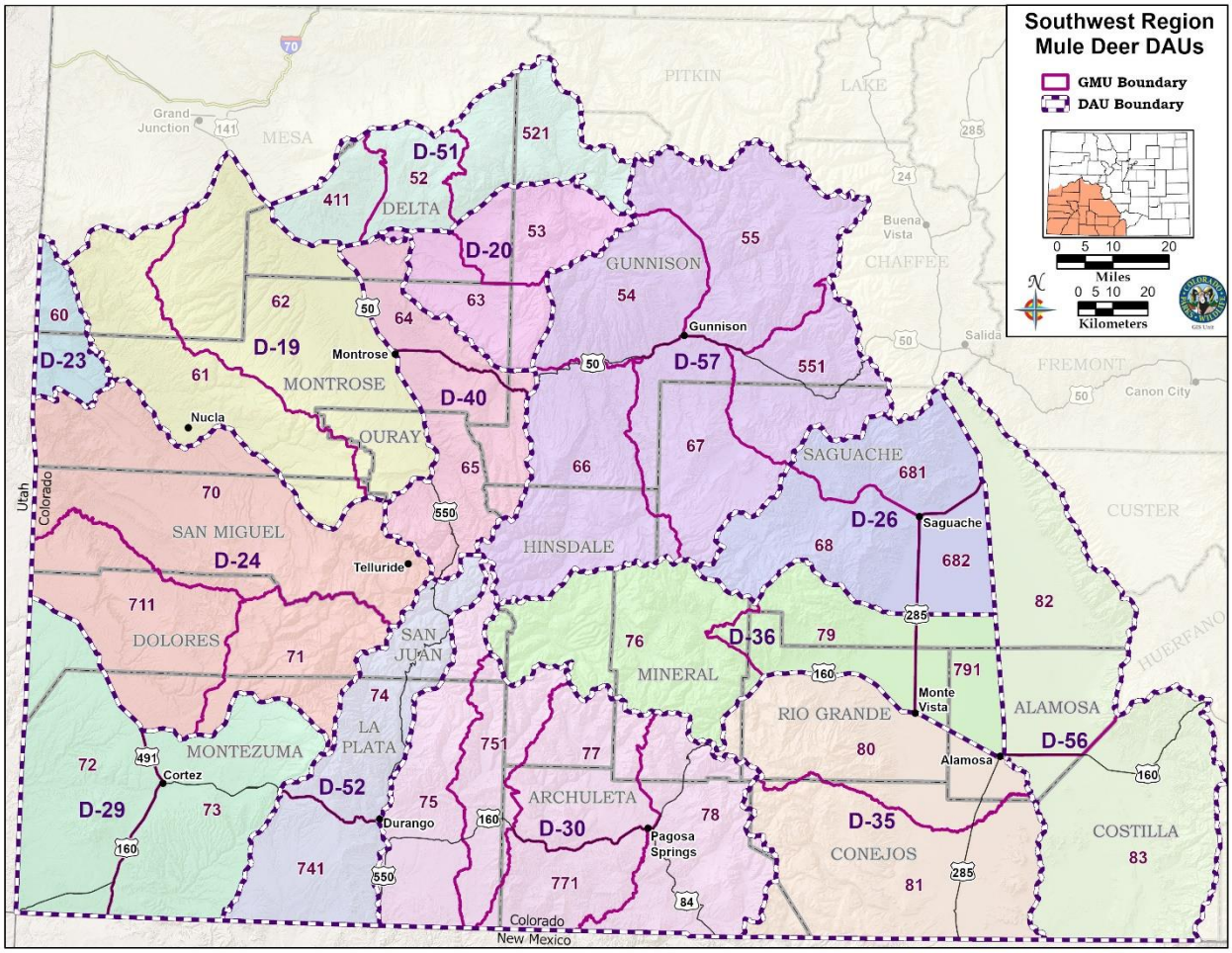
# DRAFT Mule Deer Herd Management Plans

# Colorado Parks and Wildlife

# Southwest Region




PREPARED FOR
COLORADO PARKS AND WILDLIFE

BY
SOUTHWEST REGION WILDLIFE BIOLOGISTS

*This plan was approved by the Colorado Parks and Wildlife Commission on Month Date, 2024*

# Executive Summary

Colorado's mule deer populations are iconic and known throughout the United States and the world. Today, Colorado maintains a herd of approximately 400,000 mule deer, the largest population in North America. However, mule deer populations in Colorado and throughout the western United States have steadily declined since the 1960s and 1970s, likely numbering less than half of historic highs. As recently as 2006, Colorado is estimated to have sustained a mule deer population of approximately 600,000 animals. Wildlife biologists, researchers, landowners and land management agencies, hunters, and wildlife watchers have put considerable resources and effort into maintaining mule deer populations in recent decades in an effort to mitigate growing and increasing threats to healthy mule deer populations and wildlife habitat in Colorado and across the western United States.

Hunting and angling, and other wildlife-related recreation, contribute over $5 billion annually to Colorado's economy. Funds generated by big game hunting license sales are used in the conservation of Colorado's wildlife in numerous ways, including habitat improvement and conservation projects that benefit a diversity of species. However, mule deer populations face significant ongoing and often growing threats, including habitat loss and fragmentation to development on public and private lands, increasing recreation pressure and recreational development, traditional and renewable energy development and production, highways and fencing bisecting migration routes, conflict with agricultural interests, disease, and decline in habitat quality related to invasive weeds replacing preferred forage plants, persistent drought, and climate change. All of these threats are compounded by booming human population growth across Colorado. These challenges present mule deer and wildlife managers with an uncertain future as we work to manage and conserve mule deer populations, other wildlife, minimally fragmented and secure wildlife habitats, and naturally functioning ecosystems for generations to come.

Mule deer have been widely studied in Colorado and elsewhere. CPW has taken numerous measures to attempt to understand and slow down population declines and has implemented long-term mule deer monitoring studies in five herds across the state (including the D-19 Uncompahgre Plateau and D-57 Gunnison Basin herds in southwest Colorado) to monitor annual adult doe survival and over-winter fawn survival annually since 1997. The state has conducted numerous studies to understand the relationship between habitat and predators on mule deer populations. We have completed thousands of acres of conservation easements to protect private lands from development. The state also developed a West Slope Mule Deer Strategy in 2014, which incorporated public input to guide the stabilization and recovery of deer populations that would, in turn, increase hunting and other wildlife-related recreation opportunities in the state. Following the guidance of the mule deer strategy, funds have also been made available and matched, to improve habitat across large parts of western Colorado. All of the efforts have contributed significantly to mule deer conservation and management and to the benefit of other species using similar habitat types. Through all of the monitoring efforts, research, and public input, CPW staff have identified issues impacting deer populations and herd health in southwest Colorado. In addition, CPW and partnering organizations have initiated thousands of conservation easements to protect private lands from future development. CPW and partner organizations are also continually engaged with federal and state land management agencies and private landowners to promote habitat improvement projects that benefit deer and other wildlife species. These ongoing efforts help

ensure a future for deer and other wildlife in Colorado. Conservation of Colorado's big game herds and overall wildlife habitat protection are among CPW's highest priorities[1].

The Herd Management Plans (HMPs) contained in this document will guide the management of 14 mule deer herds occurring in the Southwest Region for a 10-year period through 2034. In sum, these 14 deer herds contain an estimated 130,000 animals, representing 33% of the statewide total population estimate of 400,000 deer. Of the 14 draft HMPs contained herein, CPW staff are proposing extensions of recently approved management objectives for six of them. HMP extensions are recommended when CPW staff believe a continuation of the previous objectives, course of management actions, and strategies are supported for a given herd. Therefore, we are not proposing any changes to the objectives or management approach for six of these HMPs, all approved by the Parks and Wildlife Commission within the last few years. Extensions have reduced public levels of involvement compared to full HMP revisions, as those processes were recently completed. CPW proposes revising HMPs for the remaining eight herds, which include new management objective alternatives, whose current management objectives are more than 10 years old (Table 1). Revisions include public involvement and may result in changes to any aspect of the plan including the numerical objectives (such as population and sex ratio objective ranges) and management approach (increasing, maintaining, or reducing). Therefore, CPW may modify the population objectives or management strategies.

Management objectives established in these plans must abide by statutes and policies set forth by CPW's Big Game Season Structure, CPW's Strategic Plan, the Parks and Wildlife Commission, and the Colorado State Legislature. The primary purpose of HMPs is to establish management objectives for each herd in terms of a desired population size range and observed sex ratio (bucks:100 does) range. The management alternatives selected in these plans will drive annual elk license-setting decisions. License-setting and the resultant annual harvest modulate elk population numbers to meet population and sex ratio objectives. Each plan also describes additional strategies and techniques that will be used to achieve the desired herd objectives. The goal for the ten-year term of these plans is to manage to the most appropriate population level within the objective range based on climatic patterns, habitat conditions, forage availability, and public desires. CPW may consider revisiting an HMP prior to the end of the ten-year term of the plan if outstanding circumstances arise and a revision is deemed necessary.

