Idaho
Mule Deer Management Plan
2020-2025

Prepared by **IDAHO DEPARTMENT OF FISH AND GAME**

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Executive Summary

MULE DEER HUNTERS CCBY IDAHO FISH AND GAME

Mule deer hunting is ingrained in Idaho's cultural heritage and supports more hunters and more hunter days than any other big game species. Pursuit of mule deer has introduced generations of young Idahoans to hunting, facilitating preservation of the Gem State's rich hunting tradition. Further, mule deer hunters spend tens of millions of dollars on trip-related expenses each year, providing significant contributions to rural Idaho communities.

The Idaho Department of Fish and Game (IDFG or Department) was established to preserve, protect, perpetuate, and manage all of Idaho's fish and wildlife. This revision of the Mule Deer Management Plan tiers off the IDFG Strategic Plan and will provide guidance to staff to manage mule deer during the next 6 years at both statewide and population-specific scales.

A significant component of the Plan introduces concepts for addressing hunter congestion, which has been an ongoing concern for Idaho's mule deer hunters. The Department will work with the Idaho Fish and Game Commission and mule deer hunters to identify the most appropriate and acceptable strategies to address hunter congestion. Idaho's mule deer hunters are clear about their desire to maintain annual hunting opportunity, and IDFG has been able to continue the tradition of providing that opportunity. Identifying and implementing strategies to address hunter congestion, while continuing to provide abundant opportunity, will be a complicated endeavor. If hunters decide reducing congestion is warranted, doing so will inevitably require some reduction in opportunity.

The Plan also provides in-depth information regarding collection of mule deer demographic and survival data, how those data are utilized to assess population abundance and trends, and how that information is ultimately used to manage harvest. The previous Mule Deer Management Plan (IDFG 2008) directed IDFG to implement a monitoring program to provide annual estimates of population abundance with less reliance on annual aerial surveys. The Department has implemented a new monitoring protocol and developed an integrated population model (IPM) that utilizes periodic population and demographic estimates, harvest data, over-winter fawn survival, and annual adult female survival to model population abundance each year.

Previously, population management units (PMU) were used as the geographic unit for mule deer population monitoring and management. Recent location data from mule deer fitted with GPS radio collars provided a more informed understanding of how populations are distributed on summer, winter, and migratory habitats across Idaho. In light of this new information, this Plan introduces more biologically meaningful data analysis units (DAU), which replace PMUs as the monitoring unit for mule deer management in Idaho.

Since development of the previous Mule Deer Management Plan, IDFG conducted or supported a number of research projects that provided new and important information about mule deer populations and habitats. Department research efforts are rooted in providing meaningful insight that directly improves mule deer management. During implementation of this Plan, IDFG will continue research efforts by

1. Refining and improving mule deer population models,
2. Developing seasonal range and migration models,
3. Assessing use of remote cameras to estimate populations,
4. Evaluating effects of predator harvest on mule deer survival and population growth, and
5. Assessing impacts of habitat change and movement barriers on mule deer migrations.

Mule deer populations are ultimately limited by quality and quantity of habitat. Maintaining intact, productive habitats on summer range, winter range, and migratory corridors is paramount for ensuring long-term sustainability of Idaho's mule deer herds. Though much of Idaho's mule deer summer range occurs on public lands that are currently protected from development, decades of fire suppression and recent reductions in timber harvest have resulted in older, less productive forests in some areas. At lower elevations, vast swaths of winter range have been negatively impacted by increased wildfire frequency and intensity, infestations of non-desirable invasive plants, and human development. Migratory pathways face similar challenges, and ever increasing traffic and road infrastructure associated with Idaho's growing human population place additional stressors on migrating mule deer. Ensuring abundant mule deer populations into the future will require IDFG to continue to implement strategic habitat projects across seasonal ranges in coordination with private landowners, local governments, and partner agencies.

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Glossary of Acronyms

BLM: Bureau of Land Management

CAP: Citizens Against Poaching

CRP: Conservation Reserve Program

CWD: Chronic Wasting Disease

DOI: Department of the Interior

DAU: Data Analysis Unit

GMU: Game Management Unit

GPS: Global Positioning System

IDFG: Idaho Department of Fish and Game

IDL: Idaho Department of Lands

ITD: Idaho Transportation Department

IPM: Integrated Population Model

MDI: Mule Deer Initiative

MHR: Motorized Hunt Rule

OHV: Off-Highway Vehicle

PMU: Population Management Unit

SAFE: State Acres for Wildlife Enhancement

USFS: United States Forest Service

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Introduction

Mule deer (*Odocoileus hemionus*) are a true icon of the West, providing recreational, aesthetic, social, and cultural values for millions of outdoor enthusiasts. Mule deer hunting is ingrained in Idaho's cultural heritage and supports more hunters and more hunter days than any other big game species in the state. Over the last 10 years, the statewide mule deer population estimate has ranged from 250,000 to 325,000. In 2016, >85,000 hunters spent nearly 500,000 days pursuing mule deer in Idaho's shrub-steppe, mountain, and canyonland habitats. Pursuit of mule deer has introduced generations of young Idahoans to hunting, facilitating preservation of the Gem State's rich hunting heritage. Though many Idaho mule deer hunters value opportunities to harvest a mature buck, most report their primary motivations for hunting are related to being close to nature in scenic landscapes with friends and family, and creating pleasant memories.

Mule deer hunting contributes significantly to Idaho's economy as well as IDFG conservation programs. Mule deer hunters spend tens of millions of dollars on trip-related expenses in Idaho. Many of these expenditures are for fuel, meals, and lodging in small rural towns; resulting in an annual total economic impact of >$100 million (Cooper and Unsworth 2000). In 2016 direct revenues to IDFG from mule deer tag and license sales were >$8 million. These funds are essential for implementation of important programs including enforcement, population monitoring, research, and habitat conservation.

Purpose

Idaho Code 36-103 establishes statewide policy for wildlife, and can be paraphrased as: all wildlife will be preserved, protected, perpetuated, and managed to provide continuous supplies for hunting, fishing, and trapping. The Idaho Fish and Game Commission (Commission) is charged with administering state wildlife policy and provides direction to IDFG.

Idaho Code 67-1903 requires state agencies to develop strategic plans that specify how they will meet core mission requirements. Plans must identify outcome-based goals and performance measures. This revision of the Mule Deer Management Plan tiers off the IDFG 2015 Strategic Plan and is designed to provide guidance to IDFG staff to manage mule deer populations, hunting, and habitats over the next 6 years. The Plan describes statewide management direction and strategies, identifies new biologically meaningful data analysis units (DAU), and stipulates specific objectives and strategies for those DAUs. A major component of this Plan identifies concepts for addressing hunter congestion, a topic of increasing concern for Idaho's mule deer hunters. The Plan directs IDFG to engage with the public to identify strategies to best address the issue and to assess public acceptance of proposed strategies.

Public Involvement and Outreach

In 2017 IDFG conducted a statewide survey (Appendix B) to gain a better understanding of desires and experiences of mule deer hunters in Idaho; 2,464 hunters completed a random mail survey (49% response rate), 4,405 completed an email survey (16% response rate), and 378 individuals voluntarily submitted responses via the internet. An executive summary of survey results appears in Appendix A.

During June 2019 IDFG hosted 11 open houses around the state to solicit public comments on the draft version of this Plan. From May 31 to June 30 2019, the draft Plan was presented on the IDFG website where viewers were asked to indicate their level of support for the Plan and also encouraged to provide any general comments. On June 4 IDFG sent an email to 60,531 resident deer hunters encouraging them to review and comment on the Plan. On June 19 IDFG resent the email request to 60,483 residents who had not responded to the June 4 email;

18,241 nonresident deer hunters also received emails requesting input on the draft Plan.

These outreach efforts yielded 518 unique submissions, 94% of which were Idaho residents; 36% (*n* = 187) indicated general support, 44% (*n* = 230) indicated support with some concerns, 7% (*n* = 34) were neutral, and 13% (*n* = 67) did not support the draft Plan. The Department received additional comment letters from 6 individual hunters and also from Theodore Roosevelt Conservation Partnership, Pew Charitable Trusts, Idaho Wildlife Federation, and Nez Perce Tribe. The 5 most common comments were related to concerns about hunter congestion (*n* = 89), suggestions to limit nonresident participation (*n* = 84), support for implementation of various forms of stratified hunt structures (*n* = 63), suggestions to implement 3- or 4-point antler restrictions (*n* = 50), and desire to maintain annual hunting opportunity (*n* = 41).

Public involvement was critical to development of this Plan and continued input will be essential during the 6-year implementation period. A major component of this Plan identifies potential strategies for addressing hunter congestion, which was identified as a concern by many Idaho mule deer hunters in the 2017 survey and again during the public comment period for this Plan. Concepts outlined in the Plan represent a starting point for dialogue among IDFG, the Commission, and mule deer hunters; they are not prescriptions for immediate implementation. Following approval of this Plan, and at the discretion of the Commission, IDFG will scope these concepts through hunter surveys, public meetings, and other outreach strategies. Additionally, IDFG will continue to seek input from mule deer hunters during biennial development of rules and season setting.

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Results From Previous Planning Period

A primary goal of the previous Mule Deer Plan (IDFG 2008) was to maintain or increase mule deer populations to provide for annual "general" hunting opportunities along with some "quality" and "high quality" hunting experiences. For each type of hunting opportunity (general, quality, and high quality), management objectives were established related to hunter success, percent mature bucks in the harvest, hunter density, opportunity to hunt, and post hunt buck:doe ratios. Each IDFG administrative region was encouraged to offer ≥2 types of hunting opportunity as directed by regional hunter preference. Idaho was divided into 15 population management units (PMU) based on mule deer movements, biological data, habitats, and management priorities. Another significant objective from the previous plan was to improve population monitoring in each PMU and to assess over-winter fawn survival and adult female annual survival. This information was used along with hunter harvest and post-hunt buck:doe:fawn ratios to develop an integrated population model (IPM) which allows for annual population estimates for select PMUs. Table 1 identifies management objectives and achievements during the previous planning period..

Table 1. Achievements from the 2008–2017 planning period.

Management direction	Statewide objective	Results	Conclusions and recommendations
Implement a monitoring program that provides annual estimates of population abundance	For each PMU, develop an annual assessment of population status, over-winter fawn survival, adult doe survival, pre-winter fawn:doe ratios, post-season buck:doe ratios, body condition, and adult doe age structure	These data are collected in all significant PMUs across southern Idaho and are used in an IPM to produce annual population estimates	Restructure PMUs as needed during this planning process to better align harvest and survey data
Manage populations commensurate with habitat capabilities to maximize reproductive performance and overall herd health	Maintain fawn:doe ratios at or above long-term averages Maintain natural adult doe annual mortality at <15%	Statewide fawn:doe ratios have averaged >60:100 Statewide annual adult doe mortality has averaged <10%	Use detailed habitat information to help develop population objectives for each PMU

Table 1. Continued...

Management direction	Statewide objective	Results	Conclusions and recommendations
Reduce illegal harvest and commercialization of unlawfully taken mule deer	Increase use of Citizens Against Poaching (CAP) Hotline by >25% by 2017	CAP received 754 calls in 2008 and 1,266 calls in 2017; a 68% increase	Continue to coordinate with the CAP board on a marketing campaign including billboards and social media
Improve key winter, summer, and transitional habitats	Directly enhance 10,000 acres of mule deer habitat on public and private lands annually	IDFG exceeded this through project planning, financial support, and implementation for winter- and summer-range restoration projects on BLM and USFS lands, and by developing conservation plans with CRP and SAFE contract holders on tens of thousands of acres annually	IDFG will continue to work with agency partners to develop and improve mule deer habitat
Increase IDFG involvement in long-term, landscape-scale, land-use planning efforts	Identify 3 prime locations for reducing highway mortalities and begin discussions with appropriate entities to implement corrective measures by July 2009	IDFG and partners completed 1 underpass on SH 21 and identified 5 additional priority big game migration routes across the state: Smoky Boise Complex I-84 and US-20; US-20/SH-87 (Ashton to MT state line); US-95 McArthur Lake (Elmira to Naples); US-30 Rocky Point; and I-15 (Market Lake to MT state line)	Projects are proceeding at different levels
Minimize influence of disease as a limiting factor in mule deer populations	Collect samples from ≥500 mule deer annually to monitor for Chronic Wasting Disease (CWD)	The CWD Monitoring and Response plan has been rewritten and includes a robust sampling system	Along with revised Monitoring and Response plan, continue to propose new rules to reduce likelihood of CWD being transported into Idaho

Table 1. Continued...

Management direction	Statewide objective	Results	Conclusions and recommendations
Provide mule deer hunting opportunities that reflect preferences and desires of hunters	Maintain ≥80,000 mule deer hunters and 350,000 mule deer hunter days annually Provide ≥1 "quality" or "high quality" buck hunting opportunity in each region by 2008 Maintain ≥15 bucks:100 does in general-season hunts Achieve a hunter satisfaction level >60% for total hunting experience by 2012 Conduct a statewide mule deer hunter opinion survey by 2012 to gauge hunter opinions and measure satisfaction with mule deer management and hunting opportunities Maintain <50% of hunters who identify crowding as a significant issue affecting satisfaction in 2012	In 2017 there were 85,066 mule deer hunters and 506,697 hunter days All regions in southern Idaho provide both quality and high quality hunting experiences in addition to general hunting opportunities PMUs meet or exceed buck ratio objective on an annual basis In the 2017 survey, hunters scored their satisfaction at 3.62 out of 5, where 5 was "very satisfied" A hunter opinion survey was completed in 2017; results were similar to the 2007 survey In the 2017 survey, 45% of hunters identified hunter crowding as a significant issue, similar to the 2007 survey	Hunter congestion was identified as a major issue by hunters who took the survey. The issue will not be easily resolved given hunters also desire annual hunting opportunities
Maintain, improve, and manage access to hunting areas	Increase funding for Access Yes! by ≥50% by 2017	With passage of HB230, IDFG will receive an additional $1M/year for access	Develop protocols to distribute funds
Emphasize recruitment and retention of mule deer hunters	Increase participation of youth hunters by 20% by 2017	IDFG implemented the "Passport" program in 2013, a mentorship program for hunters who have not taken a hunter education class	IDFG will continue to look for ways to recruit and retain mule deer hunters

Hunting Opportunities

Annual Opportunity

Idaho currently offers liberal general-season hunting opportunities. In 2017, 78 of 99 game management units (GMU) provided general-season, any-weapon hunting opportunity for >70,000 mule deer hunters. These general-season hunts are typically characterized by relatively high hunter densities, and have become a staple for maintaining Idaho's hunting tradition by continuing to provide opportunities for family and friends to hunt together every year.

Idaho mule deer hunters are clear about their desire to maintain annual hunting opportunity. In the 2017 survey of mule deer hunters, opportunity to hunt every year was the most important factor contributing to hunter satisfaction (IDFG 2018). Additionally, during public review of this Plan, the fifth most common comment was IDFG needed to maintain annual hunting opportunity. The Department has a long history of making every effort to ensure Idaho mule deer hunters have the opportunity to hunt every year, and to provide a wide range of opportunities from very limited, high-quality hunts to unlimited general hunts.

Buck Opportunity

Based on surveys, Idaho hunters strongly value opportunities to harvest mature bucks as well as opportunities to hunt mule deer annually. The majority of Idaho mule deer hunters would rather harvest a mature buck than other types of deer, and have indicated they are willing to accept additional restrictions in order to manage for larger and more mule deer bucks. However, when presented with potential restrictions to manage for larger bucks, giving up the ability to hunt every year was least desirable, whereas controlled hunts were most acceptable. Apparently, hunters would accept controlled hunts as long as other opportunities are available when they do not draw a controlled-hunt tag. The Department strives to provide a diversity of hunting experiences, with a range of buck hunting opportunities across the state, to meet various motivations and preferences of Idaho mule deer hunters (Table 2).

Table 2. Characteristics of mule deer hunting opportunity types in Idaho.

	Type of hunting opportunity		
	General		Controlled
Characteristic	Unlimited	Limited	Very Limited
Hunter success (%)	≈25	≈50	≈75
4-point bucks in harvest (%)	>25	>40	>60
Chance of drawing (%)	100	≈30	<10

Any-weapon seasons in 16 GMUs are currently managed exclusively as controlled hunts to provide a hunting experience with fewer hunters and an increased opportunity to harvest a mature buck. The trade-off for hunters is the chance to participate in a controlled hunt generally ranges from 1% to 25%, and successful applicants cannot apply for these hunts the year after drawing a tag in antlered-only hunts.

Other management tools, such as motorized vehicle use management and maximum antler point restrictions (e.g., ≤2-point) during general seasons, have also been used to improve quality of hunting experiences and mature buck potential. Seasonal motorized use restrictions are generally intended to decrease hunter congestion and reduce big game harvest vulnerability. Those GMUs with the ≤2-point restriction offer popular general hunting opportunity while also providing highly coveted controlled-hunt tags for large-antlered mature bucks. The Department is currently conducting research to assess how buck vulnerability and age structure are affected by this season structure (see Mule Deer Buck Vulnerability in Research section).

Some hunters have asked IDFG to implement minimum antler-point restrictions (e.g., 3- or

4- point minimum) in general-season areas, in hopes such regulations will result in more large-antlered bucks in the population. This idea seems straightforward; do not harvest young bucks and they will grow older and larger and be available for harvest in subsequent years. After decades of use across the West, including Idaho, results of minimum antler-point restrictions have been disappointing. Such restrictions have not resulted in increased numbers of mature bucks. Rather, increased harvest pressure is placed on older bucks, resulting in decreased buck age structure. Additionally, minimum antler-point restrictions typically reduce hunter participation and harvest success, and increase numbers of sub-legal bucks shot and left in the field. For these reasons, most western states have discontinued widespread use of minimum antler-point restrictions. For more information on this topic, please refer to *Understanding mule deer and antler point restrictions*, Fact Sheet #6 (MDWG 2013).

Because of varying social attitudes and preferences, mule deer population characteristics, and habitat variability across Idaho, no single management tool is prescribed statewide for achieving buck management goals. Rather, a variety of tools, including season length and timing, weapon restrictions, area-specific tags, controlled hunts, and others, will be evaluated (see Hunter Congestion section).

Antlerless Opportunity

Antlerless harvest is an important management tool used by wildlife managers to maintain sustainable populations, increase herd productivity, address private land depredations, provide additional hunting opportunity, and increase opportunities for hunter recruitment and retention. A majority of Idaho's mule deer hunters believe antlerless harvest is appropriate, especially when biologically justified and carried out through youth hunts. Antlerless hunting is a valuable tool that provides additional hunting opportunity and helps keep youth hunters engaged in Idaho's rich heritage of mule deer hunting. Importantly, maintaining appropriate levels of female harvest increases population productivity while simultaneously supporting increased hunting opportunities.

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Hunter Congestion

Increasingly, Idaho mule deer hunters have expressed concern to IDFG and the Commission regarding what they perceive as an overabundance of hunters on the landscape. Many feel the quality of their experience has been compromised by hunter crowding. In 2017, 45% of surveyed Idaho mule deer hunters reported there were times during the 2016 hunting season when the number of hunters seriously detracted from the quality of their hunting experience, similar to opinions from the 2007 survey. Presented with potential ways to manage for lower hunter numbers, 78% of mule deer hunters favored or would accept longer seasons and 70% favored or would accept controlled hunts. Stratified hunts were favored or acceptable to 54% of respondents, though the survey did not provide specifics regarding how stratified hunts would be structured. Zone restrictions and choose-your-big-game-species (deer or elk [*Cervus elaphus*]) were not popular options.

To address hunters' concerns with overcrowding, a significant component of this management Plan is dedicated to investigating potential concepts to remedy the issue. A suite of concepts is presented and will be thoroughly vetted by the public and Commission. These concepts provide a starting point for dialogue between IDFG and mule deer hunters; they are not prescriptions for immediate implementation. In coming years, IDFG will thoroughly scope these concepts through hunter surveys, public meetings, and other outreach strategies. The Department's intention is to work toward a universal approach that can be implemented across much of Idaho.

Although previous surveys assessed respondent attitudes towards general concepts to address hunter congestion, these concept scenarios were vague in nature and no attempt was made to determine what trade-offs hunters were willing to accept to reduce crowding. Importantly, all stakeholders and decision-makers must understand there is no simple fix to crowding, and reducing hunter congestion will inevitably require some form of reduction in opportunity. Similar concerns have also been raised by elk hunters, and hunter congestion is sometimes related to overlapping deer and elk seasons. In many cases, strategies for addressing mule deer hunter congestion will need to be made in concert with considerations for overlapping elk hunting opportunities. Further, motivations for hunting and what constitutes a quality experience vary greatly among Idaho's hunting public. Willingness to forego opportunity to enhance one's hunting experience will undoubtedly vary by individual, and reaching consensus on which strategies to implement will be difficult. Regardless, hunter congestion is a major concern for many Idaho mule deer hunters, and IDFG is committed to working with them to identify strategies that will address the issue while striving to maintain Idaho's history of providing ample opportunity to pursue mule deer.

Nonresident Considerations

Considerations for addressing resident hunters' perceptions of overcrowding caused by nonresidents will likely need to be taken into account in efforts to reduce congestion. In 2017 ≈14% of all mule deer hunters were nonresidents, but proportions of residents versus nonresidents varied considerably among PMUs (Table 3). Further, nonresident participation varies by GMU within a given PMU. For example, in the Caribou PMU, which supported 8,628 total hunters, nonresidents comprised ≈18% of mule deer hunters. However, some GMUs within the Caribou PMU experienced much higher nonresident participation. In GMUs 66A and 76, for example, nonresidents comprised ≈30% of total hunters. Conversely, in the Boise River PMU (14,307 total hunters) nonresidents made up only 8% of hunters. Limiting nonresident hunters in the Boise River PMU will do little to reduce congestion, as perceived overcrowding is largely a function of resident hunter numbers.

One potential approach to address nonresident hunter numbers on the landscape, where deemed necessary, would be to create a mechanism that equitably distributes nonresident effort across DAUs or some other appropriate spatial scale, in combination with some of the concepts proposed below. This approach would allow IDFG to maintain the current statewide nonresident cap while reducing nonresident presence in some DAUs. Nonresident regular deer and white-tailed deer (*O. virginianus*) tag sales (combined) are limited annually to 15,500. During 2016 and 2017, when nonresident tags sold out, sales of nonresident regular deer tags averaged ≈11,000, with the remaining ≈4,500 tags sold as white-tailed deer tags. Of those ≈11,000 regular deer tags sold, ≈9,500 tags/year were used to hunt mule deer. The goal would be to determine an appropriate upper threshold for nonresident mule deer hunter abundance in a given location, and distribute those 11,000 tags in the desired manner.

Table 3. Resident and nonresident (NR) general season mule deer hunter distribution by PMU, 2017.

PMU	NR	Resident	Total	%NR
Bannock	1,136	7,340	8,476	13
Boise River	1,213	13,094	14,307	8
Caribou	1,583	7,045	8,628	18
Central Mountains	2,335	9,230	11,565	20
Island Park	136	3,713	3,849	4
Lower Salmon	40	188	228	18
Middle Fork	814	1,703	2,517	32
Mountain Valley	1,102	4,616	5,718	19
North Idaho	909	2,321	3,230	28
Owyhee	244	4,851	5,095	5
Palisades	186	1,317	1,503	12
Smoky Bennett	1,065	5,445	6,510	16
Snake River	85	3,537	3,622	2
South Hills	98	684	782	13
Weiser-McCall	819	9,552	10,371	8

Longer Seasons

Seventy-eight percent of survey respondents favored, or would accept, longer seasons as a method to reduce hunter congestion. Longer seasons could be achieved by adding days at the beginning or end of any-weapon seasons, expanding short-range weapon or muzzleloader opportunities, and allowing either-sex seasons for youth to coincide with general, any-weapon seasons (currently, some GMUs have shortened either-sex hunts for youth).

Advantages	Disadvantages
• Potential to spread out hunters during general season • Provide more opportunity for youth • Provide additional weekends to hunt with friends and family • New or extended opportunity often widely accepted • Could offer additional general or controlled opportunity with primitive weapons	• May limit IDFG's ability to sustain population or harvest objectives • May need to reduce or eliminate controlled either-sex or antlerless opportunity, or Nov hunts (decrease some opportunity) • May require uniform implementation across the state to prevent further congestion • May need to be implemented with some other restriction; DAU, choose your weapon, etc. • May increase congestion in areas with overlapping elk hunts

Controlled Hunts

Controlled hunts are implemented when limiting hunter numbers or harvest in an area becomes necessary or desirable. Controlled hunts can include any combination of various season lengths, season timing, weapon restrictions, or boundaries. Hunter numbers can be focused where deer numbers are high and reduced where deer numbers are low, or where managers seek to provide unique hunting opportunities in response to public desire. Controlled hunts can be implemented at several spatial scales (e.g., partial or entire GMU, group of GMUs, DAU) and temporal scales (e.g., late-summer velvet hunts, rut hunts, winter depredation hunts). Idaho has implemented controlled hunts to manage antlerless harvest, control hunter numbers through forced choice (unlimited controlled), and provide some special hunting opportunities (limited controlled).

This method provides a high degree of control for IDFG and can be used to provide quality hunting experiences, but opportunity is often limited to fewer individuals. Most controlled hunts for antlered mule deer offer increased opportunities for success and improve likelihood of harvesting a mature buck, though probability of drawing these hunts can be very low. Although these opportunities are sought after and desired by many hunters, they are not without consequences. When the only any-weapon hunting opportunity for mule deer in a GMU is controlled, hunter congestion in other units invariably increases. For example, in 2008 GMUs 70 and 78 in southeastern Idaho were converted to controlled hunts with 375 total tags. During the 3 prior years, an average of 1,320 people hunted in these 2 units. Thus, nearly 1,000 hunters were displaced to other GMUs or entirely discouraged from mule deer hunting. Without question, some groups (families or friends) were no longer able to participate in traditional annual outings. Alternatively, some GMUs provide both general, any-weapon hunts and controlled, any-weapon hunts at different times of the year, which does not displace general-season hunters.

Advantages	Disadvantages
• Very flexible system with high degree of management control • Allows a wide variety of opportunities and experience types • Can be used in combination with other season types (e.g., shorter seasons, longer seasons, types of legal animals) • Limits nonresident participation to ≤10%	• Often overly restrictive • Unsuccessful applicants may choose not to hunt during a general season and totally forego hunting that year • May lose opportunity to hunt every year if no general opportunity is offered • Displaces unsuccessful applicants and increases congestion in general hunts

Hybrid General-Controlled Hunt Structure

A standardized approach involving a predetermined combination of controlled tags and general seasons may reduce hunter congestion. As a possible scenario, in those GMUs with general mule deer hunting opportunity, calculate the 2-year average number of hunters. Provide controlled hunts with a October 5–31 season and tag levels equal to 25% of the 2-year average number of hunters. New controlled hunt tag allocations would be recalculated every 2 years during the biennial regulation cycle. General mule deer hunting seasons would run October 10–24 across the state.

Successful controlled hunt applicants in these GMUs would be able to hunt 5 days before the general season and 7 days after the general season when general tag holders cannot participate. If successful applicants concentrate hunting effort before and after the general season, hunter congestion will be reduced by up to 25% during the general season. Twenty-five percent is used as an example in this scenario,

and the actual percentage could be adjusted based on management need and public input. Similarly, the number of extra days before and after the general season could be adjusted.

Advantages	Disadvantages
• Maintains general opportunity in every GMU where implemented • May reduce hunter congestion during general season • Provides a unique hunting experience in every GMU where implemented • Drawing odds better than very limited hunts • Could maintain very limited Nov hunts in some GMUs • No new rules required to implement • Similar hunts already exist in some GMUs • Can still hunt with friends and family during general hunt • Opportunity to implement statewide	• Would shorten general season in some GMUs from Oct 10–31 to Oct 10–24 • Outfitters may lose opportunity due to shortened general season, but may be offset by additional controlled tags and longer overall seasons • Would increase nonresident participation in some areas if general-season participation is not capped for nonresidents at the hunt-unit scale

Stratified Hunts

Stratified hunts could incorporate any combination of spatial or temporal season splits by DAU, GMU, weapon type, and timing of hunt. For example, a general, any-weapon deer tag could be offered from October 5–14, October 15–24, or October 25–31 in a specific GMU or DAU. There are many ways stratified hunts could be structured, and addressing all possibilities is beyond the scope of this document. Below is a selection of possible designs for stratified hunts that would reduce congestion to varying degrees and that could be considered individually or in combination. Dates provided in examples below could easily be altered and are included as a starting point for consideration of concepts. Following the list of stratified-hunt concepts is a table that comprehensively addresses advantages and disadvantages of all concepts. All proposed concepts would require changes to the current licensing system, would introduce varying degrees of regulatory complexity, and some may require Commission action to modify or create administrative rules.

Stratify by weapon type (choose your weapon)

- Sep 1– Oct 4: archery
- Oct 5–20: any weapon
- Nov 28–Dec 20: muzzleloader

Split any-weapon season into 2 seasons (choose your season)

- Can only hunt within specified time frame, but can hunt any DAU
- Oct 1–20 or Oct 21–31, or some other combination of dates (Oct 5–14, 15–26)
- Maintain general archery and muzzleloader opportunities
- Youth could hunt both seasons

Split any-weapon season into 3 seasons (choose your season)

- Can only hunt within specified time frame, but can hunt any DAU
- Oct 1–14, Oct 15–26, or Oct 27–31
- Maintain general archery and muzzleloader opportunities
- Youth could hunt all seasons
- Some GMUs may offer only 2 time frames if 3 seasons would result in overharvest

Split by DAU and season

- Can only hunt specified time frame and specified DAU
- Oct 1–14, Oct 15–26, or Oct 27–31
- Choose DAU
- Maintain general archery, muzzleloader, etc. if available in DAU
- Youth could hunt any season, but limited to 1 DAU

Create DAU tag for nonresidents only

- Cap nonresident tags by DAU
- May define spatial scale other than DAU
- Resident tags would still be offered as regular or white-tailed deer only tags

Split general season with extra season opportunity in southern Idaho non-wilderness GMUs

- Hunters choose from first or second general, any-weapon opportunity
- Hunters choose one extra opportunity
  - o Late season any-weapon, or
  - o Any muzzleloader, short-range, archery (early or late)
- Youth could hunt both general seasons, and both extra opportunities

	General rifle opportunity (choose 1)		Extra opportunity (choose 1)	
	First season	Second season	Late rifle season	Alternative weapon season
October	10–14	15–24	25–29	Archery, muzzleloader, short-range

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Split season wilderness tag in wilderness GMUs

- Hunters choose either early (Sep 15–Nov 3) or late (Nov 4–18) any-weapon season
- No extra season

DAU-based A/B tag system

- Similar to current general elk-zone opportunity
- Hunter chooses
  - o DAU
  - o Weapon-season (A or B tag)
  - o Species (white-tailed or mule deer)

Advantages	Disadvantages
Hunters choose weapon, season, or DAU	
Increases primitive-weapon hunting opportunities (weapon) Provides increased management flexibility Provides flexibility to control nonresident distribution Distributes effort over time (season) Distributes effort over landscape (DAU)	Overall reduction in days or weekends (season, weapon) Eliminates opportunity to hunt statewide (DAU) Eliminates opportunity to hunt multiple weapon types Reduction in general-season days or weekends (season)
Stratify by DAU for nonresidents with no change to resident opportunity	
Reduces nonresident participation in some DAUs	Does not address congestion in areas with high resident hunter numbers May increase nonresident participation in some DAUs
Split any-weapon season into 2 or 3 seasons	
Provides choice of time period and still offers opportunity to hunt in all primitive-weapon seasons	May not substantially reduce congestion if most hunters choose same time period May limit IDFG's ability to sustain population or harvest objectives Reduction in general-season days or weekends
1. Choose between 2 any-weapon seasons and between 2 extra opportunities in non-wilderness GMUs or 2. Choose between early or late season in wilderness GMUs	
Offers longer seasons in wilderness GMUs Provides a wide variety of choices for hunters	May not reduce congestion if most hunters choose to hunt same any-weapon season Overall fewer days to hunt any weapon outside wilderness
DAU based A/B tag system (similar to general elk opportunity)	
Increases primitive-weapon hunting opportunities Provides flexibility in managing nonresident hunters Redistributes hunting effort over time	Eliminates ability to hunt statewide May reduce opportunity to hunt multiple weapon types

Population Monitoring and Management

Population Management Overview

IDFG manages wildlife to ensure healthy and persistent populations for current and future generations. Wildlife management is a science-based, decision-making process that requires knowledge and understanding of population trends, factors influencing wildlife populations, interactions among wildlife species, human influences, and effects of habitat conditions. For mule deer, population management means developing and implementing strategies to increase, decrease, or maintain deer numbers to stay within biological and social carrying capacities.

