Idaho
Elk Management Plan
2024 – 2030

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Executive Summary

The Idaho Fish and Game Commission (Commission) and the Idaho Department of Fish and Game (IDFG) have a responsibility to preserve, protect, perpetuate, and manage all of Idaho's wildlife. To fulfill that obligation, IDFG is guided by the Strategic Plan, which was adopted in 2015 (IDFG 2015). The Strategic Plan is broad in scope and identifies foundational challenges, objectives, and strategies that influence the more detailed action plans, including the Elk Management Plan.

This revision of the 2014 plan establishes objectives that IDFG staff will achieve over the next 6 years including:

- Identify challenges and opportunities currently faced by elk managers and outline strategies to address them.
- Provide zone-specific elk population data and objectives.
- Clearly communicate the scientific and social rationale guiding management strategies designed to meet elk population objectives.
- Provide partners with relevant information for land management planning purposes.

Elk are one of the most highly sought after big game animals in the state and are important for their recreational, aesthetic, cultural, and intrinsic value. Statewide, Idaho's elk population is robust. As a reflection of this, Idaho hunters have harvested over 20,000 elk annually in 8 out of the past 10 years.

Today, elk are widely distributed across the state and range from the thick, timbered forests of the Panhandle to the canyonlands and sagebrush deserts of southern Idaho. While elk numbers have increased at the statewide level since 2014, localized changes in elk abundance and distribution have occurred. For example, elk populations remain below objective in some units of northern and central Idaho, while some elk zones in southern Idaho are above objective. Elk are also increasingly occupying agricultural landscapes where they cause damage to standing and stored crops. Some of the biggest elk management challenges are issues of distribution rather than overall abundance. This variability in elk population performance and distribution across the state is addressed in each elk zone summary.

Elk Management – Opportunities and Challenges

Wildlife managers today face some ongoing challenges and some new ones. Idaho's human population has doubled since 1990. Approximately 268,000 people have moved into the state since the last elk plan was completed in 2014. Tourism has also increased substantially. Over 35 million people visited Idaho in 2022 and outdoor recreation ranked as one of their top motivations. These statistics highlight not only the importance of Idaho's natural resources and public lands, but also the increased pressure being placed on them. While statewide elk numbers remain robust despite these increases, human development and loss of habitat are influencing elk management and elk densities at the local level in some zones. Hunter crowding continues to be a primary concern voiced by Idaho elk hunters. Increases in resident hunter numbers will require managers to be creative and adaptable when proposing hunt season structures and tag numbers. This revised plan builds on the successes of the previous plan and the current Idaho model: offering general season elk tags that provide annual opportunity for family and friends to hunt together while also providing enhanced opportunity to hunt mature bulls in controlled hunts. This model was strongly supported by Idaho residents in the past and IDFG continues to hear

feedback consistent with previous hunter opinion surveys during the season setting process and other interactions with the public (Sanyal et al. 2012).

Changes in private land use are creating additional challenges for elk management. The increasing human population has been accompanied by increasing residential, commercial, and industrial development which have impacted elk habitat in some areas. Landownership changes also create challenges to elk management as larger parcels are being subdivided or new owners have different values with regards to elk management and hunter access. Many elk populations depend on private land for part or all of the year, so IDFG will continue to work with private landowners and hunters to seek solutions to the challenges of managing a public resource that can be heavily dependent on private land.

Predation management is a key component of elk management. IDFG has dedicated vast amounts of time and resources to monitoring predator populations, primarily wolves. IDFG has been radio-collaring elk for over two decades to assess mortality rates from predators. When predation is limiting an elk population, IDFG has developed predator management plans and implemented control measures to bolster underperforming elk herds.

Statewide Elk Management Direction

IDFG has developed statewide objectives based on annual conversations with hunters about their experiences and concerns, hunter opinion survey results, ongoing population monitoring, harvest trends, the potential for herd growth, and current management challenges associated with the presence of elk in certain portions of the state.

Proposed statewide elk management objectives include:

- Where sustainable, continue to offer general-season elk hunting opportunities by managing elk populations, managing predator populations, improving elk habitat, and modifying the general season hunt structure as needed (i.e., weapon type, timing, length, etc.).
- Work with partner organizations and interested private landowners to facilitate the movement of elk between seasonal ranges, improve forage resources, and manage disturbance in wintering areas and calving habitat.
- Implement measures to reduce elk-caused agriculture and property damage.
- Manage disease impacts to elk and livestock.
- Increase public knowledge and understanding of elk biology, management, and hunting.

Elk Zone Management Direction

IDFG will continue to manage elk using the zone management system. The zone system allows herd management based on local habitat, weather, elk movements, and harvest patterns while providing a variety of hunting opportunities throughout the state.

The number of elk that can be supported in any given management zone is influenced by many factors, including weather, habitat quality, predation, and the need to minimize elk-based agricultural depredations and disease risks to livestock. One or more of these factors can prevent an elk herd from growing or limit the ability of wildlife managers to maintain elk numbers above a certain level. For each elk zone, IDFG staff identified the limiting factors using population monitoring trends over 10 or more years, changes to available habitat, reported agricultural impacts (agricultural and property damage), known or suspected causes of elk mortality, assessments of predator populations and predation

impacts, and other data and elk management experience. The combination and severity of these limiting factors varies across the state, and even within zones. Incorporating an updated assessment of these factors, this plan makes changes to several elk zone boundaries including the Snake River, Big Desert, Owyhee, and Boise River Zones. Updates are detailed in the Elk Zone Summary section of the plan (pg. 67-173).

For each elk zone, IDFG staff proposed a 6-year management direction, population objectives, and management objectives accompanied by strategies to maintain or improve elk herd performance, fill information gaps, and provide greater hunter satisfaction. Through the development and revision process for this plan, managers will further refine management direction and strategies for each zone based on feedback from the public and IDFG staff.

The Future

While elk continue to thrive at the statewide level, elk managers must respond to new and ever-changing opportunities and challenges including elk population expansion in some portions of the state with associated increases in agriculture and property damage, ongoing and emerging diseases that affect elk, habitat loss and modification, an increasing number of elk hunters, and reduced elk populations in some backcountry areas. This revised elk plan is a product of IDFG's continuing efforts to address these challenges at the state and zone level by providing direction and specific management objectives for the next 6 years.

The plan will require public support and additional financial resources for full implementation. IDFG will work to engage additional partners in elk management including private landowners, hunters, federal and state agencies, tribes, and conservation organizations. Partnerships, combined with a common desire to improve elk management, will go a long way toward achieving the basic intent of the plan revision: "To be responsive to elk hunter desires and expectations, and maintain biologically sustainable elk populations."

Introduction

Idaho has a diversity of abundant big game species, and Rocky Mountain elk (*Cervus elaphus canadensis*) are considered by many hunters to be the state's premier big game animal. Elk provide an incredible combination of recreational, aesthetic, social, cultural, and economic value to people who work in, live in, or visit Idaho. Thanks to Idaho's diverse habitat and healthy elk populations, elk hunters can pursue their quarry in sagebrush (*Artemisia* spp.)-covered deserts, aspen (*Populus* spp.) draws, high mountain meadows, or thickly timbered ridges. Elk occur in each of the 99 Game Management Units (GMUs) within the state. Because elk are so widespread and abundant, Idaho elk hunters are fortunate to have a diversity of hunting experiences and opportunities available to them.

Historical Perspective

Historically, elk numbers were likely lower than they are today. Accounts from the Lewis and Clark expedition and trappers during the height of the fur trade generally suggest elk populations were scattered and only locally abundant in northern Idaho. Eastern Idaho elk populations appeared robust in the mid-1800s (Evans 1939). Statewide, populations were reduced during the unregulated hunting of the late 1800s and early 1900s. Ungulates, including elk, were heavily utilized for food by indigenous tribes, miners, trappers, loggers, and other settlers.

Early 1900s — European settlement brought changes to the landscape. Millions of sheep, cattle, and horses were brought into southern Idaho. There was virtually no regulation on the removal of mountain lions, black bears, and wolves, which led to the functional extirpation of wolves by the 1930s. In southern and parts of central Idaho, extreme overgrazing combined with fire suppression efforts turned what was primarily perennial grass ranges into shrublands. Unregulated harvest and conversion of grass-dominated ranges to shrublands resulted in fewer elk in southern Idaho.

Landscape-level changes also occurred in northern Idaho during the early 1900s, but those changes were more positive for elk populations. Extensive wildfires created a mosaic of grass, shrublands, and forested habitat types. The Great Fire of 1910, also known as the Big Burn, was one of the largest forest fires in American history and burned more than 3 million acres of forest in North Idaho and Western Montana over a span of 2 days. Following these fires, elk populations were augmented with elk from Yellowstone National Park (YNP). Those fires set the stage for an explosion of elk populations years later due to increased forage availability. Timber harvest also promoted the conversion of mature forests to early seral habitat communities that, in general, provided more forage to elk than was previously available. Under these conditions elk flourished in northern Idaho.

Mid 1900s — In north-central Idaho, elk populations probably peaked in the 1960s. As the early seral habitat created by the fires aged and moved towards a climax state, habitat quality for elk declined. Additionally, wildfire suppression campaigns of this time period also resulted in more late seral stage forests that were less favorable for elk.

By the 1970s, hunter numbers and access had increased to the point where the liberal hunting seasons enjoyed by hunters until then had to be replaced by more restrictive seasons to reduce elk vulnerability to harvest. Either-sex seasons throughout most of Idaho were replaced by antlered-only seasons in 1976. Elk populations responded, and by the late 1980s elk were once again abundant enough to support some antlerless opportunity. Predator control programs likely reduced predator populations

during the mid-1900s, which probably had some localized effects on elk in remote areas. With the 1974 listing of wolves as endangered under the Endangered Species Act and changes in predator poisoning practices, large carnivore populations began to increase.

