife and habitat. Simultaneously, exploding exurban development continues to fragment winter and transitional ranges for elk and deer on private lands.

Fortunately, new research on migration corridors and winter ranges, a greater understanding of wildlife habitat needs, and policies have been created that provide meaningful opportunities to conserve and restore these habitats. The TRCP hopes that this report will serve as a resource that can be utilized by the Lolo and Bitterroot National Forests to inform the planning assessment processes and help the agency set meaningful planning objectives, standards, and guidelines that conserve and restore these important migratory, winter range, and other seasonal habitats for decades to come.

For more information, contact:

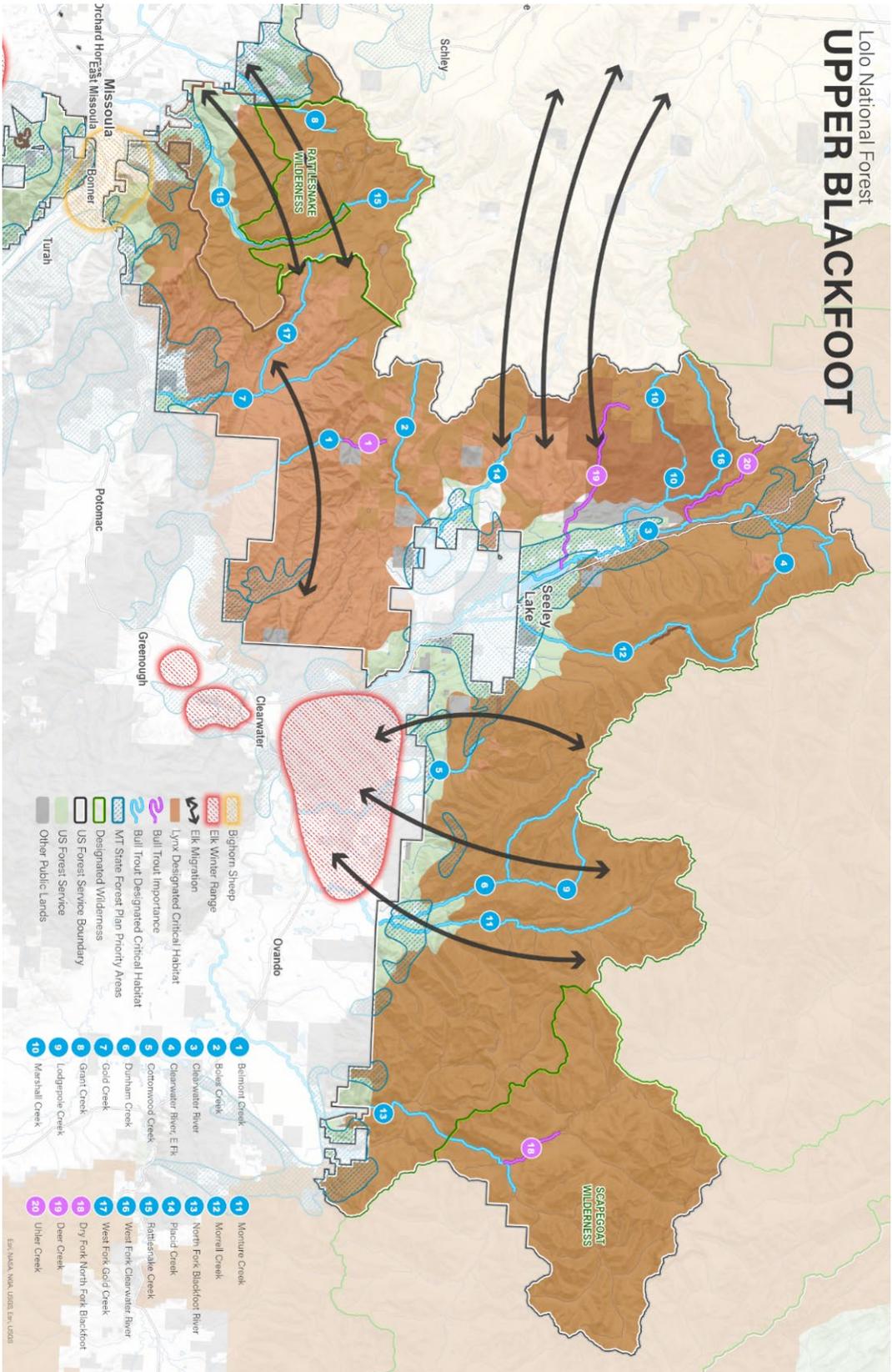
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APPENDIX A





APPENDIX C



## APPENDIX D

Table 1. Population state of bighorn sheep by hunting district and various threats to

Herd Unit Name	H.D.	Threats to Population											
		Predation	Dom. Sheep	Weed Control/Dom.	Hobby Sheep	3/ Human Develop	Road Kills	Conifer Encroachment	Small Range Size	Noxious Weeds	ATV's	Wildlife Competition	Social Limits
Kootenai Falls	100				X	X	X	X					
Ural-Tweed	101							X					
Galton Range	102		X					X		X			
North Clark Fork	121				X		X	X					
Clark Fork Cut-Off	122				X		X	X		X			
Cabinet Mountains	123				X		X	X		X			X
Paradise	124				X		X	X		X			
Wildhorse Island								X		X			
Grave Creek Range	203				X	X	X	X		X	X		
John Long Range	210		X			X	X	X		X			
Garrison	212		X	X		X		X		X			
Lost Creek	213		X	X	X	X		X		X			
West Rock Creek-Quigg Peak	216			X	X			X		X			
Watchtower	1/							X		X			
Paint. Rocks	250		X							X			
Skalkaho	261		X		X	X	X	X		X	X		
E. Bitterroot	270		X		X	X	X	X		X			
Lower Blackfoot	283			X	X	X	X	X		X			X
2/ Gallatin-Yellowstone	300					X							
Spanish Peaks	301		X			X	X	X			X		
Hilgard	302		X	X			X					X	
South Absaroka	303												
Hyalite	304												
South Yellowstone	305												
Tendoy Mountains	315		X			X							
Highland Mountains	340				X	X	X	X		X			

## APPENDIX D

Table 1 cont.

Herd Unit Name	H.D.	Threats to Population											
		Predation	Dom. Sheep	Weed Control/Dom.	Hobby Sheep	Human Develop	Road Kills	Conifer Encroachment	Small Range Size	Noxious Weeds	ATV's	Wildlife Competition	Social Limits
Radersburg	380		X			X				X			
Sleeping Giant	381		X			X	X			X			
Mill Creek													
Greenhorns			X										
Deep Creek	421												
Castle Reef	422												
Gibson Lake North	423												
Ford Creek	424												
North Fork Birch Creek-Teton	441									X			
Fergus	482												
Beartooth WMA-GMWA	455		X		X					X			
Stillwater River									X		X		
Monument Peak	500												
Beartooth Mountains	501								X		X		
Hellroaring	502												
Pryor Mountains	503		X	X								X	
Little Rockies	620												
Middle Missouri Breaks	622												
Chouteau-Blaine-Phillips	680												
Blue Hills			X	X									

1/ The Watchtower and Painted Rocks subunits have separate winter areas but do have interchange and are considered one population.

2/ Population objectives for the Upper Yellowstone Complex is for a total of 215 bighorn sheep and includes sheep in Hunting Districts 300, 303, 304 and 305.

3/ Human developments include residential and industrial development.