IDFG, the Commission, and stakeholders cooperatively develop management objectives which serve as the foundation for management direction and decisions. These decisions take into account both biological and social objectives. Social desires are an important component of objective development but must be considered in concert with biological limitations. Scientifically based monitoring protocols and population models are used to track population parameters and ultimately determine responsible allocation of harvest.

The following sections outline IDFG data collection, how data are analyzed and used to assess population status relative to objectives, and how resulting estimates are used to inform management.

Data Analysis Unit (DAU) Description and Development

Population management units (PMU) were formerly used as the geographic unit for mule deer analyses and management in Idaho. Recent location data from mule deer fitted with GPS radio collars across Idaho prompted the re-evaluation of PMUs, which led to development of more biologically meaningful data analysis units (DAU). These DAUs, comprised of multiple GMUs that provide summer and winter range and migratory routes for mule deer populations, are now used as the sampling unit for mule deer management. Delineation of DAUs such that data collected for population vital rates in winter and hunter harvest reports from summer-autumn apply to the same population is critical to developing appropriate management recommendations. Simply stated, to the maximum degree possible, DAUs should be representative of the entire seasonal range for an interbreeding population of deer. In areas with limited mule deer movement and demographic data, DAUs have been delineated by grouping GMUs with similar habitats, weather, and predator communities, which are expected to result in comparable mule deer demographics within DAUs.

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DAUs and Data Collection

Under this Plan, IDFG will develop formalized population demographic and abundance objectives for select mule deer DAUs. Intensive mule deer survey efforts have been focused in these areas for the last several years because the majority of mule deer in Idaho are found in these DAUs, mule deer occur at relatively high densities, and survey methodologies result in reliable demographic data. Data collection and analysis objectives defined in this Plan will continue to place emphasis on high-density mule deer populations.

DAUs with limited data or low-density mule deer populations are evaluated independently for data needs and management direction (see individual

DAU sections for more information). Monitoring techniques developed for high-density mule deer populations have limitations preventing effective application under some circumstances (e.g., dense overstory vegetation in northern Idaho; large, remote wilderness areas in central Idaho; and large areas of low-density populations such as high-desert habitats of southwestern Idaho). New techniques for assessing mule deer populations and distribution in such DAUs, including utilization of remote camera surveys, will be evaluated during this planning period. Additionally, Idaho, Washington, Montana, and British Columbia have initiated research on mule deer and other ungulates occupying dense forest habitats to better understand predation, productivity, and nutrition, and to develop new techniques to monitor populations (see Research section for more information).

Abundance Monitoring

Management decisions are best made when we have access to reliable information about population size, recruitment, over-winter fawn survival, and adult female survival (White and Bartmann 1998). IDFG relies heavily on aerial surveys and mule deer equipped with radio collars to collect these data and manage mule deer populations.

Initial efforts by IDFG to monitor population size began as annual aerial counts in key drainages. These surveys were later expanded to estimate total number of deer in certain GMUs every few years. However, because not all animals are observed during aerial surveys (Caughley 1974), IDFG developed a "sightability model" which corrects for those deer not observed (Unsworth et al. 1994). Beginning in the mid-1990s this sightability model was used to estimate mule deer abundance on 28 distinct winter ranges (trend areas) across southern Idaho. Although these surveys provided reliable information on herd composition and improved understanding of population trends, they were not designed to estimate overall abundance and likely failed to detect changes occurring in herds using smaller or peripheral winter ranges. To address concerns about the usefulness of trend-area surveys and provide estimates of total abundance, IDFG began complete aerial surveys of select mule deer PMUs in 2008. For select DAUs, surveys are now conducted across all winter ranges at the DAU-level using a complete coverage sightability model. Additional data will be collected over the life of this Plan to provide abundance estimates in significant DAUs currently lacking sufficient data for reliable abundance estimates (see individual DAU sections for specific information).

Herd Composition Surveys

Early winter fawn:doe ratios, a measure of fawn survival for the first 6 months of life, are an important component of the modeling process. Estimates of fawn:doe ratios are obtained in select DAUs during December via helicopter. Surveys should cover areas representative of deer distribution in a given DAU and classify enough animals to accurately estimate composition. Typically, these criteria can be met in as little as one-half day, but up to 2 days may be required, depending on the DAU. Acquiring these data requires approximately 100 hours of survey time annually. IDFG is developing camera-based composition survey protocols, which may provide an alternative to helicopter composition surveys in some DAUs in the future (see research section).

The primary purpose and design of composition surveys is to acquire reliable fawn:doe ratios, though buck:doe ratios can be concurrently obtained. However, because bucks are typically in much smaller groups and occupy different areas than fawns and does, buck:doe ratios are inherently conservative and typically underestimate buck numbers. Obtaining more accurate buck:doe ratios from aerial surveys would require additional regional and statewide funding. The population modeling section below provides an alternative to aerial surveys for estimating buck:doe ratios.

Survival Monitoring

Quality survival data are critical for population monitoring. Changes in adult female survival have the greatest potential to affect populations. However, adult female survival is relatively

constant over time. Put another way, adult female survival typically does not vary significantly over time; but when survival does change, implications for population abundance are significant. Conversely, population trajectories are less sensitive to changes in fawn survival, but fawn survival does vary considerably from year to year. Therefore, fawn survival usually drives routine annual fluctuations in Idaho's mule deer populations (Unsworth et al. 1999). However, large population reductions following very severe winters are driven primarily by reduced adult female survival.

IDFG began monitoring over-winter fawn survival with collared individuals in 1998 (≈250 fawns annually), as annual changes in mule deer populations are largely driven by this metric. In 2005, IDFG also began monitoring adult female survival in select GMUs. Using models based on habitat and weather variables, IDFG can now predict over-winter fawn and adult female survival with reasonable accuracy across many mule deer populations in Idaho (Hurley et al. 2017). However, actual over-winter fawn survival data and annual adult female survival data remain necessary components of mule deer population monitoring to ensure long-term accuracy.

Typical monitoring methods used in southern Idaho are generally not effective in more densely vegetated habitats of northern Idaho. IDFG is currently investigating new population assessment techniques for these habitats, using trail cameras, to estimate both total populations and fawn survival to 6 months of age. When possible, IDFG will attempt to estimate mule deer population size concurrent with white-tailed deer and elk camera-grid surveys in combination with estimates of neonatal survival and harvest.

Integrated Population Model (IPM)

The previous Mule Deer Plan directed researchers and managers to develop a monitoring program for mule deer that is less dependent on aerial surveys. Aerial surveys present considerable safety risks to IDFG employees. IDFG strives to minimize such risks in an effort to prioritize employee safety. Additionally, the cost of helicopter rentals continues to escalate and availability of suitable helicopters and experienced pilots is declining. Thus, IDFG implemented a new monitoring program that utilizes periodic population estimates (from comprehensive aerial surveys) combined with annual data for harvest, recruitment, over-winter fawn survival, and adult female survival to allow wildlife managers to annually model population status, without the need for large-scale, annual aerial surveys.

Building on data collection efforts outlined above, Nowak et al. (2018) developed a monitoring structure based on estimating annual deer abundance using an integrated population model (IPM). A web-based interface (PopR) allows biologists to estimate population performance with different hunting regulation and weather scenarios. PopR (http://www.popr.cfc.umt.edu/) contains modules for aerial survey models, survival estimation from radio-collar data, and predictive models for estimating survival from weather conditions. Managers can derive annual population estimates with the IPM, which is driven by a known starting population (from the most recent comprehensive survey), December herd composition ratios, hunter harvest, and survival rates.

The IPM currently produces reliable population and survival estimates for several PMUs (Nowak et al. 2018), which have been the geographic sampling units for data collection and analysis to date. Transitioning from PMUs to DAUs has resulted in fairly significant realignments of some monitoring areas. Where feasible with current data, we present relevant survival and population estimates in individual DAU sections later in the Plan. During implementation of this Mule Deer Management Plan, new estimates of survival and population abundance will be generated for additional DAUs. Collectively, survival and population abundance estimates will be produced for DAUs encompassing the majority of Idaho's mule deer population.

Population Parameters

Maintaining productive and healthy mule deer populations is a primary management objective for IDFG. As animal density increases, or habitat quality or quantity decreases, deer productivity and survival decline. The number of deer the landscape can sustain varies in the short-term (e.g., weather, wildfires) and the long-term (e.g., plant maturation, ecological succession). Rather than using habitat characteristics alone to assess carrying capacity, IDFG systematically monitors mule deer population characteristics that provide a reliable assessment of whether populations are nutritionally limited, and therefore, likely to be near or at carrying capacity (Table 4). Populations managed below carrying capacity are typically characterized by high recruitment, including recruitment of bucks into the population, and low natural mortality of adults, whereas populations at or near carrying capacity are usually characterized by low recruitment and survival (Table 4).

As populations and deer densities increase, population growth rates decline due to reduced over-winter fawn survival associated with limitations of the habitat to support more deer. In central and western Idaho, high-quality summer habitat is limited. When there are fewer adult females competing for the best habitat, fawn production and over-winter survival reach peak levels because more resources are available for each deer. Most mule deer populations in Idaho function in this manner. If attempts are made to maintain exceedingly high deer numbers, fewer deer will be recruited than would be under a reduced population level. Further, severe weather events result in losses of deer that could otherwise be harvested. The population range in which growth rate is maximized is considered the high productivity range and represents the population level that will promote greatest productivity, and subsequently, the most opportunity to hunters.

Table 4. Biological parameters monitored by IDFG and typical characteristics of a mule deer population approaching, or at, carrying capacity.

Parameter	Characteristics
December fawn weight	Below long-term average and declining over time
Adult female annual natural mortality	>15%
Over-winter fawn survival	Below long-term average and declining over time
December fawn:doe ratio	Below long-term average and declining over time
Body condition	Below long-term average and declining over time
Female age structure	Majority of females in older age classes

To estimate the high productivity range for a DAU, IDFG will use monitoring data to produce growth-rate curves that relate population growth to population abundance (Fig 1). When populations are too low, predation, annual habitat quality, or age structure may not allow for maximum population growth. When populations are too high, competition among deer, especially between adult females on summer range, will reduce fawn production and survival, limiting population growth. Population growth is maximized at some level lower than carrying capacity (top of curve in Fig 1), providing the greatest sustained number of deer for harvest. During implementation of this Mule Deer Management Plan, high productivity ranges for select DAUs will be identified by evaluating growth-rate curves based on monitoring and survival data unique to that DAU. In Figure 1, the maximum productivity range for a theoretical population is between 31,000 and 34,000 deer (See DAU sections for DAU-specific data).

Harvest Frameworks

The IPM can be used to forecast population abundance under various harvest strategies. Accurate population forecasts are particularly important for antlerless harvest because population trajectory is closely related to adult female survival. The impact of antlerless harvest

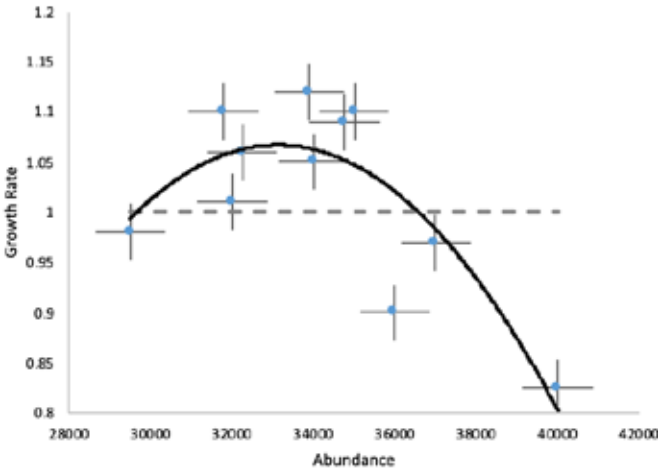

Figure 1. Population growth rate in relation to population abundance for a theoretical DAU. Growth rate = 1.0 indicates a stable population, <1.0 indicates declining production, and >1.0 indicates increasing production.

on population trend depends on the proportion of adult females harvested and recruitment of fawns into the population. The IPM allows managers to adjust antlerless harvest to appropriate levels to maintain a population within the range of highest productivity. The IPM also provides estimates of the number of bucks in a particular DAU. Therefore, IDFG can use the IPM to evaluate effects of varying levels of future buck harvest in a DAU, and adjust harvest frameworks to attain desired buck abundance and age structure.

Prior to development of the IPM, IDFG utilized a framework based on trends in fawn:doe ratios, over-winter fawn survival, and annual adult female survival to assess appropriate female harvest rates (Table 5). The framework is not prescriptive, but rather a support tool used in combination with other population data to help inform the decision-making process when populations are below carrying capacity. IDFG will use the IPM as the foundation for decision making related to antlerless harvest. However, in DAUs where insufficient data are available to reliably utilize the IPM, IDFG may continue to use the basic framework presented in Table 5 to further inform antlerless harvest decisions.

Unlike antlerless harvest, hunter success and harvest of bucks tend to follow the population trajectory, rather than influence that trajectory. Existing information suggests <5 bucks:100 does are required for mule deer breeding purposes. However, opinion surveys suggest hunter satisfaction declines at buck:doe ratios <15:100. IDFG will continue to provide a range of buck hunting opportunities (Table 2) across the state to meet various motivations and preferences of Idaho mule deer hunters. Because of varying social attitudes and preferences, mule deer population characteristics, and habitat variability across Idaho, no single management tool is prescribed for achieving buck objectives. Rather, a variety of tools, including season length and timing, weapon restrictions, area-specific tags, controlled hunts, and others, will be evaluated (see Hunter Congestion section).

Table 5. Adult female (>1 year) harvest rates (%) that will maintain population stability for mule deer populations below carrying capacity.

	40 Fawns:100 Does			60 Fawns:100 Does			80 Fawns:100 Does		
Over-winter Fawn Survival	0.2	0.5	0.8	0.2	0.5	0.8	0.2	0.5	0.8
85% Annual Adult Female Survival[a]	<1%	<1%	1%	<1%	1%	4%	1%	1%	9%
90% Annual Adult Female Survival[a]	<1%	<1%	1%	<1%	1%	8.5%	1%	4.5%	13.5%
95% Annual Adult Female Survival[a]	<1%	1%	5.5%	1%	4.5%	13%	1%	9%	18%

[a]**Excludes harvest mortality.**

Habitat

Wallmo (1981), in his seminal book on mule deer, noted "the only generalization needed to account for the mule deer decline throughout the West is that practically every identified trend in land use and plant succession on the deer ranges is detrimental to deer. Hunting pressure and predators might be controlled, and favorable weather conditions could permit temporary recovery, but deer numbers ultimately are limited by habitat quality and quantity." The same holds true today; no other management tool can be utilized to make up for absence of quality habitat.

Idaho's mule deer habitat is highly diverse and variable. With elevation gradients spanning 11,952 ft (710–12,662 ft), annual precipitation ranging from 6 to 104 inches, and temperature varying more than 120° F during the year, vegetation types vary considerably. Mule deer exploit this diversity, improving their chances for survival. Maintaining intact productive habitats on summer range, winter range, and migratory pathways is paramount for ensuring long-term sustainability of Idaho's mule deer herds. These essential seasonal habitats are all affected to varying degrees by ecological succession, forest management, wildfire, climate change, invasive and noxious weeds, and human development.

Summer Range

Mule deer seek higher elevations with abundant food to raise offspring and increase fat reserves during summer. A deer's ability to survive harsh winter conditions is directly related to the amount of reserves obtained on summer range. Much of Idaho's mule deer summer range occurs on U. S. Forest Service (USFS) lands dominated by pine (*Pinus* spp.) and fir (*Abies* spp.) forests that vary in productivity. The most productive forests are those in early and mid-successional stages. Reduced summer-range productivity in some locations has resulted from recent reductions in timber harvest rates, reduced wildfire frequency, increased wildfire severity, increased human development, and increased prevalence of invasive and noxious weeds.

Late-successional conifer forests provide little forage for mule deer (Wallmo 1981), as their dense overstory limits growth in the understory. Conversely, disturbance-dependent early and mid-seral aspen (*Populus* spp.) stands and mountain-shrub communities provide considerable forage and concealment cover for lactating females and their fawns, and for bucks during antler development. From 1979 to 2015, there was an 88% reduction in annual timber harvest on USFS lands in Idaho (Simmons and Morgan 2017), dramatically reducing amounts of beneficial early and mid-seral forest habitats across mule deer summer range. Additionally, fire suppression has been common practice for many decades, and fire-return intervals in conifer forests are now much longer than those prior to advanced fire suppression activities (Keane et al. 2002). Reductions in timber harvest and longer fire-return intervals result in maturing conifer forests across Idaho. Not only are older forests less productive for mule deer and other early successional species, but they are more prone to stand-replacing fires rather than historical mixed-severity fires. Further, maturing conifer forests put highly productive aspen communities at risk, as conifers encroach and out-compete aspen stands and prevent regeneration.

Rainfall, topography, soil types, and ecological region also affect productivity on summer range. For example, females with access to highly productive habitats in southeast Idaho select for bitterbrush (*Purshia tridentata*) and wild geranium (*Geranium* spp.) (Thiel 2012). Conversely, females in more arid regions of central Idaho, where forage quality is lower, rely heavily on sagebrush (*Artemisia* spp.) to maximize fitness. This finding highlights the value of sagebrush for mule deer in arid portions of Idaho. However, deer with access to higher-quality forage exhibit better body condition and higher twinning rates, and produce fawns

with higher survival and better growth potential (Shallow et al. 2015). Furthermore, male fawns born to females in poor condition experience diminished growth potential (Monteith et al. 2014), which helps explain differences in body size and potential for antler growth among regions in Idaho.

Much of mule deer summer range is protected from rural residential development via federal ownership. However, in Caribou and Bear Lake counties, phosphate mining occurs across a large landscape, primarily on federal lands. Forest and shrub habitats disturbed during mining activities are primarily reclaimed into grassland habitats, permanently removing important shrub and forest habitats from mule deer summer range. Also, important summer range continues to see increases in rural and exurban development on private lands in places such as Wood River Valley (Blaine County) and McCall (Valley County, Fig. 2). Forested lands, especially those adjacent to population centers, are subject to increased recreational activity (e.g., trail riding, hiking) that may increase disturbance on summer range (Taylor and Knight 2003). Additionally, increased human activity also increases spread of invasive and noxious weeds as people or their pets, livestock, or equipment carry weed seeds to new areas. Canada thistle (*Cirsium arvense*), leafy spurge (*Euphorbia esula*), spotted knapweed (*Centaurea maculosa*), houndstongue (*Cynoglossum officinale*), and many other weeds can outcompete beneficial native plant species, ultimately reducing amounts of quality forage on summer ranges.

Winter Range

Migratory mule deer accumulate energy in the form of fat reserves on summer and transition ranges and migrate to lower-elevation winter ranges with less snow to conserve energy and minimize fat loss. Winter survival depends on an energy conservation strategy where mule deer use winter-range habitats at lower elevations and on south-facing slopes with adequate thermal or canopy cover. However, vegetative quality and quantity, topography, and weather conditions vary widely on Idaho's winter ranges, and contribute to differences in habitat use patterns and behavior among wintering populations. These discrepancies among winter ranges are important considerations for understanding habitat requirements of mule deer, and ultimately, how winter ranges should be managed (Smith 2011).

Most winter range in Idaho is located on sagebrush-steppe habitat across lands managed by the Bureau of Land Management (BLM) and private landowners. These communities, comprised of sagebrush, bitterbrush, mountain mahogany (*Cercocarpus ledifolius*), juniper (*Juniperus* spp.), grasses, and native forbs, provide critical food resources during winter. Healthy sagebrush-steppe ecosystems generally occur in lower precipitation zones and are slower to recover from disturbance than higher elevation summer ranges. Mountain (*A. t. vaseyana*) and Wyoming (*A. t. wyomingensis*) big sagebrush may take 70–300 years to recover after fire events (Baker 2006). Hence, winter ranges across Idaho are extremely susceptible to negative effects from increased wildfire frequency, wildfire severity, prevalence of invasive and noxious weeds, and human development.

Historically, fire-return intervals in Idaho's shrub-steppe averaged 60–110 years and fires were generally small and patchy (Whisenant 1989). More recent fire-return intervals have shortened to 10–25 years, with some areas in southern Idaho burning 7 times over a 32-year period (Fig. 3). Additionally, fires have generally become larger, less patchy, and more intense. Reductions in fire-return intervals are perpetuated by invasion of newly burned sites by invasive plants such as cheatgrass (*Bromus tectorum*), medusahead (*Taeniatherum caput-medusae*), jointed goatgrass (*Aegilops cylindrica*), ventenata (*Ventenata* spp.), and rush skeletonweed (*Chondrilla juncea*). These plants provide a fine fuel source that ignites easily and burns rapidly. Beyond creating an environment that is more prone to wildfire, these plants have limited forage value and directly compete with beneficial native plants for limited soil moisture, ultimately reducing the quality of mule deer winter range.

Much of Idaho's historical winter range has been lost or severely compromised by human

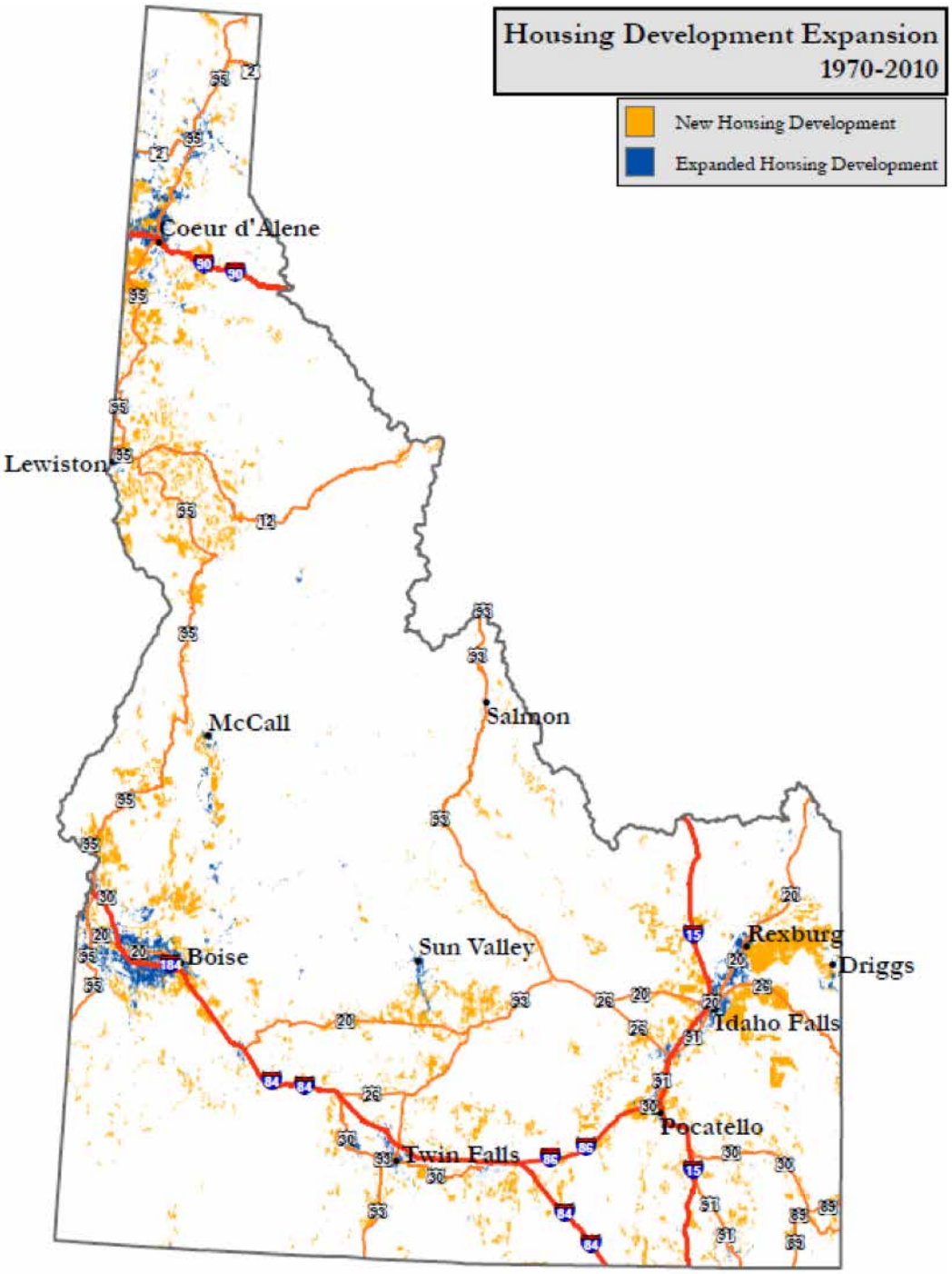

Figure 2. Expansion of housing development in Idaho, 1970–2010, as adapted from National Park Service (2010). The "New Housing Development" class includes areas that were undeveloped in 1970 and were developed into low-, medium-, or high-density housing by 2010. The "Expanded Housing Development" class includes areas that were low-density housing in 1970 and were developed into medium- or high-density housing by 2010.

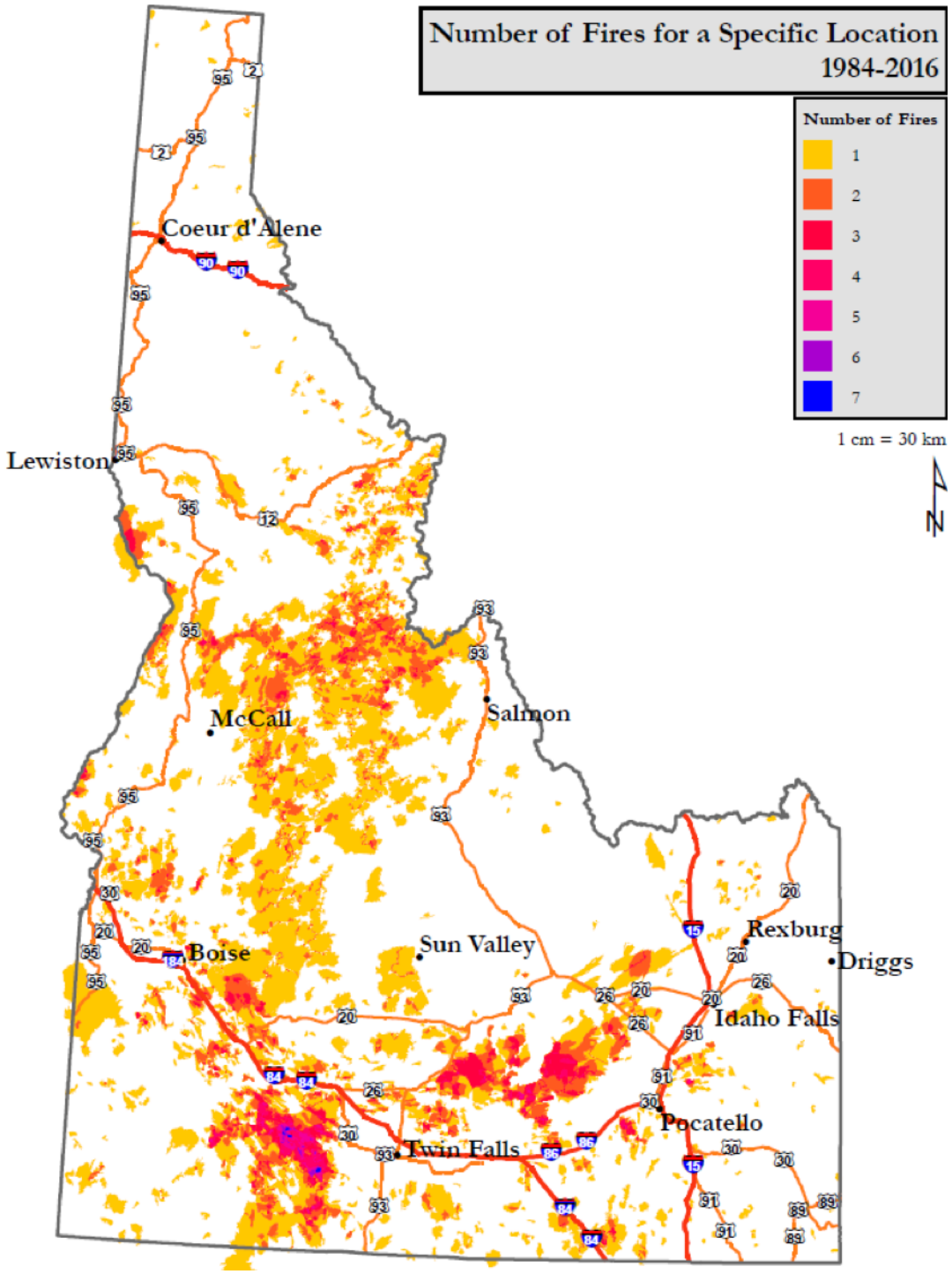

Figure 3. Number of fires (>1,000 acres) that overlapped a specific location, Idaho, 1984–2016.

development. Additional winter range exists on other private lands that are currently unprotected from direct and indirect threats. Idaho's human population more than doubled from 1970 to 2010. Since 2010, the population has increased nearly 1% every year, making Idaho the fastest growing state in the nation (U. S. Census Bureau 2019). During the same time period, rural (42%), exurban (373%), suburban (187%), and urban (612%) development all increased, resulting in a 32% loss of undeveloped private lands (Fig. 2; National Park Service 2019). Areas of particular concern for residential development on winter range include the Treasure Valley and much of eastern Idaho. Urban sprawl in prime winter range will continue to directly affect the long-term sustainability of mule deer in Idaho (Johnson et al. 2017). Indirect effects of development are also of concern. Increased human activity in and around winter range can result in far greater energy expenditure during disturbance events (Parker et al. 1984) than on summer range, thereby reducing overwinter survival. Increased mule deer densities and poor body condition during winter exacerbate effects of small disturbances, which may lead to reduced survival and lower herd productivity.

Migratory Habitat

Migration and movement pathways provide crucial seasonal habitats that link summer and winter ranges. Migration allows mule deer to avoid deep snow and other harsh conditions during winter and take advantage of high-quality forage during summer. These migratory pathways concentrate mule deer and increase their vulnerability to human development and other threats, such as direct mortality from vehicles.

As the western U. S. becomes more heavily populated, the focus on protecting and managing migratory pathways has increased. In 2018 the Secretary of the U. S. Department of Interior (DOI) signed Secretarial Order 3362, directing DOI staff to focus efforts on identification and protection of these migratory pathways in coordination with state wildlife management agencies (U. S. Department of Interior 2018). As an extension of this effort, IDFG is currently analyzing information from radio-collared mule deer to refine our knowledge of migratory pathways across the state (see Research section).