Late 1900s — In the mid-1990s, portions of northern Idaho witnessed another downward cycle in elk numbers. Declining habitat potential in forested habitat, black bear and mountain lion predation, and the localized impacts of hard winters (1996 and 1997) all played a role. With protection and harvest restrictions implemented during the 1970-1990s, black bear and mountain lion populations likely stabilized and began to flourish, particularly in backcountry areas with limited hunting access. Wolves were re-established in the 1990s, both through natural recolonization from Canada and Montana and through a U.S. Fish and Wildlife Service (USFWS) reintroduction effort. Wolf predation on elk further accelerated declines in elk herds in many parts of northern and central Idaho.

In other portions of the state, including much of southern Idaho, elk numbers increased during this same timeframe. Wildfires that converted vast acreages of low elevation sagebrush habitat and mid-elevation shrublands to grasslands, hunting season frameworks designed to promote growth in elk numbers, and expanded elk use of irrigated agriculture in the wildland interface combined to enable southern Idaho elk populations to grow to all-time highs during the latter half of the 1900s.

An important change to Idaho's elk management framework occurred in 1998 with the establishment of the dual tag zone management system. In response to concerns over adult bull numbers, bull age structure, and hunter distribution in certain parts of the state, the Commission collaborated with the public and wildlife managers to implement this new strategy for managing elk populations. This new hunting framework had two primary components: create discrete hunting areas (zones) and try to maintain general season elk hunting opportunities. Twenty-eight Elk Zones were created by grouping Game Management Units (GMUs) that had similar habitat, shared elk management objectives, and/or distinct elk populations. General hunting opportunities were maintained by offering two different tag options in these zones where possible. The two tag types were identified as A and B tags, with A tag hunts offering more opportunity for archery hunters and limited rifle options whereas B tag seasons generally provided comparatively more rifle hunting opportunities. The zone structure and dual tag system remains the cornerstone for elk hunt structure and population management.

Today —Idaho's elk population continues to flourish across much of the state. The productive nature of the state's elk herds has supported enhanced hunting opportunities in some areas but has also led to some challenges that IDFG, hunters, and private landowners have not historically faced.

Elk populations in the southern part of the state are mostly robust and limited more by sociological constraints, such as damage to agricultural crops and property, than by habitat suitability.

Central Idaho's elk populations peaked in the mid-1990s and began declining shortly thereafter, reaching documented lows around 2011. Much of central Idaho burned during that time, leading to a decline in habitat quality as unpalatable invasive species became established and arid conditions limited the re-establishment of beneficial forage and cover vegetation. Varying predator densities between backcountry and frontcountry areas have also impacted elk numbers and distribution. Populations have stabilized but remain below historical management objectives.

Elk populations in the northern portions of the state have shifted from historically higher densities on federally managed forests towards higher densities on privately managed forest lands and agricultural

areas. This shift is largely in response to changes in habitat productivity resulting from a significant reduction of timber harvest on federally owned forests, coupled with fire suppression, and an increase in timber harvest on privately owned forests over the last 30 years. Varying predator densities between backcountry and frontcountry areas have also impacted elk numbers and distribution.

Purpose

Idaho Code 36-103 establishes statewide policy for wildlife and can be paraphrased as "all wildlife will be preserved, protected, and perpetuated; and that wildlife will be managed to provide continued supplies for hunting, fishing, and trapping." The Commission is charged with administering state wildlife policy and directs IDFG actions.

Idaho Code 67-1903 requires state agencies to develop strategic plans expressing how they will meet core mission requirements. Plans must identify outcome-based goals and performance measures. This revision of the Elk Management Plan tiers off the 2015 Strategic Plan and is intended to provide guidance to IDFG staff for managing the state's elk populations, hunting opportunities, and habitat over the next 6 years. This revised plan outlines statewide management direction and strategies, compiles updated information on elk ecology, and highlights revised management objectives and boundaries for a few elk zones. Many changes within this version of The Plan are associated with the realities of shifting elk populations in the state (e.g., more elk in front country and agriculture-associated landscapes and fewer elk in some backcountry habitat) and the habitat and social carrying capacities across these landscapes.

Results from Previous Planning Periods

Management of elk has been an Idaho priority since the inception of IDFG. Since the 1980s, IDFG has had 4 formal statewide elk management plans. A key feature of the 1986-1990 plan was the establishment of a minimum post-season bull:cow ratio goal of 25:100 for backcountry units and 15:100 for all other units. The elk "sightability" helicopter survey method was implemented as a statewide plan for inventorying elk in most units. IDFG also advocated for timber harvest guidelines that maintained adequate cover for elk and minimized open road densities on the landscape. A comprehensive elk rifle hunting study was initiated that quantified and qualified elk hunting experiences.

The 1991-1995 planning period was focused on maintaining or increasing bull elk numbers. General any-weapon seasons were moved out of the breeding season in the majority of GMUs. Spike-only general seasons and branch-antlered, permit-only hunts were implemented in eastern Idaho. Hunters were forced to choose between hunting 14 central Idaho GMUs with the mountain zone elk tag or the remaining GMUs with the regular elk tag.

By the mid-1990s, the number of elk tags sold eclipsed 100,000. Increasing hunter densities and declining bull:cow ratios drove the 1996-2010 Elk Management Plan process. A new minimum bull:cow ratio goal of 20:100 was adopted, along with higher bull:cow ratio goals for "quality" and "high quality" hunting areas. The A/B-tag zone management concept was implemented to manage hunter distribution across the state by incentivizing certain zones and seasons.

A 20% decline in statewide hunter numbers and significant declines in north-central and central Idaho elk herds precipitated the 2014-2024 elk plan review process (IDFG 2014). The primary emphasis of that elk plan was to implement strategies to increase elk populations and maintain as much elk hunting opportunity as possible.

While this current revision does not make fundamental changes to statewide elk hunting opportunity, it does provide targeted updates to elk management strategies across the state. This plan integrates the groundbreaking work that has been done to identify movement routes into zone management direction, realigns select zones to better address elk distribution and hunter opportunity, adjusts population objectives in the Lolo Zone to reflect on-the-ground habitat conditions, updates applicable zone strategies to reflect the detection of CWD, and details changes that have been made since the last elk plan to address hunter concerns regarding issues such as crowding.

Population Monitoring

IDFG manages elk with the goal of maintaining robust and healthy populations today and into the future. The wildlife management decisions made to achieve these goals rely on scientific data. Key pieces of information contributing to this decision-making process include an understanding of what factors influence population trends, seasonal distribution patterns, human interests and influences, climatic and habitat variables, interactions with other species, and social conflicts. Elk have an incredible ability to survive across a wide range of habitat types and will change movements and home ranges as pressure and forage resources dictate. This plasticity can create challenges for managers striving to maintain populations within biological and social management goals.

Elk zone-specific population objectives form the basis for elk management across the state. These objectives are established cooperatively with input from public stakeholders, the Commission, and IDFG staff. Objectives typically include an upper and lower bound. This range gives managers some flexibility with which to make decisions relative to current conditions, management challenges, and hunter desires while also allowing for natural fluctuations in elk populations due to annual variation in productivity and mortality. Managers use survey and harvest information and data-driven population models to monitor populations and establish harvest opportunities.

Elk populations are routinely monitored to evaluate their performance relative to objectives. Elk abundance (total number of elk), composition (percentage of bulls, cows, and calves; Table 1), and survival (how many elk survive a given year) are 3 primary data sources that wildlife managers use to monitor elk populations. The specific causes of mortality (e.g., harvest, predation, malnutrition, vehicle collisions, etc.), seasonal movements, and habitat use for different elk populations are additional data that inform management decisions when available. Managers have been collecting this information on elk populations across the state for decades and have continued to evaluate data gaps and methods to improve the quality of the information gathered. However, population monitoring techniques are not equally effective across all habitat types and landscapes. For example, aerial surveys (counting animals from aircraft) are very useful in the more open habitat types of southern and central Idaho but are far less effective in the dense forests found across the northern portions of the state. Consequently, different techniques that are appropriate for local conditions are implemented across the state to collect the highest quality data possible. IDFG continues to develop and test new survey and monitoring tools in varying landscapes. The methods used to gather information are chosen based on effectiveness and efficiency, human and animal safety, cost, and resulting data quality.

The following sections describe the data collection methods and tools used to monitor elk populations, discuss how the information is analyzed, and explain how the resulting products are used to make management decisions.

Table 1. Demographic categories used to classify elk during population monitoring surveys.

Category	Description
Calf	Young of the year elk born the preceding May or June. Body size, head shape, coat color and other indicators are used to differentiate calves from cows.
Cow	All antlerless elk older than a calf. Body size, head shape, coat color and other indicators are used to differentiate cows from calves.
Spike	Yearling bull elk. Typically have a single spike antler but can carry more than one point per antler. Antler size and configuration along with body size are used to identify spike bulls.
Raghorn Bull	Bull elk older than a spike that don't meet mature bull criteria. Typically, branch-antlered bulls with fewer than 6 points on a side or bulls with 6 points that lack a pronounced backward sweep on the sixth point. Additionally, raghorn antlers generally lack the mass of mature antlers.
Mature Bull	Determined by antler mass and configuration. Typically, 6 points or greater on a side and the sixth point has a pronounced backward sweep. Some 5-point bulls can fall into the mature category.
Unclassified	Elk that are seen but due to vegetation, safety concerns, or other factors cannot be effectively classified into one of the categories.