Local CPW staff have conducted extensive public and stakeholder outreach to inform the various proposed management objective alternatives for each HMP. Evaluation of newly available optional hunter satisfaction data from annual hunter harvest surveys, as well as meetings with the public, local governments and organizations, and other stakeholders, have guided the development of these plans and management alternatives. In addition, the draft plan was posted on the CPW website and advertised with press releases from November 1, 2023 – December 15, 2023, for another public comment period to evaluate the proposed objective alternatives. The draft plan was presented to the Parks and Wildlife Commission on Month Date, 2024, for final review and comment, and was formally approved on Month Date, 2024.

[1] https://cpw.state.co.us/Documents/About/StrategicPlan/CPWStrategicPlan.pdf

**Table 1.** Population and management status of 14 mule deer herds occurring in SW Colorado.

| DAU | Mule Deer Herd | Current Herd Management Plan Approved | Current Population Objective | 2022 Post-hunt Population Estimate | Current Buck Ratio Objective | 3-Yr Avg Observed Buck Ratio | Proposed Population Objective | Proposed Buck Ratio Objective |
|---|---|---|---|---|---|---|---|---|
| D-19 | Uncompahgre Plateau | 2006 | 36,000-38,000 | 10,300 | 34-36 | 32 | 12,000-15,000 | 30-35 |
| D-20 | North Fork Gunnison River | 2018 | 7,500-9,500 | 8,700 | 33-38 | 34 | Extension | Extension |
| D-23 | La Sal | 2008 | 2,500-3,000 | 1,500 | 25-30 | 32 | 1,500-1,800 | 20-25 |
| D-24 | Groundhog | 2014 | 15,000-19,000 | 18,300 | 23-28 | 27 | 19,000-23,000 | 23-28 |
| D-26 | Saguache | 2019 | 5,500-6,500 | 5,500 | 26-29 | 29 | Extension | Extension |
| D-29 | Mesa Verde | 2014 | 5,500-7,000 | 9,300 | 23-28 | 30 | 9,000-12,000 | 23-28 |
| D-30 | San Juan Basin | 2020 | 23,000-27,000 | 22,700 | 25-30 | 31 | Extension | Extension |
| D-35 | Lower Rio Grande | 2018 | 5,500-6,500 | 6,800 | 23-25 | 30 | 6,000-8,000 | 25-30 |
| D-36 | Upper Rio Grande | 2022 | 2,200-2,800 | 2,600 | 23-28 | 29 | Extension | Extension |
| D-40 | Cimarron | 2022 | 6,500-8,500 | 6,900 | 25-30 | 23 | Extension | 22-27 |
| D-51 | South Grand Mesa | 2018 | 8,000-10,000 | 9,100 | 25-30 | 26 | Extension | Extension |
| D-52 | Hermosa | 2010 | 4,000-6,000 | 4,500 | 25-30 | 31 | Extension | Extension |
| D-56 | Sand Dunes | 2010 | 4,300-5,500 | 3,400 | 25-40 | 35 | 4,300-5,500 | 30-35 |
| D-57 | Gunnison Basin | 2013 | 15,400-16,900 | 18,900 | 35-40 | 45 | 17,000-20,000 | 35-40 |

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# Introduction and Purpose

Colorado Parks and Wildlife (CPW) manages big game for the use, benefit, and enjoyment of the people of the State following CPW's Strategic Plan (2015). Deer management is also determined by mandates from the Colorado Parks and Wildlife Commission (PWC) and the Colorado Legislature. Colorado's wildlife species require careful and increasingly intensive management to accommodate the many varied public demands and growing human impacts. CPW uses a "Management by Objective" approach to managing the State's big game populations (Figure 1).


**Figure 1.** Management by Objective process used by Colorado Parks and Wildlife to manage big game populations by Data Analysis Unit (DAU).

The Management by Objective approach provides a data-driven process to achieve population objectives established for each Data Analysis Unit (DAU) established by the Herd Management Plan (HMP). A DAU is a geographic area that includes the year-round range of a big game herd. The DAU includes the area where most animals in a herd are born, live, and die. DAU boundaries are delineated to minimize the interchange of animals between adjacent DAUs. The geographic area may be divided into several Game Management Units (GMUs) to distribute hunters and harvest within a DAU.

The primary purpose of HMPs is to establish population size and buck ratio (i.e., the number of males per 100 females) objectives for each DAU. The HMP also describes the strategies and techniques that will be used to reach these objectives. During the HMP planning process, CPW solicits and collects public input through questionnaires, public meetings, and comments to CPW staff and the PWC. CPW's mission as wildlife stewards is integrated with the concerns and ideas of various stakeholders, including the State Land Board (SLB), the Bureau of Land Management (BLM), the United States Forest Service (USFS), the Habitat Partnership Program (HPP), agricultural producers, city and county governments, hunters, guides and outfitters, private landowners, local chambers of commerce, the Southern Ute Indian Tribe (SUIT), the Ute Mountain Tribe (UMT), and the public. In preparing an HMP, agency personnel attempt to balance the biological capabilities of the herd and its habitat with the public's demand for

wildlife recreational opportunities. HMPs are approved by the PWC and are reviewed and updated approximately every 10 years.

The purpose of these HMPs is to set estimated population and observed buck ratio objectives for mule deer herds in southwest Colorado from 2024-2034, with the expectation that they will be reviewed and updated in 2034.

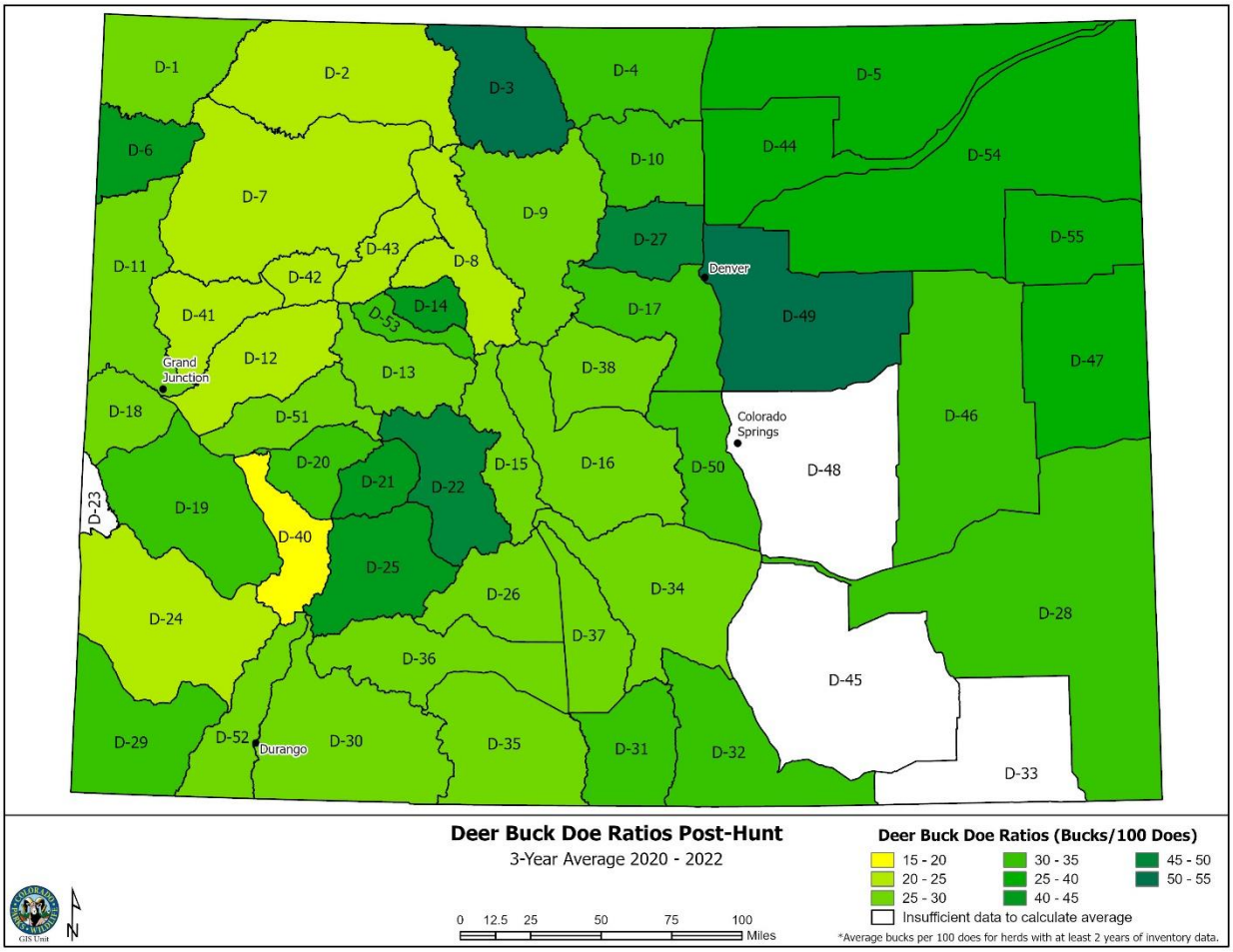



**Figure 2.** Average post-hunt (winter) buck:doe ratios for Colorado deer herds, 2018-2022.

## Common Management Issues and Strategies

Mule deer populations peaked most recently in the 1940s through the 1960s, sustained by irrigated agricultural fields and expansive landscapes, and have slowly but steadily declined since then. Historic populations in Colorado were likely more than double the current population estimate of 400,000 animals statewide. As recently as 2006, Colorado's mule deer population estimate was approximately 600,000 animals. These declining trends have generally occurred throughout the 14 deer herds existing in Colorado's Southwest Region. As one example, the D-19 Uncompahgre Plateau mule deer population has declined from approximately 60,000 deer in 1980 to an estimated 10,000 deer currently. The current