Timing, speed, and distance of migration between summer and winter ranges varies greatly by location and individual. Mule deer migrations may take <1 week or as long as 2 months, and some individuals migrate >150 miles (Sawyer et al. 2014). Protecting migratory habitat is essential if mule deer are to persist on the landscape. Also important to mule deer fitness and productivity is forage quality along these pathways. Though mule deer could easily complete long migrations in a few days, they instead take weeks or longer to complete their migrations, utilizing forage resources along the way (Sawyer and Kauffman 2011). Mule deer may avoid human development and human disturbances along migratory pathways, which reduces their ability to maximize nutritional intake during migration (Sawyer et al. 2016). Housing development, highway construction and expansion, fences, wildfires, and energy development negatively affect these high-value, long-distance migration corridors. Identifying limiting factors to each migratory pathway and focusing on solutions to protect and improve movement along migration pathways will be a priority during implementation of this Plan.

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Mule Deer Initiative

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The Mule Deer Initiative (MDI) is an adaptive program with a holistic focus on Idaho's mule deer and has 3 basic goals: 1) increase mule deer numbers, 2) increase mule deer hunter satisfaction, and 3) protect and improve mule deer habitat. The MDI initially focused on southeastern Idaho, but has expanded to other important mule deer regions in the state. The foundation for the program lies in implementing meaningful habitat projects that will benefit mule deer populations and, ultimately, mule deer hunting.

Recent focus of the MDI program has been on engaging and collaborating with public land management agencies to encourage and facilitate active habitat restoration and management to benefit mule deer populations across seasonal ranges. Examples include working with the Caribou-Targhee, Salmon-Challis, and Sawtooth National Forests as well as the Salmon, Challis, and Pocatello BLM field offices to develop and complete new aspen restoration projects on mule deer summer range. MDI staff have also developed collaborative strategies and agreements to restore critical winter range on BLM lands across southern Idaho.

Working with private landowners and producers to improve mule deer habitat continues to be an important component of MDI. IDFG biologists serve as technical service providers, in collaboration with the U. S. Department of Agriculture, and have developed conservation plans on >100,000 acres enrolled in the Conservation Reserve Program. Additionally, MDI continues to work with the Idaho Transportation Department (ITD) to develop strategies to minimize deer-vehicle collisions and to conserve connectivity of migratory pathways in priority locations.

Hunter Access

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Lack of access has been identified as a direct threat to hunting. Providing access to hunters is a priority for IDFG, as access to public and private lands is an important consideration for Idaho mule deer hunters when making decisions about where to hunt (IDFG 2018). Growing threats to public land access include:

- Limited access to public lands surrounded by private lands,
- Exclusive leasing of private lands, and
- Hazardous conditions following wildfires and associated losses of trail and road infrastructure.
- Lack of funding to maintain backcountry airstrips,

IDFG recognizes the importance of continued efforts to provide access to and through both private and public lands and uses a suite of tools to improve hunter access:

- The *Access Yes!* program secures access to private lands or across private lands to landlocked public lands. During 2017 approximately 800,000 acres of land statewide were open to the public via Access Yes!; split evenly between private lands and previously landlocked public lands.
- A 2018 agreement between IDFG and Idaho Department of Lands (IDL) will allow continued public access to 2.3 million acres of IDL-managed lands. Historically, these lands were open to the public, but were at risk of lease agreements limiting public access. This agreement ensures Idaho state endowment lands are open to the public to hunt mule deer and other game species.
- The *Large Tracts Program* secures access to private land tracts ≥50,000 acres. Funding for this program resulted from passage of a budget package by the Idaho Legislature in 2017, which was intended to increase funding that supports public access programs.
- Backcountry properties managed by IDFG have received increased attention for hunter, trapper, and angler opportunities, as recent congestion issues in central Idaho have highlighted the consequences of lost access in the backcountry. In 2017 IDFG formed an internal working group to review and make recommendations on IDFG-owned backcountry properties, trail conditions, and other access portals in or near wilderness areas in central Idaho. As a result, IDFG staff improved 2 existing IDFG runways, built 1 new runway, and engineered plans for another runway on IDFG lands. These runways serve as critical portals for access in the backcountry.

In addition to these programs, which are primarily focused on private or state-owned lands, the Department continues to work with our partners to secure access to federal lands and to explore additional tools for maintaining and expanding access. For example, IDFG provided technical input and funding to improve road and trail systems in the Nez Perce-Clearwater and Salmon-Challis National Forests, secured walking access through private land to >22,000 acres of BLM lands in the Antelope Creek drainage in the Appendicitis Hills, and is currently negotiating access agreements that will provide access to several hundred thousand acres of private timber corporation and adjacent public lands.

Motorized Use

Since the late 1980s Idaho has witnessed a substantial increase in off-highway vehicle (OHV) registrations, not only for hunting, but also for other outdoor recreation. Statewide, 157,393 OHVs were registered in 2017; >20 times the number registered in 1989. Increased use has been accompanied by a trend toward a greater variety of more powerful machines capable of transporting people farther into remote areas.

Many of Idaho's mule deer hunters use OHVs to retrieve game or reach areas inaccessible to larger motorized vehicles. Hunters with limited or compromised physical abilities may use OHVs to increase mobility. However, conflicts between people not using motorized equipment and those who do (legally and illegally) have escalated concurrently with increased use of OHVs. In 2002 IDFG implemented a Motorized Hunt Rule (MHR) in some GMUs, limiting use of OHVs to only those roads designated for legal travel by a full-sized automobile. This rule was implemented to reduce conflicts between hunters using motorized and non-motorized transportation, and to decrease impacts to big game, particularly elk. Generally, a majority of mule deer hunters support restricting use of OHVs as a tool to improve quality of the hunting experience (IDFG 2018). However, the rule is confusing to some, especially when it differs from land management agency travel plans (e.g., when motorized trails remain open to non-hunting users). As one of the primary contacts for hunters in the field, IDFG Conservation Officers will continue to participate in and develop programs that help educate hunters and explain benefits of the MHR where the rule is implemented.

IDFG directly manages a very small portion of mule deer habitat in the state. Approximately 60% of Idaho's landmass is managed by federal agencies (38% USFS, 22% BLM), which have primary responsibility for road, trail, and travel management. These federal agencies address motorized travel management through travel planning, which incorporates public input into the decision-making process. Travel rules generally restrict OHV use to designated routes and trails, eliminating cross-country travel. The current travel-planning cycle for USFS lands in Idaho is nearly complete, with a few exceptions related to ongoing litigation. The BLM in Idaho initiated a similar process, but completion of plans will likely require several years. Though IDFG does not have authority to close or open roads or trails on federally managed lands, IDFG does serve in an advisory capacity to state and federal managers during travel management decision making. IDFG regularly provides input regarding proposed travel rules as related to hunting and recreational access, as well as potential impacts to wildlife populations. Additionally, IDFG Conservation Officers, through a memorandum of understanding with the USFS, are able to enforce travel regulations on USFS lands in Idaho.

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Research

Biological investigations are conducted to provide wildlife managers with improved knowledge and tools for managing mule deer populations. Since development of Idaho's previous Mule Deer Plan, researchers across the West have conducted a number of investigations and produced findings that provide new and meaningful insight into mule deer populations and habitats. IDFG researchers made significant contributions to these efforts with investigations that will directly improve mule deer management in Idaho.

Research during the past 10 years has highlighted influences of nutrition and habitat quality on mule deer population dynamics. Numerous studies have drawn attention to the importance of both summer and winter nutrition on survival and productivity of bucks, does, and fawns (Bishop et al. 2009, Hurley et al. 2011, Hurley et al. 2014, Monteith et al. 2014). Shallow et al. (2015) found neonatal fawns occupying summer ranges characterized by high nutritional quality in eastern Idaho exhibited significantly higher survival than fawns in central Idaho where availability of high-quality forage is limited. Hurley (2016) found mule deer populations in southeast Idaho could be self-limiting. When populations were high, fawn production declined. Competition for high quality fawn-rearing range likely limited population growth.

Predation on mule deer has also been a priority for research and management in Idaho. We have a solid understanding of predation rates on adults and fawns from a sample of nearly 9,000 radio-collared mule deer over the last 20 years. IDFG has also tested effects of removing mountain lions (*Puma concolor*) and coyotes (*Canis latrans*) on population dynamics of mule deer (Hurley et al. 2011).

Understanding how nutrition and predation influence populations is important. To move research results into management actions, IDFG has developed predictive models to estimate winter fawn survival without the need for radio collars (Hurley et al. 2017). IDFG has also developed population modeling software that allows managers to evaluate and estimate effects of harvest and weather on deer populations (Nowak et al. 2018).

IDFG is currently engaged in a variety of research projects that will continue to advance our knowledge of mule deer populations and ultimately lead to more informed management of mule deer in Idaho. Below are highlights from ongoing research projects.

Mule Deer Population Modeling is focused on continued refinement of a web-based integrated population model (IPM) for mule deer and elk. The IPM and associated web-based interface (PopR) contain modules for

aerial survey sightability models and radio-collar survival estimates along with annual estimates of population size. Predictive models for winter fawn survival have also been developed, which reduces the need to deploy radio collars. This research will provide a nutrition-based estimate of carrying capacity for each mule deer DAU and provide a scientific basis to evaluate population or harvest goals. Further, an assessment of data collection quality, efficiency, and usefulness for the IPM is being conducted in collaboration with the University of Montana.

An assessment of ***Buck Vulnerability*** will predict effects of season structure and habitat security on male mule deer survival. Research will alternate among GMUs with varying season structures, hunt types, hunter access, and habitat security to determine relationships between those metrics and buck mortality. This project will capitalize on current capture and monitoring efforts and the statewide vegetation map to provide vegetation security cover estimates. Results of this research will provide managers with information needed to objectively estimate effects of changing hunting season structure or habitat security on buck vulnerability, while maintaining hunter opportunity.

Mule deer ***Seasonal Range Modeling*** is using GPS location data collected from all collared mule deer in Idaho to model seasonal ranges, transitional ranges, migration routes, and fawning habitat.

Efforts to ***Utilize Remote Camera Stations*** to estimate population size, buck:doe:fawn ratios, and recruitment of ungulates are underway in collaboration with researchers from the University of Montana. If camera stations produce reliable estimates, aerial survey time could be reduced, thereby enhancing employee safety and providing financial benefits. Additionally, multi-species remote camera research in forested habitats of northern Idaho will provide an opportunity to test the feasibility of assessing demographics of low-density mule deer populations.

Current mule deer PMUs have been re-evaluated to develop ***Biologically Meaningful DAUs*** by using radio-collar location data collected across Idaho. These new mule deer DAUs are the foundation for mule deer analyses and management in Idaho.

Effects of Predator Harvest on Ungulate Survival and Population Growth in systems with multiple predators and prey are being evaluated in collaboration with the University of Montana. Mule deer, white-tailed deer, elk, and carnivore monitoring data from Idaho and surrounding states are being used to build predator-prey models and ultimately estimate how harvest of various predators (gray wolf [*Canis lupus*], bear [*Ursus* spp.], or mountain lion) will affect deer and elk population growth.

Influence of Habitat Quality and Weather on White-tailed Deer, Mule Deer, Moose (Alces alces), and Elk in Forested Habitats in northern Idaho will be assessed in collaboration with the University of Idaho by developing techniques to monitor abundance or vital rates of mule and white-tailed deer from camera surveys. Results will be used to link habitat quality and weather to population performance. Predictive models will be developed using habitat quality to predict population performance in various habitats.

The ***Development of a Statewide Fine-Scale Vegetation Map and Models*** is utilizing existing spatial and remotely sensed data layers combined with ground surveys. A prototype fine-scale vegetation map will be used to predict nutritional conditions for a variety of wildlife, including mule deer.

Assessing Habitat Change, Connectivity, and Barriers to Movement for Wildlife is a long-term project to evaluate effects of habitat change on species survival and landscape connectivity. This project has multiple subprojects, including 1) evaluation of population-level effects of wildlife-vehicle collisions and effectiveness of mitigation efforts, 2) evaluation of landscape connectivity and potential barriers to movement for multiple species, and 3) evaluation of large-scale habitat changes in agricultural landscapes (e.g., proportions of CRP, crops, and native vegetation). This major research project involves collaborators from other state agencies, multiple universities, and several non-governmental organizations.

Predation

Primary predators of mule deer in Idaho are mountain lions and coyotes. Additionally, bobcats (*Lynx rufus*), black bears (*U. americanus*), gray wolves, and several other species utilize mule deer as part of their prey base. Vulnerability of mule deer to these various predators is dependent on age. For example, black bears utilize neonate mule deer (0–6 months) as part of their prey base, but rarely kill older fawns or adults. Coyotes are common predators of neonates and fawns, but rarely kill healthy adult mule deer (IDFG, unpublished data). Mountain lions prey upon mule deer of all ages and may have population-level impacts on mule deer in some circumstances.

When determining effects of predators on mule deer populations, predation should be viewed in the context of compensatory or additive mortality. Compensatory mortality occurs when 1 source of mortality offsets another source (i.e., reducing 1 source of mortality will result in an increase in another source, with no net decrease in total mortality), whereas additive mortality results in an increase in total mortality. Similarly, proximate and ultimate causes of mortality need to be considered when determining effects of predation. For example, a predator is more likely to kill (proximate cause of mortality) an individual that is dying due to starvation or disease (ultimate cause of mortality). Viewing predation in this context is an important factor when considering whether predator management activities might be an effective means of increasing prey populations.

Hurley et al. (2011) monitored effects of mountain lion and coyote removal in southeastern Idaho using tools readily available to wildlife managers at a practical management scale. While managed coyote removal increased survival of neonatal fawns, this effect was dependent on reduced densities of alternate prey and did not translate into population growth. Furthermore, removal of coyotes at described levels did not increase over-winter fawn survival or adult survival. Removal of mountain lions at described levels slightly increased December fawn:doe ratios, over-winter fawn survival, and adult female survival. However, these changes in survival had minimal positive effects on mule deer population growth rates and were less important than climatic influences. They concluded benefits of predator management in southeastern Idaho appeared to be minor and only short-term in duration. Research utilizing mule deer and carnivore monitoring data to estimate how predator harvest might influence population growth is ongoing (see Research section).

Management of predators to increase mule deer populations is a complex issue, as differing segments of Idahoans have contrasting views of predators. Additionally, investigating the topic and making decisions about the efficacy of predator control are difficult because survival of mule deer depends on many factors, not just predator populations. Level of predation; mule deer population status relative to habitat carrying capacity; abundance of alternate prey; forage abundance; and, very importantly, weather conditions all interact to affect survival and population change in mule deer.

In 2000, the Idaho Department of Fish and Game Commission implemented a *"Policy for Avian and Mammalian Predation Management"* to guide IDFG's implementation of predator management activities. The policy directs IDFG to implement predator management if there is evidence predation is a significant factor preventing prey populations from meeting IDFG population management objectives. Furthermore, IDFG is directed to use the best available scientific information to guide their actions concerning predator management. At this time, the weight of available evidence does not suggest predator management is an effective tool for increasing mule deer populations at a meaningful scale in Idaho.

Interactions With White-tailed Deer and Elk

BULL ELK CCBY IDAHO FISH AND GAME

Scientists, hunters, and others have questioned whether competition with white-tailed deer or elk may negatively affect mule deer. As mule deer populations are often limited by availability of quality habitat, increased use of these habitats by other ungulates has drawn attention of many hunters and wildlife managers. Specifically, expansion of white-tailed deer and elk populations in historical mule deer habitat has been cause for concern.

Although white-tailed deer and mule deer exhibit some dietary overlap, the 2 species are often segregated based on vegetation communities and elevation. White-tailed deer are generally associated with rivers, streams, and agricultural lands at lower elevations, whereas mule deer are usually found at higher elevations and drier habitats. Nevertheless, IDFG has been cautious about encouraging expansion of white-tailed deer in parts of Idaho. In southern Idaho, IDFG's management priority has traditionally been placed on mule deer, and liberal harvest of white-tailed deer is employed as a tool to reduce potential competition with mule deer in areas where the 2 species' ranges overlap.

Of greater interest to many hunters and wildlife managers is the impact increasing elk populations may have on mule deer. Research results investigating competitive effects of elk on mule deer populations have been inconclusive and sometimes contradictory. Complicating the issue is changing landscapes, where habitat change may favor 1 species over another (Keegan and Wakeling 2003). For example, many shrublands (to which mule deer are best adapted) have been converted to grasslands, while others transitioned to tree-dominated forests or over-mature shrubfields (Lutz et al. 2003; see Habitat section). These habitat changes are detrimental to mule deer populations and often beneficial to elk.

Several mechanisms have been suggested whereby elk might negatively affect mule deer populations. In general, elk are capable of utilizing most mule deer forages, but mule deer are incapable of using many common elk forages. Additionally, mule deer avoid elk in some circumstances (Lindzey et al. 1997, Johnson et al. 2000), which may be of concern if mule deer are relegated to lower-quality habitats. If presence of elk on critical mule deer fawning or wintering habitats causes displacement of mule deer to lower-quality habitats, productivity and fawn survival may be negatively impacted.

In response to localized declining populations of mule deer and increasing populations of elk in southern Idaho, IDFG initiated an investigation into mule deer and elk interactions on the Tex Creek winter range. During a mild winter, mule deer and elk diets did not overlap and the species occupied different space (Atwood 2009). Conversely, during a harsh winter, both species occupied the same area, with a potential for forage overlap. However, winter severity was the most important factor affecting mule deer, not competition with elk for the same resources.

Emergency Winter Feeding

Winter is a period of cold temperatures, reduced availability and quality of forage, and higher energy demands. Mule deer evolved to survive most winters by migrating to lower elevations, reducing energy expenditures, and utilizing fat accumulated during summer and fall. However, there are occasional circumstances when emergency supplemental feeding may be a useful management tool.

Winter feeding by IDFG is guided by Commission policy and authorized by IDAPA 13.01.18. In accordance with these policies, IDFG does not sanction widespread supplemental feeding of big game, but is authorized to feed deer, elk, and pronghorn (*Antilocapra americana*) if 1 or more of the following conditions exist:

- Actual or imminent threat of depredation to private property
- Threat to public safety, including traffic hazards
- Excessive mortality that would affect herd recovery
- Limited or unavailable winter forage caused by fire or unusual weather

Although policies do not specifically define excessive mortality, IDFG generally considers mortality rates of ≥30% of the adult female population to be excessive.

Since 1984 funds used for winter feeding have been generated from deer, elk, and pronghorn tag sales; currently $1.75 from each tag sold. These funds are maintained in a set-aside account to be used only for emergency winter feeding and winter range habitat improvement (Idaho Code 36-111).

Idaho Code 36-123 establishes citizen advisory committees in regions where emergency winter feeding occurs. These committees developed criteria for determining when emergency conditions exist. Although criteria vary somewhat among regions, they are primarily based on measurable, science-based, environmental conditions such as snow depth, minimum temperatures, body condition entering winter, and winter-range conditions. Committees play an important liaison role between IDFG and local communities relative to winter feeding and importance of maintaining quality winter ranges. The Idaho State Department of Agriculture prohibits private feeding of big game animals, including mule deer, in several counties in eastern Idaho (Idaho Code 25-207A, IDAPA 02.04.25) unless feeding is part of emergency activities authorized by IDFG. The rules were implemented to address concerns of potential brucellosis transmission between elk and livestock.

Supplemental winter-feeding programs, despite broad social appeal and acceptance, are expensive and can negatively affect mule deer behavior and biology. More importantly, winter feeding will not eliminate mortality and will do little to address malnutrition at a scale meaningful to the population. Prior to initiating winter feeding, potential for long-term benefits to mule deer, as well as habitat conditions, must be critically evaluated. Recognition that mule deer population fluctuations are normal is an important part of understanding mule deer ecology; attempts to reduce temporary population declines during harsh winters may not be in the best long-term interest of the population or habitats that support them.

Mule deer are highly selective foragers, in part due to their specialized digestive system. A mule deer's digestive system, as with other ruminants, is dependent on bacteria to break down their food. As deer diets change throughout the year, so do the bacteria, adjusting to differences in diet composition and quality. Changes in bacteria can take several weeks; therefore deer are poorly adapted to sudden changes in diet. As a consequence, even foods with high nutritional value may become difficult or impossible to digest, and animals will often die with full stomachs.

Winter-feeding programs generate artificially high animal densities at feeding sites, which may lead to increased disease transmission, increased predation, heightened competition, and localized habitat degradation. High animal densities provide ideal opportunities for transmission of diseases and parasites, and decisions about supplemental feeding must take into consideration the growing threat of Chronic Wasting Disease (CWD) to Idaho's mule deer herds (IDFG Strategy for CWD 2018). Intense competition at feed grounds seems to be particularly detrimental to fawns, the segment of the population most susceptible to malnutrition, as larger, stronger deer outcompete them for food. Those animals receiving too much food as they gorge on supplied feed also jeopardize their own survival due to complications from dietary shock. Lastly, habituation to supplemental feed and feeding sites may result in deviation from normal winter diets and traditional migratory behavior, which, in the long term, are detrimental to sustained mule deer populations.

WINTER FEED CCBY IDAHO FISH AND GAME

Urban Mule Deer

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Mule deer are increasingly living in Idaho's cities and towns. As Idaho's human population continues to grow and encroaches on previously undeveloped deer habitat, urban deer conflicts are expected to become more prevalent. Deer quickly learn life within city limits has many advantages. With few natural predators, restrictions or prohibitions on hunting and discharging firearms, steady food supplies, and little or no need to migrate, many sources of mortality are virtually eliminated for these deer.

As urban deer populations increase and generations of females teach fawns to survive in towns and cities, vehicle collisions and nuisance complaints increase, and predators arrive to take advantage of ample prey. Complaints are often directed to IDFG, but municipalities themselves can help address urban mule deer populations with ordinances that allow hunting or prevent feeding.

Most municipalities prohibit discharging firearms within city limits, and many prohibit use of archery equipment. Weapons restrictions and limited access to private property makes hunting, IDFG's preferred method of population control, difficult to implement. Some residents see deer as a nuisance, while others continually feed them and enjoy their presence. This situation creates neighborhood conflicts, as habituated deer with no fear of humans or pets do not differentiate between tolerant residents and those who want to avoid damage to gardens, shrubs, and trees. Predators are also attracted to areas with high densities of urban deer, and their presence often incites fear and concern among local residents.

Challenges presented to IDFG and municipalities by urban wildlife are extensive. IDFG will continue to work with local municipalities to identify potential solutions to jointly deal with urban deer conflicts. Support and potential strategies will vary by municipality, and many constituents may not be hunters or possess knowledge of wildlife management practices. Managers must consider sensitivities of citizens within a given community to gain support and garner a positive public image for any proposed action. Potential solutions should be consistent with IDFG's tenants to preserve, protect, perpetuate, and manage wildlife, and the community's guidelines and tolerances.

Depredation

Mule deer damage to agricultural crops is a concern for both landowners and IDFG. Depredations may occur when populations are high, environmental conditions cause deer to seek high-quality forage during drought or heavy snows, or when historical seasonal ranges are impacted by development or disturbance. Idaho Code 36-1108 identifies statutory requirements that must be met and appropriate actions IDFG must take to address depredation situations.

IDFG works cooperatively with private landowners to provide suitable alternatives or solutions to address depredations by deer and other wildlife. Hazing, permanent fencing, depredation hunts, kill permits, continued-use agreements, and perpetual easements are some of the tools used to manage depredations.

In 2017 IDFG received additional funding from a legislative package (House Bill 230) to take a more proactive approach to developing solutions to manage depredations. For example, IDFG built >300 new stack yards on private land to reduce damage to stored forage. This aggressive focus on reducing depredation will continue into the future.

For more information on IDFG's Depredation Program please refer to *A Landowners Guide to Preventing Big Game Damage and Filing Damage Claims.*

Ilegal Harvest and Unlawful Commercialization

Illegal harvest of mule deer can result in lost opportunities for wildlife enthusiasts and hunters. Obtaining estimates of illegal harvest, and thus impacts to deer populations, can be very difficult. Research suggests illegal harvest rates vary greatly by location, time of year, and whether does or bucks are illegally taken. Often, illegal activities occur during open hunting seasons, further complicating detection.

Effects of illegal harvest may be additive to legal harvest, particularly for mature bucks. Unlawful removal of older bucks can have an impact on herd composition, as mature bucks are generally the smallest and most desirable segment of the population. Importantly, illegal harvest of mature bucks can reduce lawful hunting opportunities.

As an ever-increasing monetary value is placed on fish and wildlife resources, incentive to violate game laws may also increase. Currently, there are few regulations requiring those dealing in ungulate parts to demonstrate they were legally obtained. Idaho restricts sale of bighorn sheep (*Ovis canadensis*) horns to reduce trafficking in illegally taken animals. However, no such protection for other ungulate species exists in Idaho.

No single solution can completely control illegal harvest, although many law enforcement options are available and currently being employed by IDFG. Of those, hunter reporting may be the single best tool available to enforcement officers. More than 70% of illegal harvest detections currently come directly from the public.

Poached Deer ©Rob Howe FOR IDAHO FISH AND GAME

Disease

A variety of pathogens, some with individual-level, and others with population-level implications, affect mule deer. IDFG has conducted targeted and opportunistic disease surveillance on approximately 4,000 mule deer since 1987 and has detected cervine adenovirus, carotid artery worm, exotic biting louse, a variety of other parasites, abscesses, and papillomas. Detailed information on diseases and health issues affecting mule deer are on the IDFG website: https://idfg.idaho.gov/spp/4915.

Though CWD has not been detected in Idaho, the disease is prevalent in free-ranging mule deer in neighboring Wyoming and Utah, and was recently detected in Montana. In Idaho and the western U. S., CWD is currently the primary disease of concern for mule deer populations. The disease is caused by an abnormal protein (prion), has been documented in all native cervid species in North America, and is always fatal. Since 1999 CWD has been found in wild mule deer in 7 states and 2 Canadian provinces and in captive mule deer in 2 states and 1 province. There is no common explanation for expansion of the known range of the disease, which is transmitted by direct contact with affected fluid discharges from infected animals and contaminated soil. To date, management attempts to eliminate CWD in mule deer populations have been ineffective.

Animals infected with CWD usually do not show symptoms until later stages of the disease's cycle and are outwardly indistinguishable from healthy individuals. Animals in later stages of the disease appear emaciated, drink and urinate excessively, are often isolated from other deer, and may salivate or drool. Behavioral signs include loss of fear of humans and loss of awareness of their surroundings.

Humans are not known to be affected by CWD. However, the Centers for Disease Control and the World Health Organization recommend not consuming meat from an animal that has tested positive for CWD.

IDFG's Strategy for Chronic Wasting Disease was updated in 2018. The strategy provides a framework for a statistically valid CWD monitoring protocol, identifies actions to reduce spread of CWD, provides a framework for internal and external communications, and commits to integrating relevant knowledge and research for CWD prevention, detection, and management. IDFG began implementing the new surveillance protocol in 2017 and the following rules were implemented in 2018:

- Use of natural cervid urine for big game hunting is prohibited.
- The CWD risk strategy will be considered during emergency winter feeding decision making.
- Public feeding of deer and elk will be prohibited in designated CWD management zones if CWD is discovered in Idaho.

Papilloma Virus ©Michelle Kemner FOR IDAHO FISH AND GAME

Statewide Management Direction

Statewide mule deer management direction (Table 6) is tiered down from the IDFG Strategic Plan and provides higher resolution for management objectives, taking into account stakeholder desires, agency resources, and resource opportunities and challenges that exist in Idaho.

Table 6. Strategic Plan objectives and corresponding mule deer management direction.

Strategic Plan objective	Mule deer management direction
Maintain or improve game populations to meet demand for hunting, fishing, and trapping	When DAUs are meeting objectives, manage populations to maximize hunting opportunity, reproductive performance, and overall herd health commensurate with habitat capabilities When DAUs are below objectives, implement management strategies to promote maximum population growth Continue to refine and implement the mule deer monitoring program; provide annual estimates of population abundance Continue to implement biological investigations to improve population and habitat management capabilities Implement proactive measures to minimize mule deer depredations
Increase capacity of habitat to support fish and wildlife	Evaluate a cost-effective and reliable habitat monitoring protocol Integrate habitat assessment in development of mule deer population goals Manage winter ranges to minimize negative effects of disturbance to mule deer Improve and protect key winter, summer, and migratory habitats, on public, private, and IDFG lands Provide technical assistance for long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve mule deer habitat and migrations
Eliminate the impacts of fish and wildlife diseases on fish and wildlife populations, livestock, and humans	Minimize the influence of disease as a limiting factor in mule deer populations Continue to implement a robust monitoring protocol for CWD Continue to implement disease surveillance for diseases of concern for mule deer

Table 6. Continued…

Strategic Plan objective	Mule deer management direction
Provide a diversity of mule deer hunting opportunities	Assess participation, demand, and satisfaction with mule deer hunting; adjust management to achieve objectives Provide a diversity of hunting opportunities, including socially desirable and biologically sustainable levels of antlerless and mature buck opportunity Provide annual mule deer hunting opportunities
Sustain fish and wildlife recreation on public land	Work with landowners to obtain public access across private lands to public lands Work with IDL to maintain recreational access on state endowment lands
Increase the variety and distribution of access to private land for fish and wildlife recreation	Maintain, improve, and manage access to private lands
Improve citizen involvement in the decision-making process	Increase breadth of participation in mule deer management decisions by targeting opinions of a random sample of hunters for substantial decisions Explore strategies to include hunters or interested publics in biological studies or management activities (e.g., CWD surveillance, volunteer opportunities, habitat projects, etc.)

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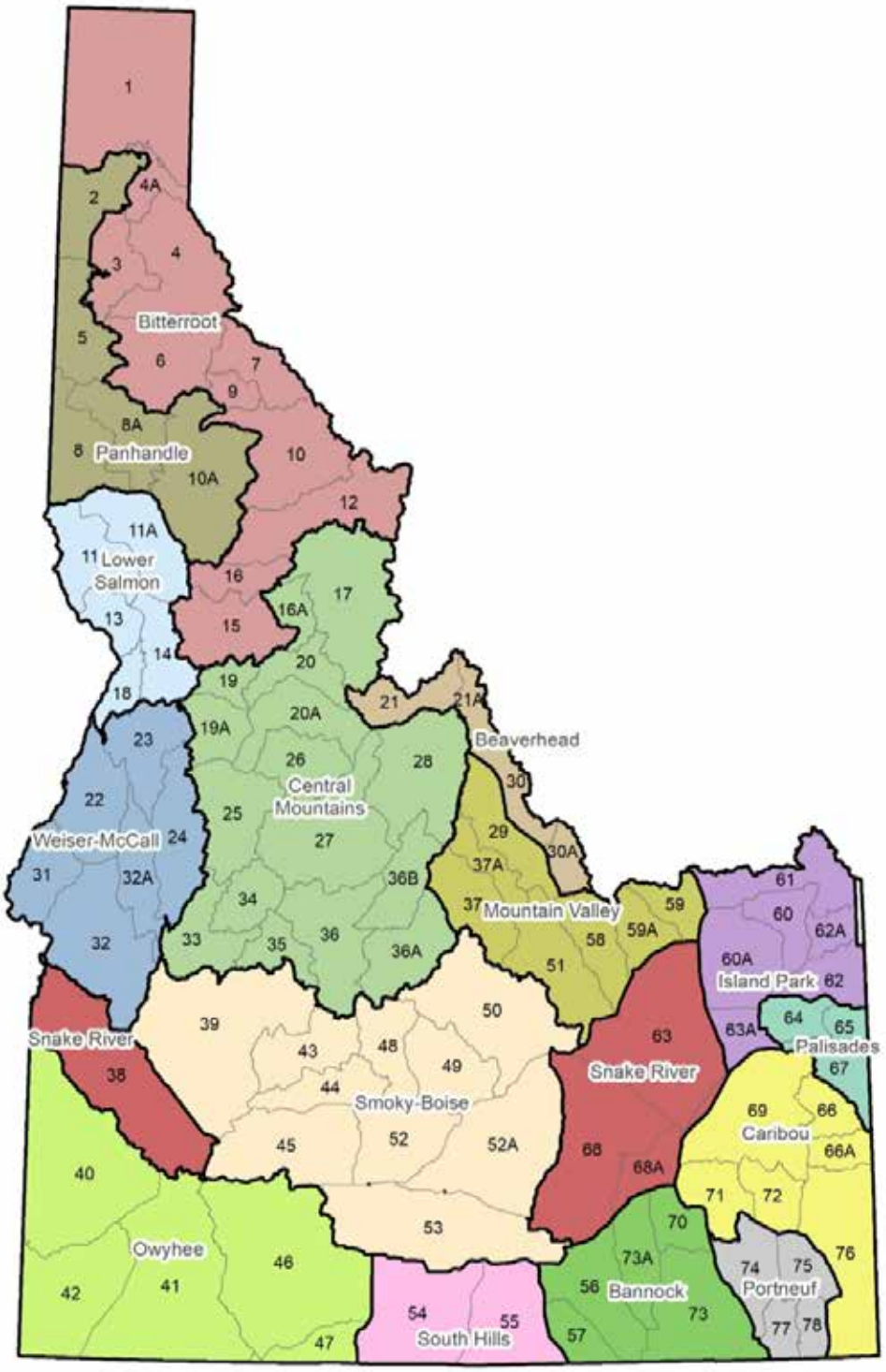
Mule Deer Data Analysis Units

IDFG monitors and manages mule deer populations in 16 distinct Data Analysis Units (DAU). Each DAU, comprised of multiple GMUs, represents the seasonal range for an interbreeding mule deer population. For more details on DAU description and development, refer to the Population Monitoring and Management section. Each DAU is presented in the following pages, with pertinent information regarding population status and management strategies.