Abundance and Composition Monitoring

Aerial Surveys — Prior to the 1980s, key drainages within elk winter ranges were surveyed periodically using helicopters to establish a minimum population size and quantify herd composition. These surveys could be used to infer trends but could not provide reliable population estimates because not all animals had the potential to be observed (Caughley 1974). IDFG developed a sightability model—which estimates the number of animals that were missed during a survey—and coupled it with a more complete and robust aerial survey sampling design and protocol (Unsworth et al. 1994). Since the late 1980s, that aerial sightability model and survey protocol has been the primary elk abundance and composition monitoring tool for IDFG and is utilized in 22 of the 28 elk management zones. This technique has enabled IDFG to generate population estimates with confidence intervals, establish population trends, and statistically compare surveys. Since its initial development, IDFG's sightability survey protocol has been refined to further enhance the method's reliability. IDFG continues to follow a rigorous protocol to ensure the quality of these population estimates, which includes training and minimum standards for staff involved in the design, implementation, and analysis of sightability surveys.

While aerial sightability surveys work very well in many zones across the state, there are challenges in using them in some parts of the state and in solely relying on them for future population estimation. Efficient and effective aerial surveys are difficult in heavily forested habitats and when animal distribution significantly changes due to changing snow loads or winter range conditions. Another challenge is the continued availability of the types of helicopters with large viewing areas that existing sightability models were designed for (e.g., Bell 47) and pilots who have the required training and experience conducting these types of surveys. Consequently, IDFG is working to develop additional methods for estimating elk abundance and composition. Other motivations behind developing alternative or complimentary methods to aerial surveys include reducing risk to survey personnel, avoiding delays or reductions in conducive survey conditions caused by weather (lack of snow coverage, animals not being concentrated, etc.), and an interest in obtaining more frequent estimates.

Camera-based Surveys — An alternative to aerial surveys is the use of camera-traps to generate population estimates for elk. The use of cameras has emerged as a promising new tool for monitoring elk populations (Moeller et al. 2018). Since 2018, IDFG has deployed camera-traps in various GMUs across the state with the goal of developing a protocol for camera-based population estimates for several big game species, including elk. Moeller et al. (2018) demonstrated promise in estimating abundance of unmarked animals using remote cameras and Idaho continues to refine these concepts. This method relies on an array of remote cameras placed throughout the area of interest (e.g., seasonal range of an elk population). Cameras are programmed to take photographs at pre-determined time intervals. The number and timing of animals captured in photographs and the collective area of the cameras' fields-of-view are then used to estimate abundance. These methods also have the potential to produce separate abundance estimates for different sex and age classes of elk, allowing for the calculation of composition ratios (i.e., bull:cow:calf ratios). Camera-based population monitoring has particular significance for elk zones where aerial surveys are difficult or cannot be implemented effectively, such as forested habitats in northern Idaho.

Survival Monitoring

Understanding annual survival of different age and sex classes within a population can be an extremely useful data point for managing elk populations. Adult cow and calf survival are the most important as they have the largest impact on population trajectory. Over the last couple of decades, IDFG has invested significant time and resources towards understanding survival across different populations. This work has involved the deployment of thousands of radio-collars on individual elk followed by intensive monitoring of movements and survival of these individuals. These radio-collars give staff the ability to investigate the cause of death for individual collared elk and provide IDFG with information on the major causes of mortality for different elk populations. Figure 1 is a summary of this data for 6-month-old calves. Understanding the impacts that different habitat types, climatic conditions, predator communities, predator densities, diseases, and harvest rates have on elk populations across the state is useful to inform management and harvest decisions.

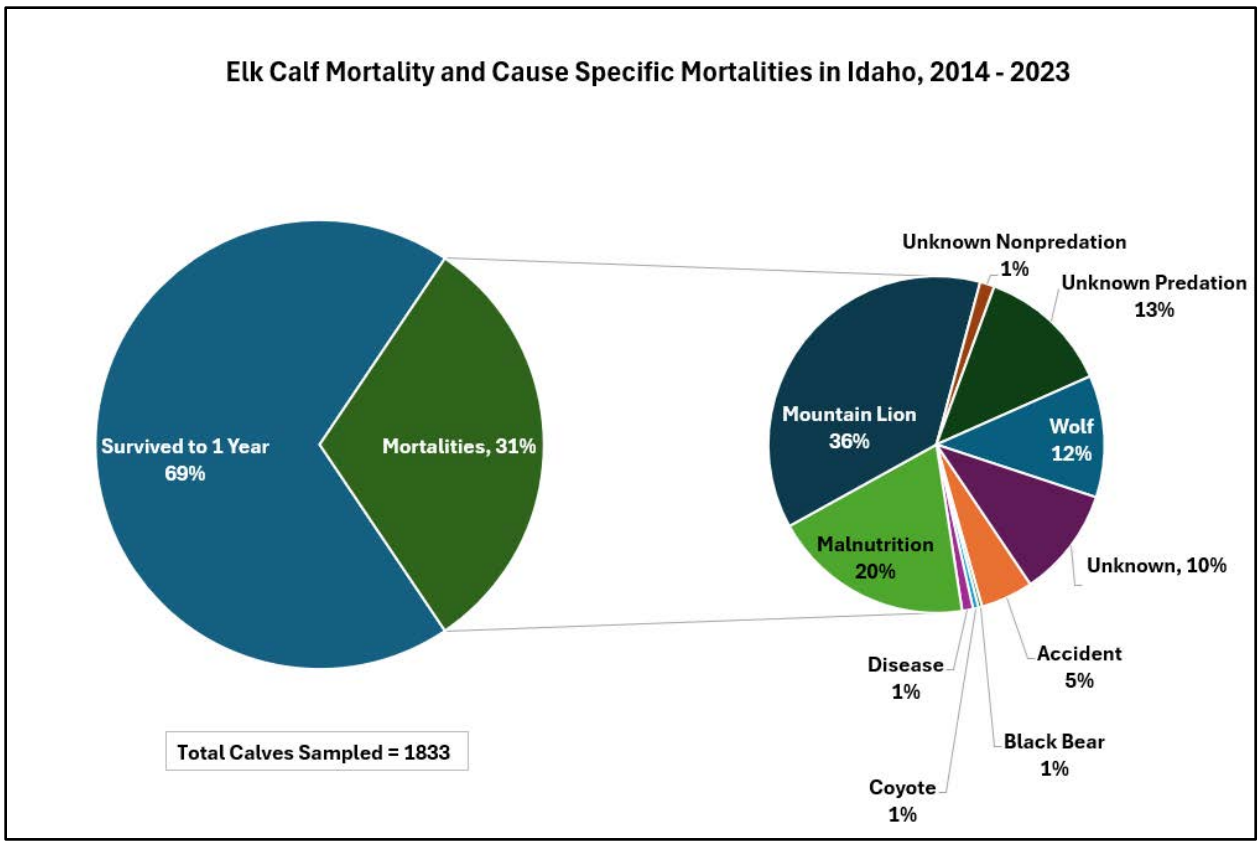


Figure 1. Cause-specific mortality of collared 6-month-old elk calves (2014-2023).

Hunter harvest is usually an important part of the survival equation. When natural mortality factors are combined with the number of bulls, cows, and calves being harvested, managers are better able to understand and predict the performance of individual populations. Success rates for hunters are influenced by a variety of factors including weapon type, season timing and length, number of tags available, and weather events. IDFG implemented the current Mandatory Hunter Reporting framework in 2000 to more accurately monitor hunter and harvest information. By asking hunters to report how many days they hunted, where they hunted, which weapon they hunted with, and if they were successful or not, IDFG managers are able to more precisely manage this source of mortality, which in turn results in an abundance and diversity of opportunity for the hunting public.

Integrated Population Modeling

IDFG is developing an integrated population model (IPM) for elk monitoring similar to the one that is currently being used for mule deer (*Odocoileus hemionus*) populations throughout the state. An IPM combines information from abundance and composition surveys, annual harvest data, survival monitoring, and other data sources (e.g., climate data) into a comprehensive analysis of population performance. An IPM can provide estimates of vital rates, composition, and abundance on an annual basis, allowing managers to estimate and monitor populations in between abundance surveys. Other benefits of the IPM include the ability to share information between different sources of data and obtain measures of error for each resulting estimate about the population (Royle and Dorazio, 2008, Ahrestani et al. 2017). When fully implemented, this approach should allow IDFG managers to model elk populations each year with the expectation of reducing overall aerial survey flight time.

Influence of Monitoring Data on Harvest Opportunity

The primary purpose for the collection of survival and population information is to provide a foundation for managers, the public, and the Commission to use in the process of crafting hunting seasons. In many parts of the state, harvest is the primary factor driving elk populations. Because of this, it is important to implement appropriate season frameworks and to monitor both elk populations and harvest rates to ensure elk populations remain within management objectives and meet hunter expectations. Allowable harvest for a given zone is directly tied to the survival, composition, and abundance of the population and the desired population trajectory. Table 2 provides a general reference of how cow survival and winter calf ratios influence population performance. Calf ratios are the result of many factors (e.g., habitat quality, forage availability, predation) and are not easily manipulated by wildlife managers. Managers can manipulate adult cow survival by increasing or decreasing antlerless harvest opportunity, which will also increase or decrease the total elk population. The simulation summarized in Table 2 shows the anticipated elk population trajectory based on varying annual cow survival and calf:cow ratios. However, the effects of cow harvest on specific elk populations may differ due to multiple factors, including annual variation or uncertainty in survival rates and age ratios and movements of elk between elk zones that result in a misalignment of harvest and survey estimates. The methods used to develop Table 2 are referenced in Appendix B.

Table 2. Population trajectory simulation illustrating the expected relationship between calf:cow ratios collected during winter abundance surveys, annual cow survival (including harvest), and population performance of elk in Idaho.