combined population estimate for the southwest deer herds is 130,000 deer. Mule deer declines in Colorado and across the western United States have been exacerbated by habitat loss due to anthropogenic changes to the landscape, including housing and energy development, increasing recreation pressure, and loss of connectivity and movement corridors. Noxious weed invasion replacing natural forage, drought, disease, competition with livestock and elk, and predation, are other important factors impacting mule deer populations. Wildlife enthusiasts, landowners, and hunters often support increases in population objectives. However, how many deer Colorado can support in the future, given current and expanding levels of anthropogenic disturbance and influence, is currently in question. In 2014, Colorado Parks and Wildlife completed the West Slope Mule Deer Strategy, which guides management decisions to help rebuild our mule deer populations. The Strategy states: Together with the public and stakeholders, CPW will work to stabilize, sustain, and increase mule deer populations in Western Colorado and, in turn, increase hunting and wildlife-related recreational opportunities. The West Slope Mule Deer Strategy outlined seven strategic priorities to address the many threats facing mule deer populations. To learn more, read Colorado's Mule Deer Story and Colorado's West Slope Mule Deer Strategy at: https://cpw.state.co.us/learn/Pages/CO-WestSlopeMuleDeerStrategySummit.aspx

CPW also has a long history of mule deer research in Western Colorado. For publications and more information, visit
https://cpw.state.co.us/learn/Pages/ResearchMammalsPubs.aspx

Habitat Availability and Quality

Mule deer abundance is ultimately limited by the availability and quality of habitat. The habitat available to mule deer in Colorado has changed significantly over the last century. However, the rate at which habitat loss has occurred within the last 50 years has accelerated considerably compared to the homesteading days of the late 1800s – early 1900s. Settlement of the West resulted in intensive livestock grazing through the 1930s that increased the size, density, and vigor of shrub communities in Colorado and increased the amount of habitat available to mule deer. These increases in habitat contrast greatly with the losses of mule deer habitat within the last 50 years. Changes in climate and weather patterns and the direct and indirect losses of mule deer habitat due to the growth of Colorado's human population have been driving factors in mule deer population trends.

Factors influencing habitat quality include extreme weather conditions, invasive noxious weeds, fire, shrub eradication, overgrazing, and fragmentation. Quality habitat allows an animal to physically access the biological components for survival, including nutritious vegetation for growth and sustenance and security cover for thermal protection and predator avoidance. Mule deer are selective feeders with a diverse diet. Functionally, a mule deer's digestive system depends upon high-quality forage and low consumption rates when compared to more generalist grazers, such as cattle and elk. Nutritional requirements for mule deer require various plant types including shrubs, forbs, and grasses, which vary across seasonal ranges.

Colorado's population increased from 1.3 million people in 1950 to 4.3 million people in 2000 to 5.8 million people in 2021. The human population on Colorado's western slope is projected to grow by another 67% between 2020 and 2050 (US Census Bureau, 2021), presenting increasing pressures on wildlife and the habitats they rely on. Increased housing developments, infrastructure, traffic, and recreation activities, come with a growing human population. Factors such as competition with livestock, fences, vehicle collisions, disease,

and predation all contribute to deer population declines; however, habitat loss and fragmentation stemming from residential, recreational, and industrial development - compounded by the long-term effects of human population growth and climate change - present the greatest risks to Colorado's deer population.

Mule deer habitat quantity has further been reduced by traditional and renewable energy exploitation in Colorado. There are currently over 37,000 producing natural gas wells in Colorado, compared to 5,125 in 1989. There are also three surface coal mines in Colorado. Oil shale exploration and oil wells are also expected to increase in the future. These activities reduce the amount of available habitat through pads, roads, pipelines, and open mine pits. Proposed renewable energy projects have increased significantly in the past several years, with a focus on utility-scale photovoltaic (PV) solar projects in Western Colorado. Of particular concern for big game species, the National Electric Code (NEC) requires that solar energy facilities be fenced for security purposes. This exclusionary fencing requirement results in a complete loss of habitat for big game and frequently creates a significant barrier to daily and/or seasonal movement patterns. When siting locations for utility-scale solar projects, developers typically seek areas close to existing electrical transmission lines and substations, flat topography, southern exposures, and limited forest canopy cover. Frequently, these landscape characteristics also represent high-quality winter range areas for big game in Western Colorado. Additionally, to avoid lengthy federal permitting processes, most of these proposed projects have been located on privately owned lands with 20 to 30-year lease agreements.

CPW intensively monitors annual adult doe survival and winter fawn survival in five Intensive Mule Deer Monitoring Areas (Figures 3 and 4). We also monitor buck survival in two of these herds. CPW annually monitors well over 1,000 radio-collared mule deer in the five monitoring areas, and annual survival rates from these herds are used in deer population models for the rest of the herds west of I-25. CPW conducts winter herd classification inventories with helicopters to estimate the sex ratios of males/100 females and the age ratios of young/100 females. Ratios of fawns/100 does are an index of annual fawn production and survival to December, which indicates the "fitness" of an individual herd. The ratio of mule deer fawns/100 does has declined slowly but steadily since the early 1970s. CPW continues to monitor and evaluate the factors influencing fawn and adult deer survival rates in Colorado; these factors include declining quality and availability of winter ranges due to human development and fragmentation, increasing recreation pressure on public-lands, noxious weed invasion replacing native forage, persistent drought that influences forage quality and hiding cover for fawns, disease, and predation.

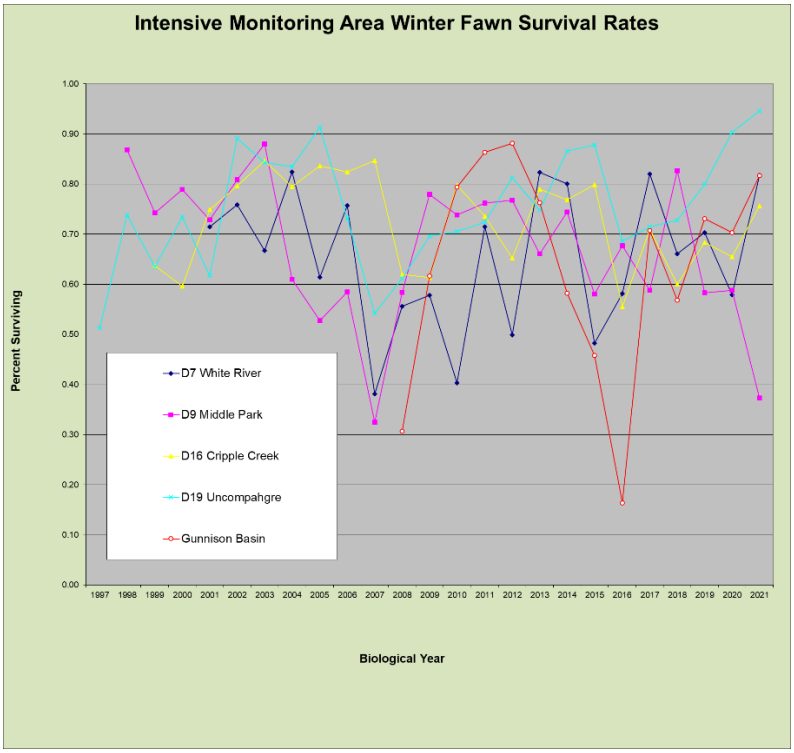



**Figure 3.** Overwinter (Dec 15 – June 15) fawn survival rates for Colorado's five intensive monitoring areas, biological years 1997-2021.