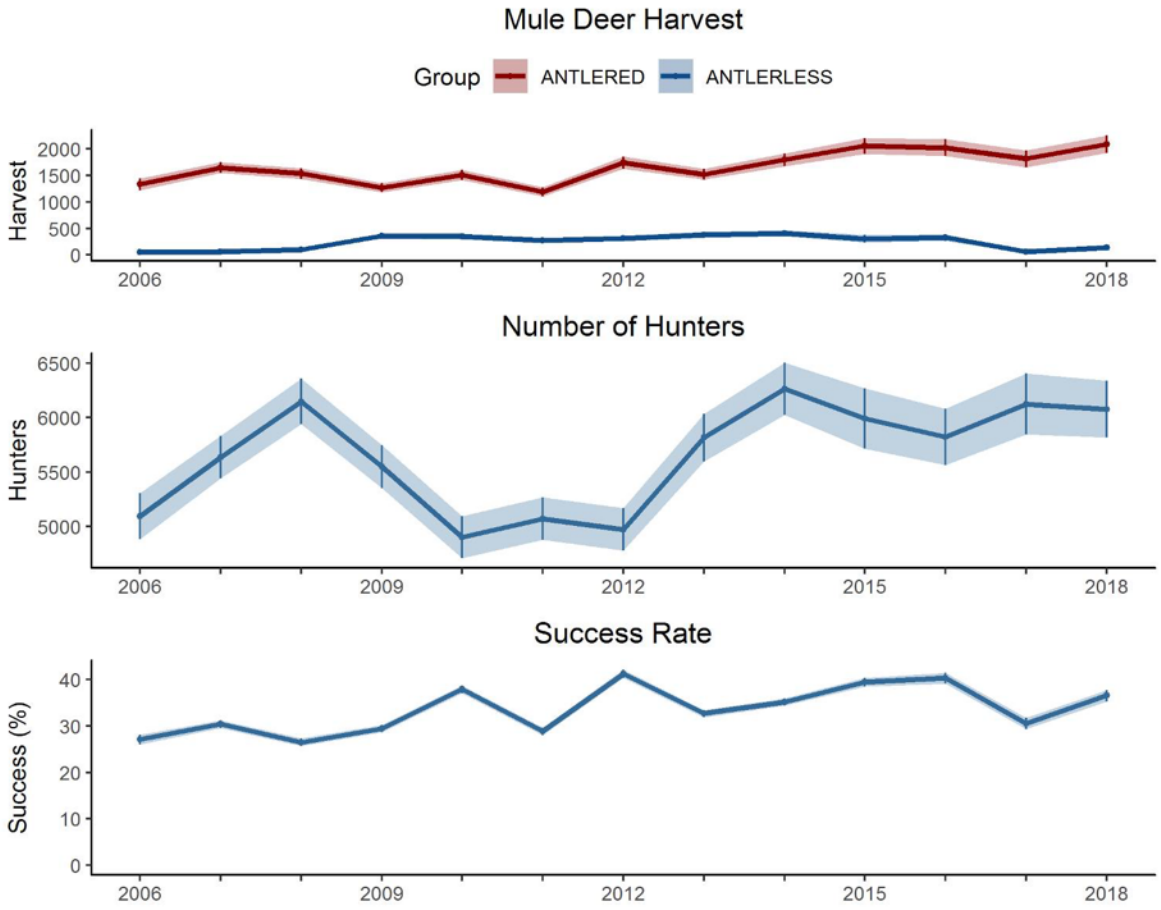
Bannock DAU

GMUs 56, 57, 70, 73, 73A

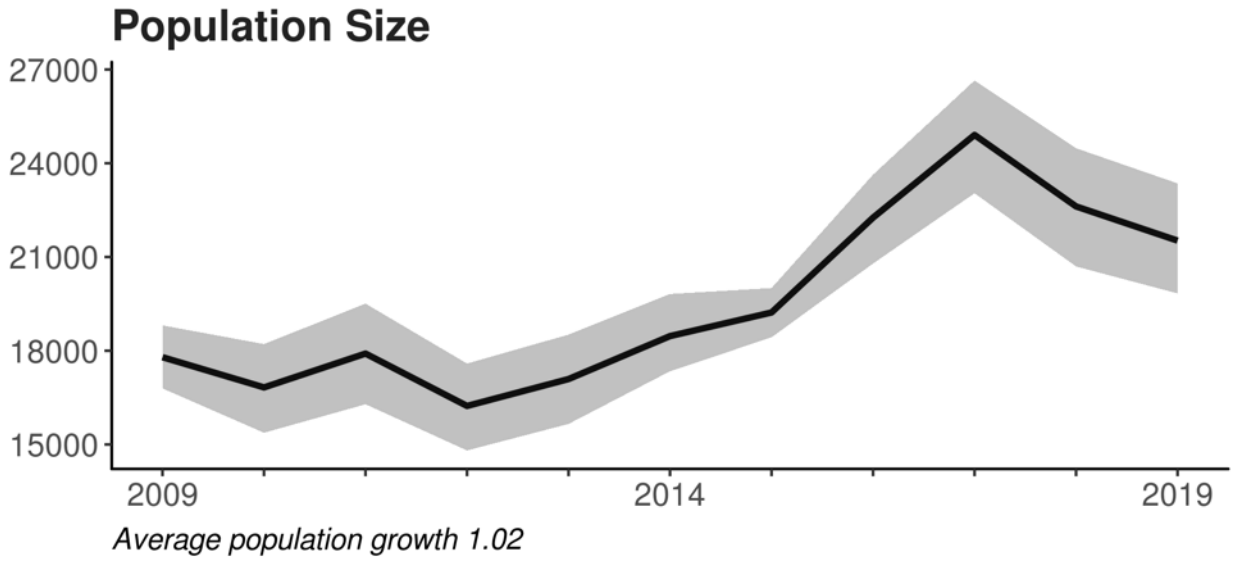
The Bannock DAU spans a number of mountain ranges in southeast Idaho, including the Bannock Range, Malad Range, Pleasantview Hills, Samaria Mountains, North Hansel Mountains, Deep Creek Mountains, Sublette Range, and Black Pine Mountain. High-elevation summer range is dominated by mixed-conifer forests interspersed with aspen, sagebrush, and mountain-shrub communities on lands managed by Caribou-Targhee and Sawtooth National Forests, BLM, and IDL. Low-elevation winter range on BLM, private, and Shoshone-Bannock tribal lands are dominated by sagebrush-steppe, mountain-shrub communities, juniper woodlands, and cultivated agricultural lands. Although summer and winter ranges can overlap, mule deer in the Bannock DAU are generally migratory. Some mule deer make relatively short seasonal movements between high-elevation summer range and adjacent valleys during winter, whereas others exhibit long-distance migrations. A variety of hunting opportunities are offered, including general seasons, an unlimited controlled hunt in GMU 73, and controlled hunts in GMUs 57, 70, and 73.

Mule deer abundance and demographic data have been systematically collected in this DAU for several years and the IPM functions well. Data collection efforts to inform management decisions and the IPM will continue, and a high productivity range will be developed during early implementation of this Plan.

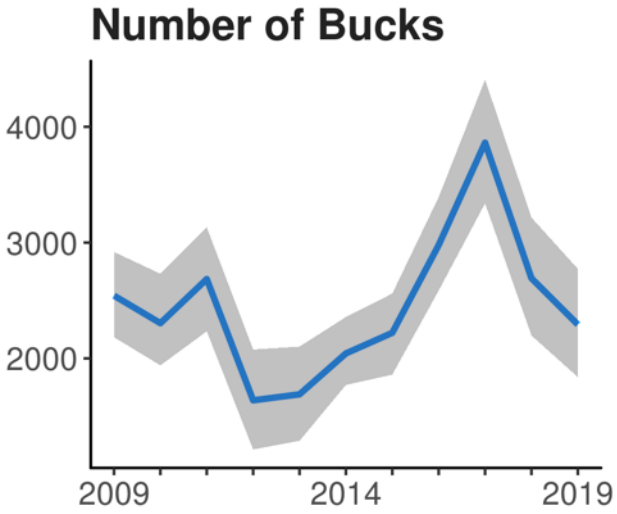
Square miles	3,443
% public land	42



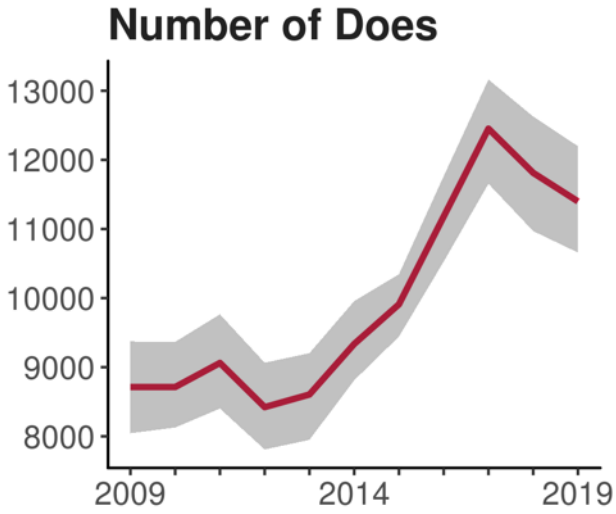
Bannock DAU



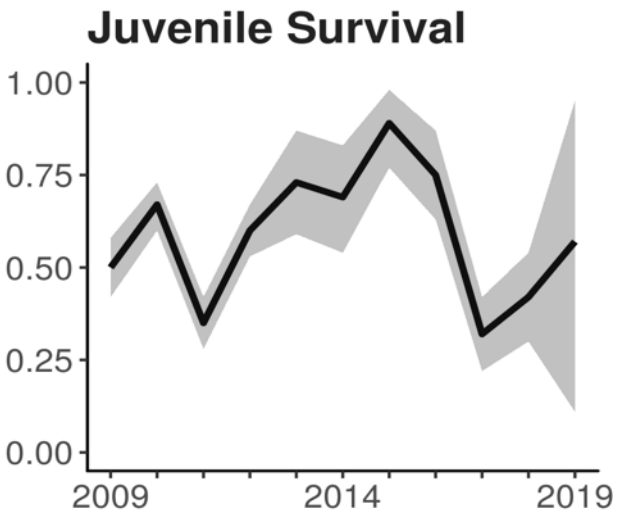
Average population growth 1.02



Average adult male survival = 0.88



Average adult female survival = 0.85



Average juvenile survival 0.59

Bannock DAU

Management Objectives

Management Direction	Strategy
Improve and protect key winter, summer, and transitional habitats on public and private lands	Pursue strategies to protect spring water and to protect and promote riparian vegetation Provide input and support projects that encourage aspen enhancement and restoration on federal, state, and private lands
Provide a diversity of hunting opportunities, including socially desirable and biologically sustainable levels of antlerless and mature buck opportunity	Monitor population trends to assess appropriate levels of antlerless hunting opportunity in individual GMUs Continue to provide controlled hunting opportunity for mature bucks
Continue to refine and implement the mule deer monitoring program	Capture and radio-mark deer in GMU 57 to assess seasonal movements, migration patterns, and habitat use By 2022, conduct a sightability survey in the newly aligned Bannock DAU Capture and radio-mark 6-month-old fawns to validate weather-based survival models

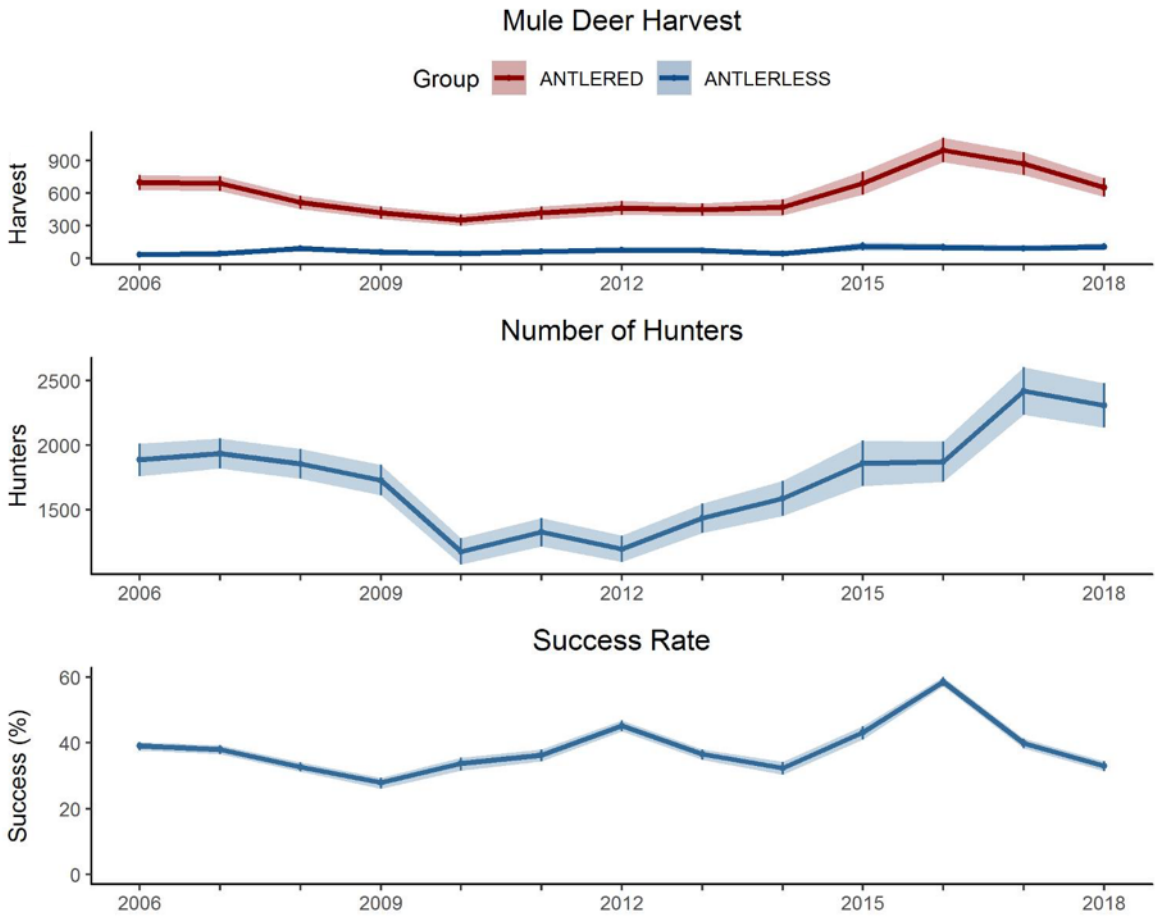
Beaverhead DAU

GMUs 21, 21A, 30, 30A

The Beaverhead DAU encompasses parts of the Salmon-Challis National Forest. Habitat is mainly comprised of sage-steppe and high-elevation conifer forest. Many deer summer in Montana, followed by an October-November migration to Idaho. Human population centers are small and scattered. Mule deer populations in this DAU experience moderate growth rates and over-winter fawn mortality due to good habitat quality found across the DAU. This population is most represented by deer that summer in Montana and winter in Idaho. A minor segment of the population summers at higher elevations and around agricultural fields in Idaho. Antlered hunting seasons follow the standard general-season framework, with GMU 30A the exception as a controlled hunt. Antlerless hunting is limited to youth hunts on private lands.

Survival and abundance data have been collected in portions of this DAU for several years. Upcoming survival monitoring and population surveys will be conducted in accordance with the new DAU configuration. The IPM will be used to estimate survival rates, population abundance, and the high productivity range for this DAU during early implementation of this Plan.

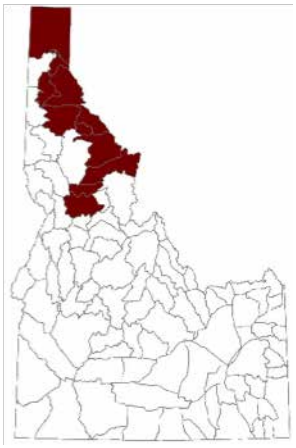
Square miles	1,434
% public land	89



Beaverhead DAU

Management Objectives

Management Direction	Strategy
Continue to implement biological investigations to improve population and habitat management capabilities	Collect vital-rate data and coordinate with State of Montana to assess and manage population performance and hunting seasons Utilize statewide fine-scale vegetation mapping to assess functional habitat capabilities and identify limiting factors to population performance
Improve and protect key winter, summer, and transitional habitats on public and private lands	Provide technical assistance and seek partnership opportunities with land management agencies to promote and protect aspen, riparian, and subalpine habitats that provide high-quality fawning and summer range Provide input to land management agencies and seek partnership opportunities to improve enforcement and monitoring of motorized travel management Coordinate with land management agencies to control invasive weeds on critical mule deer ranges
Provide annual mule deer hunting opportunities	Continue general-season buck opportunity and maintain hunt quality and unique experiences available in this DAU Provide late-season, mature buck opportunity when populations allow
Continue to refine and implement the mule deer monitoring program	Update and refine utility of IPM to provide annual estimates of population abundance



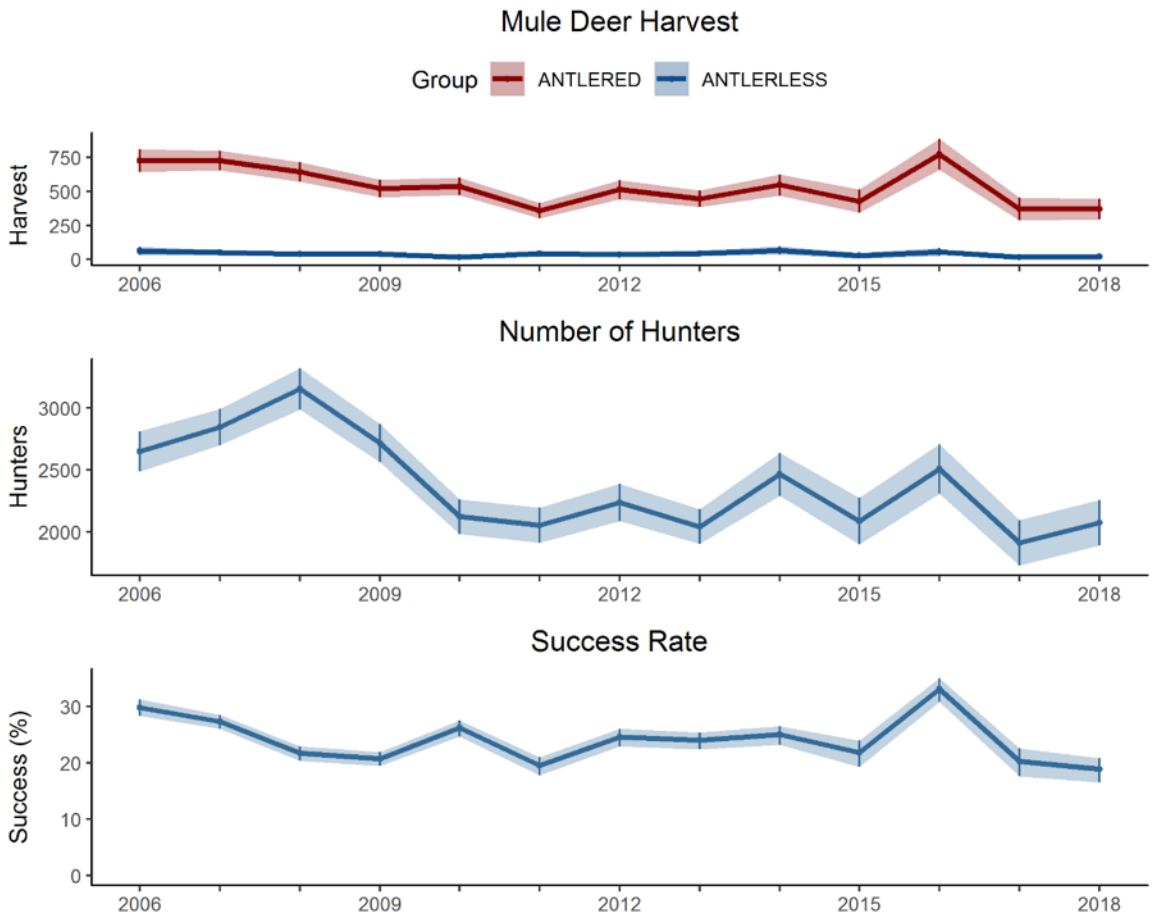
Bitterroot DAU

GMUs 1, 3, 4, 4A, 6, 7, 9, 10, 12, 15, 16

The Bitterroot DAU is dominated by coniferous forest habitats on the Idaho Panhandle and Nez Perce-Clearwater National Forests. Limited information about population status or migratory behavior of mule deer is available for this DAU. In general, mule deer exist at low population densities, but provide a resource important to local hunters. A considerable portion of the Bitterroot DAU supports robust white-tailed deer populations. Portions of the DAU have traditionally offered general-season opportunity for antlered and antlerless mule deer; however, the majority of hunters focus their efforts on white-tailed deer.

Additional data collection efforts for several big game species will be implemented in this DAU over the life of this Plan, including use of remote cameras to collect demographic data on mule deer. Additionally, mule deer population monitoring through analysis of harvest metrics will continue. However, the IPM is not designed to provide reliable estimates in low-density mule deer populations and these data will likely not be sufficient to allow the IPM to function in this DAU over this planning period.

Square miles	10,008
% public land	78



Bitterroot DAU

Management Objectives

Management Direction	Strategy
Improve and protect key winter, summer, and transitional habitats on public and private lands	Provide technical assistance and seek partnership opportunities with land management agencies to increase amount of early seral habitats through fire or timber harvest
Assess participation, demand, and satisfaction with mule deer hunting; adjust management to achieve objectives	Gather public input to better understand desires as they relate to mule deer hunting in Bitterroot DAU Refine statewide harvest data collection to gain species-specific harvest and hunter effort information
Provide annual mule deer hunting opportunities	Provide general-season mule deer hunting opportunity

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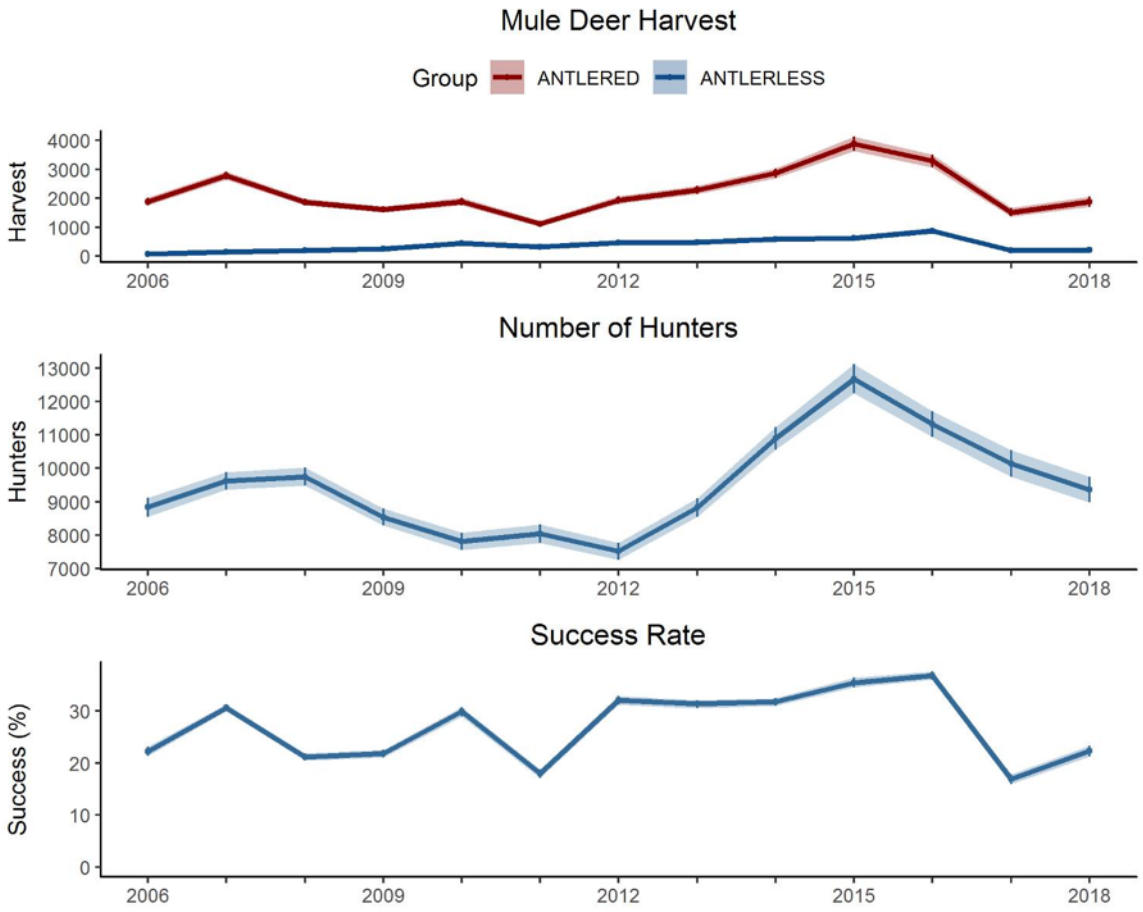
Caribou DAU

GMUs 66, 66A, 69, 71, 72, 76

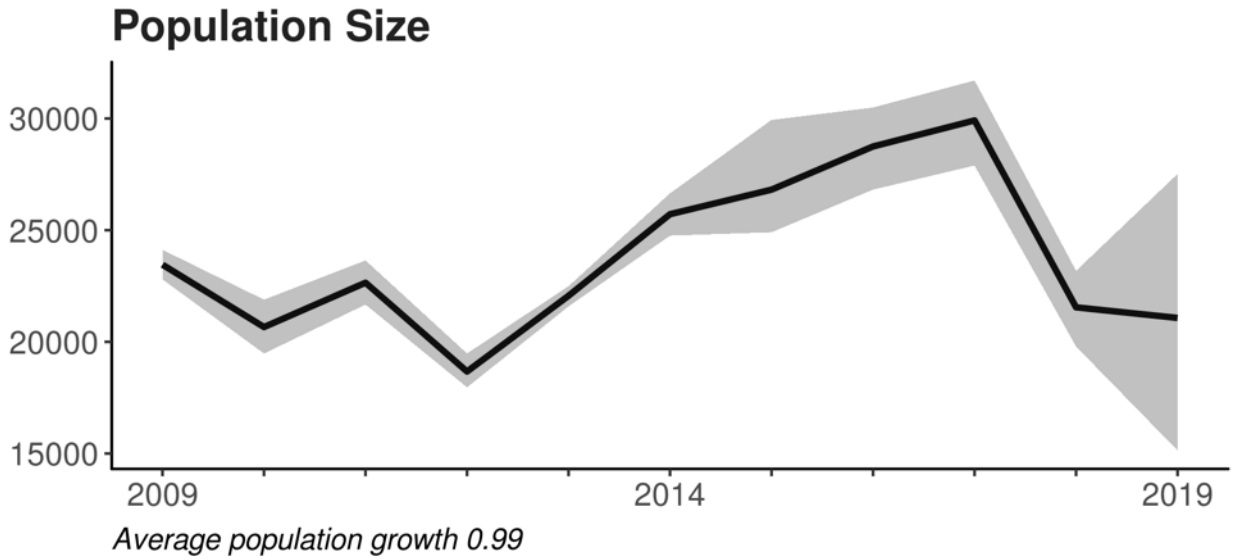
The Caribou DAU spans the Caribou, Chesterfield, and Pocatello ranges in southeastern Idaho on lands managed by the Caribou-Targhee National Forest, Idaho Falls BLM District, Shoshone-Bannock Tribes, State of Idaho, and private owners. Winter range is comprised of sagebrush communities intermixed with bitterbrush, mahogany and juniper woodlands; high-elevation sagebrush, aspen, and mixed-conifer communities are common on summer range. Migrations in the Caribou DAU vary dramatically, as some deer make short seasonal movements between summer and winter range, whereas others migrate ≥50 miles. The Bear Lake Plateau in GMU 76, Soda Hills in GMU 72, Blackrock Canyon in GMU 71, and Wolverine Canyon and Tex Creek in GMU 69 support the majority of wintering mule deer. General-season archery and any-weapon opportunities are currently available in each GMU in the Caribou DAU, and a variety of late-season archery and any-weapon controlled hunts are also offered.

Mule deer abundance and demographic data have been systematically collected in this DAU for several years and the IPM functions well. Data collection efforts to inform management decisions and the IPM will continue, and a high productivity range will be developed during early implementation of this Plan.