		Annual Cow Survival (Including Harvest)				
		0.75	**0.80**	**0.85**	**0.90**	**0.95**
Calves per 100 Cows	**10**	Decreasing	Decreasing	Decreasing	Decreasing	Stable
	20	Decreasing	Decreasing	Decreasing	Stable	Increasing
	30	Decreasing	Decreasing	Decreasing	Increasing	Increasing
	40	Decreasing	Decreasing	Increasing	Increasing	Increasing
	50	Decreasing	Stable	Increasing	Increasing	Increasing
	60	Decreasing	Increasing	Increasing	Increasing	Increasing
	70	Stable	Increasing	Increasing	Increasing	Increasing

Hunting Opportunities and Experiences

Elk hunting is engrained in Idaho history and culture. Based off past public input, Idaho elk hunters valued the opportunity to hunt every year, the chance to spend time hunting with family and friends, seeing elk in natural settings, being close to nature, harvesting an elk, and obtaining quality meat (Sanyal et al. 2012). Hunters also wanted to harvest large bulls, but most were unwilling to give up the ability to hunt every year to manage for larger bulls (Sanyal et al. 2012). For managers, providing annual hunting opportunity while also maintaining high numbers of older age-class bulls is often a challenging proposition. The Department attempts to accommodate all these desires by managing for a range of hunting experiences through a combination of hunt season types that are classified as general hunts, capped general hunts, and controlled hunts. It is important to recognize that each hunt experience comes with associated trade-offs. Controlled hunts typically have fewer numbers of tags, enjoy higher success rates, and often provide an opportunity to see a greater number of mature animals, but the odds of drawing a tag can be low. General hunts offer the opportunity for hunters to be afield each year, but often with higher numbers of other hunters and lower success rates. The availability and portion of tags is different between residents and non-residents amongst the various hunt types. These differences are briefly outlined in the following hunt opportunity sections. As part of the allowance of elk tags for non-residents, it is important to recognize that the Commission has established a total limit of 12,815 general-season elk tags for non-residents. This limit includes all general-season non-resident tags and tags allocated to outfitted hunters for both capped and uncapped elk zones.

General Hunt Opportunity

Idaho currently offers general season hunting opportunities across the state. In 2023, 26 of the state's 28 elk management zones provided some form (i.e., weapon type) of over-the-counter general season hunting opportunity. The dual-tag zone management concept was implemented to address concerns regarding numbers of adult bulls and bull age structure and to better manage hunter numbers among GMUs. A-tag hunts typically provide more opportunity for archery or muzzleloader hunters and may include harvest opportunities for antlerless, either-sex, or antlered animals. B-tag hunts typically provide more any-weapon opportunities, often for antlered elk only. These hunts are fundamental in maintaining Idaho's hunting tradition by allowing annual opportunity for family and friends to hunt together for antlered or antlerless elk with a variety of weapon types.

These unlimited annual hunting options are maintained whenever possible once hunter numbers, harvest rates by weapon type and season timing, and zone management goals are considered. Harvest success rate factors heavily into the types of hunting opportunities that can be provided to Idaho hunters. Weapon types and hunting opportunities that result in reduced harvest success can typically sustain longer seasons and more hunter participation. Management criteria and population dynamics for specific zones are discussed in further detail in the Population Monitoring and Management (pg. 15) and Elk Management Zone (pg. 65) sections of this plan.

In response to growing resident concerns about hunter crowding, the Commission recently assessed nonresident participation in uncapped elk zones. Although there is a statewide nonresident tag limit (12,815), the Commission had not previously managed nonresident hunter numbers at the zone level in uncapped zones. Beginning with the 2021 hunting season, the Commission implemented a restriction that limited nonresident participation in uncapped zones to 10% or 15% of the total hunters in each zone based on historical use. These restrictions resulted in a nonresident limit being implemented for

every uncapped elk zone. This change resulted in substantial reductions in nonresident hunter numbers for some zones, especially for uncapped A-tag seasons.

Capped General Hunt Opportunity

When the A/B tag system was originally instituted in 1998, both tag types were intended to be available to resident hunters in unlimited numbers. However, the Commission recognized that caps might be necessary in the future to manage hunter density and reduce elk harvest mortality. A cap is a limit on the total number of general hunt A or B tags available in a zone. Capped hunts still fall under the general or annual type of hunting opportunity because they are available to all hunters each year on a first-come, first-served basis. In 2023, there were 18 different capped zone hunts across the state, 12 on B-tag hunts and 6 on A-tag hunts.

In recent years, increasing demand for some capped elk zones has resulted in tags selling out earlier and earlier. For example, tags in the Sawtooth Zone currently sell out just minutes after they go on sale. As the number of capped zones and demand for capped tags increases, so does concern about hunter congestion in the remaining uncapped zones. To increase the likelihood of getting a capped tag for those that prioritize annual opportunity over controlled hunts, the Commission implemented a 5-day waiting period to purchase a capped zone tag for any resident that applied for a controlled hunt beginning with the 2020 season. As a general rule, IDFG typically tries other options (e.g., changing season length or weapon types) before implementing caps on general hunts. If a cap is deemed necessary, IDFG also considers potential impacts to hunter distribution in adjacent uncapped zones.

In capped zones, nonresident participation is limited to a predefined percentage of the total hunters, including residents and outfitted hunters. The nonresident percentage is based on historical use preceding implementation of the zone cap. A change to the cap results in a corresponding proportional change in the number of tags allotted to nonresidents, residents, and outfitted hunters. In response to high demand for some capped zone tags, the Commission adopted a rule allowing nonresident tags to be limited to no less than 25% of the total tags in capped zones with historically high nonresident participation, with the balance of those tags made available to residents. In 2020, the Diamond Creek A tag and the Salmon B tag were limited to 25% nonresident participation under this rule.

Controlled Hunt Opportunity

Controlled hunts are typically implemented to provide hunters with a unique or enhanced hunting opportunity but may also be used in areas to directly manage elk populations, either because they cannot sustain the level of harvest associated with general hunting opportunity, or to address a very specific management needs, such as cow harvest on a population above objective or to (i.e., manage a depredation issue). Idaho currently offers 172 different controlled elk hunt opportunities: 50 antlered-only hunts, 86 antlerless-only hunts, and 36 either-sex hunts. Antlered-only hunts are highly sought after and provide the hunter an opportunity to harvest a mature animal with fewer tag holders afield than in general seasons, while antlerless-only and youth hunts provide high potential for harvest.

Controlled hunts are offered through a lottery system. A set number of tags are allotted for each hunt and each applicant has the same chance of being selected. For most controlled hunts, nonresidents cannot be awarded more than 10% of the tags available.

Predation

Predators of Elk

Gray wolves, mountain lions, black bears, grizzly bears (*U. arctos horribilis*), coyotes (*Canis latrans*), bobcats (*Lynx rufus*), and, occasionally, golden eagles (*Aquila chrysaetos*) prey on elk. Wolves, mountain lions, and black bears occur across most of Idaho and are the primary predators of elk. Coyotes, bobcats, grizzly bears, and eagles prey on elk calves in the early spring, but research indicates these losses are minimal or restricted in distribution (Zager et al. 2007*b*, White et al. 2010, Griffin et al. 2011). An ecological system with multiple large predator species likely has more impact on elk populations and reduces harvestable surplus more than simple systems (Griffin et al. 2011).

Wolf predation occurs on all age classes of elk and can be a limiting factor on elk populations (Zager et al. 2009, Brodie et al. 2013). Wolf predation rates vary depending upon time of year, weather and snow conditions, prey densities, and other factors. Elk are more vulnerable and suffer higher predation rates in late winter and during winters with deeper snow (Husseman et al. 2003, Smith et al. 2004, Brodie et al. 2013, Horne et al 2019). Wolves have the greatest impact on elk calves between 6 and 12 months of age (Zager et al. 2007*b*, White et al. 2010, Griffin et al. 2011, Pauley and Zager 2010).

Mountain lion predation occurs on all age classes of elk, often in proportion to their availability in the population (Zager et al. 2007*a*, *b*; White et al. 2010; Griffin et al. 2011; Horne et al.2019). The effect of predation on an elk population can be additive (i.e., animals that died from predation would have otherwise lived) or compensatory (i.e., animals that died from predation would have died from some other source of mortality anyway). The impact (additive or compensatory) mountain lion predation has on elk calf survival isn't always clear (White et al. 2010) but it may be at least partially compensatory (Griffin et al. 2011). In some elk populations, mountain lion predation occurs at a high enough rate that it can influence overall adult female elk survival (Brodie et al. 2013, Horne et al. 2019). Combined wolf and mountain lion predation on cow elk can have an additive effect on elk mortality (Horne et al 2019). As an obligate predator, mountain lions in a single-prey system are not believed to trigger declines or depress prey populations for extended time periods (Ballard and Van Ballenberghe 1997, Ballard et al. 2001); however, in most of Idaho, mountain lions are one predator in multiple predator systems (Horne et al. 2019).

Black bears are often the primary predator of elk calves <90 days old with the greatest impact during the first 2 weeks of an elk's life, when calves are most vulnerable (Schlegel 1986, White et al. 2010, Griffin et al. 2011). Black bear predation on elk calves is an additive source of mortality in some instances (White et al. 2010, Griffin et al. 2011) but other factors can also play a role (e.g., habitat condition which would pre-dispose elk calves to black bear predation; Zager and Beecham 2006, White et al. 2010). Management actions that reduce black bear densities prior to elk calving can have a strong positive impact on elk calf survival (White et al. 2010). Bear-caused mortality was additive in a calf elk survival study in Yellowstone National Park, where both black and grizzly bears occur (Griffin et al. 2011). Grizzly bears are geographically restricted to eastern and northern Idaho and occur at relatively low densities.