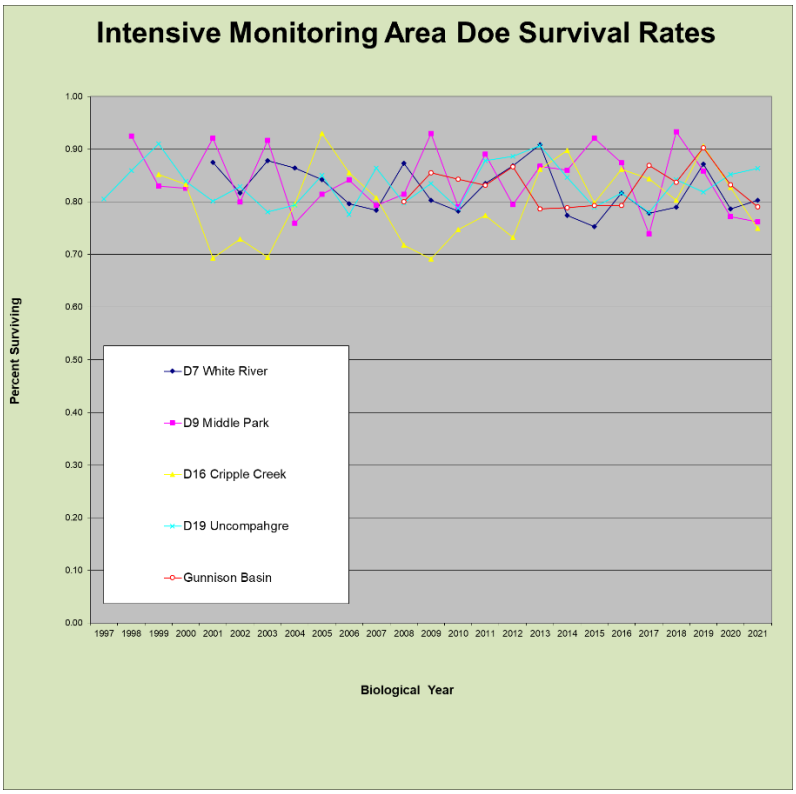



**Figure 4.** Annual (Dec 15 – Dec 15) doe survival rates for Colorado's five intensive monitoring areas, biological years 1997-2021.

Altering habitat quality and quantity through land use activities can have significant and long-term impacts (both positive and negative) on big game habitats and populations (Johnson et al., 2016). Examples of habitat alteration include, but are not limited to, land use conversion from agriculture to residential, habitat type change by natural causes such as wildfires, habitat quality change as a result of domestic grazing practices, habitat fragmentation, and climate change. Recreation and energy development, occurring at unprecedented levels in Colorado, are two examples of human uses on the landscape that increasingly overlap with, fragment, and negatively impact big game habitats. Colorado has a network of roads that total approximately 90,000 miles. Road construction directly removes available habitat, results in population loss from road kill, and indirectly affects ungulate migration patterns and behavior. Roads are continually expanding into deer range from housing, energy development, and recreation.

Converting rural and agricultural lands that once functioned as wildlife habitat amounts to a permanent loss of habitat. Real estate values have increased exorbitantly, so the financial incentive for ranch owners to subdivide and sell their properties has been immense. The cost to deer and other wildlife is the likely irreversible loss of habitat and, therefore, decreased carrying capacity across the landscape for many wildlife species. Conservation of private lands should be a priority in order to protect and maintain connectivity of the remaining undeveloped lands for wildlife use. The Colorado Wildlife Habitat Program ("Habitat Stamp") and Great Outdoors Colorado (GOCO), as well as federal programs and non-governmental organizations such as land trusts, provide funding and mechanisms to help private landowners set up conservation easements. The challenge, however, is that conservation easement efforts must compete with the region's extremely high real estate prices.

The above impacts have cumulatively resulted in the direct loss of habitat available to deer and other wildlife. Furthermore, the direct loss of wildlife habitat is often amplified by the indirect losses that occur due to noise pollution, disturbance, and the overall fragmentation of remaining habitat. Habitat fragmentation and reduced connectivity are increasingly concerning as Colorado's deer attempt to navigate through their annual cycles between seasonal ranges. The connectivity between the available habitat that is left is fractured, impacting the quality of habitat deer use through their life cycle from summer to winter ranges. Ultimately, these impacts and ongoing habitat loss will continue to reduce Colorado's carrying capacity for the renowned deer population we presently support.

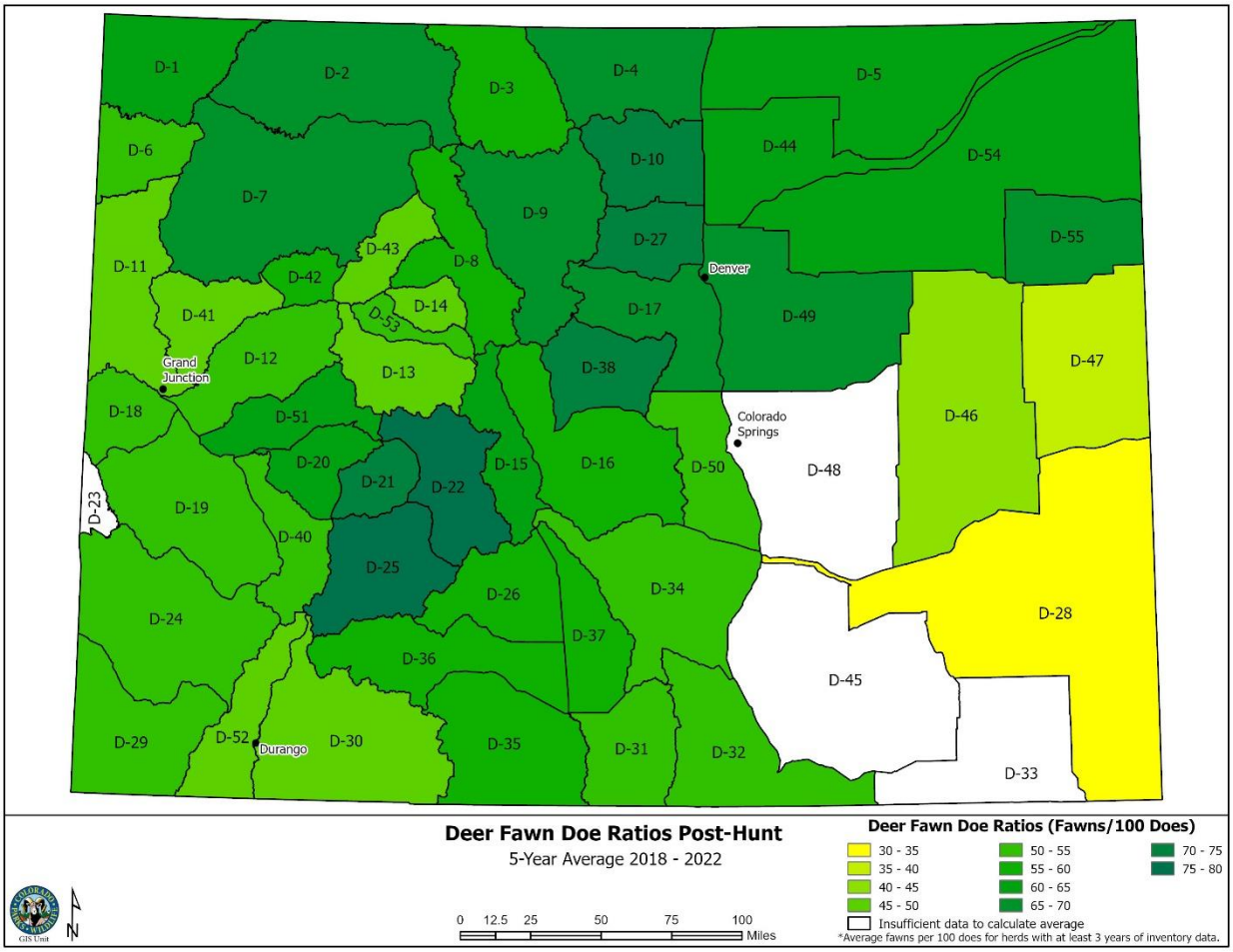



**Figure 5.** Average post-hunt (winter) fawn:doe ratios for Colorado deer herds, 2018-2022.

Recreation

Human recreation causes both direct loss of habitat from the development of infrastructure (roads, trails, parking areas, etc.), and indirect loss of habitat through the behavioral avoidance of these areas by wildlife. Human presence on the landscape in the form of recreation evokes a physiological stress response for mule deer that impacts habitat usage, activity times, competition, foraging, reproduction, and body condition. Wild animals minimize energy expenditure by reducing their spatial and temporal activity, but human disturbance disrupts this energy-saving behavior by causing extra movement to escape or find cover. Deer react to the presence and activity of humans either by fleeing or by being vigilant, both of which detract from the animal's ability to feed and rest. These disturbances on the scale of individual encounters between an animal and a human recreationist may seem minor in isolation, but when translated to the lifetime of the animal or even to the scale of the whole deer population, the cumulative effects of year-round disturbance will lead to lower recruitment of fawns, higher mortality, and overall decline in population fitness over time. Disturbance from human activity can make what would otherwise be suitable habitat from a forage standpoint into poor quality habitat from a behavioral standpoint.

Avoidance of recreationists effectively decreases the carrying capacity of an area, as mule deer and elk generally do not habituate to hiking or mountain biking. Distances from roads and trails are an essential habitat feature for wildlife, and large-scale patches of land that

remain un-fragmented by routes in Colorado are becoming increasingly rare, even in protected areas such as Wilderness. When route densities increase to the point that the predicted behavioral avoidance zone overlaps or intersects with another route, habitat effectiveness is severely reduced or eliminated and can result in a barrier to movement and seasonal migrations for ungulates. Often, the indirect impacts associated with noise and avoidance buffers greatly outweighs the direct habitat loss associated with recreation trails. Increased recreational activity associated with increased density of routes (roads and trails) leads to both immediate and long-term impacts on individual animals and populations by displacing wildlife into less-optimal habitats. The result is a decrease in available energy for winter survival, growth and reproduction, and ultimately reduced fitness of a population.