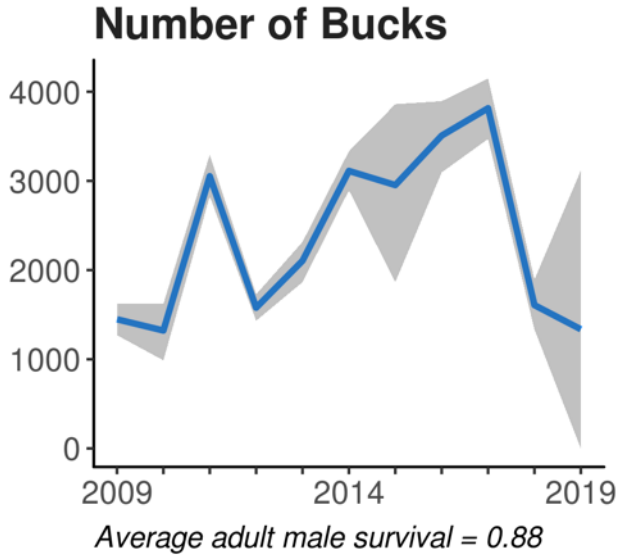
Square miles	4,404
% public land	44



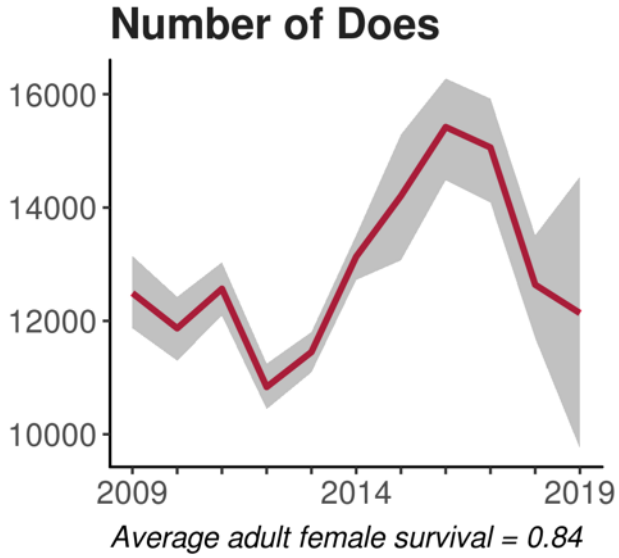
Caribou DAU



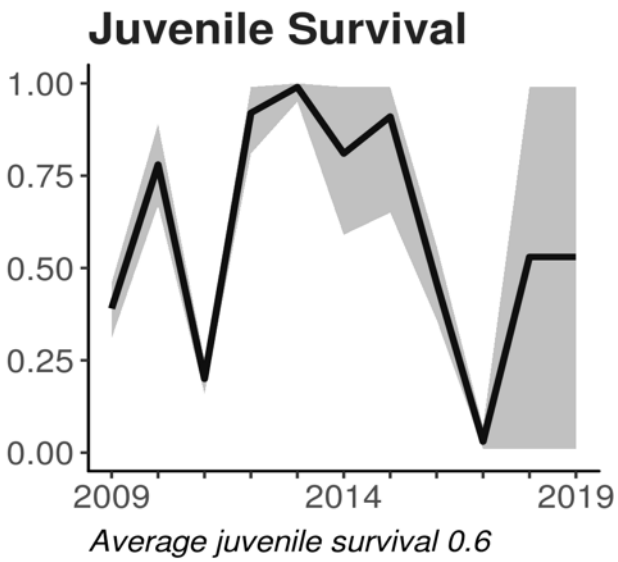
Average population growth 0.99



Average adult male survival = 0.88



Average adult female survival = 0.84



Average juvenile survival 0.6

Caribou DAU

Management Objectives

Management Direction	Strategy
Improve and protect key winter, summer, and transitional habitats on public and private lands	Provide input and support projects that encourage aspen enhancement and restoration on federal, state, and private lands Develop strategies with ITD, mining corporations, and other entities to implement projects to minimize deer-vehicle collisions and otherwise reduce impacts of development on mule deer migration (e.g., Rocky Point on US 30) Pursue opportunities to improve mule deer winter range affected by wildfire (e.g., Tex Creek) Pursue opportunities to enhance and protect private land winter ranges
Maintain, improve, and manage access to hunting areas	Maintain agreements to access public lands across private lands (e.g., Blackfoot Mountains) Pursue opportunities for private land access easements to provide access to IDL lands
Continue to implement biological investigations to improve population and habitat management capabilities	Capture and radio-mark deer to better inform projects intended to reduce mortality due to deer-vehicle collisions Enhance monitoring of juvenile mule deer to assess survival and inform understanding of population impacts related to the Tex Creek fire and other large-scale habitat disturbances, and to increase surveillance related to disease concerns in nearby Wyoming
Continue to implement a robust monitoring protocol for CWD	Sample an appropriate number of mule deer for disease surveillance when conducting research and management actions

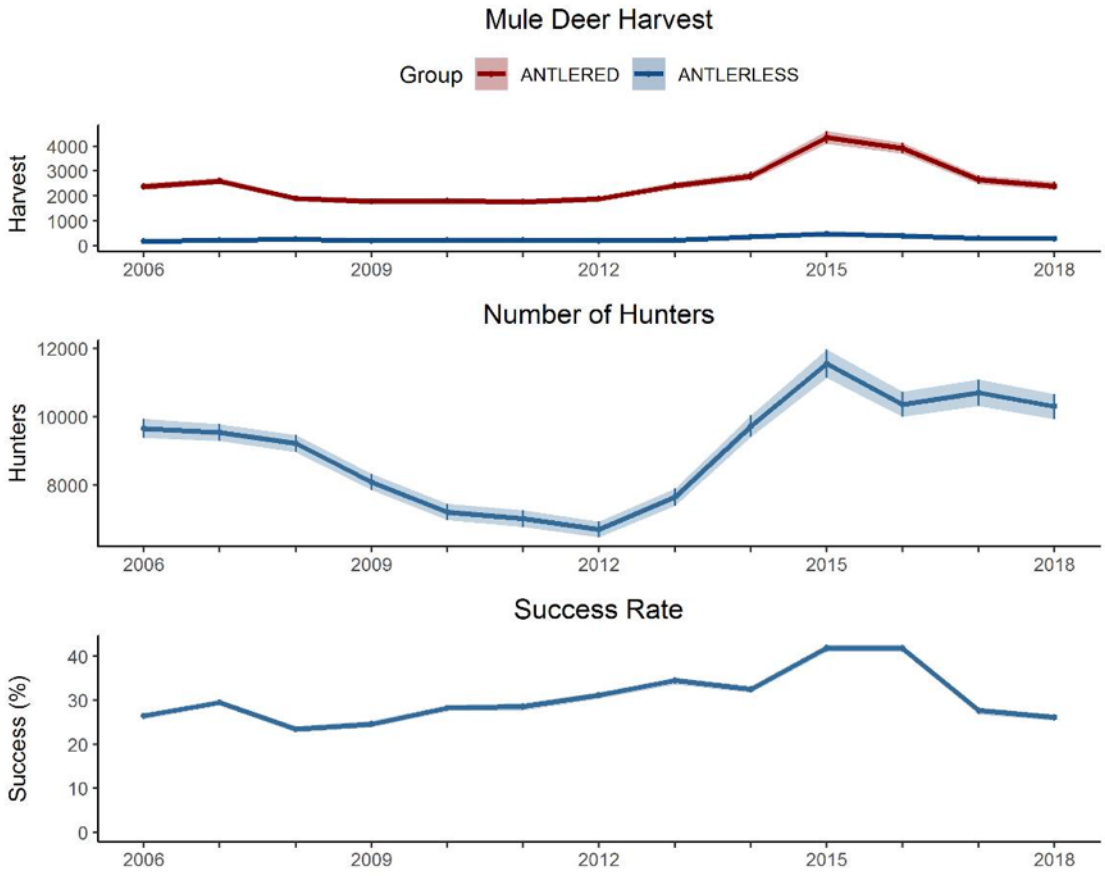
Central Mountains DAU

GMUs 16A, 17, 19, 19A, 20, 20A, 25, 26, 27, 28, 33, 34, 35, 36, 36A, 36B

The Central Mountains DAU encompasses all or parts of 5 National Forests (Bitterroot, Boise, Nez Perce-Clearwater, Payette, and Salmon-Challis) and 7 wilderness areas. Designated wilderness comprises 47% of the total area. Habitat is mainly comprised of dry, lowland forest and high-elevation conifer forest. Human population centers are small and scattered. Overall mule deer densities are low, reflective of the granitic soils and limited nutrition found in this DAU. Overwinter conditions and subsequent fawn survival are highly variable among winters. Mule deer winter along the South Fork Payette River in GMUs 33 and 35 and Salmon River drainages in GMUs 19, 19A, 20, 20A, 25, 28, and 36B. Mule deer tend to move up from river drainages to higher elevation montane forests and meadows rather than migrating to a common summer range. Hunters in wilderness GMUs enjoy long general seasons and relatively abundant late-season controlled hunts. Antlerless hunting opportunities are available only in areas adjacent to or on cultivated lands or in GMUs with abundant white-tailed deer.

Mule deer data in this DAU have been systematically collected in some GMUs, but are incomplete for the entire DAU due to remoteness and low deer densities. Priorities for data collection during this planning period will be centered on informing local management needs. However, those data will likely not be sufficient to allow the IPM to function for mule deer in this DAU over this planning period.

Square miles	11,979
% public land	98



Central Mountains DAU

Management Objectives

Management Direction	Strategy
Continue to implement biological investigations to improve population and habitat management capabilities	Develop and implement a cost-effective deer monitoring protocol that provides data needed for management and is reflective of low hunter density and difficult access within this DAU Develop a disturbance GIS layer to evaluate habitat changes in select wilderness areas Utilize statewide fine-scale vegetation mapping to assess habitat capabilities and identify limiting factors to population performance Ensure herd composition surveys are well distributed throughout the DAU
Improve and protect key winter, summer, and transitional habitats on public and private lands	Work with land management agencies to reduce spread of noxious weeds and restore key mule deer habitats, including aerial application of herbicides (and seed where needed) in inaccessible and rugged terrain Provide technical assistance and seek partnership opportunities with land management agencies to promote maintenance and restoration of winter ranges Provide technical assistance and seek partnership opportunities with land management agencies to promote and protect aspen, riparian, and subalpine habitats that provide high-quality fawning and summer range Provide technical assistance to promote post-fire rehabilitation, especially where invasive grasses are present or in areas with a high potential for invasion
Provide annual mule deer hunting opportunities	Provide general-season opportunity and maintain hunt quality and unique experiences available in this DAU Continue to offer abundant late-season opportunities in wilderness GMUs and limited late-season buck opportunities in front-range GMUs

Central Mountains DAU

Management Direction	Strategy
Maintain, improve, and manage access to hunting areas	Continue to work with USFS to promote backcountry hunting access via trails, airstrips, and motorized cherry-stem roads Continue to evaluate IDFG properties for potential additional backcountry access opportunities

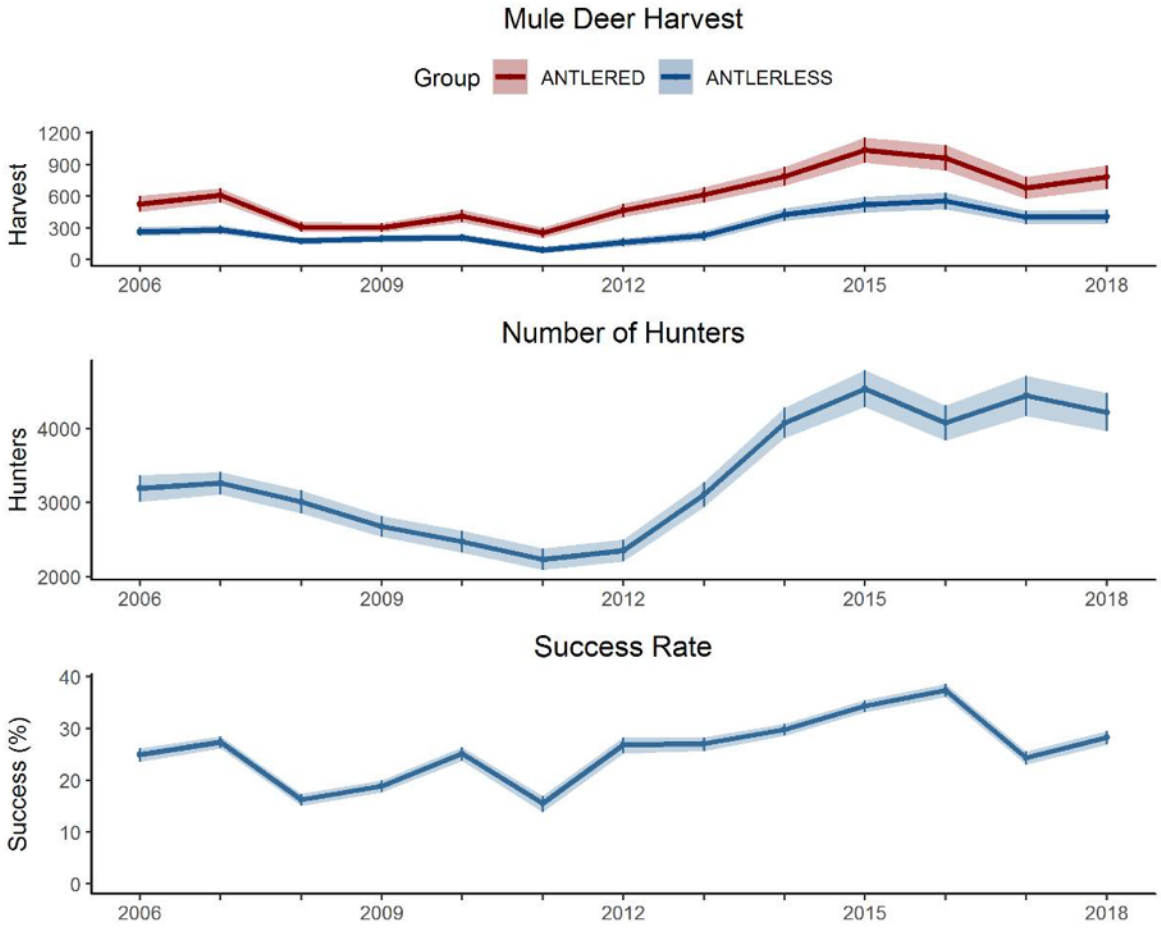
Island Park DAU

GMUs 60, 60A, 61, 62, 62A, 63A

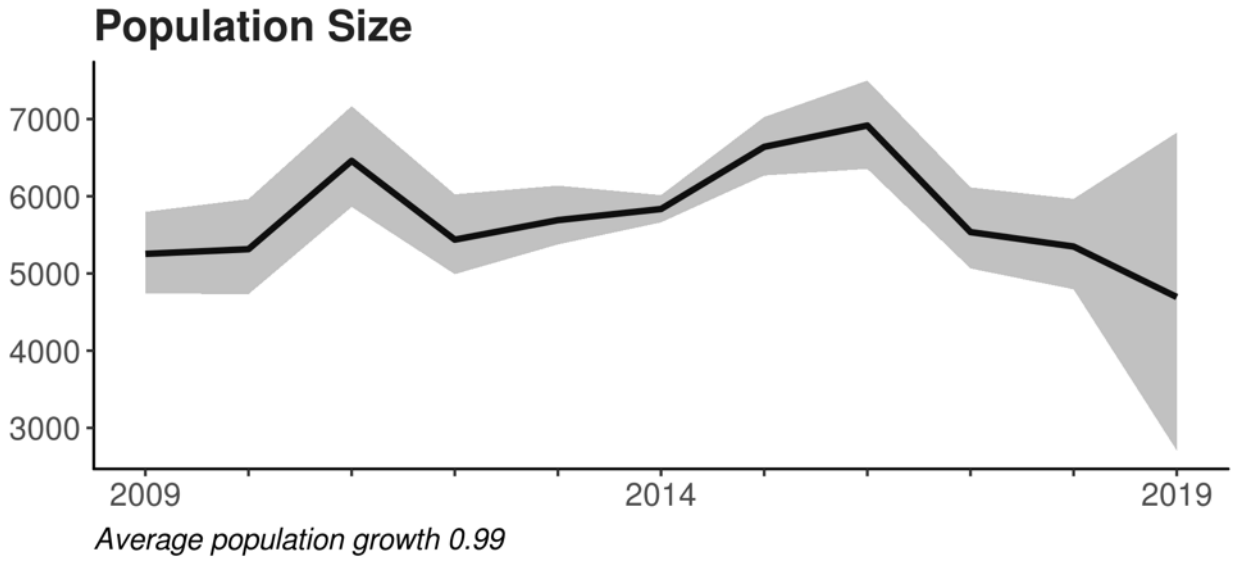
The Island Park DAU encompasses the Centennial Mountain Range, Island Park Caldera, west slope of the Teton Range, Teton River drainage, and Sand Creek Desert. High-elevation summer range, with mixed-conifer forests interspersed with aspen and sagebrush, is largely managed by Caribou-Targhee National Forest. The Sand Creek Desert's productive mountain big sagebrush, bitterbrush, and juniper woodlands provide the most important winter range in the DAU on BLM, State, and private lands. Teton Canyon also provides critical winter range in an otherwise agriculturally dominated landscape in GMU 62. Many mule deer undertake relatively long migrations as animals from GMUs 60, 61, 62A, and Yellowstone National Park migrate to winter range on the Sand Creek Desert in unit 60A. Deer from the Teton Range in Wyoming and Yellowstone National Park migrate to winter range in the Teton River Canyon. General-season archery and any-weapon opportunities are currently available in most GMUs in the Island Park DAU, and a variety of late-season controlled hunts are also offered.

Mule deer abundance and demographic data have been systematically collected in this DAU for several years and the IPM functions well. Data collection efforts to inform management decisions and the IPM will continue during this planning period. The *high productivity range is 4,500–6,000* deer.

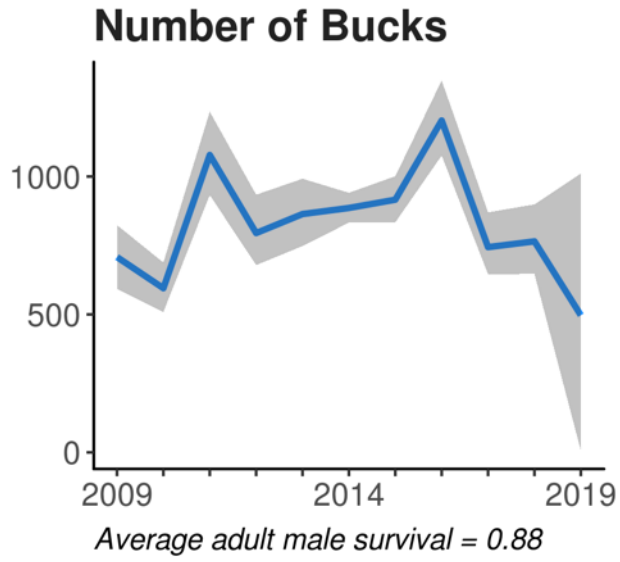
Square miles	3,210
% public land	57



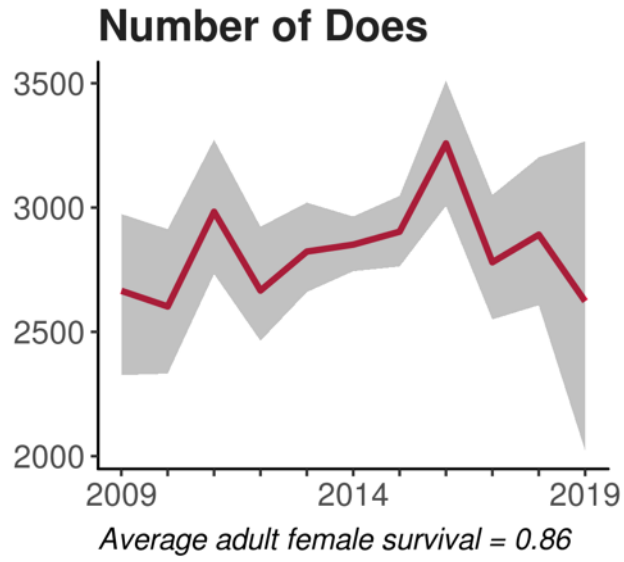
Island Park DAU



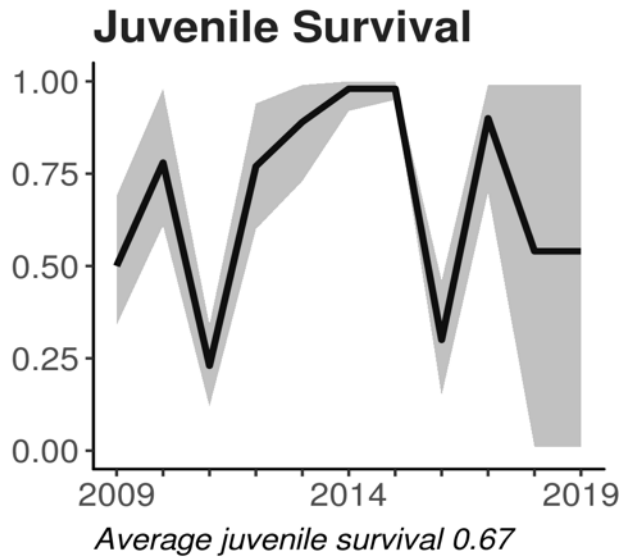
Average population growth 0.99



Average adult male survival = 0.88



Average adult female survival = 0.86



Average juvenile survival 0.67

Island Park DAU

Management Objectives

Management Direction	Strategy
Improve and protect key winter, summer, and transitional habitats on public and private lands	Provide technical assistance and seek partnership opportunities with land management agencies to promote aspen and riparian restoration and maintenance on summer range Work with land management agencies to identify key mule deer habitats for rehabilitation efforts following wildfires Develop strategies with ITD and other entities to implement projects to minimize deer-vehicle collisions, provide continued habitat connectivity for migration, and otherwise reduce impacts of development on mule deer migration Pursue opportunities to enhance and protect private-land winter ranges
Provide annual mule deer hunting opportunities	Maintain general-season hunting opportunity Provide antlerless hunting opportunity for youth where populations allow Provide controlled late-season buck hunting
Continue to implement a robust monitoring protocol for chronic wasting disease	Sample an appropriate number of mule deer for disease surveillance when conducting research and management actions

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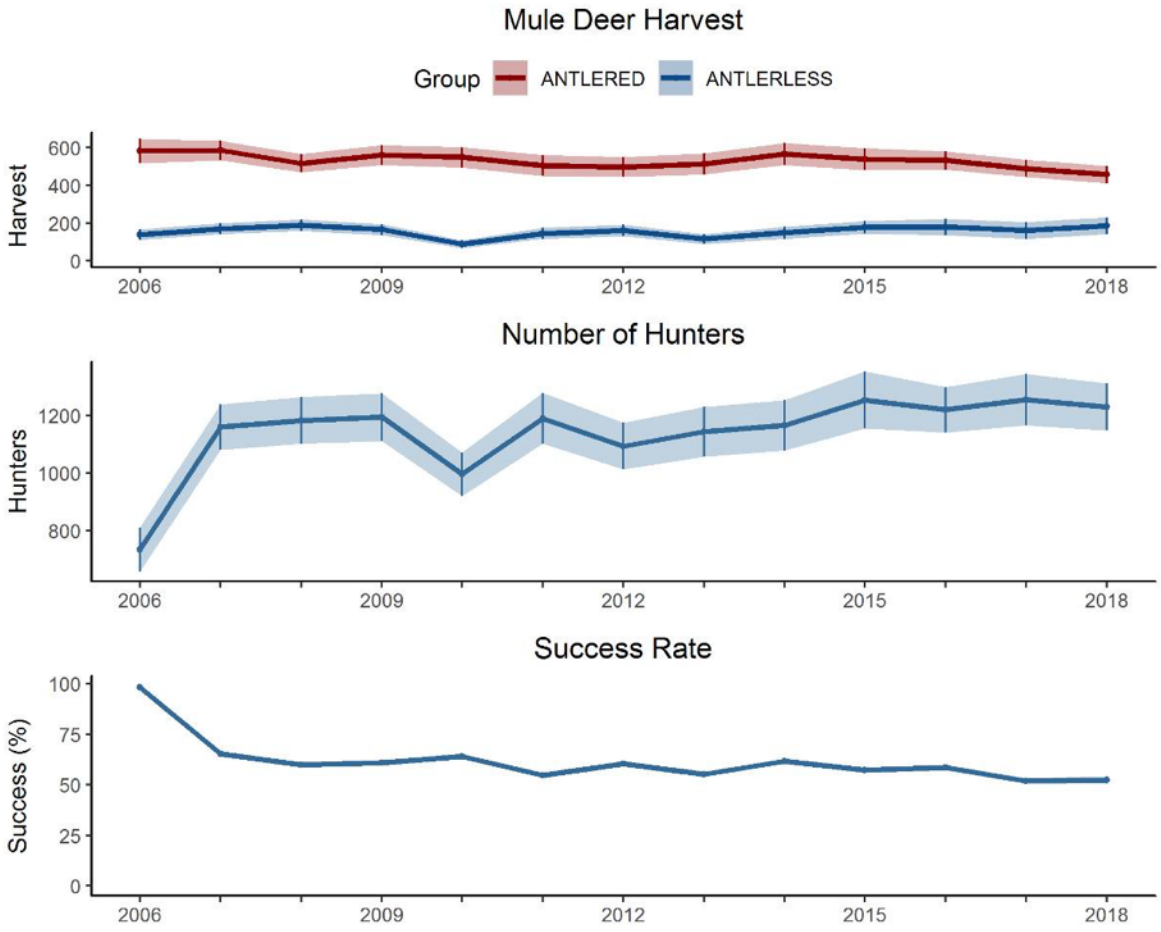
Lower Salmon DAU

GMUs 11, 11A, 13, 14, 18

The Lower Salmon DAU consists of a mixture of private agricultural and rangelands intermixed with forested lands at higher elevations that are interspersed with BLM, Nez Perce Tribe, and State lands in the Snake, Salmon, and Clearwater drainages. Considerable acreage in GMUs 14 and 18 lies within the Wallowa-Whitman and Nez Perce-Clearwater National Forests, including the Hells Canyon and Gospel-Hump Wilderness Areas. Limited information about recent population status of mule deer is available for this DAU. In general, mule deer in the Lower Salmon DAU do not undertake long migrations. Portions of the population make short seasonal movements from high-elevation forest habitats during summer to low-elevation canyonlands during winter, whereas others likely make little to no seasonal movement. Harvest is managed conservatively under a controlled hunt format.

Mule deer data in this DAU have been systematically collected in some GMUs in the past, but are incomplete for the DAU. Priorities for data collection during this planning period will be centered on informing local management needs. Additionally, mule deer population monitoring through analysis of harvest metrics will continue. However, these data will likely not be sufficient to allow the IPM to function for mule deer in this DAU over this planning period

Square miles	2,788
% public land	32



Lower Salmon DAU

Management Objectives

Management Direction	Strategy
Continue to implement biological investigations to improve population and habitat management capabilities	Develop and implement a cost-effective deer monitoring protocol capable of assessing population trend and demographics Utilize statewide fine-scale vegetation map to assess habitat capabilities for mule deer
Improve and protect key winter, summer, and transitional habitats on public and private lands	Reduce spread of noxious weeds, especially on mule deer winter range
Provide a diversity of hunting opportunities, including socially desirable and biologically sustainable levels of antlerless and mature buck opportunity	Continue to provide controlled buck hunting opportunity

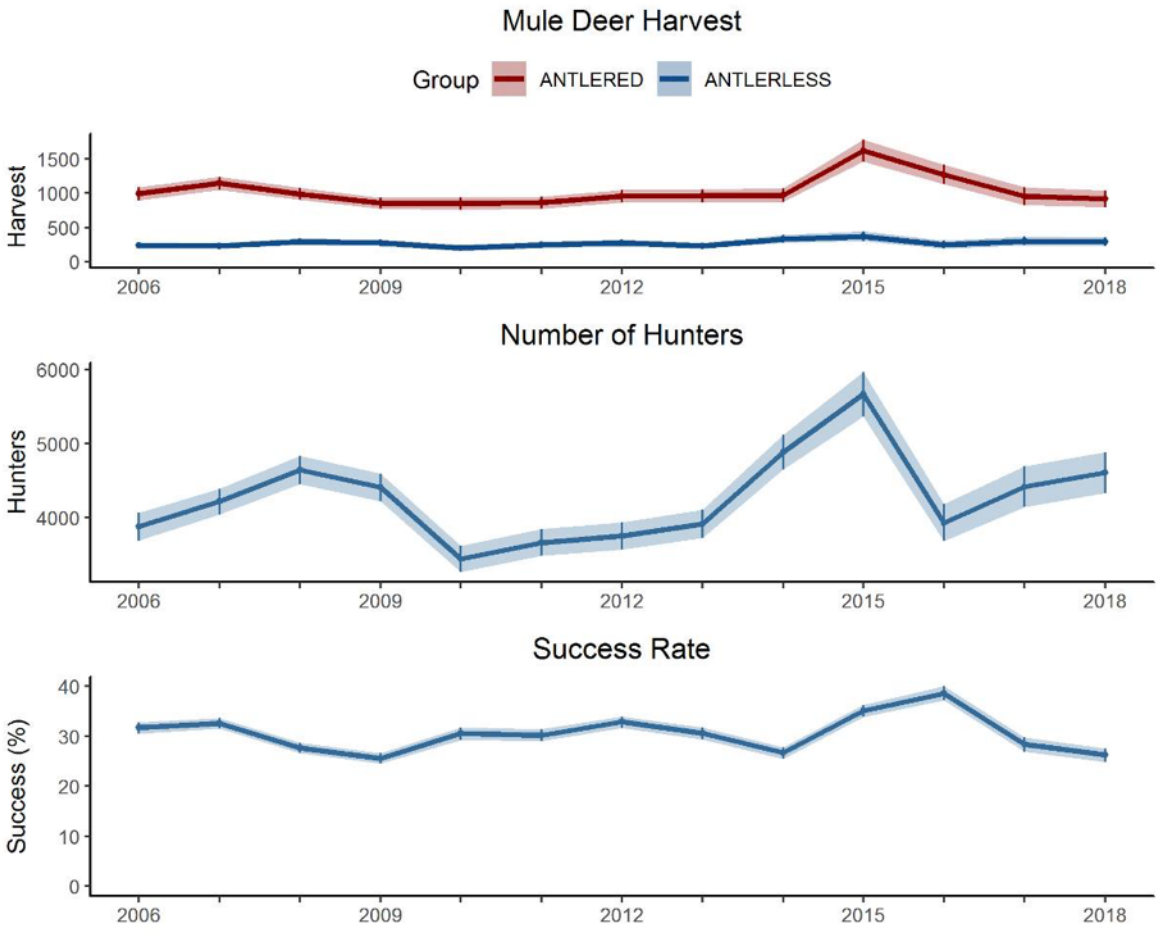
Mountain Valley DAU

GMUs 29, 37, 37A, 51, 58, 59, 59A

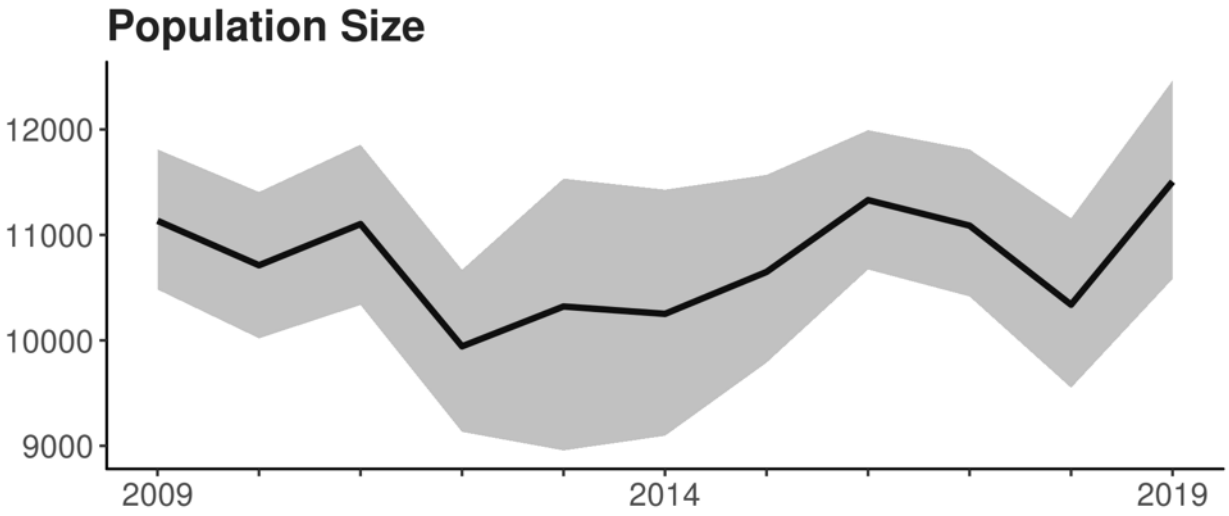
The Mountain Valley DAU encompasses parts of 2 National Forests (Salmon-Challis and Caribou-Targhee). Habitat is mainly comprised of sage-steppe and high-elevation conifer forest. Human population centers are small and scattered. Mule deer populations in this DAU experience low growth rates and moderate to high over-winter fawn mortality due to fair habitat quality found across the DAU. Various winter, summer, and transitional ranges define several subpopulations. Antlered hunting seasons primarily follow the standard general-season framework. Antlerless hunting is limited to primitive-weapon and youth-only opportunities.