Population Limitation

Several variables are important for evaluating impacts of predation, including whether predation is limiting the elk population, what segment(s) of the elk population is being impacted, and what predator(s) are the primary causes of elk mortality. Cow elk pregnancy rates, calving rates, and calf

survival to reproductive age are critical factors of elk population performance. Changes in cow and calf survival, in concert with elk productivity, can result in different elk population trajectories (Table 2).

Predation is a limiting factor on calf survival, and potentially cow survival, in some Idaho elk zones. During 2004-2016, IDFG assessed cow and calf elk survival and causes of mortality across 29 elk populations that were grouped in to 3 analysis areas (North Idaho, Central Idaho and Southern Idaho; Table 3; Horne et al. 2019). The populations represented the primary range of elk habitats, weather regimes, harvest levels, and predator densities found across Idaho. Overall adult female and calf annual survival averaged 90% and 60%, respectively. The role of predation, and the primary predator(s), varied across the analysis areas and between years. Overall, predation by mountain lions had a greater impact on ungulates than wolf predation. Primary causes of mortality included harvest, mountain lion predation, wolf predation, unknown predation, and other causes and mortality rates varied by area (Horne et al. 2019).

Table 3. Average annual fate (%) of collared cow and calf elk in 3 elk analysis areas in Idaho, 2004-2016 (Horne et al. 2019).

Area	Age	Wolf	Mountain Lion	Malnutrition	Other	Unknown	Harvest	Lived
North Idaho	**Calves**	5.6	8.3	0.6	4.6	12.3	2.5	66.1
	Adults	5	2.1	0.9	1.2	15.9	0.3	74.6
Central Idaho	**Calves**	11.2	12.6	3.1	4.5	11.5	7.7	49.4
	Adults	4.9	5.2	2.3	1.3	7.8	3.9	74.6
Southern Idaho	**Calves**	1.5	10	4.1	1.5	3.1	2.6	77.2
	Adults	1.5	4	0.2	1.7	6.4	15	71.2

IDFG has also investigated neonate (birth through 90 days) and 6-month-old elk calf survival and cause-specific mortality in several other elk research projects over the last 30 years. Survival of neonates and 6-month-old calves (Jan-Jun) during those studies ranged from 19% to 100% and 9% to 78%, respectively. Predation was the primary proximate cause of mortality among neonates and 6-month-olds, though the suite of predators and the relative importance of each species varied among study areas and years (Schlegel 1986; Zager et al. 2009; Pauley and Zager 2010; White et al. 2010; Griffin et al. 2011; IDFG, unpublished data).

Although neonate mortality from predation can result in low recruitment in some populations, trends in seasonal or annual composition data (calf:cow ratios) are not always useful in identifying impacts of predation (Ballard et al. 2001). For example, poor nutrition may cause a lower birth rate, lower birth weights, and subsequently a lower growth rate of an elk population without high levels of predation-caused mortality. Depending on when herd composition data is collected, it can help identify the timing and likely source of offspring mortality. It is most useful to consider composition ratios along with population estimates and information on cause-specific mortality to determine how reproduction compares to total and cause-specific mortality, thereby identifying the truly limiting factors for the population.

Conversely, annual recruitment may outpace total mortality even with significant predation mortality, resulting in an increasing elk population. The effects of predation on elk population dynamics can be further complicated in situations where predation losses are compensatory with other mortality factors.

However, just the opposite may also be true, where the combined effects of predation, including human harvest, may be a long-term additive cause of an elk population decline (Barber-Meyer et al. 2008, White et al. 2010, Brodie et al. 2013). Given that the literature provides examples of both, managers responding to declining elk populations should carefully consider all available data and insight to develop strategies to achieve positive outcomes. Focusing solely on predation by one species may have very little impact on a declining prey situation unless predation by that species is additive and a significant limiting factor. Additionally, when predation is a limiting factor, predator management actions must be maintained over the long term to be effective in increasing elk populations (National Research Council 1997, White et al. 2010).

Predation Management

Predation management can be an important tool for elk population management. The Commission approved the Policy for Avian and Mammalian Predation to guide IDFG's implementation of predator management activities (https://idfg.idaho.gov/conservation/predators/policy-avian-mammalian). The policy directs managers to "recognize the role of predators in an ecological and conservation context. The actions by IDFG must be based on the best available scientific information and will be evaluated in terms of risk management to all affected wildlife species and habitat."

Current statewide management plans for the major predators of elk (wolves, black bears, and mountain lions) emphasize hunting and/or trapping seasons as the primary tool for population and conflict management of those species. Existing rules and laws provide a regulatory framework to manage big game species, including black bears, mountain lions, and wolves, through hunting and trapping. Idaho currently has liberal hunting seasons and methods for these species. Spring and fall seasons for black bears include the use of bait and hounds in most areas, mountain lion seasons allow the use of hounds, and wolf harvest consists of a long hunting season statewide and a trapping season over a portion of the state. Harvest strategies available to affect predator populations include:

- Controlled hunts
- General seasons without quotas
- Decreased tag prices (in predation management zones)
- Multiple tags (in predation management zones)
- Trapping (for wolves)

The harvest strategies above, alone or in combination, may help wildlife managers achieve desired predator population levels. Additional predators can often be removed by the U.S. Department of Agriculture, Animal Plant Health Inspection Service, Wildlife Services in situations where human safety or depredation on livestock are a concern. Harvest strategies and the removal of predators for human safety or livestock concerns are guided by the species plans for black bears (IDFG 1998), mountain lions (IDFG 2023), and wolves (IDFG 2023).

Managers will implement different tools in addition to regulated harvest strategies to reduce predator populations determined to be negatively impacting elk populations. The effectiveness of each approach can vary between frontcountry and backcountry areas because of factors such as road density, seasonal accessibility, habitat types, and distance from towns. The IDFG Policy for Avian and Mammalian Predation Management states, "the Director may implement a Predation Management Plan in those circumstances where wildlife management objectives for prey species cannot be accomplished within two years by habitat manipulation, sportsman harvest, or interagency action designed to benefit the

prey species, and where there is evidence that action affecting predators may aid in meeting management objectives."

Predation management plans have been developed for the Lolo, Selway, Middle Fork, Panhandle, and Sawtooth zones where elk populations are below management objectives. In addition to the harvest strategies listed above for wolves, black bears, and mountain lions, agency control actions were initiated in 2011 with the purpose of reducing wolf abundance in the Lolo zone. IDFG staff incorporated existing zone-specific predation management plans into zone level goals and strategies in this plan. Predation management plans are available at: https://idfg.idaho.gov/wildlife/predator-management.

There are numerous examples of predation management programs initiated to increase prey species (National Research Council 1997). Idaho has conducted several noteworthy studies which have demonstrated increased ungulate survival after predator removal, although the increase did not always appreciably change the overall population trend (Schlegel 1986, White et al. 2010, Hurley et al. 2011). Long-term benefits are dependent on continued predator removal and habitat improvement, or on weather events that could not be controlled.

Predator control is often logistically difficult, staff time-intensive, expensive, and can be controversial with some of the public. Therefore, managers must consider the potential benefits, costs, and the potential effectiveness of the proposed actions on prey populations. It is important that IDFG develop, test, and utilize appropriate tools to manage both predator and prey populations. IDFG strives to use hunters and trappers to implement management whenever possible and adaptively and incrementally moves to other management tools when necessary. Table 4 provides guidelines on how effective predator management activities may be in increasing elk populations. This information should be considered as part of the development of predation management plans to gauge the potential for success and to help determine the suite of tools and information needed to benefit elk populations showing signs of predator-caused decline.

Table 4. Guidelines for determining whether predator management activities can be expected to increase elk numbers (adapted from Ballard et al. 2003).

Increased elk numbers likely	Increased elk numbers unlikely
Elk population below habitat carrying capacity	Elk population near habitat carrying capacity
Predation identified as a major cause of mortality	Predation not identified as a major cause of mortality; or elk in poor or substandard body condition
Predator management efforts can result in a significant decline in predator numbers	Predator management efforts unlikely to achieve a significant reduction in predator numbers
Predator management efforts timed just prior to predator or prey reproductive periods	Predator management efforts haphazardly scheduled throughout the year
Predator management efforts focused (e.g., generally <400 mi^2)	Predator management efforts scattered over a relatively large area or no clear goals and objectives

Private Lands and Elk

Elk Use of Private Lands

When American settlers moved west into Idaho, their preferred homestead sites centered around areas suitable for agricultural production. These selections favored valley floors with consistent water, deeper soils, and longer growing seasons. As livestock production in the state continued to expand, areas with consistent water and higher forage production were prioritized. As a result, when looking at current landownership in the state, many of the most productive forage producing areas are privately owned. These highly productive private lands provide valuable elk habitat and assist with maintaining viable elk populations in management zones. Many private landowners enthusiastically support Idaho elk populations and, in many cases, take active measures to improve elk habitat on their properties. The abundant elk population currently enjoyed in many of our elk zones would not be possible without the support of private landowners.

Private lands occur within both winter and summer range habitat for migratory elk, but proportionally, private landownership of winter range is much higher. Quality elk winter range is very important in reducing elk damage to private lands during winter; however, winter range is increasingly being impacted by human development. Idaho's human population increased from 1.33 million people in 2000 to 1.85 million people in 2020 (U.S. Census Bureau 2020). While much of this population growth has occurred around metropolitan areas, the associated outward expansion of development continues to impact elk habitat. This expansion is, perhaps, most prevalent on elk winter ranges where larger undeveloped properties that host elk are increasingly developed into smaller ranchettes or residential communities.