Winter range forage and habitat for mule deer are becoming increasingly limited in Colorado due to recreation, roads, and residential development. Mule deer are highly vulnerable to disturbance during the winter and early spring when they struggle to maintain body condition and have limited energy reserves. Snow depths restrict animals to lower elevations where higher densities of roads and trails exist and subsequently have greater human use. The combination of deep snow, cold temperatures, and limited forage requires animals to expend higher amounts of energy for thermal regulation, daily movement, and feeding. Recreation on winter ranges, including hiking, snowshoeing, snow/fat-biking, skiing, snowmobiling, and shed antler gathering, can negatively impact ungulate behavior by causing them to flee and altering their feeding, resting, and travel patterns. When a deer is disturbed, it forgoes foraging in favor of hiding until the disturbance has ended. Even low levels of disturbance from human recreation can negatively impact mule deer during winter months and decrease survival. While some animals show no apparent behavioral response, ungulates may still experience physiological stress and elevated heart rates, resulting in relatively high energy expenditures. CPW established a shed antler gathering season, an activity which CPW can regulate, prohibiting shed antler gathering on public lands from January 1st to May 1st annually. The presence of dogs accompanying recreationists increases the zone of influence, flushing distances, and temporal displacement for ungulates. Dogs are efficient at chasing deer, causing extreme energy expenditure and potential mortality, particularly for fawns. Deer concentrated on winter ranges are especially vulnerable to harassment and predation by dogs. Avoidance behavior can be critically impactful during the winter if deer spend time and energy evading dogs when they need to be foraging for food and expending as little energy as possible.

To ensure that essential habitats remain connected and usable for elk and other big game animals, CPW recommends the following when planning for recreation infrastructure:

- Federal land management agencies should consult the 2021 Trails with Wildlife in Mind Guide (Trails with Wildlife in Mind Task Force 2021) to aid in management decisions when planning new trails or trail improvements.
- Avoid the highest-priority deer habitats when planning recreation infrastructure, wherever possible.
- Limit the density of motorized and non-motorized roads and trails in important wildlife habitats.
- Seasonal closures should be considered to benefit deer and other wildlife in the winter months and during calving when they are most vulnerable.
- Strategic seasonal closures of motorized routes should be considered during annual hunting seasons to promote big game use and fidelity to public lands where they are available for harvest.

Preserving contiguous swaths of the sagebrush, grassland, mountain shrub, and forest landscapes that deer rely on for habitat, and facilitating safe passage along migration and movement routes - within and between seasonal ranges - are priorities for wildlife and land managers in Colorado as well as other western states. CPW relies heavily on federal land management agencies as well as private property owners to conserve and enhance habitats for elk and other wildlife species. In 2017 and 2018, several secretarial orders issued by the U.S. Department of Interior (DOI) directed federal land managers to work with states to protect big game species and their habitat within the region. Secretarial Order (SO) 3356: Hunting, Fishing, Recreational Shooting, and Wildlife Conservation Opportunities and Coordination with States, Tribes, and Territories, and SO 3362: Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors, respectively, provided direction to federal land managers for improving access to lands for recreational activities, particularly hunting and fishing. SO 3362 also directed DOI agencies to improve habitat quality to ensure the long-term viability of big game and other wildlife populations, particularly migration corridors and sensitive winter ranges for elk, deer, and pronghorn. Various solutions are being considered at all levels of government and by private sector stakeholders to enhance the protection of big game winter range and migration and movement routes. These policies aim to foster collaboration, expand data collection and research, incentivize participation in habitat connectivity programs, and implement targeted infrastructure solutions.

Chronic Wasting Disease

University scientists studying captive mule deer in facilities west of Fort Collins, CO, first recognized Chronic Wasting Disease (CWD) in the 1960s. Within a few years thereafter, symptomatic CWD cases were diagnosed in free-ranging deer and elk in northcentral Colorado and southeastern Wyoming. By the early 1990s, the growing number of documented cases compelled early attempts to estimate infection rates (prevalence) by sampling harvested and vehicle-killed deer and elk. Applying diagnostic advances that afforded more accurate detection of infected animals, surveys in the late 1990s revealed that CWD was already well-established in much of northeastern Colorado and southeastern Wyoming. This disease occurs in deer, elk, and moose. Infections are much less common in elk and moose than in deer. CWD is an infectious prion (misfolded protein) disease that affects the nervous system over approximately three years (Miller and Fischer, 2016). CWD can spread from the host by direct contact or through resources shared with an infected individual. To add to the complexity, prions can last for many years in the environment, further challenging management. This disease is 100% fatal, and a treatment has not yet been developed.

CPW developed a CWD Response Plan in December 2018 to address growing concerns of increasing spread throughout the state (CPW, 2018). This plan contains management actions and recommendations to control CWD prevalence while managing towards population and sex ratio objectives. The plan established a schedule to monitor deer herds every five years for prevalence rates. In addition, if prevalence is determined to be at 5% or greater in the two-year old and older adult male segment of the population, management actions should be taken to reduce that prevalence to below the 5% benchmark. The primary recommendations to manage CWD prevalence in deer herds are: 1) Reduce population and density, 2) Reduce male/female ratios, 3) Change age structure, 4) Maximize ability to remove diseased animals at the smallest scale possible (hot spot management), 5) Remove motivations that cause animals to congregate, 6) Minimize prion point sources, and 7) Incorporate CWD management actions and prevalence threshold into herd management plans. The Southwest deer management plan objectives have been developed to reflect the recommendations from the

CWD response plan and attempt to reduce prevalence rates to or below the 5% benchmark. The primary tool for CWD management at the herd level is to manage for lower buck:doe ratios, as bucks carry CWD at approximately twice the rate of females. Furthermore, managing for lower population densities can also help reduce the prevalence of CWD. When possible, license allocation will be directed to later seasons and locations to best address hot spots of higher CWD prevalence. When harvest is sufficient and sustained, it can be a tool for attenuating CWD prevalence in adult male mule deer, especially early in the course of an epidemic (Miller et al. 2020 and Conner et al. 2021). Increasing male harvest reduces male and overall deer abundance and density, male age structure, and the number of infected deer, all of which appear to reduce disease. Likewise, timing hunting seasons closer to the breeding season when mature males are more vulnerable to harvest is another strategy to reduce CWD prevalence (Miller et al. 2020 and Conner et al. 2021).

As of April 2022, CWD has been detected in 40 of Colorado's 54 deer herds, 17 of 42 elk herds, and 2 of 9 moose herds (Figures 4 and 5). Disease prevalence is highest in deer and lowest in moose. Prevalence appears to be rising in many affected Colorado herds.

For more information on Chronic Wasting Disease in Colorado, visit:
https://cpw.state.co.us/learn/Pages/About-CWD-in-Colorado.aspx