Mule deer abundance and demographic data have been systematically collected in this DAU for several years and the IPM functions well. Data collection efforts to inform management decisions and the IPM will continue, and a high productivity range will be developed during early implementation of this Plan.

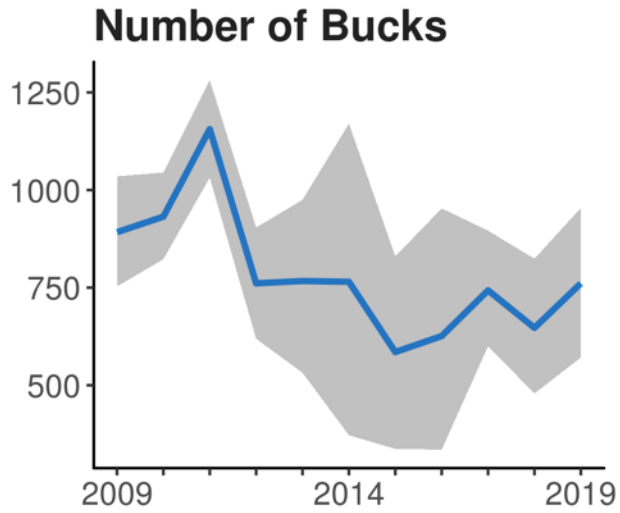
Square miles	4,063
% public land	88



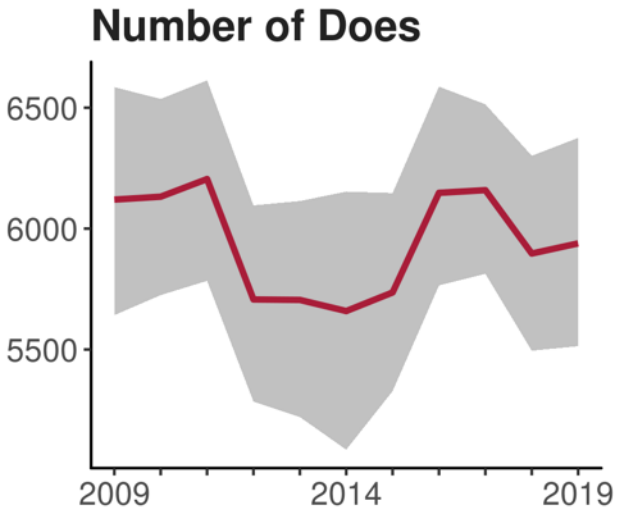
Mountain Valley DAU



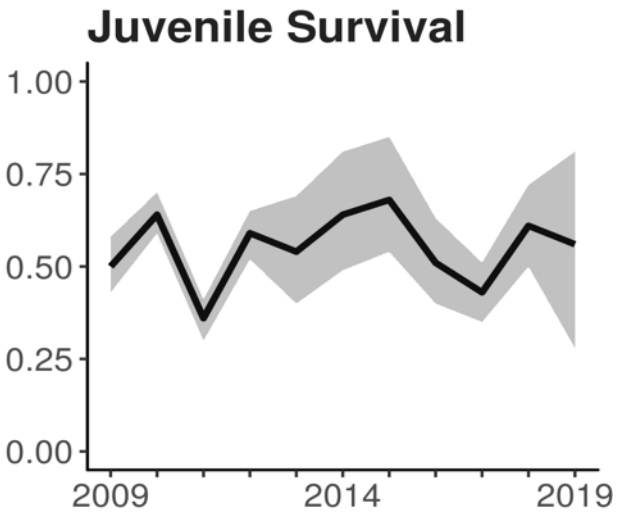
Average population growth 1.01



Average adult male survival = 0.87



Average adult female survival = 0.86



Average juvenile survival 0.55

Mountain Valley DAU

Management Objectives

Management Direction	Strategy
Continue to implement biological investigations to improve population and habitat management capabilities	Capture and radio-mark additional mule deer in GMUs 29, 37, and 51 to determine seasonal movements, survival and productivity rates, and habitat use Utilize statewide fine-scale vegetation mapping to assess functional habitat capabilities and identify limiting factors to population performance
Improve and protect key winter, summer, and transitional habitats on public and private lands	Provide technical assistance and seek partnership opportunities with land management agencies to promote aspen and riparian area restoration and maintenance on mule deer summer range. Provide input to land management agencies and seek partnership opportunities to improve enforcement and monitoring of travel management Coordinate with land management agencies to control invasive weeds on critical mule ranges
Provide annual mule deer hunting opportunities	Continue general-season hunting opportunity and maintain hunt quality and unique experiences available in this DAU Provide antlerless hunting opportunity for youth where populations allow Provide late-season mature buck hunting opportunity
Continue to refine and implement the mule deer monitoring program	Ensure herd composition surveys are well distributed throughout the DAU on major subpopulation segments to better inform the IPM Update and refine utility of the IPM for the DAU

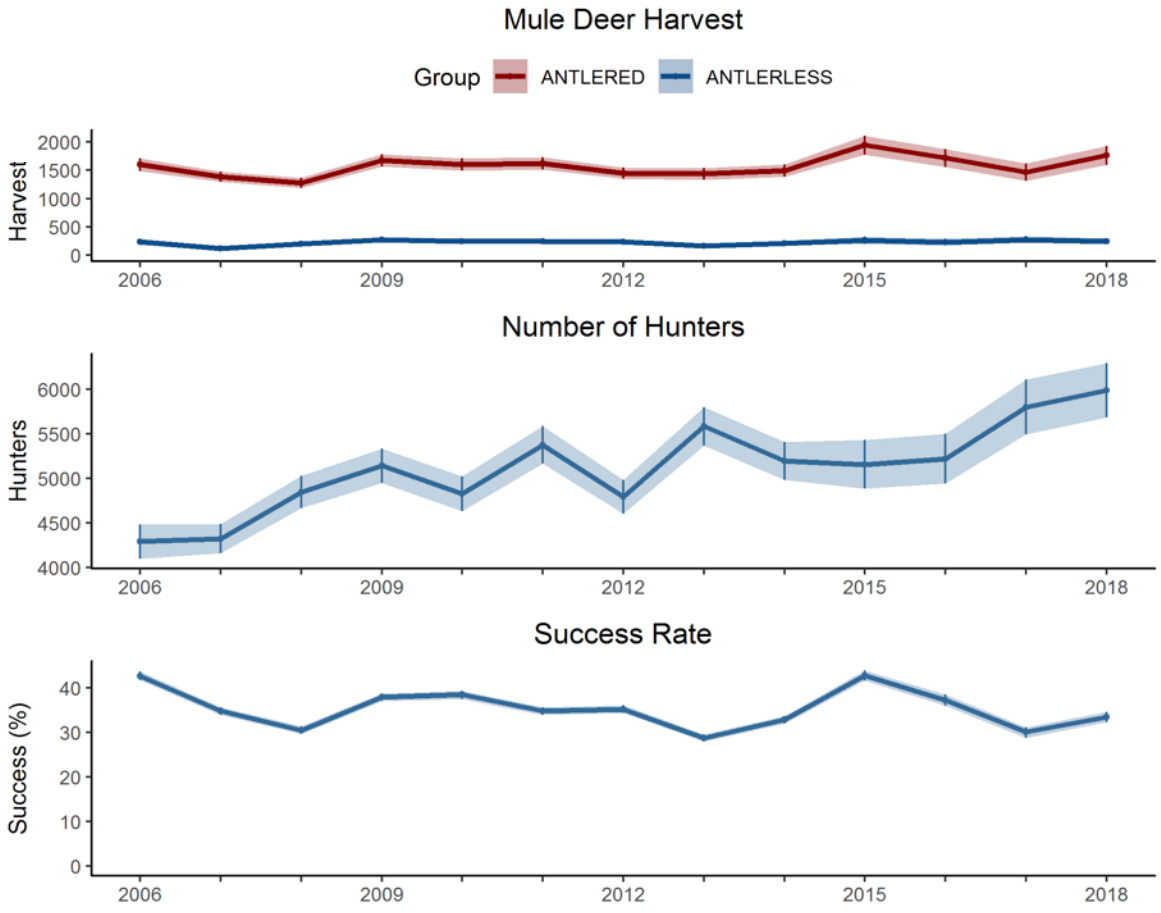
Owyhee DAU

GMUs 40, 41, 42, 46, 47

The Owyhee DAU encompasses portions of the Boise and Jarbidge Districts of the BLM, as well as Shoshone-Paiute lands. Habitats are characterized by low precipitation relative to DAUs to the north and east. Overall deer densities are low, reflective of limited nutrition of high-desert habitats found in this DAU. Mule deer demonstrate some migration in the northwestern portion of the DAU, moving up in elevation to summer and wintering at lower elevations, although distribution of mule deer in winter is only beginning to be understood. Seasonal distribution of mule deer in other portions of the DAU is poorly understood, but mule deer do not appear to congregate in large numbers on communal winter ranges. GMUs 40, 41, 42, and 46 are extremely popular general-season deer hunting destinations, and hunters can choose among a variety of seasons and weapon types. Additionally, GMUs 40, 41, 42, and 47 offer highly coveted controlled hunts for mature bucks.

Mule deer data collection efforts have recently been implemented in GMU 40 and include radio-marking and herd composition surveys. Efforts will likely be expanded to additional GMUs in this DAU in the future. Additionally, mule deer population monitoring through analysis of harvest metrics will continue. However, these data will likely not be sufficient to allow the IPM to function for mule deer in this DAU over this planning period. Mule deer populations will continue to be monitored through harvest metrics.

Square miles	9,015
% public land	80



Owyhee DAU

Management Objectives

Management Direction	Strategy
Provide a diversity of hunting opportunities, including socially desirable and biologically sustainable levels of antlerless and mature buck opportunity	Continue to provide general-season opportunity Continue to manage for mature buck hunting opportunity Incorporate research results into the season-setting process for general 2-point hunt and antlerless harvest
Continue to implement biological investigations to improve population and habitat management capabilities	Conduct annual aerial herd composition flights in GMU 40 to assess fawn:doe ratios Develop and implement a cost-effective mule deer survey protocol capable of assessing population trend and demographics in GMU 40 over this planning period Capture and radio-mark additional mule deer in GMUs 40, 41, and 42 to determine seasonal movements, survival rates, and habitat use
Provide technical assistance for long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve mule deer habitats	Provide technical assistance and seek partnership opportunities with land management agencies to promote maintenance and restoration of sage-steppe habitats Work with land management agencies to identify key mule deer habitats for rehabilitation efforts following wildfires
Improve and protect key winter, summer, and transitional habitats on public and private lands	Seek partnership opportunities with BLM and IDL to develop and implement habitat improvement projects to benefit mule deer, including eliminating juniper encroachment in mahogany stands, removing juniper in aspen stands, and reducing erosion in riparian areas Provide assistance to private landowners interested in conducting habitat improvement projects on their property

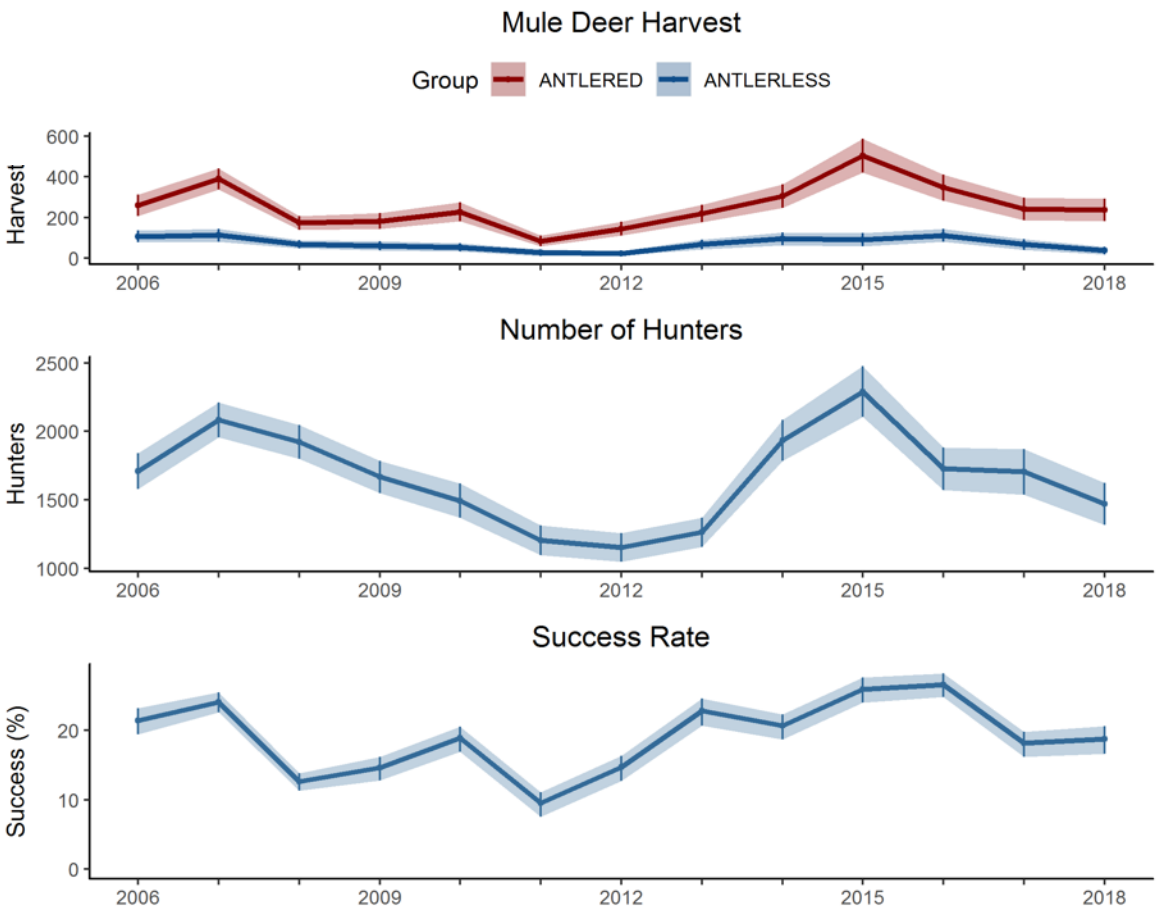
Palisades DAU

GMUs 64, 65, 67

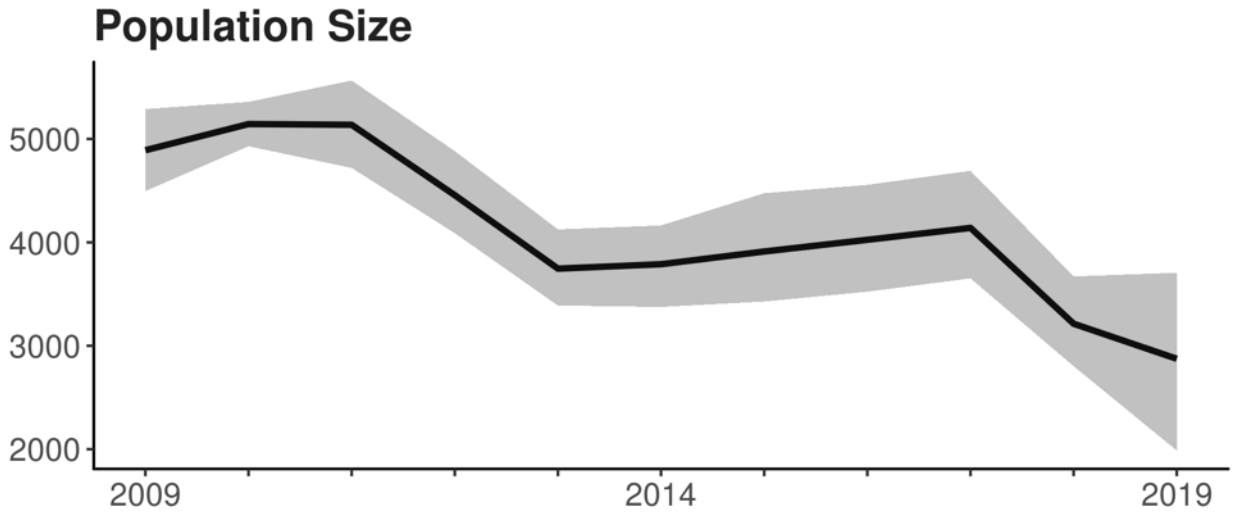
The Palisades DAU encompasses the Snake River Range, Big Hole Mountains, and tributaries of the Teton and Snake Rivers. High-elevation summer range, with mixed-conifer forests interspersed with aspen and sagebrush, is almost entirely on the Caribou-Targhee National Forest. Low elevations in GMUs 64 and 65 are dominated by private agricultural lands intermixed with minimal sage-steppe habitat and are dissected by canyons that provide some winter habitat. Private, USFS, and BLM lands along Snake River in GMU 67 support low-elevation sagebrush communities with juniper woodlands that provide important wintering habitat. The Heise area in GMU 67 is the most important winter range in the DAU, supporting deer that migrate from GMUs 64, 65, 67, and from the Teton and Snake River ranges in Wyoming. General-season archery and any-weapon opportunities are currently available in all GMUs, and a variety of late-season controlled hunts are also offered.

Mule deer abundance and demographic data have been systematically collected in this DAU for several years and the IPM functions well. Data collection efforts to inform management decisions and the IPM will continue during this planning period. The *high productivity range is 4,000–5,500 deer*.

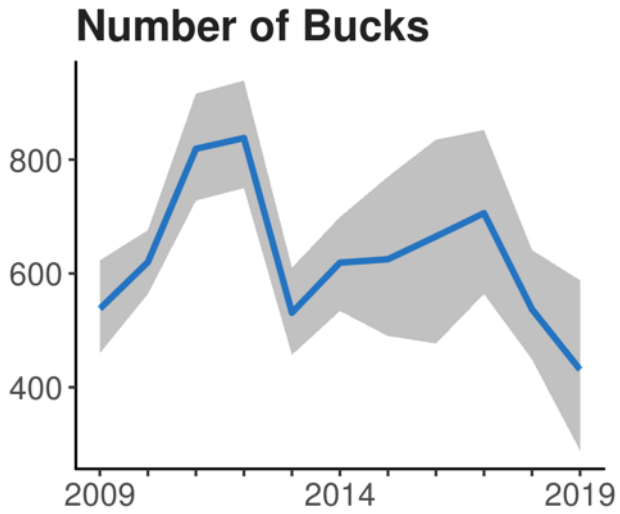
Square miles	994
% public land	52



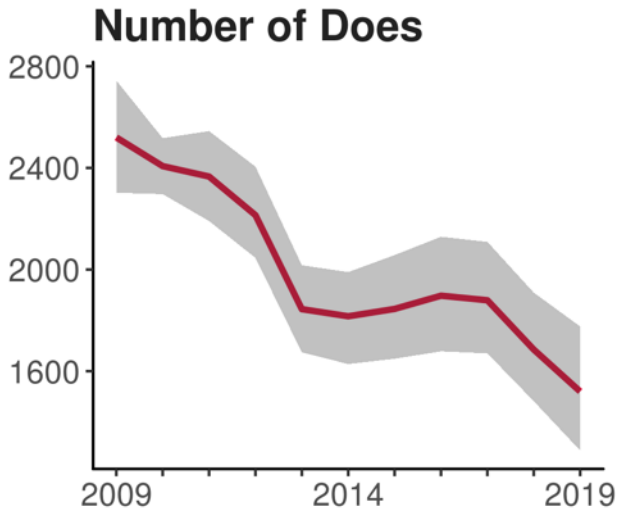
Palisades DAU



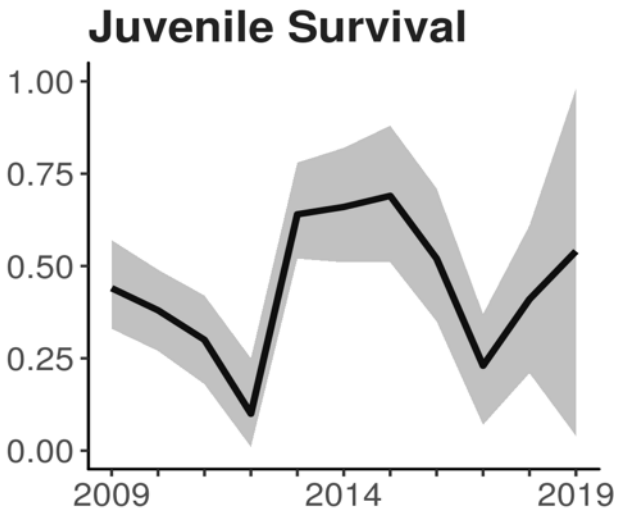
Average population growth 0.95



Average adult male survival = 0.86



Average adult female survival = 0.82



Average juvenile survival 0.45

Palisades DAU

Management Objectives

Management Direction	Strategy
Improve and protect key winter, summer, and transitional habitats on public and private lands	Provide technical assistance and seek partnership opportunities with land management agencies to promote aspen and riparian restoration and maintenance on summer range Develop strategies with ITD and other entities to implement projects to minimize deer-vehicle collisions and otherwise reduce impacts of development on mule deer migration Pursue opportunities to enhance and protect private-land winter ranges
Provide annual mule deer hunting opportunities	Maintain general-season hunting opportunity Provide antlerless hunting opportunity for youth where populations allow Provide controlled late-season buck hunting
Continue to implement a robust monitoring protocol for chronic wasting disease	Sample an appropriate number of mule deer for disease surveillance when conducting research and management actions

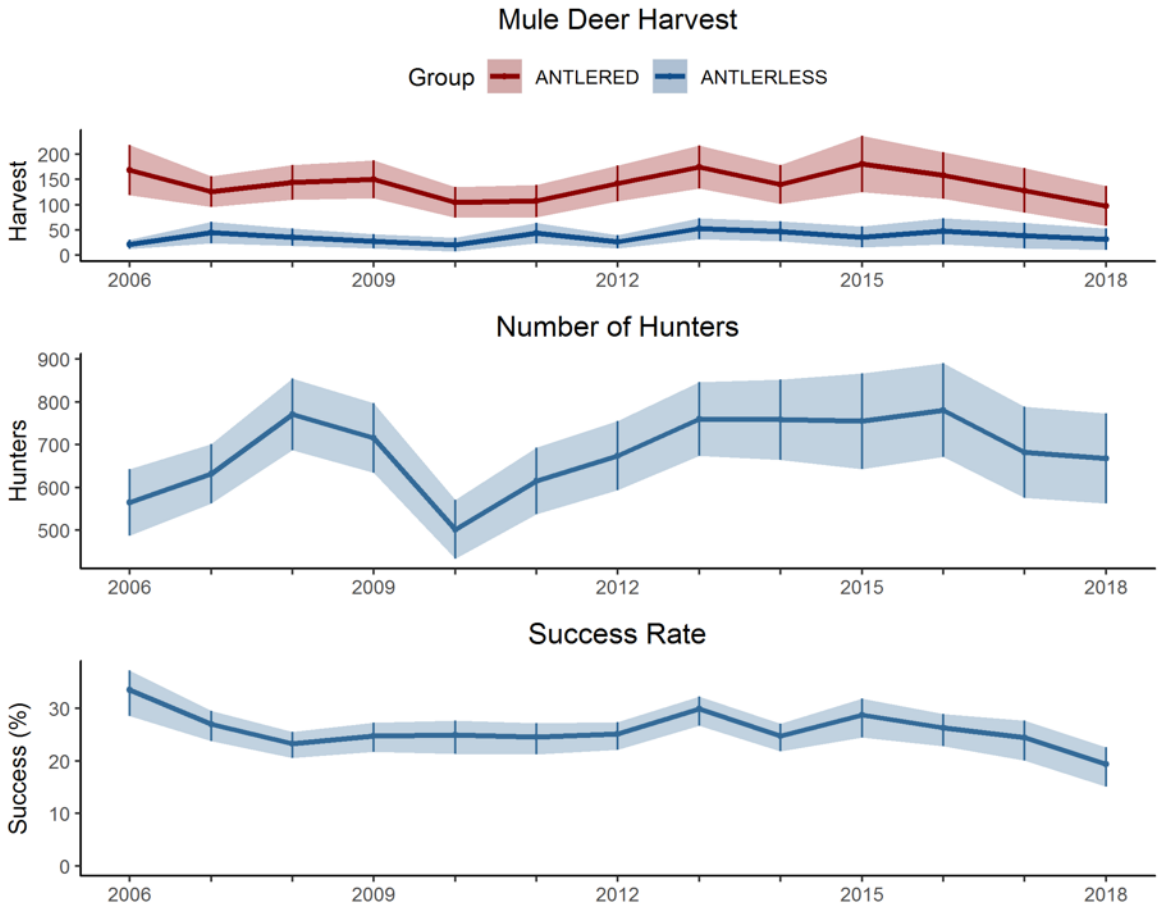
Panhandle DAU

GMUs 2, 5, 8, 8A, 10A

The Panhandle DAU is dominated by agriculture on both private land and lands of the Nez Perce and Coeur D'Alene tribes, which are intermixed with private, corporate, and state-owned coniferous forests. Portions of units 8A and 10A lie within Nez Perce-Clearwater National Forest. The DAU supports robust populations of white-tailed deer, and limited information exists on the population status of mule deer. In general, mule deer exist at low densities in localized home ranges and do not undertake seasonal migrations. The vast majority of hunters focus their effort on white-tailed deer, although mule deer provide a resource important to some local hunters. General-season antlered mule deer hunting has been traditionally offered throughout the DAU, and general-season antlerless hunts have been offered in GMUs 8, 8A, and 10A.

Additional data collection efforts for several big game species will be implemented in this DAU over the life of this Plan and may provide ancillary information on mule deer distributions, habitat use, and movement patterns in portions of this DAU. Additionally, mule deer population monitoring through analysis of harvest metrics will continue. However, the IPM is not designed to provide reliable estimates in low-density mule deer populations and these data will likely not be sufficient to allow the IPM to function in this DAU over this planning period.

Square miles	4,463
% public land	28



Panhandle DAU

Management Objectives

Management Direction	Strategy
Improve and protect key winter, summer, and transitional habitats on public and private lands	Provide technical assistance and seek partnership opportunities with land management agencies to increase amount of early seral habitats through fire or timber harvest
Assess participation, demand, and satisfaction with mule deer hunting; adjust management to achieve objectives	Gather public input to better understand desires as they relate to mule deer hunting in Panhandle DAU Refine statewide harvest data collection to gain species-specific harvest and hunter effort information
Provide annual mule deer hunting opportunities	Provide general-season mule deer hunting opportunity

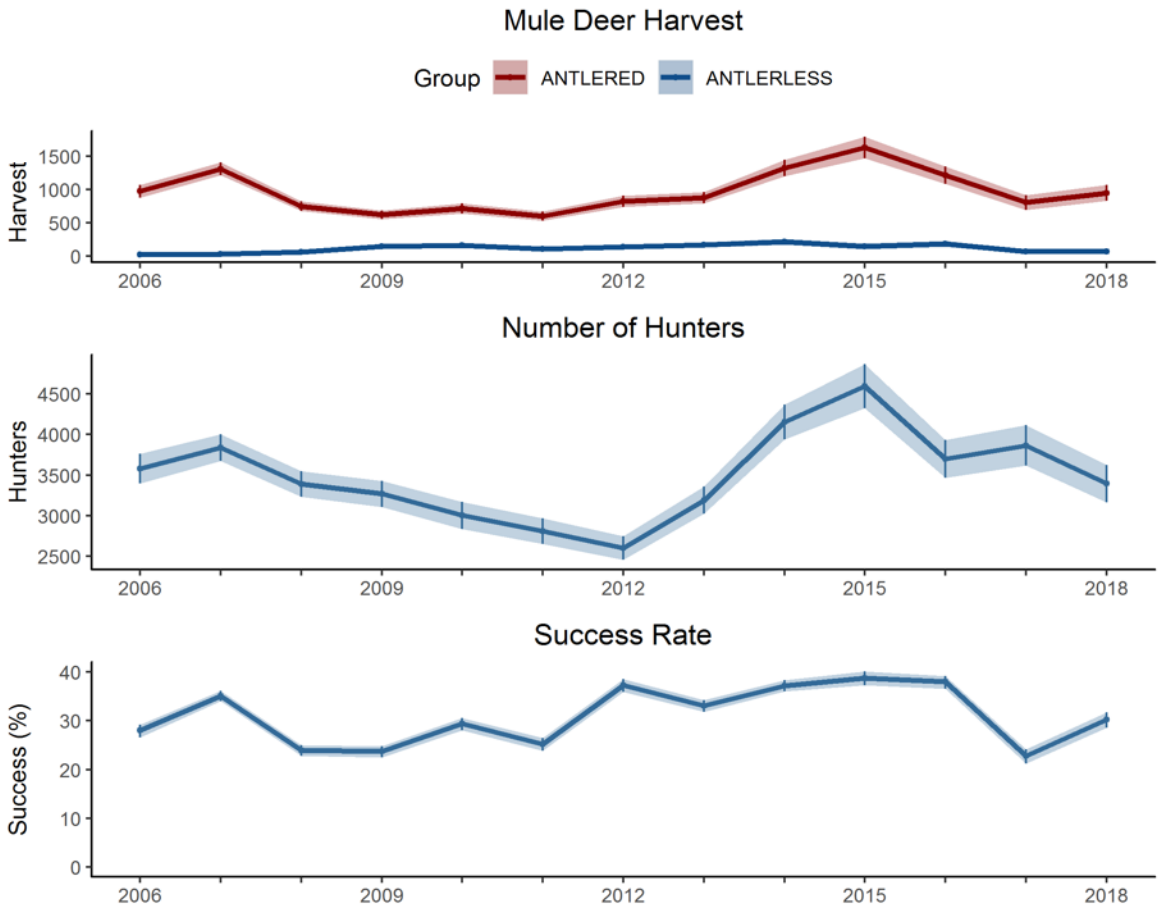
Portneuf DAU

GMUs 74, 75, 77, 78

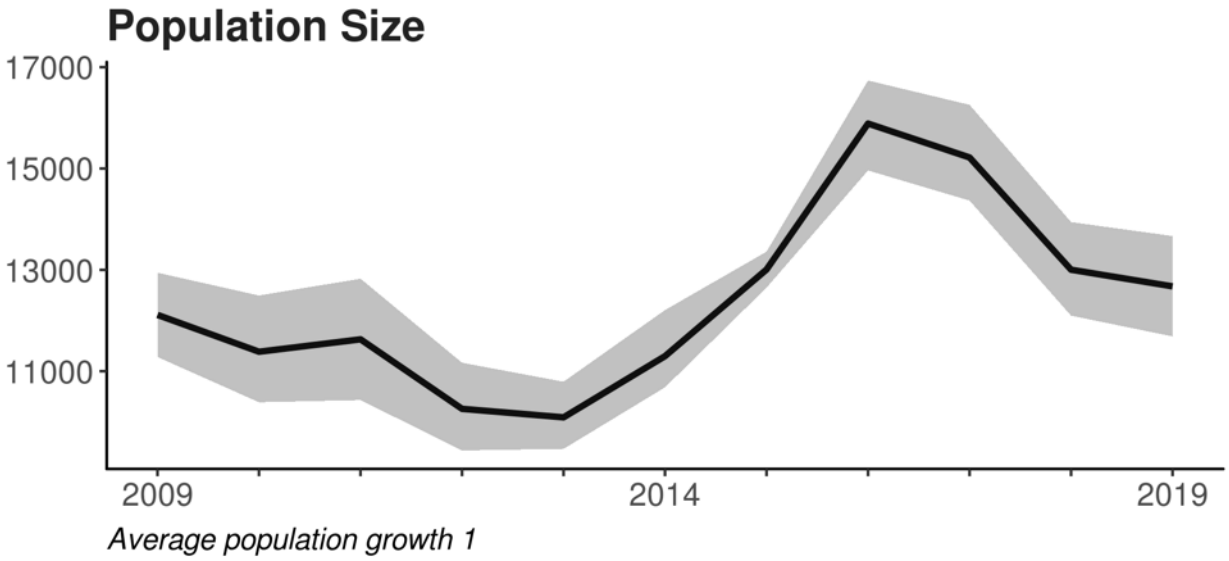
The Portneuf DAU encompasses the southern end of the Portneuf Range and the northern end of the Bear River Range in southeastern Idaho. Major landowners include the Caribou-Targhee National Forest, Idaho Falls BLM District, State of Idaho, and private entities. Winter range is dominated by sagebrush-steppe communities; high-elevation sagebrush, aspen, maple (*Acer* spp.), and mixed-conifer communities dominate summer range. Although summer and winter ranges can overlap, mule deer in the Portneuf DAU generally display relatively short migrations between higher elevations and adjacent uplands and valleys. Mule deer winter at lower elevations throughout this DAU, although Georgetown Wildlife Management Area supports the only high concentration of wintering mule deer east of the Bear River Range and north of Highway 36. General-season buck hunting is offered in GMUs 74, 75, and 77, and a controlled buck hunt is offered in GMU 78.