Private Land Refugia — When private land management creates a refuge for elk, it can create management challenges. Private land elk refugia are areas where standard elk management practices are not effective due to differing land management practices and priorities (e.g., limited or no access for hunting) or when subdivision of private land into small parcels makes traditional elk management practices ineffective or unsafe. Studies have shown that elk readily respond to pressure and that solving the challenges associated with elk seeking out more secure locations can be difficult (Sergeyev et al. 2022, Proffitt et al. 2013). In many parts of Idaho, private lands are interspersed with or adjacent to public land, and elk habitat spans both. These refuge properties often harbor elk that cause damage to neighboring agricultural operations. IDFG works with many willing landowners to improve habitat and secure hunter access, either to or through private land. This complexity of ownership and how elk are valued across an area narrows the range and effectiveness of traditional options available to assist landowners experiencing damage.

In some areas in the state, refuge properties can host large segments of the overall elk population for significant portions of the year; examples include the Brownlee, Snake River, and Weiser Zones. This further complicates IDFG's ability to manage populations within desired objectives as these elk are included in the overall population estimates but not necessarily available for harvest, highlighting the complexity of managing a public resource on privately owned lands. IDFG wildlife managers are well-suited to handle this complexity, considering the various strategies available and working with landowners and the public to address issues as they arise.

Agricultural Depredations

Preventing crop and property damage by wildlife (depredation) is a priority management objective for IDFG and our response to depredation complaints is directed by Idaho Code 36-1108. Each IDFG region has the responsibility to assist landowners in minimizing or eliminating depredations. Typical strategies to reduce depredations include hazing, permanent fencing, depredation hunts, landowner permission hunts, kill permits, continued use agreements, targeted general or controlled hunts, and perpetual easements. Depredation problems and their solutions are an increasingly complex matter involving not just the ecology and management of elk, but socio-economic issues and human population dynamics as well.

Decades of effort to provide permanent solutions to depredation problems have proven successful in some instances, particularly with stored crops. IDFG's depredation program provides those that have issues with elk damaging stored crops, such as hay, with materials to construct permanent exclusion fences. The construction of stackyard fencing over the years has reduced stored feed depredations.

IDFG received a total of 3,904 elk depredation complaints over the past 3 years (fiscal year 2021-2023; Figure 2). Over that same period, IDFG paid 321 claims (less than 10% of complaints) for damage caused by elk (Figure 3). IDFG's responsiveness to complaints often resolves the issue sufficiently so that the landowner does not file a damage claim. However, claims related to depredations on growing crops have increased in magnitude and expense on a near annual basis since the depredation program began in 1984. Over the past 30 years, the IDFG depredation program has undergone several changes brought about through internal restructuring as well as legislation that simplified the claim filing process and increased available funding, which in turn contributed to the increase in claims (Table 5). The increasing cost and number of claims will be an ongoing challenge for managers as they balance elk population objectives with mitigating depredations.

Although elk populations have declined in some management zones over the last decade, other zones have experienced an increase in elk abundance and conflicts, particularly in the urban-rural and agricultural interface. Multiple factors likely influence these conflicts, including but not limited to, an increase in the number of acres being farmed, shifts in the types of crops being grown, an increasing human population, habitat suitability, wildfires, changes in landowner values and tolerance, and predator-prey relationships. As production costs rise and commodity markets improve for crops like corn, alfalfa, wheat, rapeseed, and specialty crops, so does the cost of damage caused by elk. Favorable commodity markets influence the number of acres planted into more profitable crops, which are often very attractive to elk. Increasing dairy production in the southern half of Idaho, and the increased crop production needed to support that industry (e.g., silage corn and alfalfa hay), are driving factors in the rising costs associated with elk depredations.

In response to rising depredation costs, House Bill 230 (HB 230) was passed in 2017 to increase funding for the damage compensation fund from $750,000 to $1.1 million, annually. Additionally, HB 230 increased IDFG's depredation response capacity by allowing the hiring of additional permanent depredation support staff in each region. HB 230 also decreased the one-time damage deductible from $1,000 to $750, therefore if the damage evaluation is at least $750 a landowner is eligible to file a claim. From state fiscal years (FY) 1995 to 2015, total claim values averaged around $127,000. The average total of all claims across the state has increased in recent years to about $1.2 million annually (Table 5; Figure 3). Depredation claim payments for elk-related damage since FY1995 have ranged from a low of $34,550 in FY1996 to a high of $2,349,240 in FY2019 (Table 5). Total depredation claims exceeded the depredation budget for the first time in 2008 and continued to increase thereafter.

Since 2017, even with the increase of the depredation compensation fund, total claims exceeded the budget in 3 of the 7 years, resulting in the proration of claim payments. In 2022, the compensation cap was increased again from $1.1 million to $1.8 million through legislation. Despite the cap being increased in 2022, IDFG had to prorate damage payments again in 2023. This was due to unusually severe winter conditions in the southern portion of the state, which resulted in higher pressure on stored commodities.

Moving forward, IDFG will face decisions related to the rising costs of elk damage. The current trend suggests continued increases in claims which would result in additional proration to agricultural producers. One solution would be to further increase funds for damage compensation; however, this could come at a cost to other existing programs that are dependent on the limited funding IDFG generates, unless alternative funding was identified. Routinely prorating damage claims is not ideal for producers and IDFG will strive to collaboratively develop solutions that are agreeable for all stakeholders. Potential solutions include exploration of additional funding sources and development of alternative compensation programs over the course of this planning period.

Outside of increased funding for damage compensation, other potential depredation solutions include strategic reductions in elk abundance, fostering increased tolerance of elk, and promoting increased access for hunting. Targeted reductions are predicated on our ability to facilitate access to depredating elk on private land. Refuge properties increase the challenge with this approach, as changing landowner values may not align with IDFG elk management objectives. Increased tolerance of elk and associated damages might be achieved by incentivizing landowners with additional hunting opportunities. This must be strategically implemented, as sportsmen who expect a sufficient abundance of elk to pursue recreationally may struggle to support lower elk abundance. IDFG is committed to working aggressively to reduce elk damage and explore new opportunities to work with affected landowners.

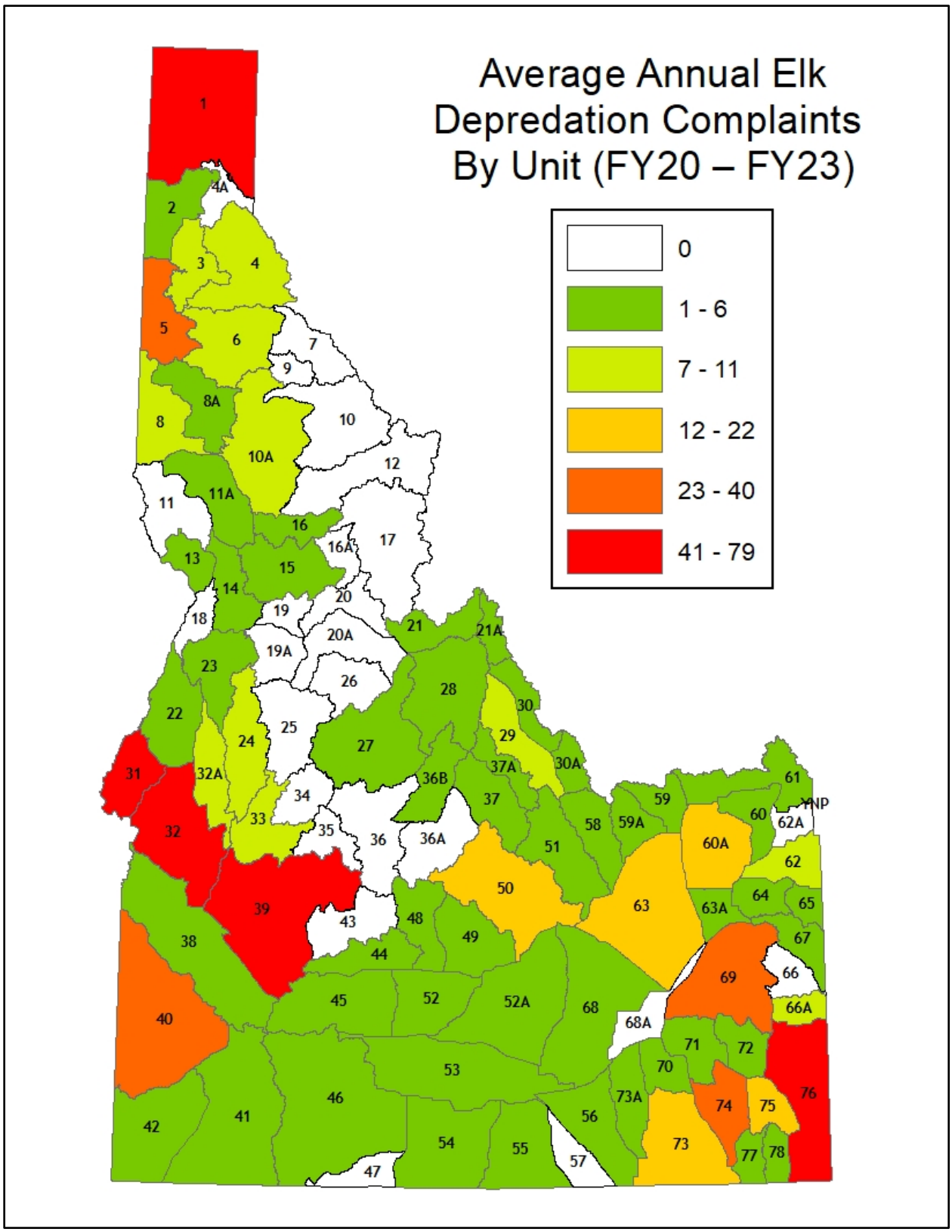


Figure 2. Average annual number of elk depredation complaints by game management unit in Idaho, FY20-23.