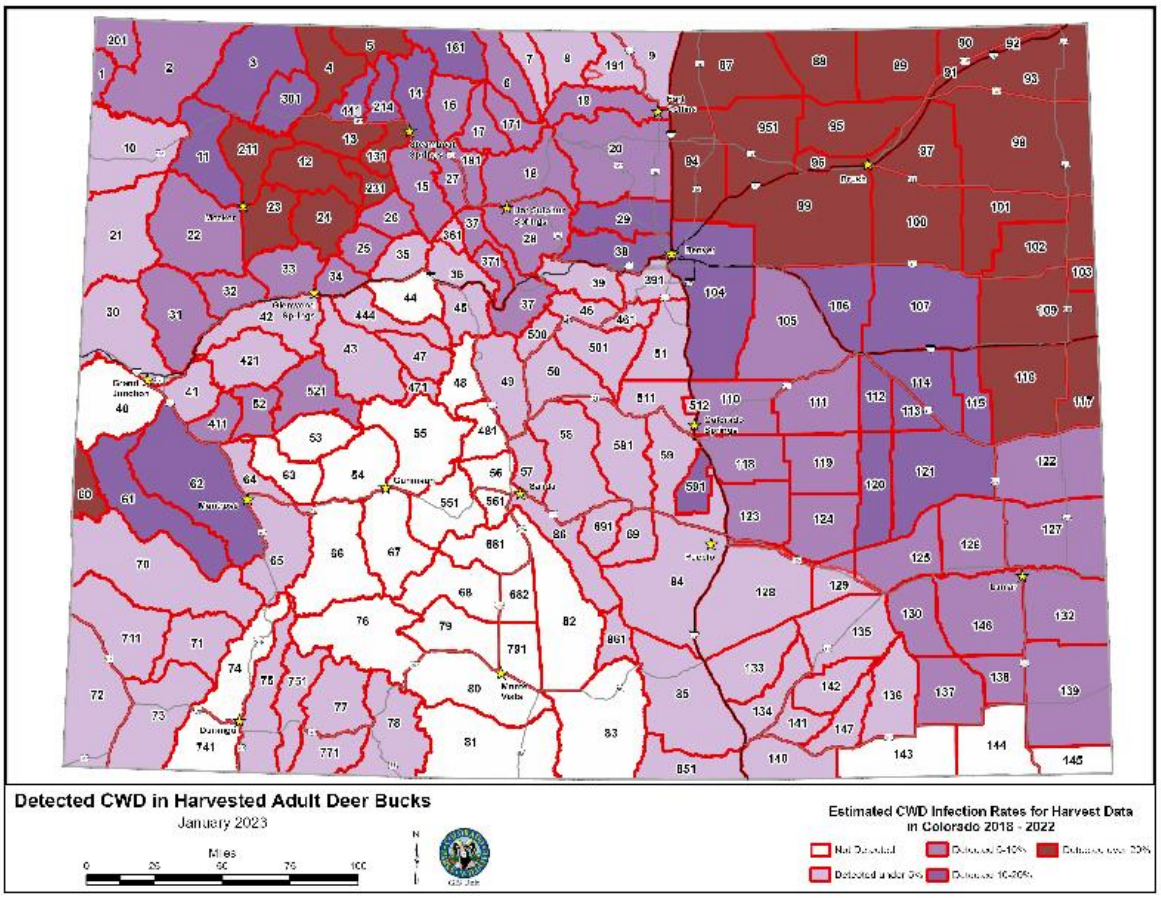



**Figure 6.** Chronic Wasting Disease infection rates in Colorado deer herds.

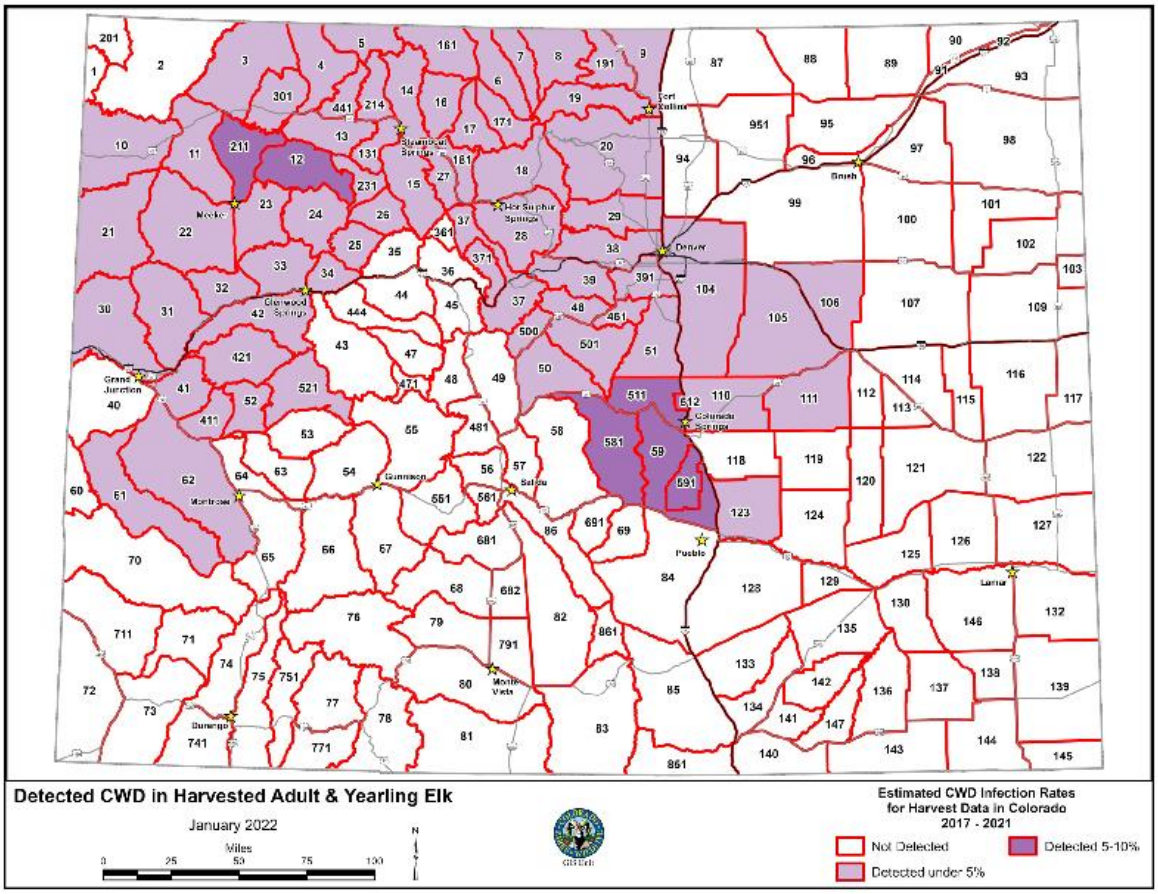



**Figure 7.** Chronic Wasting Disease infection rates in Colorado elk herds.

Collaboration with Stakeholders

Wildlife management is affected by many environmental and external anthropogenic factors, often with no easy solutions, and requires collaboration and compromise. CPW will remain engaged with various stakeholders, including local and Tribal governments, federal land management agencies, private landowners, local land conservancies, conservation organizations, hunters and wildlife enthusiasts, and others, to proactively manage Colorado's natural resources and wildlife habitats. These relationships and collaborations ensure elk and other wildlife remain across Colorado's landscapes for generations to come. Colorado would not be the same without its iconic elk herds, and it is incumbent upon the citizens of Colorado to altruistically work together to promote the continued existence of elk and other wildlife. By protecting and enhancing elk country, we ensure a future for many other wildlife species and maintain some of the wild places and spaces that make Colorado unique.

## The Brunot Agreement of 1873

In 1873, the confederated bands of Utes ceded a large portion of their 1868 reservation to the Federal government under a treaty commonly known as the "Brunot Agreement." This ceded area – or "Brunot Area" – is approximately 3.7 million acres of the San Juan Mountain region of southwest Colorado and includes many of the herds in this herd management planning document (Figure 6). Contained within the 1873 Agreement was an important provision reserving for the Utes the right to "hunt upon said land so long as the game lasts and the

Indians are at peace with the white people." Despite the continued loss of lands, the corresponding reduction in the size of the Ute reservation, and the relocation of certain Ute bands outside of Colorado – this reserved right within the Brunot Area has remained undiminished to this day. In 2008, the Southern Ute Indian Tribe entered a new agreement – this time with the State of Colorado – addressing the Tribe's exercise of its long-held Brunot Area hunting and fishing rights. The Ute Mountain Ute Indian Tribe entered into a similar agreement with the State of Colorado in 2013. These agreements – or Memorandums of Understanding (MOUs) – detail how the Tribes and State approach Brunot Area hunting, fishing, and wildlife law enforcement, and expresses the intent of Tribal and State governments to work cooperatively towards the long-term conservation of wildlife within the Brunot Area. With the completion of the MOUs, Tribal Members can exercise the Tribe's long-held rights to hunt and fish within the Brunot Area in accordance with regulations established by the Tribes and State.

Working in tandem with our Tribal neighbors is of utmost importance to CPW as we cooperatively manage wildlife species, including elk, migrating seasonally across political boundaries. Annual meetings, harvest reporting, and open communication have allowed CPW and the Tribes to collaborate on population monitoring, radio-collaring efforts, and habitat improvement and connectivity. Tribal lands provide essential winter ranges and other seasonally-important habitats for a variety of wildlife, and the partnership between CPW and the Tribes is critical for future wildlife conservation in southwest Colorado (see Appendix A: Southern Ute Indian Tribe Comment Letter, on page XX).