Mule deer abundance and demographic data have been systematically collected in this DAU for several years and the IPM functions well. Data collection efforts to inform management decisions and the IPM will continue, and a high productivity range will be developed during early implementation of this Plan.

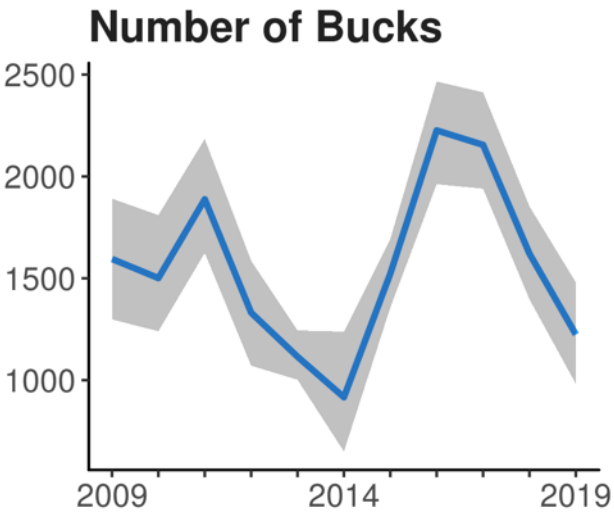
Square miles	1,498
% public land	41



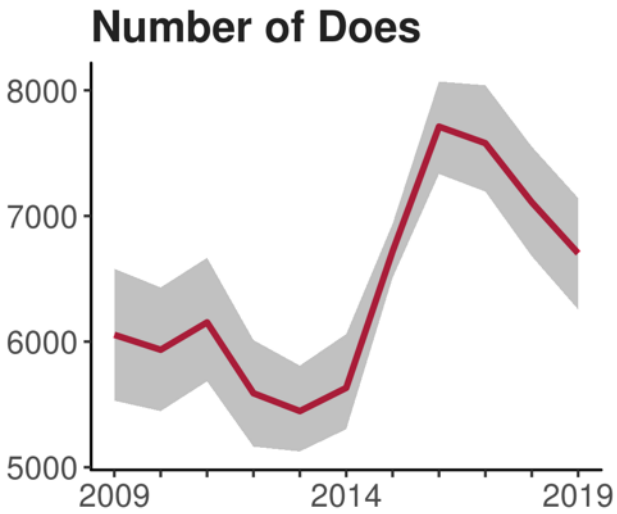
Portneuf DAU



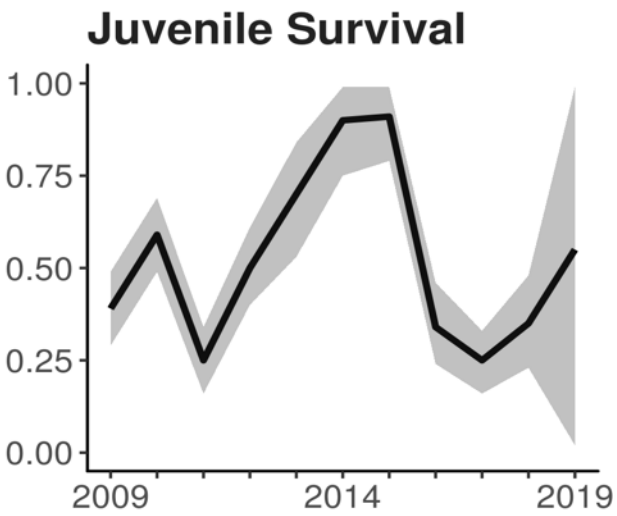
Average population growth 1



Average adult male survival = 0.88



Average adult female survival = 0.86



Average juvenile survival 0.52

Portneuf DAU

Management Objectives

Management Direction	Strategy
Improve and protect key winter, summer, and transitional habitats on public and private lands	Provide input and support projects that encourage aspen enhancement and restoration on federal, state, and private lands
Continue to refine and implement the mule deer monitoring program	By 2021, conduct a sightability survey in the newly aligned Portneuf DAU Closely monitor female harvest to ensure no negative impacts to population growth Capture and radio-mark 6-month-old fawns to validate weather-based survival models

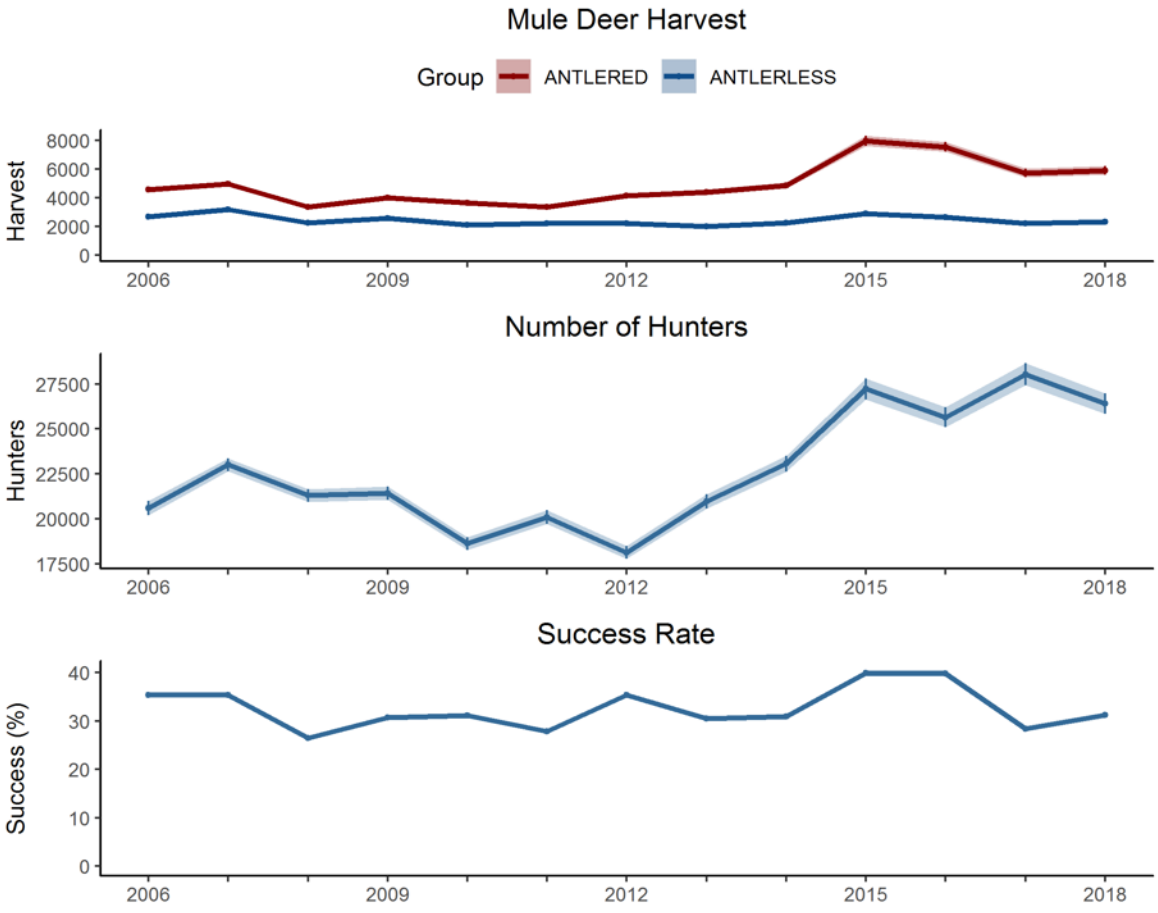
Smoky-Boise DAU

GMUs 39, 43, 44, 45, 48, 49, 50, 52, 52A, 53

The Smoky-Boise DAU encompasses portions of the Boise, Sawtooth, and Salmon-Challis National Forests, as well as portions of the Boise, Twin Falls, and Idaho Falls Districts of the BLM. Mule deer in this DAU are predominantly migratory, wintering at lower-elevation foothills along the southern portion of the DAU in GMUs 39, 45, and 52, sagebrush-desert portions of GMUs 52A and 53, lower-elevation tributaries of the Big Wood River in GMU 49, and low-elevation foothills in GMU 50. Summer habitat for most mule deer in the DAU occurs in higher-elevation forested habitats in the northern portion of the DAU in GMUs 39, 43, 48, 49, and 50. Major winter range areas in the DAU include the Boise Front, Bennett Hills, and Big Lost River drainage. Units 39, 43, 48, 49, and 50 are extremely popular general-season destinations and hunters can choose among a variety of seasons and weapon types. Some of the most highly coveted mature buck hunts in the State occur in GMUs 44 and 45.

Several years of survival and abundance data have been collected in portions of this DAU. Upcoming survival monitoring and population surveys will be conducted in accordance with the new DAU configuration. The IPM will be used to estimate survival rates, population abundance, and the high productivity range for this DAU during early implementation of this Plan.

Square miles	12,431
% public land	71



Smoky-Boise DAU

Management Objectives

Management Direction	Strategy
Provide a diversity of hunting opportunities, including socially desirable and biologically sustainable levels of antlerless and mature buck opportunity	Continue to provide general-season opportunity Continue to manage for mature buck hunting opportunity Provide antlerless hunting opportunities appropriate to maintain a viable and productive deer herd wintering on marginal-quality ranges; particularly on the Bennett Front
Continue to refine and implement the mule deer monitoring program; provide annual estimates of population abundance	Capture and radio-mark deer in non-traditional locations within the DAU to gain a more complete understanding of seasonal movements, migration, and habitat use Continue to collect herd composition and vital-rate information to populate the IPM If an alternate mule deer monitoring protocol is developed and adopted, initiate the protocol in Smoky-Boise DAU as a surrogate to aerial surveys if possible
Manage winter ranges to minimize negative effects of disturbance to mule deer	Work with land management agencies to manage human activities on winter ranges Use traditional and social media to inform public of negative effects to mule deer resulting from human disturbance on winter ranges
Improve and protect key winter, summer, and transitional habitats on public and private lands	Work with land management agencies to identify key mule deer habitats for rehabilitation efforts following wildfires Use emergency winter-feeding funds to improve winter range habitat Work with county and city planning agencies to inform land-use planning decisions that may affect mule deer habitat Provide technical assistance and seek partnership opportunities with land management agencies to promote maintenance and restoration of sage-steppe habitats on winter ranges

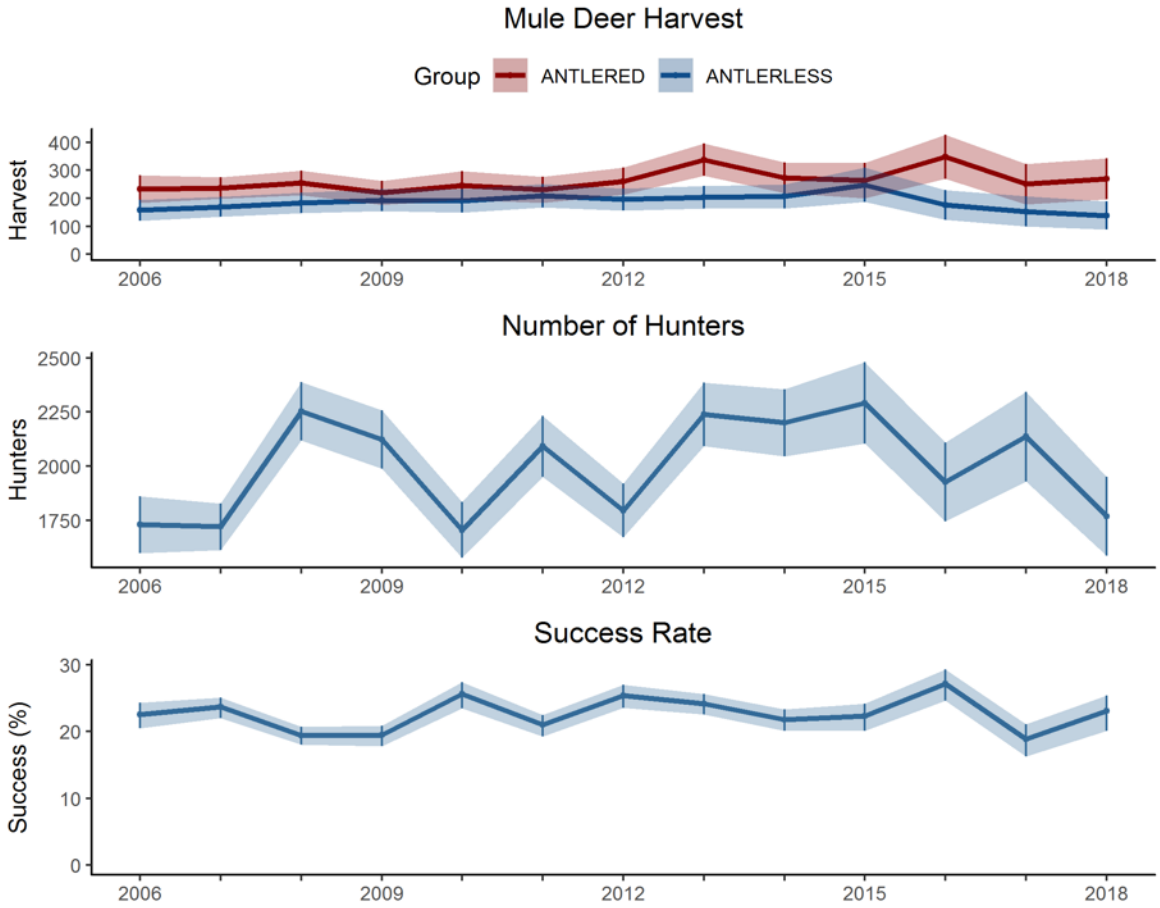
Snake River DAU

GMUs 38, 63, 68, 68A

The Snake River DAU has GMUs in both eastern and western Idaho, but these GMUs share common characteristics. Land ownership is a mix of federal, state, tribal, and private and includes Craters of the Moon National Monument in GMU 68 and Idaho National Laboratory in GMU 63. Unit 38 includes the Treasure Valley, the largest urban area in Idaho. Mule deer in this DAU are generally year-round residents and densities are low. Habitats are characterized by low elevations and limited precipitation, with deer tending to favor river corridors and irrigated agriculture. Deer depredation in agricultural areas has been a management priority. Mule deer hunting opportunity is liberal.

Mule deer populations are currently monitored and managed with harvest metrics and measures of conflicts with agriculture. No additional data collection in this DAU is anticipated over the life of this Plan.

Square miles	6,262
% public land	54



Snake River DAU

Management Objectives

Management Direction	Strategy
Provide annual mule deer hunting opportunities	Continue to provide general-season opportunity
Implement proactive measures to reduce and minimize mule deer depredations	Manage summering deer herds at levels commensurate with low potential for private property depredation

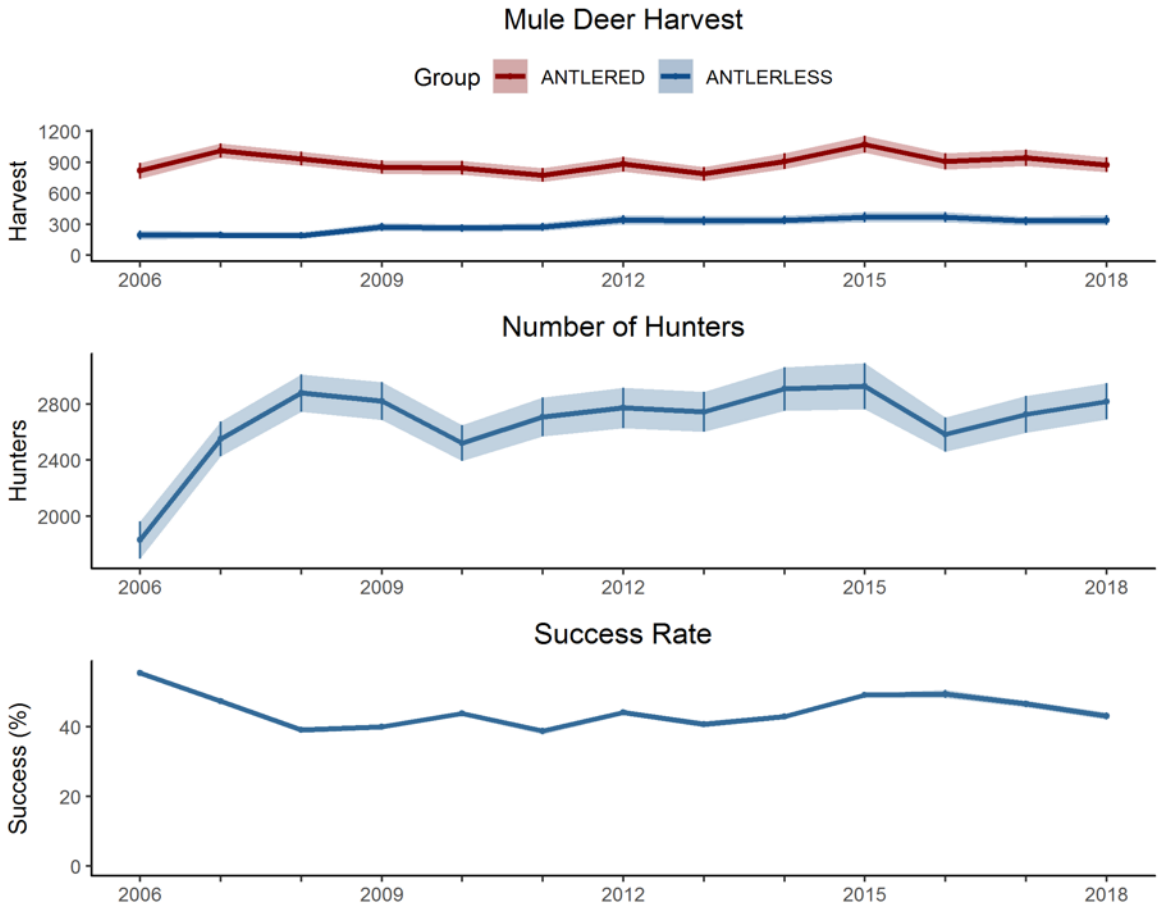
South Hills DAU

GMUs 54, 55

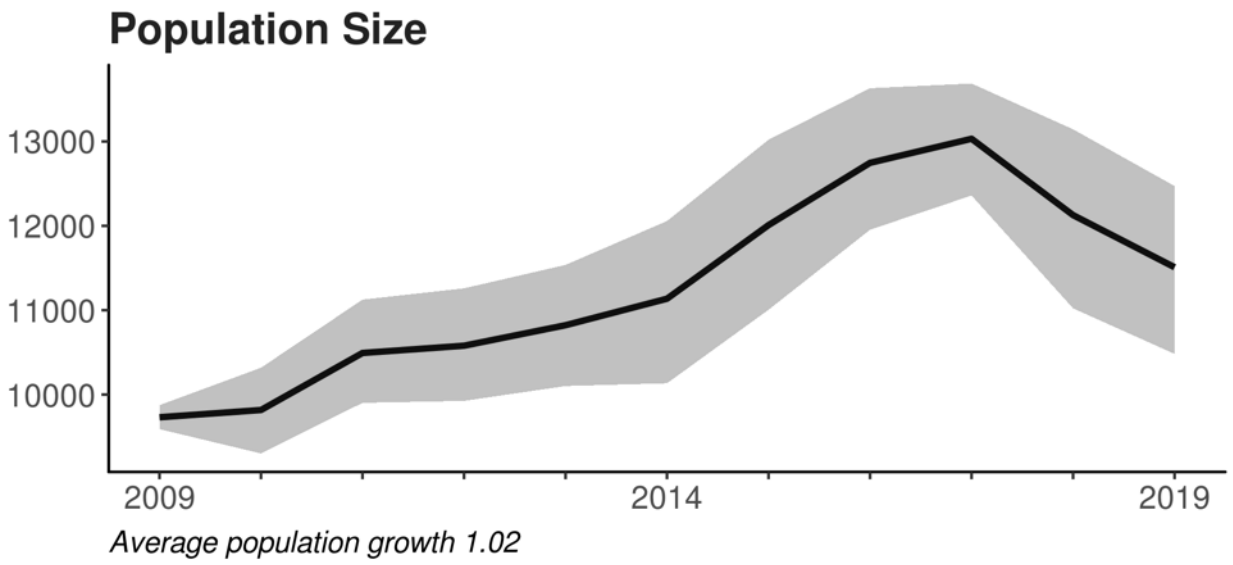
The South Hills DAU spans several mountain ranges in GMUs 54 and 55. Important summer range in the Albion Mountains and South Hills is comprised of mixed-conifer forests interspersed with aspen and expansive areas of productive high-elevation sagebrush communities on the Sawtooth National Forest. Wintering mule deer in GMU 55 congregate in low-elevation pinyon-juniper and sagebrush communities on BLM lands on the Jim Sage, Middle, and Cottrel mountains. In GMU 54, wintering mule deer are dispersed across lower-elevation shrub communities on BLM lands in the South Hills. The South Hills DAU provides a variety of hunting opportunities: controlled early-season any weapon buck; general late-season either-sex archery; and controlled any-weapon during the rut.

Mule deer abundance and demographic data have been systematically collected in this DAU for several years and the IPM functions well. Data collection efforts to inform management decisions and the IPM will continue during this planning period. The ***high productivity range*** is ***9,000–11,500*** deer.

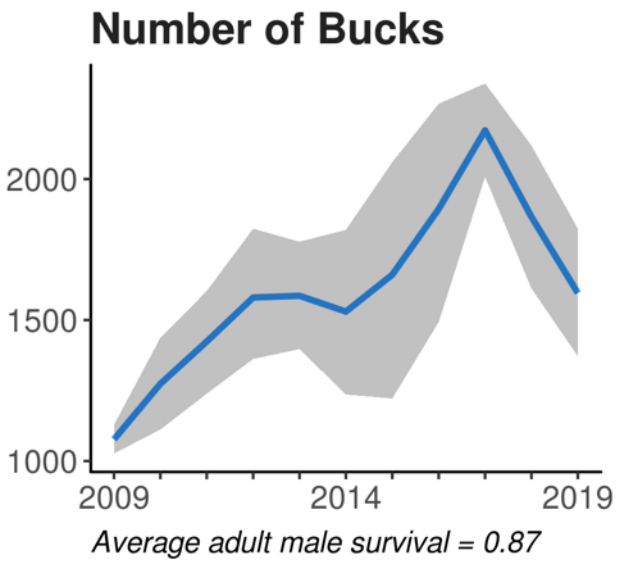
Square miles	2,378
% public land	56



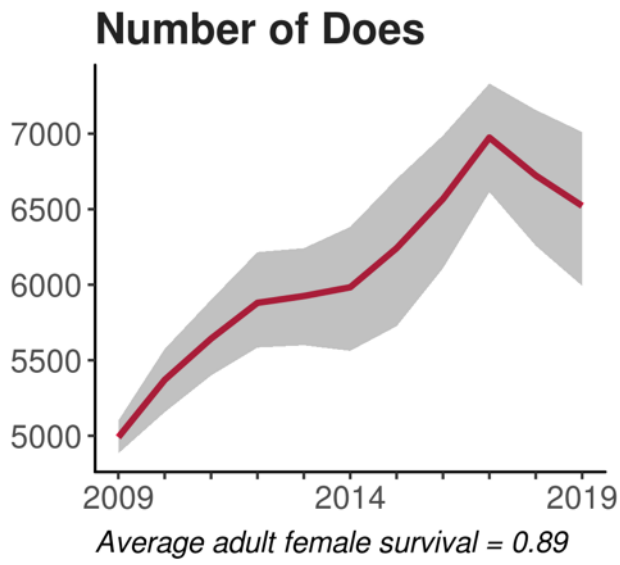
South Hills DAU



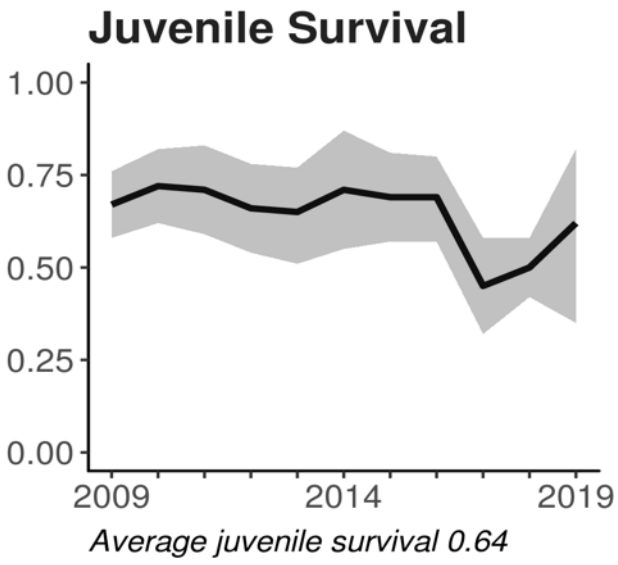
Average population growth 1.02



Average adult male survival = 0.87



Average adult female survival = 0.89



Average juvenile survival 0.64

South Hills DAU

Management Objectives

Management Direction	Strategy
When DAUs are meeting objectives, manage populations to maximize hunting opportunity, reproductive performance, and overall herd health commensurate with habitat capabilities	Assess reproductive rates of adult females to determine if periodic low fawn:doe ratios are density-dependent and related to weather and habitat quality; adjust management actions as needed Continue to offer antlerless hunting opportunities to maintain a viable and robust deer population
Assess participation, demand, and satisfaction with mule deer hunting; adjust management to achieve objectives	Conduct survey of South Hills DAU hunters to assess their satisfaction with current hunting opportunities and desires
Continue to refine and implement the mule deer monitoring program; provide annual estimates of population abundance	Capture and radio-mark additional mule deer in non-traditional locations in GMU 54 to determine seasonal movements and use of non-traditional winter ranges, and document interstate movements and migrations into Nevada
Manage winter ranges to minimize negative effects of disturbance to mule deer	Work with land management agencies to manage human activities on winter ranges Use traditional and social media to inform public of negative effects to mule deer resulting from human disturbance on winter ranges
Improve and protect key winter, summer, and transitional habitats on public and private lands	Work with land management agencies to identify key mule deer habitats for rehabilitation efforts following wildfires Partner with land management agencies and private landowners to implement habitat projects to benefit mule deer, including juniper management, aspen restoration, and riparian habitat restoration

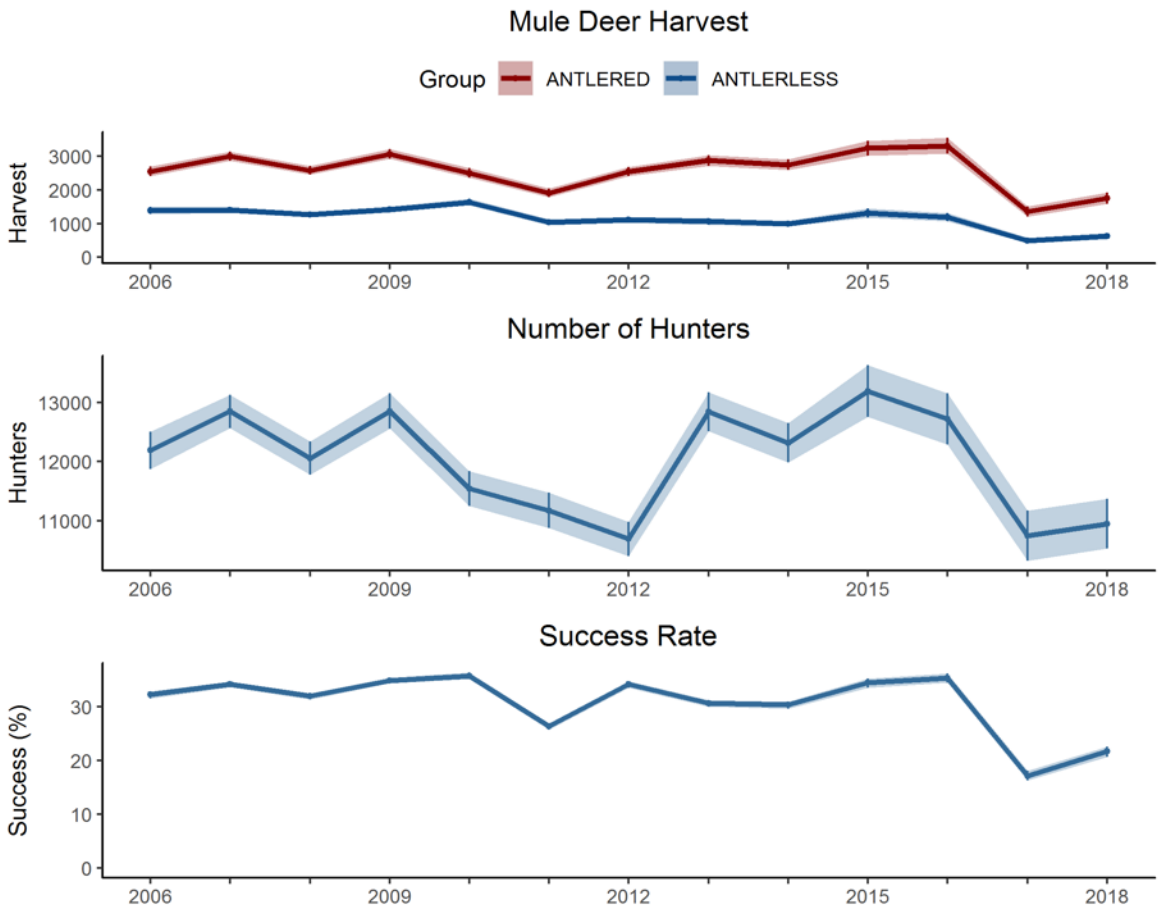
Weiser-McCall DAU

GMUs 22, 23, 24, 31, 32, 32A

The Weiser-McCall DAU encompasses portions of the Boise and Payette National Forests, as well as portions of the Boise BLM District. Mule deer in this DAU are predominantly migratory, wintering in lower-elevation portions of GMU 32, and along canyons and river corridors in GMUs 22, 23, 25, and 31. Significant winter ranges include portions of GMU 32 south of Crane Creek Reservoir, the Snake River Canyon in GMUs 22 and 31, and the Rapid, Little Salmon, and main Salmon rivers in GMU 23. Summer habitat for most mule deer in the DAU occurs in higher-elevation forested habitats throughout all 6 GMUs. Units 32 and 32A are popular general-season deer hunting destinations and allow hunters to choose among a variety of weapon types and seasons. Some of the most highly coveted mature buck hunts in the State are offered in GMU 22.