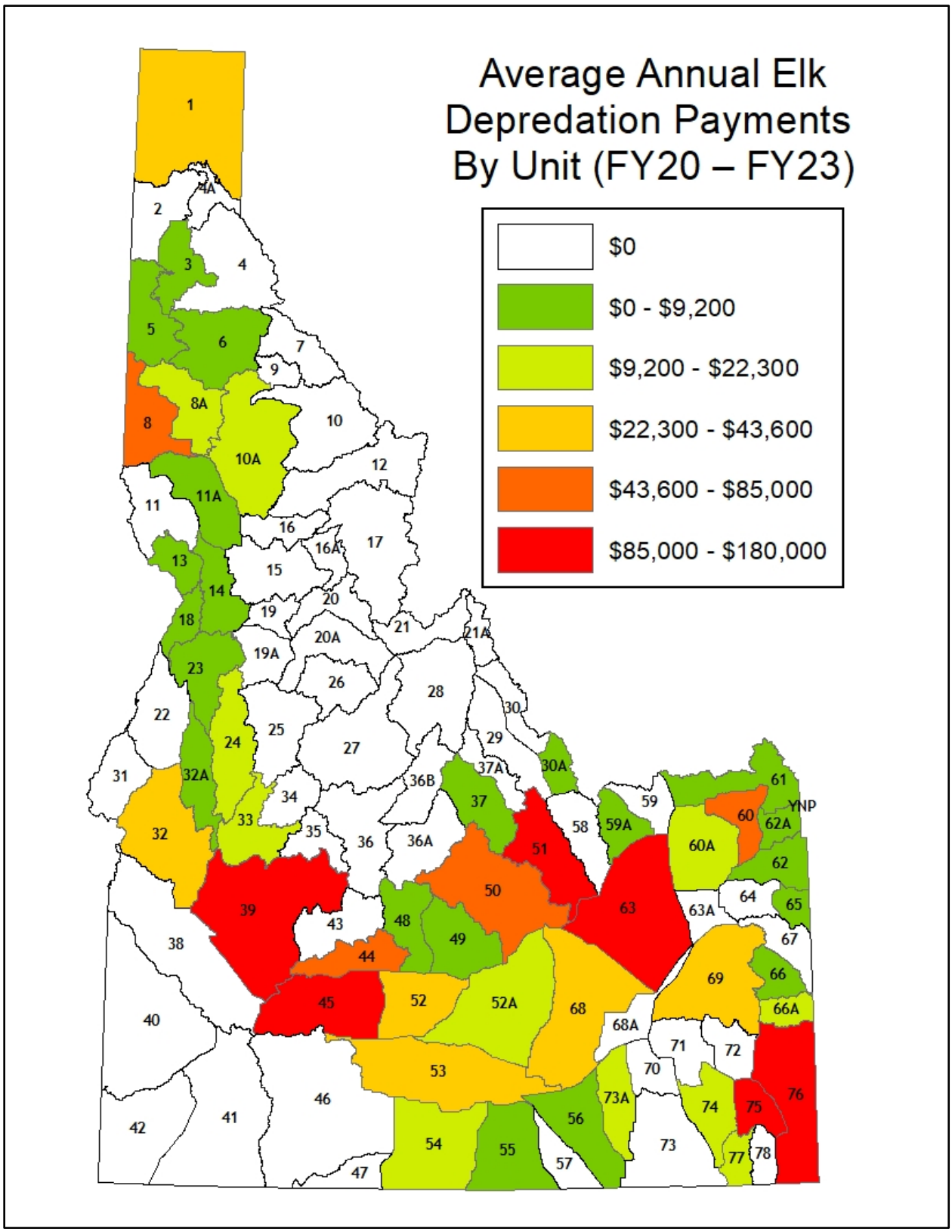


Figure 3. Average annual elk depredation claims by game management unit in Idaho, FY20-23.

Table 5. Elk-related depredation claims by IDFG Region, Idaho, FY95-23.

	Panhandle		Clearwater		Southwest		Magic Valley		Southeast		Upper Snake		Salmon		Statewide Total	
Fiscal Year	# Claims	$ Final Claim	# Claims	$ Final Claim	# Claims	$ Final Claim	# Claims	$ Final Claim	# Claims	$ Final Claim	# Claims	$ Final Claim	# Claims	$ Final Claim	# Claims	$ Final Claim
1995	0	$0	4	$5,449	9	$50,035	0	$0	0	$0	1	$2,150	1	$106	15	$57,740
1996	0	$0	4	$16,653	7	$16,978	0	$0	1	$919	0	$0	0	$0	12	$34,550
1997	1	$1,890	2	$4,847	8	$52,894	0	$0	7	$19,266	3	$9,515	1	$5,090	22	$93,502
1998	0	$0	8	$50,402	7	$29,729	0	$0	1	$1,126	0	$0	4	$5,627	20	$86,884
1999	0	$0	1	$4,151	4	$31,922	0	$0	1	$3,375	3	$7,363	0	$0	9	$46,810
2000	0	$0	5	$15,617	9	$75,103	0	$0	0	$0	1	$2,125	1	$3,470	16	$96,315
2001	0	$0	6	$56,342	5	$10,175	0	$0	2	$530	0	$0	3	$6,788	16	$73,835
2002	1	$3,000	3	$11,136	9	$45,503	0	$0	2	$4,285	1	$7,582	0	$0	16	$71,507
2003	0	$0	2	$5,288	5	$25,233	0	$0	1	$2,699	2	$5,923	1	$816	11	$39,958
2004	1	$275	6	$19,715	6	$26,337	0	$0	0	$0	2	$4,439	1	$1,610	16	$52,376
2005	1	$5,107	4	$5,762	7	$27,737	0	$0	2	$12,111	1	$1,400	1	$1,390	16	$53,506
2006	0	$0	9	$40,742	5	$32,634	0	$0	0	$0	2	$7,000	0	$0	16	$80,376
2007	0	$0	19	$126,118	4	$35,874	1	$2,983	2	$20,793	1	$1,750	2	$6,145	29	$193,663
2008	1	$8,009	22	$400,729	6	$23,042	1	$19,314	4	$19,114	2	$5,739	0	$0	36	$475,946
2009	3	$8,054	9	$62,510	10	$89,114	2	$35,399	0	$0	4	$17,765	1	$2,106	29	$214,949
2010	1	$1,500	13	$96,265	6	$33,210	1	$3,845	1	$7,276	1	$4,000	1	$3,250	24	$149,347
2011	0	$0	5	$30,176	5	$70,441	4	$54,213	7	$27,077	3	$38,336	1	$1,868	25	$222,110
2012	1	$1,400	1	$4,483	4	$18,000	3	$31,068	4	$11,210	1	$4,000	1	$20,014	15	$90,174
2013	3	$4,018	4	$41,758	5	$32,886	2	$93,401	3	$13,080	2	$4,815	2	$18,088	21	$208,046
2014	2	$4,714	5	$43,031	6	$49,620	3	$67,380	1	$3,450	0	$0	2	$27,216	19	$195,411
2015	2	$9,776	5	$43,689	3	$10,388	4	$71,125	1	$3,038	2	$5,860	1	$5,398	18	$149,273
2016	1	$4,887	1	$4,643	7	$79,201	7	$102,268	3	$7,710	3	$79,497	3	$23,918	25	$302,124
2017	3	$9,923	4	$79,221	11	$126,759	12	$218,685	7	$45,322	10	$158,553	3	$33,961	50	$672,425
2018	9	$57,355	5	$24,286	11	$126,036	8	$335,474	6	$64,382	7	$81,341	2	$7,184	48	$696,057
2019	3	$23,359	14	$157,975	12	$240,864	18	$1,550,732	17	$190,596	15	$182,834	1	$2,880	80	$2,349,240
2020	4	$32,059	12	$141,192	3	$324,880	11	$415,498	18	$349,859	18	$346,893	1	$3,178	67	$1,613,559
2021	4	$31,595	15	$137,340	11	$253,834	12	$527,554	20	$395,817	10	$74,513	0	$0	72	$1,420,653
2022	6	$46,311	8	$77,920	8	$128,781	10	$245,102	15	$287,260	18	$572,677	2	$11,240	67	$1,369,290
2023	5	$30,443	4	$20,188	17	$151,861	13	$237,045	31	$655,300	33	$845,226	3	$20,975	106	$1,961,038

Elk Habitat

No single factor impacts wildlife, including elk, more than habitat. Like all wildlife species, elk need adequate amounts of food, water, cover, and space throughout their life to survive and reproduce. These fundamental requirements change throughout the year as elk use winter, summer, and transitional ranges. Positive or negative impacts to these seasonal habitat types influence the distribution and abundance of elk, ultimately affecting associated recreational opportunities.

Natural phenomena that alter elk habitat, such as wildfire and drought, are common throughout the western states and impact wildlife across the landscape. Human-caused impacts can also influence the ability of habitat to sustain elk populations throughout the year. Primary management issues affecting the quantity, quality, and connectivity of elk habitat are forest succession, invasive plants, wildland fires, timber and rangeland management, and infrastructure development.

Forest Succession

Elk populations in forested landscapes tend to be most productive when their habitat includes a mosaic of plant successional stages. Evidence suggests this is due to associated vegetation diversity and availability of high-quality forage. Nature is dynamic and communities do not remain in a single successional state, even with active management. Thus, a landscape's ability to support elk year-round is highly dependent on existing habitat conditions and successional stage.

Elk diets vary seasonally and annually due to changing nutritional demands, plant phenology, and weather patterns. Elk are mixed feeders consuming both herbaceous and woody plants (Cook 2002). Elk select for grasses and forbs during the summer because of their high digestibility and nutrient content but may also consume a large proportion of shrubs (Cook 2002). Early seral moist, coniferous forests, high elevation meadows, and riparian areas are preferred summer habitat types (Adams 1982). Summer nutrition is important for over-winter cow and calf elk survival (Cook et al. 2004). When nutrition during summer and autumn is poor, cow elk are likely to breed later than cows in good condition, or not at all (Cook et al. 2001). Elk eat woody shrubs throughout winter. However, if summer habitat conditions do not allow elk to obtain good body condition by autumn, elk may not survive through winter even on high-quality winter range (Cook 2011). Elk body condition in autumn is dependent on summer habitat quality, not on body condition of the individual during the prior spring (Cook 2011).