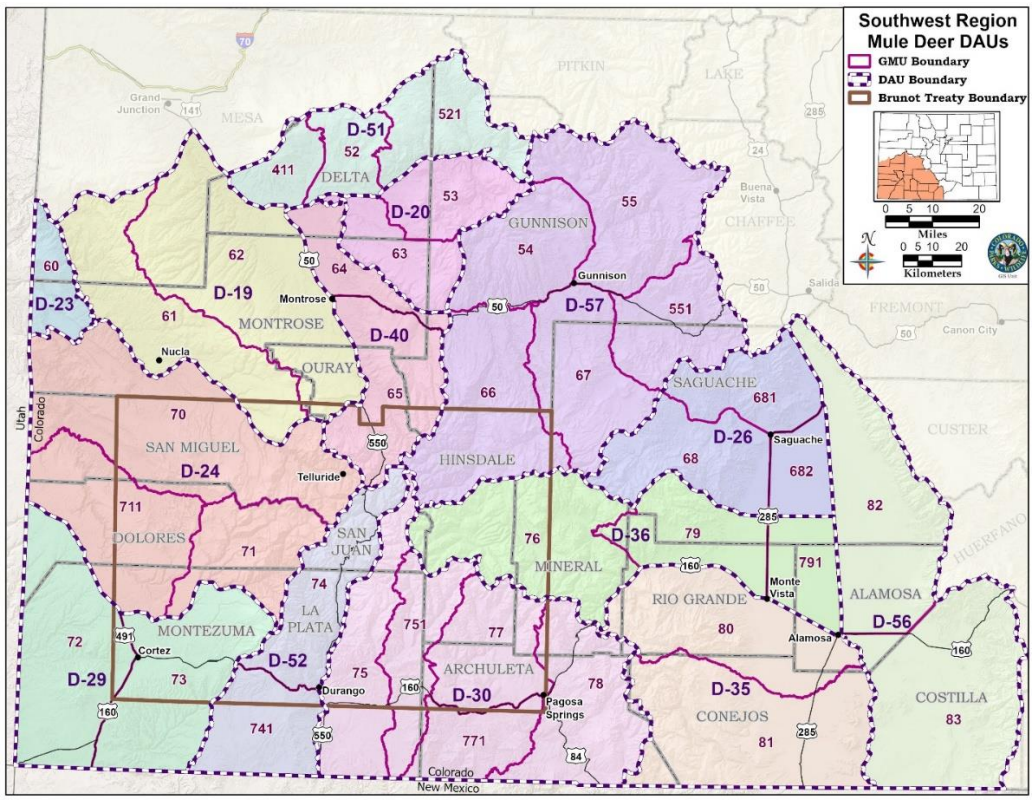
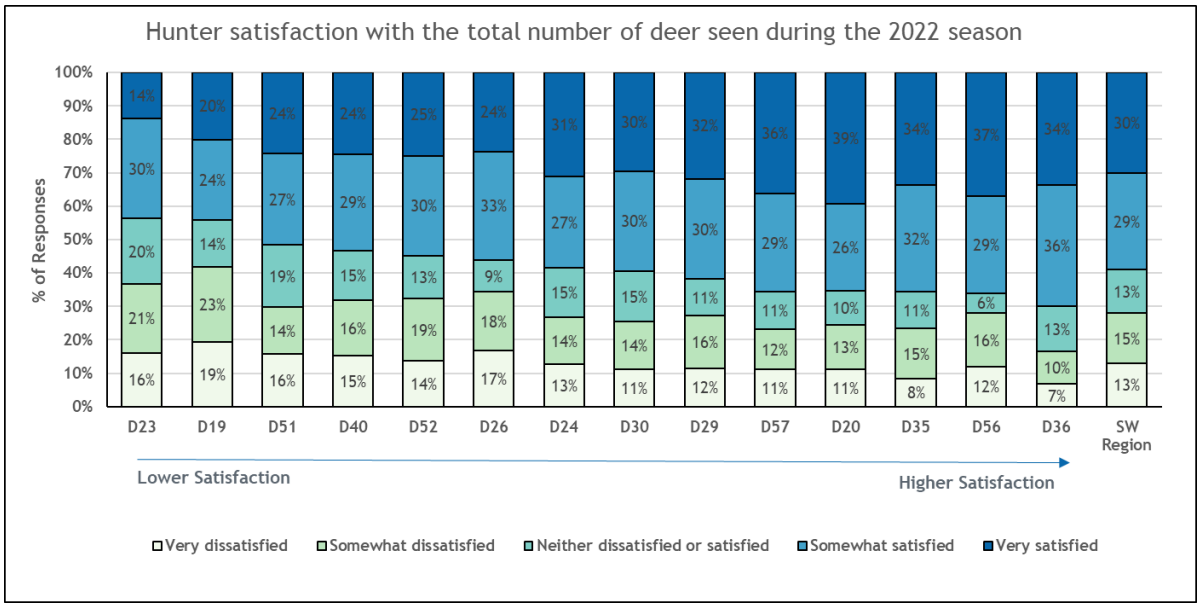



**Figure 8.** The Brunot Treaty area, established in 1873 as an agreement between the Southern Ute Indian Tribe, Ute Mountain Ute Indian Tribe, and the US Government preserving hunting and fishing rights for Ute tribal members.

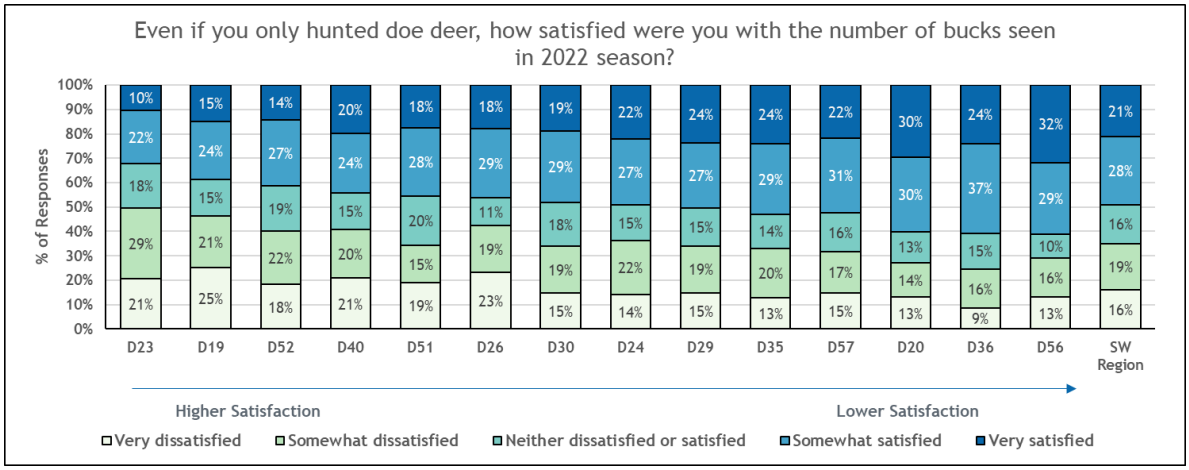
## Public Involvement

There are 14 deer DAUs in southwest Colorado. The following section comprises the 14 individual deer HMPs with proposed objectives and justification. Seven of the 16 deer herd management plans have been approved within the last three years and will be extending those objectives as status quo. The other nine HMPs have proposed population and sex ratio objectives. Meetings and stakeholder outreach have occurred throughout southwest Colorado to collect input on the status of local deer populations and management concerns, and provide direction for future management. The plan has been presented to county commissioners, local Habitat Partnership Program (HPP) committees, and federal agencies for additional input. All input is collected and provided in the following Appendices. In addition, CPW staff have reviewed the optional hunter-harvest attitude survey data to capture feedback from hunters on their experience during the 2022 hunting season. Of the 19,548 deer license holders in southwest Colorado in 2022, 5,505 hunters opted in for the additional hunter harvest attitude survey. The seven graphs below depict the hunters' responses to seven questions relating to their hunting experience and observations in the 14 different DAUs in southwest Colorado. The DAUs in each graph are ranked from least satisfied to most satisfied. The draft plan was posted for 30 days for the public to provide additional comments on the proposed objectives for each DAU from October XX to November XX, 2023. The final draft plan will be presented to the Colorado Parks and Wildlife Commission this winter, with a tentative schedule to first present in January and for approval in March.

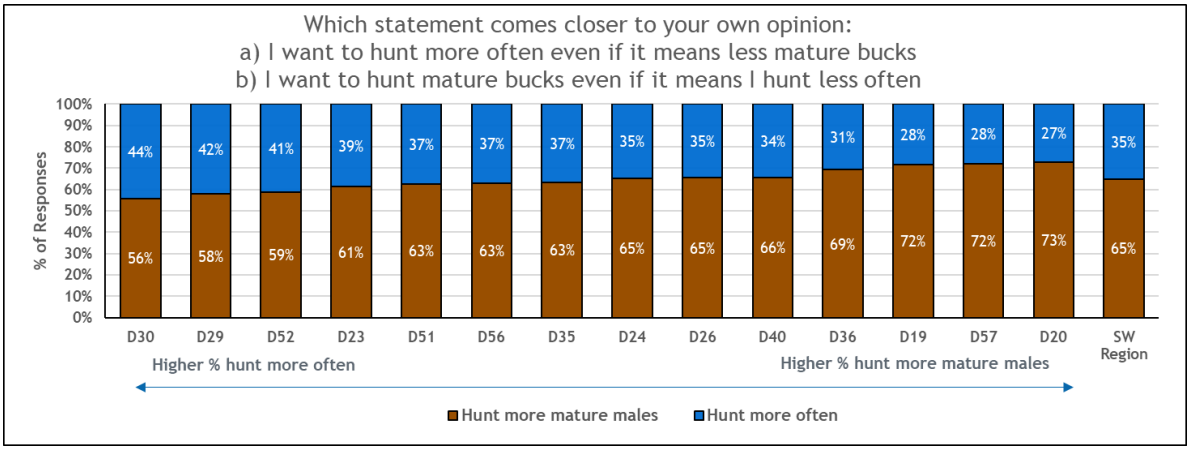
a.