Several years of survival and abundance data have been collected in portions of this DAU. Upcoming survival monitoring and population surveys will be conducted in accordance with the new DAU configuration. The IPM will be used to estimate survival rates, population abundance, and the high productivity range for this DAU during early implementation of this Plan.

Square miles	5,116
% public land	55



Weiser-McCall DAU

Management Objectives

Management Direction	Strategy
Provide a diversity of hunting opportunities, including socially desirable and biologically sustainable levels of antlerless and mature buck opportunity	If DAU is meeting objectives, continue to offer either-sex opportunity for youth Continue to manage GMU 22 as a mature buck hunt Provide hunting opportunity for multiple weapon types
Continue to refine and implement the mule deer monitoring program; provide annual estimates of population abundance	Continue to expand collaring efforts to include populations on primary winter ranges previously not sampled Include GMUs previously not sampled to ensure herd composition surveys are well distributed throughout the DAU
Manage winter ranges to minimize negative effects of disturbance to mule deer	Evaluate potential closure of Wildlife Management Areas when winter-feeding criteria are met for mule deer
Improve and protect key winter, summer, and transitional habitats on public and private lands	Work with habitat staff and BLM to address habitat degradation on key winter ranges Work with land management agencies to minimize disturbance from illegal OHV use

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Appendix A: 2017 Idaho Mule Deer Hunter Survey Executive Summary

Response rates in 2017 significantly varied between survey delivery methods. Surveys sent by standard mail garnered a 49% response (*n* = 2,464 hunters), whereas only 16% (*n* = 4,405) of hunters who received the survey via email responded. An additional 378 individuals voluntarily submitted responses via the internet. Response rate for the 2007 standard mail survey was similar (52%, *n* = 1,462 hunters).

Experience Level (Q 1, 2, and 3)

Respondents in 2017 claimed 34 years of total hunting experience, including 23 years hunting mule deer. On average, hunting experience was 2–3 years longer compared to hunters in 2007. Increased experience levels are consistent with declining trends in hunter recruitment and an aging constituency.

Weapon Type (Q 4, 5, and 6)

Similar to results in 2007, the vast majority (72%) of respondents used rifles to hunt mule deer during the previous hunting season; 64% of hunters had only hunted mule deer with a rifle during the last 5 years. Of those who chose to hunt with archery, short-range, or muzzleloader equipment, the most important reason was to "hunt when fewer hunters are in the field."

Previous Harvest (Q 7 and 7A)

Of hunters who took the survey in 2017, 47% were successful during the previous hunting season (2016), which was significantly higher than those who took the 2007 survey (33% success during 2006 hunting season). Significantly fewer antlerless deer were taken by hunters in 2016. In both surveys, the majority of hunters reported taking either "Small" or "Medium" bucks.

Where They Hunt (Q 8 and 9)

The 5 most popular GMUs among 2017 respondents were 39, 43, 32, 76, and 32A. Similarly, in 2007, the top 5 GMUs were 39, 32A, 76, 32, and 40. Approximately one-half of hunters reported hunting in 2–3 different GMUs each year; and a significant number hunt in the same GMU every year. Hunter spatial distribution patterns have not changed over time.

Why They Hunt (Q 10)

In 2017, when asked about reasons for hunting mule deer in Idaho, top choices were

- Being close to nature
- Creating pleasant memories
- Viewing scenery
- Being with friends and family

These reasons are not different from those given in the 2007 survey. However, importance of "putting meat on the table" significantly increased in 2017.

Desirable Animal (Q 11)

In 2017, when asked what type of deer was most desirable to harvest, respondents identified "Large Mule Deer Buck" as most desirable and "Antlerless Mule Deer" as least desirable. These results were similar for the 2007 survey. However, desirability of any deer, antlerless deer, and small and medium bucks all significantly increased over 2007 results, which is consistent with increased importance of acquiring venison for consumption.

Antlerless Mule Deer Hunting (Q 12, 13, 14, 15, 16, and 17)

When asked about justification for antlerless harvest, 81% of mule deer hunters supported harvest "to increase productivity of the herd," 78% identified antlerless harvest as a desirable management tool to "maintain a balanced population size for the quality of habitat," and 78% favored antlerless hunts "to provide opportunities for Youth Hunts." Due to an error in how this question was analyzed in 2007, we were unable to make comparisons across years.

Participation in antlerless mule deer hunts declined somewhat in 2017 (47%) compared to the 2007 survey (52%). Similar to the 2007 survey, when asked if they would participate in an antlerless hunt in the future, 50% of 2017 respondents said "yes." Opinions regarding appropriateness of antlerless harvest (88% support) and use of youth hunts as the favored method to achieve necessary harvest were similar across years.

Compared to 2007, more respondents (65%) in 2017 reported they would harvest an antlerless deer in addition to a buck.

Reasons for Not Hunting (Q 18 and 18A)

Top reasons listed for not being able to hunt included:

- Work schedule
- Family obligations
- Too many hunters

When the category "other" was excluded, work schedule was the most important reason listed for not hunting. Results were similar to the 2007 survey.

Factors Considered When Deciding Where to Hunt (Q 19)

The 5 most important factors for selecting an area to hunt were similar across years:

- Access to public lands
- Ability to hunt every year
- Best chance to harvest a deer
- Opportunity to also hunt elk
- Familiarity with an area

Hunter Crowding (Q 20 and 21)

Similar to 2007 respondents, 45% of hunters reported there were times during the 2016 hunting season when number of hunters seriously detracted from quality of their hunting experience. When asked about potential strategies to reduce hunter density, 54% of 2017 respondents favored

longer seasons (significantly more than in 2007), and 36% favored controlled hunts (similar to 2007 response). Stratified hunts were somewhat acceptable. As in 2007, neither choosing a single species to hunt nor zone restrictions were popular choices, but both were significantly more acceptable in the most recent survey.

Opportunity vs. Buck Quality (Q 22)

Hunters were asked to select 1 scenario for each of 7 pairs of opposing choices representing trade-offs between hunting opportunity (i.e., years between hunts) and size of bucks available for harvest. Answers to this arrangement of choices allowed us to examine whether hunters were willing to accept reduced hunting opportunity over time to improve likelihood of harvesting a larger buck when eventually allowed to hunt. Respondents in 2017 consistently favored more frequent hunting opportunity over size of bucks available, and compared to 2007 responses, proportions of hunters choosing opportunity over buck size increased in all 7 scenarios.

Willingness to Accept Additional Restrictions (Q 23 and 23A)

Similar to opinions in 2007, 62% of hunters in 2017 reported they were willing to accept additional restrictions in order to manage for larger and more mule deer bucks. In general, hunters prefer restrictions that preserve (maximize) hunting opportunity and harvest. We observed little change in hunter acceptance of restrictions between surveys. "Controlled Hunts" were most acceptable, while "Giving Up the Ability to Hunt Every Year" was least acceptable. Hunters appear willing to accept additional controlled hunts as long as there are still adequate opportunities to hunt during general season if they do not draw a controlled tag. However, this scenario would likely lead to increased hunter congestion in areas with general seasons unless additional measures are taken to reduce hunter density.

Mule Deer vs. Elk (Q 24)

Hunters were asked their thoughts about reducing elk populations on a large scale to potentially increase mule deer, or whether mule deer should be given management priority over elk or elk populations reduced in GMUs where they hunt to potentially increase mule deer numbers. In all cases, and as found in 2007, hunters rejected these concepts and would not accept these management options.

Hunter Satisfaction (Q 25)

In the 2017 survey hunters were asked about several aspects of their 2016 hunt:

- Number of deer they saw
- Number of bucks they saw
- Size of bucks they saw
- Length of season
- Timing of season
- Overall quality of their hunt

All of the above measures of hunter satisfaction significantly increased over 2007 hunter survey results. However, hunter satisfaction with respect to number of other hunters encountered significantly declined since 2007.

Appendix B: 2017 Idaho Mule Deer Hunter Survey

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Mule Deer Hunting in Idaho

Understanding the needs and experiences of hunters.

First, some questions about your general hunting behavior.

1. **About how many years have you hunted—any species, anywhere?** ***(Please enter number)***

_____ Years

2. **About how many years have you hunted in Idaho?** ***(Please enter number)***

_____ Years

Now some questions about your Idaho Mule Deer hunting experiences and preferences.

3. **About how many years have you hunted Mule Deer in Idaho?** ***(Please enter number)***

_____ Years

4. **What type of weapon(s) did you use to hunt Mule Deer in 2016?** ***(Please check all that apply)***

❑ I did not hunt mule deer in Idaho in 2016

❑ Shotgun
❑ Rifle
❑ Handgun
❑ Traditional Muzzleloader
❑ Inline Muzzleloader
❑ Compound Bow
❑ Recurve or Longbow
❑ Crossbow

5. **Which of the following Idaho Mule Deer archery, short-range weapons or muzzleloader seasons did you hunt in during the last 5 years (2012-2016)?** ***(Please check all that apply)***

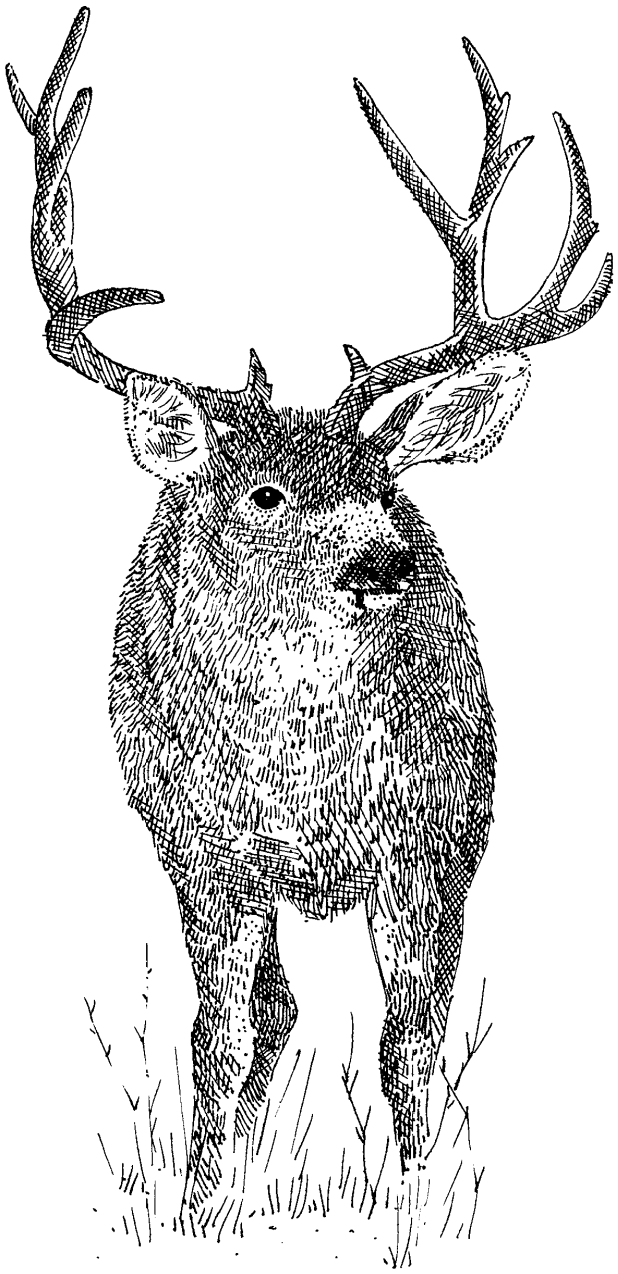
❑ None, I only hunted Mule Deer with a rifle >> Please continue with #7, below
❑ I hunted in archery-only seasons
❑ I hunted in short-range weapon seasons
❑ I hunted in muzzleloader-only seasons

6. **How important was each of the following in your decision to hunt in a Mule Deer archery, short-range weapons or muzzleloader season?**

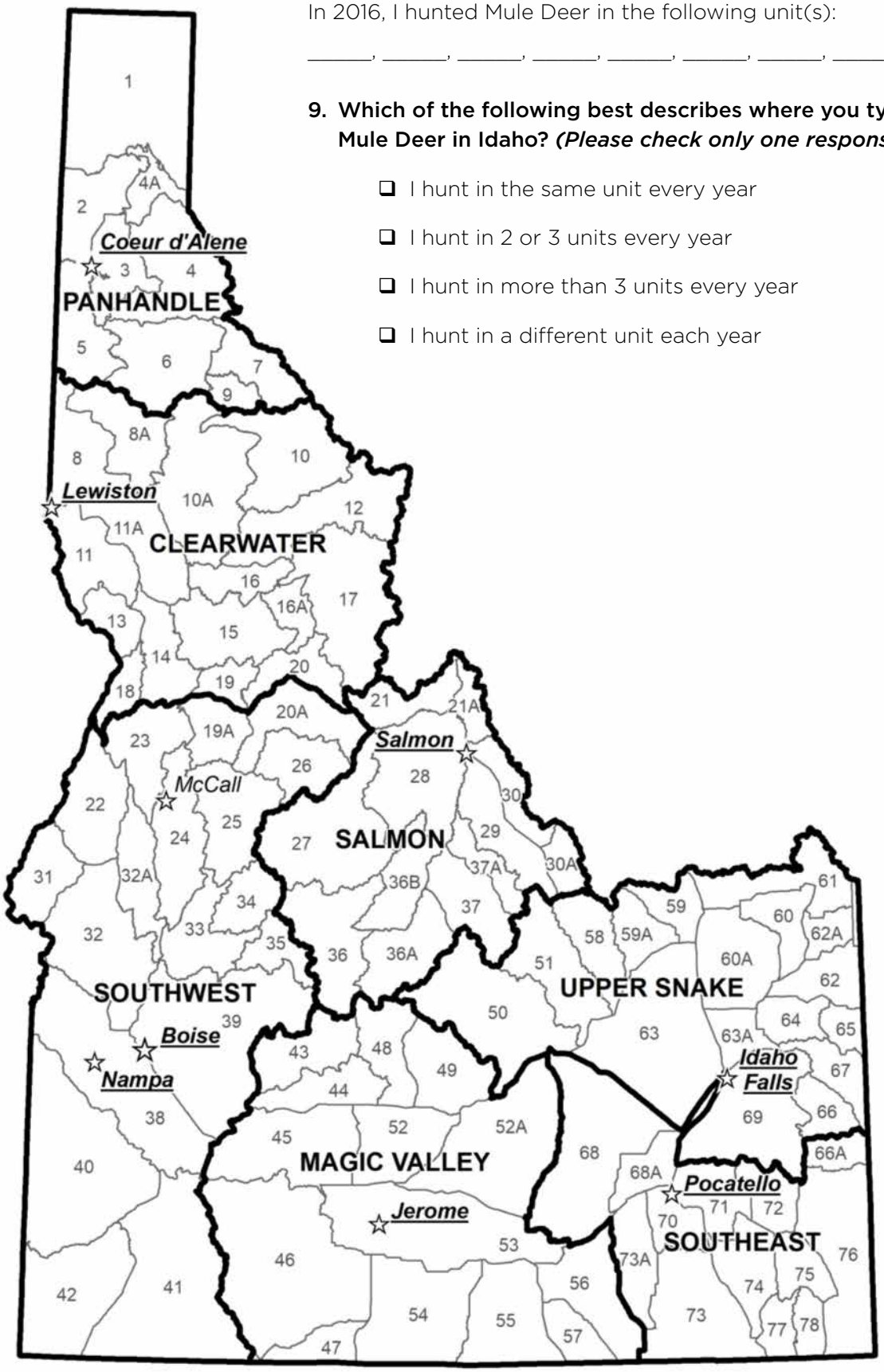
Reasons for archery, short-range weapons or muzzleloader hunting	How important was each reason for hunting in a Mule Deer archery, short-range weapons or muzzleloader season? *(Please circle one response for each reason)*			
A. To increase the challenge	Not Important	Somewhat Important	Moderately Important	Extremely Important
B. To hunt when fewer hunters are a-field	Not Important	Somewhat Important	Moderately Important	Extremely Important
C. To improve my chance of getting a Mule Deer	Not Important	Somewhat Important	Moderately Important	Extremely Important
D. To expand my hunting season	Not Important	Somewhat Important	Moderately Important	Extremely Important
E. To hunt where I otherwise wouldn't have the opportunity to do so	Not Important	Somewhat Important	Moderately Important	Extremely Important

7. Did you harvest a Mule Deer in Idaho in the 2016 season? *(Please check only one response)*

- ❑ I did not hunt Mule Deer in Idaho in 2016
- ❑ No, I did not harvest a Mule Deer in Idaho in 2016
- ❑ Yes, what did you harvest? *(Pleas check one)*
  - ❑ Large Mule Deer Buck (antlers extend outside the ears, over 24 inches wide and 4 or more points a side)
  - ❑ Medium Mule Deer Buck (antlers not wider than the ears, over 18-24 inches wide and 3–4 or more points a side)
  - ❑ Small Mule Deer Buck (1–2 points a side)
  - ❑ Anterless Mule Deer Buck (doe or fawn)



8. In which unit(s) did you hunt Mule Deer in Idaho during 2016? *(Please refer to the map)*



In 2016, I hunted Mule Deer in the following unit(s):

_____, _____, _____, _____, _____, _____, _____, _____, _____, _____

9. Which of the following best describes where you typically hunt Mule Deer in Idaho? *(Please check only one response)*

- ❑ I hunt in the same unit every year
- ❑ I hunt in 2 or 3 units every year
- ❑ I hunt in more than 3 units every year
- ❑ I hunt in a different unit each year

Now, some questions about your reasons for hunting Mule Deer in Idaho.

10. Below is a list of possible reasons for hunting Mule Deer in Idaho. How important to you is each of the following reasons for hunting Mule Deer in Idaho?

Reasons for hunting	How important is each reason for hunting Mule Deer in Idaho? *(Please circle one response for each reason)*			
A. Developing my hunting skills	Not Important	Somewhat Important	Moderately Important	Extremely Important
B. Releasing or reducing some built-up tension	Not Important	Somewhat Important	Moderately Important	Extremely Important
C. Being close to nature	Not Important	Somewhat Important	Moderately Important	Extremely Important
D. Showing others I can do it	Not Important	Somewhat Important	Moderately Important	Extremely Important
E. Using my deer stalking skills	Not Important	Somewhat Important	Moderately Important	Extremely Important
F. For the stimulation and excitement	Not Important	Somewhat Important	Moderately Important	Extremely Important
G. Getting an antlerless deer	Not Important	Somewhat Important	Moderately Important	Extremely Important
H. Viewing the scenery	Not Important	Somewhat Important	Moderately Important	Extremely Important
I. Developing personal spiritual values	Not Important	Somewhat Important	Moderately Important	Extremely Important
J. Competing against other hunters	Not Important	Somewhat Important	Moderately Important	Extremely Important
K. Getting away from the usual demands of life	Not Important	Somewhat Important	Moderately Important	Extremely Important
L. Getting any deer	Not Important	Somewhat Important	Moderately Important	Extremely Important
M. Seeing deer in a natural setting	Not Important	Somewhat Important	Moderately Important	Extremely Important
N. Experiencing tranquility	Not Important	Somewhat Important	Moderately Important	Extremely Important

Reasons for hunting	How important is each reason for hunting Mule Deer in Idaho? *(Please circle one response for each reason)*			
O. Getting a good shot at a deer	Not Important	Somewhat Important	Moderately Important	Extremely Important
P. Testing my abilities	Not Important	Somewhat Important	Moderately Important	Extremely Important
Q. Being on my own	Not Important	Somewhat Important	Moderately Important	Extremely Important
R. Harvesting a large buck (antlers extend outside the ears, over 24" wide and 4 or more points a side)	Not Important	Somewhat Important	Moderately Important	Extremely Important
S. Sharing what I have learned with others	Not Important	Somewhat Important	Moderately Important	Extremely Important
T. Being with friends	Not Important	Somewhat Important	Moderately Important	Extremely Important
U. Getting to know the lay of land	Not Important	Somewhat Important	Moderately Important	Extremely Important
V. Getting a small buck (1 or 2 points on a side)	Not Important	Somewhat Important	Moderately Important	Extremely Important
W. Learning more about nature	Not Important	Somewhat Important	Moderately Important	Extremely Important
X. Doing something with my family	Not Important	Somewhat Important	Moderately Important	Extremely Important
Y. Putting meat on the table	Not Important	Somewhat Important	Moderately Important	Extremely Important
Z. Keeping physically fit	Not Important	Somewhat Important	Moderately Important	Extremely Important

Reasons for hunting	How important is each reason for hunting Mule Deer in Idaho? *(Please circle one response for each reason)*			
AA. Getting any buck	Not Important	Somewhat Important	Moderately Important	Extremely Important
BB. Testing and using my equipment	Not Important	Somewhat Important	Moderately Important	Extremely Important
CC. Developing close friendship with my hunting companions	Not Important	Somewhat Important	Moderately Important	Extremely Important
DD. Thinking about my personal values	Not Important	Somewhat Important	Moderately Important	Extremely Important
EE. Bringing back pleasant memories	Not Important	Somewhat Important	Moderately Important	Extremely Important
FF. Learning more about deer	Not Important	Somewhat Important	Moderately Important	Extremely Important

In this section, we seek an understanding of what you consider when deciding what kind of Mule Deer to hunt and where to hunt them.

11. How desirable is it to you to harvest the following kinds of Mule Deer?

Kind of Mule Deer	How desirable do you find harvesting each kind of Mule Deer? *(Please circle one response for each reason)*			
A. Large Mule Deer buck (Antlers extend outside the ears, over 24 inches wide and 4 or more points a side)	Not Desirable	Somewhat Desirable	Moderately Desirable	Extremely Desirable
B. Medium Mule Deer buck (Antlers do not extend outside the ears, 18-24 inches wide and 3 - 4 points a side)	Not Desirable	Somewhat Desirable	Moderately Desirable	Extremely Desirable
C. Small Mule Deer buck (1 – 2 points a side)	Not Desirable	Somewhat Desirable	Moderately Desirable	Extremely Desirable
D. Antlerless Mule Deer (does or fawns)	Not Desirable	Somewhat Desirable	Moderately Desirable	Extremely Desirable
E. Any Mule Deer	Not Desirable	Somewhat Desirable	Moderately Desirable	Extremely Desirable

12. The Department of Fish and Game offers regulated hunting of antlerless Mule Deer, including does, in some areas for a variety of reasons. How do you feel about the following reasons for conducting antlerless Mule Deer hunts?

Reasons for anterless Mule Deer hunts	How do you feel about the following reasons for conducting antlerless Mule Deer hunts? *(Please circle one response for each reason)*			
A. To reduce agricultural damage	Favor It	Do Not Favor, But Would Accept It	Would Not Accept It	Would Need More Information
B. To provide additional hunting opportunity	Favor It	Do Not Favor, But Would Accept It	Would Not Accept It	Would Need More Information
C. To maintain a balanced population size for the quality of the habitat	Favor It	Do Not Favor, But Would Accept It	Would Not Accept It	Would Need More Information
D. To increase productivity of the herd	Favor It	Do Not Favor, But Would Accept It	Would Not Accept It	Would Need More Information
E. To provide opportunities for Youth Hunts	Favor It	Do Not Favor, But Would Accept It	Would Not Accept It	Would Need More Information

13. Have you ever participated in an antlerless Mule Deer hunt in Idaho? *(Please check one)*

❑ Yes ❑ No

14. Would you participate in an antlerless Mule Deer hunt in Idaho in the future? *(Please check one)*

❑ Yes ❑ No ❑ Don't Know

15. Do you feel hunting antlerless Mule Deer is ever appropriate? *(Please check one)*

❑ Yes ❑ No

16. If you could harvest an antlerless Mule Deer in addition to a buck, would you participate? *(Please check one)*

❑ Yes ❑ No

17. If it is determined that antlerless Mule Deer harvest is needed, what is your preferred method? Please rank all the following methods as to which is most acceptable to YOU. *Please write in your answers (1-5), where 1= MOST acceptable, 5 = LEAST acceptable*

_____ Controlled Hunts
_____ Youth Hunts
_____ General Hunts
_____ Extra Deer Hunts
_____ Archery and/or Muzzleloader Hunts

18. If you did not hunt Mule Deer in Idaho during all 5 of the past 5 years (2012 through 2016), please tell us why. *(Please circle the numbers of all that apply)*

1. Poor health
2. Work schedule
3 Family obligations
4. Low deer numbers
5. I hunted other game species
6 No hunting partner
7. I couldn't afford it
8. Access limitations
9. The season length
10. The timing of the season
11. Too much ATV activity
12. Too many hunters
13. Other (*please explain*)_____
_____
_____

Of those you circled above, which one was the most important reason you did not hunt Mule Deer for the past 5 years? *Enter the number (1-13) from the list above* _____

19. Each of the following characteristics may be things you consider when deciding where to hunt Mule Deer in Idaho. How does each characteristic affect your choice of where to hunt Mule Deer in Idaho?

Characteristics	How does each characteristic affect where you decide to hunt Mule Deer in Idaho? *(Please circle one response for each reason)*				
A. An area with lots of other hunters	Strongly Negative	Negative	No Affect	Positive	Strongly Positive
B. An area that has many Mule Deer but few mature bucks	Strongly Negative	Negative	No Affect	Positive	Strongly Positive
C. An area known for large bucks	Strongly Negative	Negative	No Affect	Positive	Strongly Positive
D. An area with many open roads	Strongly Negative	Negative	No Affect	Positive	Strongly Positive
E. An area where I can also hunt other game during the Mule Deer season	Strongly Negative	Negative	No Affect	Positive	Strongly Positive
F. An area where I can also hunt elk during the Mule Deer season	Strongly Negative	Negative	No Affect	Positive	Strongly Positive
G. An area close to home	Strongly Negative	Negative	No Affect	Positive	Strongly Positive
H. An area I am familiar with	Strongly Negative	Negative	No Affect	Positive	Strongly Positive

Characteristics	How does each characteristic affect where you decide to hunt Mule Deer in Idaho? *(Please circle one response for each reason)*				
I. An area with a short Mule Deer season	Strongly Negative	Negative	No Affect	Positive	Strongly Positive
J. An area where I may use any weapon to hunt Mule Deer	Strongly Negative	Negative	No Affect	Positive	Strongly Positive
K. An area where I have access to public lands (Forest Service, BLM)	Strongly Negative	Negative	No Affect	Positive	Strongly Positive
L. An area where I have access to private lands	Strongly Negative	Negative	No Affect	Positive	Strongly Positive
M. An area where I think I have the greatest chance of harvesting a Mule Deer	Strongly Negative	Negative	No Affect	Positive	Strongly Positive
N. An area where I can hunt every year	Strongly Negative	Negative	No Affect	Positive	Strongly Positive
O. An area where I do not have to compete with motorized hunters using ATV's or trailbikes	Strongly Negative	Negative	No Affect	Positive	Strongly Positive
P. An area where I am able to use my ATV or trailbike	Strongly Negative	Negative	No Affect	Positive	Strongly Positive

Now, we would like your opinion about some possible management options.

20. Were there times during your 2016 Mule Deer season when the numbers of other hunters seriously detracted from the quality of your hunting experience? *(Please check one)*

❑ Yes ❑ No ❑ I did not hunt in 2016

21. How do you feel about each of the following potential ways of managing for lower hunter numbers during Mule Deer season, if needed?

Potential Management Options	How do you feel about the following potential ways of managing hunter numbers during the Mule Deer season? *(Please circle one response for each reason)*			
A. Longer seasons	Favor It	Do Not Favor, But Would Accept It	Would Not Accept It	Would Need More Information
B. Choose a species (deer or elk)	Favor It	Do Not Favor, But Would Accept It	Would Not Accept It	Would Need More Information
C. Controlled hunts	Favor It	Do Not Favor, But Would Accept It	Would Not Accept It	Would Need More Information
D. Stratified hunts (a choice of one of several short seasons)	Favor It	Do Not Favor, But Would Accept It	Would Not Accept It	Would Need More Information
E. A zone restriction (like the elk zones)	Favor It	Do Not Favor, But Would Accept It	Would Not Accept It	Would Need More Information

22. Managing to produce more mature (large) Mule Deer bucks would require reductions in buck harvest. Wildlife managers need to know whether hunters are willing make trade-offs between the size of bucks and the amount of opportunity to hunt. *(For each of the following pairs of opportunity choices please indicate which one is most favorable to you by circling the appropriate letter)* <u>Please answer every one, even if you do not like either option.</u>

The opportunity to hunt for a small buck every year	**A**	OR	**B**	The opportunity to hunt for a big buck once every 10 years
The opportunity to hunt for a medium buck every year	**A**	OR	**B**	The opportunity to hunt for a big buck once every 3 years
The opportunity to hunt for a small buck every year	**A**	OR	**B**	The opportunity to hunt for a medium buck once every 10 years
The opportunity to hunt for a medium buck once every 3 years	**A**	OR	**B**	The opportunity to hunt for a small buck every year
The opportunity to hunt for a big buck once every 10 years	**A**	OR	**B**	The opportunity to hunt for a medium buck once every 3 years
The opportunity to hunt for a small buck every year	**A**	OR	**B**	The opportunity to hunt for a big buck once every 3 years
The opportunity to hunt for a big buck once every 10 years	**A**	OR	**B**	The opportunity to hunt for a medium buck every year

23. Are you willing to accept additional restrictions in order to manage for larger and/or more Mule Deer bucks? *(Please check one)*

❑ Yes ❑ No >> *Please continue witwh #24, below*

If YES, please rank the following restrictions according to their acceptability to YOU. (P*lease write in your answers 1-6, where 1= MOST acceptable, 6 = LEAST acceptable*)

Rank

_____ Controlled Hunts
_____ Being restricted to short range weapons (shotgun, muzzleloader, bow)
_____ Road and trail closures during hunting season
_____ General harvest restricted to bucks with 4 or more points to increase buck numbers but not antler size
_____ Giving up the ability to hunt every year

24. We would like to know how you feel about the management of Mule Deer and Elk in Idaho. Please indicate your opinion on the following potential management options? *(Check one answer for each management action)*

Management Options	How you feel about the following potential Mule Deer management options? *(Please circle one response for each reason)*			
A. Reduce elk populations on a large scale to potentially increase Mule Deer	Favor It	Do Not Favor, But Would Accept It	Would Not Accept It	Would Need More Information
B. In some selected units, mule deer will be given management priority over elk. This means elk populations in those units may decrease	Favor It	Do Not Favor, But Would Accept It	Would Not Accept It	Would Need More Information
C. Reduce elk population in the units I hunt in to potentially increase Mule Deer	Favor It	Do Not Favor, But Would Accept It	Would Not Accept It	Would Need More Information

Now, some questions about satisfaction you experienced with Mule Deer hunting in Idaho in 2016.

25. How satisfied were you with each of the following aspects of your 2016Mule Deer hunting experience?

If you did not hunt Mule Deer in 2016, please check here ❑

Attributes of your 2016 Idaho Mule Deer hunting experience	How satisfied were you with your 2016 Idaho Mule Deer hunting experience? *(Please circle one response for each reason)*				
A. The number of deer you saw	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
B. The size of bucks you saw	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
C. The numbers of bucks you saw	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
D. The length of the season	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
E. The timing of the deer season	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
F. The number of other hunters you encountered	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
G. The amount of access	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
H. The overall quality of your Mule Deer experience	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied

26. If you were Very Dissatisfied with any of the attributes above, please tell us why. *(Please write in your reasons)*

_____

_____

_____

_____

Continue to next page...

Is there anything else you'd like to tell us about hunting Mule Deer in Idaho? We would appreciate any comments.

Thank you

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Idaho

Mule Deer Mangement Plan

2020-2025