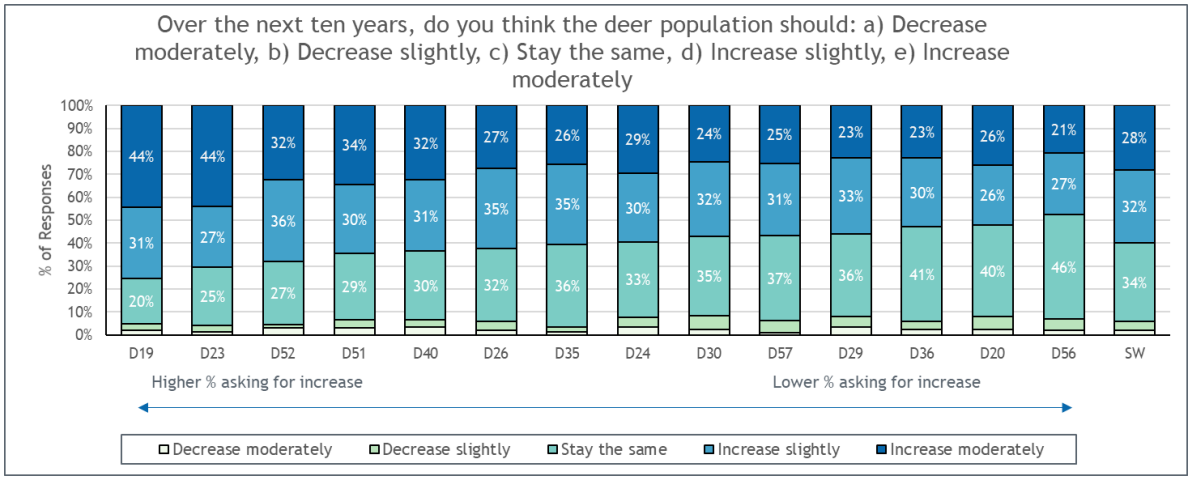
b.


Even if you only hunted doe deer, how satisfied were you with the number of bucks seen in 2022 season?
% of Responses
D23 D19 D52 D40 D51 D26 D30 D24 D29 D35 D57 D20 D36 D56 SW Region
Higher Satisfaction
Lower Satisfaction
Very dissatisfied
Somewhat dissatisfied
Neither dissatisfied or satisfied
Somewhat satisfied
Very satisfied

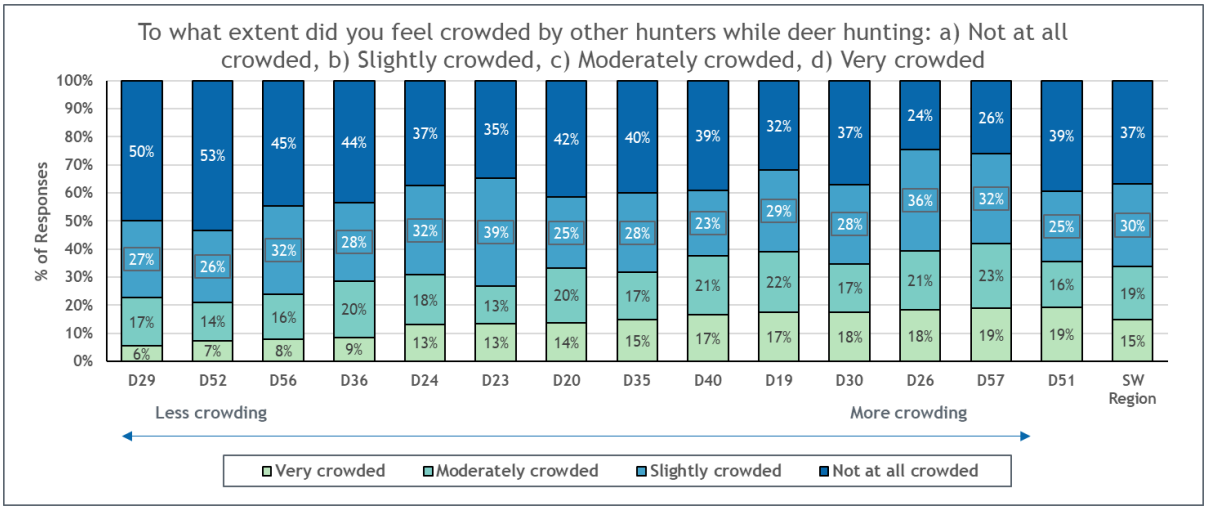
c.


Which statement comes closer to your own opinion:
a) I want to hunt more often even if it means less mature bucks
b) I want to hunt mature bucks even if it means I hunt less often
% of Responses
D30 D29 D52 D23 D51 D56 D35 D24 D26 D40 D36 D19 D57 D20 SW Region
Higher % hunt more often
Higher % hunt more mature males
Hunt more mature males
Hunt more often

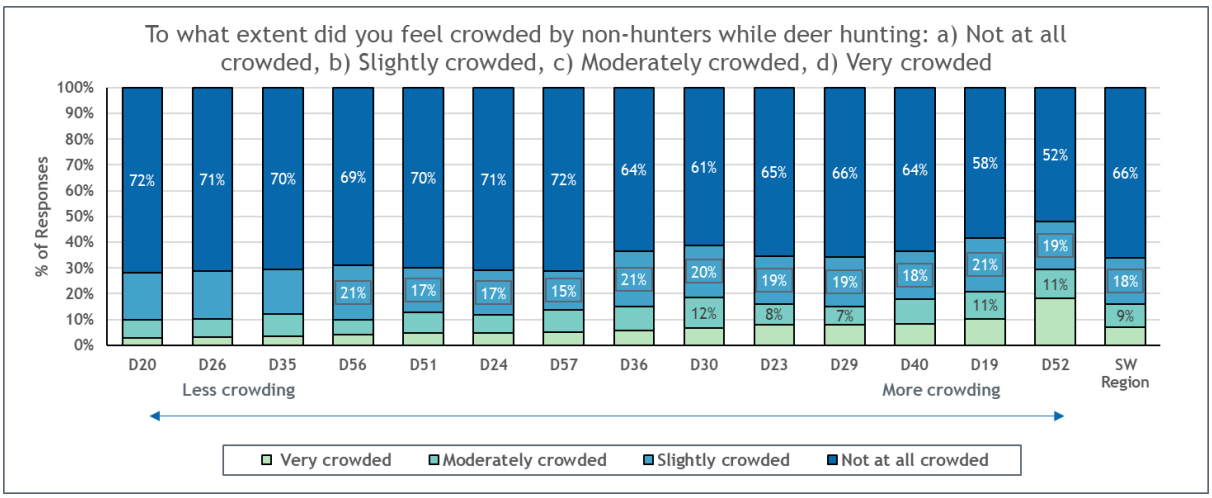
d.


Over the next ten years, do you think the deer population should: a) Decrease moderately, b) Decrease slightly, c) Stay the same, d) Increase slightly, e) Increase moderately
% of Responses
D19 D23 D52 D51 D40 D26 D35 D24 D30 D57 D29 D36 D20 D56 SW
Higher % asking for increase
Lower % asking for increase
Decrease moderately
Decrease slightly
Stay the same
Increase slightly
Increase moderately

e.




f.




g.

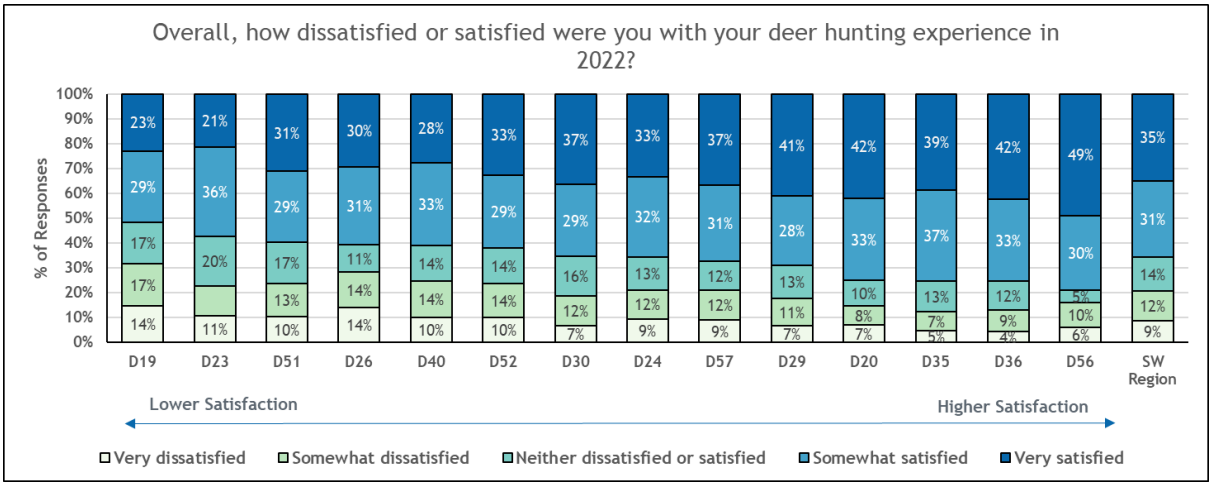



**Figure 9 (a-g).** Hunter-harvest attitude survey questions and results for the 16 deer DAUs ranked from low DAU to high DAU (left to right) in relation to the specific question.