Typically, most of the edible biomass in late successional or climax forest systems is out of reach of terrestrial herbivores. In mature coniferous forests of the Rocky Mountains, more than 99% of total above ground vegetation biomass may be tied up in trees (Wallmo 1981). Shrubs and herbaceous plants make up <1% of the total vegetation biomass in these late-seral systems (Gary 1974, Landis and Mogren 1975). Forage supply is inversely related to the amount of tree overstory in forested habitat types (Folliott and Clary 1972). However, some xeric forest habitat types maintain forage availability with overstory canopies. Mature forests can also be beneficial to elk when mature stands are associated with mid-seral stands in areas that elk frequent during late summer and early autumn prior to and during early breeding season.

In general, managing habitat in a mosaic of plant successional stages will prove most beneficial to elk. Overall plant diversity and forage is higher in recently disturbed areas. Exceptions to this might be on certain winter ranges where shrubs can take much longer to regenerate or areas where herbicides have been used to suppress growth of non-tree species. Disturbance is crucial to maintaining high quality elk

habitat. Traditionally, more frequent fire cycles and human disturbance, such as timber harvest, resulted in higher elk densities than occur in many areas today. In the short-term, weather patterns can affect elk populations, but landscape-scale habitat changes will impact long-term trends.

Invasive Plants and Noxious Weeds

Invasive plants and noxious weeds are plants that may cause harm to people or the environment. A plant is designated noxious when it is injurious to public health, agriculture, recreation, wildlife, or property. Most of these plants are native to Europe or Asia and were accidentally introduced or were introduced as ornamentals that subsequently naturalized. These plants have developed specialized mechanisms to survive and have limited or no natural controls (insects, disease, animals), allowing them to spread rapidly and outcompete native vegetation. Infestations of invasive plants and noxious weeds have major impacts on ecological conditions that support wildlife. Infestations can reduce or replace native or desirable vegetation, eliminate wildlife forage, alter thermal and escape cover, change water flow and availability, and alter fire regimes. Such disruptive processes affect the quantity and quality of available elk habitat and can significantly influence elk populations.

IDFG is a member of the Idaho Invasive Species Council and adheres to the Idaho Invasive Species Strategic Plan 2022-2026 (2022). This plan outlines three key goals to combat invasive species: 1) prevent the introduction of new invasive species, 2) limit the spread of existing invasive species, and 3) abate ecological and economic impacts that result from invasive species populations in Idaho.

To implement these strategies, IDFG works diligently on lands owned or managed by IDFG and active Cooperative Weed Management Areas across the state to combat noxious weeds. Management efforts follow an integrated pest management approach, which is an ecosystem-based strategy that focuses on long-term prevention. Techniques include chemical, mechanical, and biological control; habitat manipulation; modification of cultural practices; and the inclusion of resistant species. The intent is to sustain or restore important wildlife habitat using the most effective and efficient tools available and limit impacts to humans and the environment.

Wildfire

Wildfire plays a critical role in creating and maintaining elk habitat. Fire can contribute to a mosaic of plant communities across the landscape and influences elk nutritional resources by altering the composition, abundance, and quality of forage species (Proffitt et al., 2019). Post-fire vegetation can provide excellent forage and cover for elk in many forested areas. However, current wildfire frequencies have departed from historical regimes, resulting in suboptimal elk habitat in many areas. In general, wildfires have become less frequent in mid- to upper-elevation shrubfields, aspen, and coniferous forests and more frequent in low-elevation shrub-steppe and canyon dry grasslands.

Early seral forest habitat is a crucial component of elk summer range. Summer nutritional limitations on elk body condition and reproduction are evident in Idaho and across much of the west (Cook et al. 2013, Rowland et al. 2018). Wildfires transition conifer forests to early successional stages by opening the canopy and promoting abundant regrowth of highly nutritious forbs and grasses, enhancing the availability and quality of preferred elk forage. These post-fire plant communities generally provide high-quality elk nutrition. However, the resulting forage quality can vary depending on fire frequency, severity, intensity, seasonality, and site-specific characteristics such as existing vegetation, land-use, and ecosystem nutrient richness (Proffitt et al. 2019). Early seral forest communities on elk summer range across much of Idaho have been altered because of fire suppression, reduced timber harvest, forest conversion for agriculture, urbanization, and increasing reforestation practices after logging. Forest

management practices can be designed to both reduce the risk of catastrophic wildfire and support elk populations.

Shrub-steppe and canyon dry grassland communities are an important component of elk winter range in central and southern Idaho. Wildfires in low elevation sagebrush-steppe were historically small and patchy, creating a mosaic of burned, recovering, and unburned lands (Howard 1999). By the mid-1900s, a combination of wildfire suppression and land use change resulted in landscapes largely composed of monotypic woody stands (such as sagebrush and rabbitbrush (*Chrysothamnus* spp., *Ericameria* spp.) and losses of important herbaceous forb and grass understory vegetation. Additionally, non-native annual grasses were introduced and rapidly spread throughout important habitat. As a result, large expanses of elk winter range have been converted to monotypic stands of invasive annual grasses, increasing fine fuel loads and continuity, and altering fire regimes. Higher frequencies and sizes of wildfires have occurred in these plant communities resulting in vast areas that are less desirable to elk and currently cannot be effectively restored.

Changes in fire frequency across much of Idaho have drastically impacted elk seasonal ranges including decreased availability of quality forage, altered structure of plant communities, increased patch sizes, and decreased patch diversity. These changes influence how elk use habitat for foraging, bedding, security, and breeding. In general, decreased diversity and structure has resulted in fewer areas that provide the natural vegetation to meet the needs of elk year-round.

Timber and Rangeland Management

Idaho elk populations frequently occur within landscapes managed for timber and agricultural production. Habitat quality and distribution can be impacted by these management activities through time, and a changing landscape can have complex implications for elk. For example, loss of security cover due to timber harvest may increase elk vulnerability to predators and hunters (Christensen et al. 1993) but timber harvest in many systems can increase forage production and nutritional quality (Collins and Urness 1983, McConnell and Smith 1970). Agricultural production may provide abundant forage opportunities on the landscape but may lead to elk depredation issues and conflicts. Habitat values can be maximized in conjunction with management actions and treatments by considering elk management objectives during land management planning and project design stages. This presents a tremendous opportunity to work with partners and landowners to support and enhance Idaho elk populations within these landscapes.

Idaho rangelands also provide important forage and cover resources for elk. Livestock production on rangelands is a primary component of Idaho's agriculture-based economy. Livestock grazing systems are primarily designed to benefit livestock but can be designed and managed to also benefit wildlife habitat (Vavra 2005). Improper grazing management can negatively affect wildlife production, plant vigor, water quality, soil erosion and productivity. Timing of livestock grazing can also impact elk use of rangelands, especially with cattle, as elk distribution changes in response to cattle presence (Stewart et al. 2002) and elk and cattle tend to select for some of the same resources during late summer (Coe et al. 2001). Some studies suggest livestock grazing can have a positive effect on forage conditions (crude protein, digestibility) for elk when timing, intensity, and duration of livestock grazing are controlled, while other studies showed no effects (Clark et al. 2000, Chaikina and Ruckstuhl 2006). IDFG works with land management agencies and landowners by providing technical assistance, labor, and/or financial support on grazing management strategies and habitat improvement efforts that can benefit elk.

Infrastructure Development

In 2020, the U.S. Census Bureau reported that Idaho was the second fastest growing state in the nation (U.S. Census Bureau 2020). Idaho's population increased by 271,524 (17.3%) between 2010 and 2020 to exceed 1.8 million people. Population growth has disproportionately occurred in urban and suburban areas. Madison, Kootenai, and Ada counties (containing the cities of Rexburg, Coeur d'Alene, and Boise, respectively) were the 3 fastest growing counties from 2010 to 2020 (U.S. Census Bureau 2021). However, low-density, rural-residential housing is also expanding in nonmetropolitan portions of Idaho (U.S. Census Bureau 2021). Projections through 2030 anticipate future population growth clustered in several general areas: greater Coeur d'Alene area, Palouse area, greater Boise area, Magic Valley-Blaine County, and eastern Snake River Plain-Teton Valley areas. Several of these areas also provide important elk summer and winter habitat. As a result, elk populations that have been adversely affected by past and current development will likely be further impacted by human population expansion.

Development associated with economic expansion includes new housing, transportation system upgrades, energy production and transmission, and industrial infrastructure. For example, the number of housing units increased by 12.5% from 2010 to 2019 (Idaho Dept. of Labor 2020) while Idaho's miles of roadways increased 8% during that same time period (FHWA 2010, FHWA 2020). This increase is likely to accelerate during the next decade as part of the Idaho Transportation Department's (ITD) Transportation Expansion & Congestion Mitigation (TECM) Program (ITD 2024). Road construction and increasing traffic volumes can increase the risk of elk-vehicle collisions and can affect important seasonal habitat and migration routes. Improving motorist safety is an important reason for upgrading Idaho's transportation system, which includes reducing risks of vehicle collisions with big game such as elk.

Idaho's expanding human population is also increasing local energy demands. The state's electricity generation is primarily from renewable energy sources that include hydroelectricity, wind, solar, geothermal, and biomass (OEMR 2021). In 2019, renewable sources generated 76% of in-state electricity with hydroelectricity composing 58% (OEMR 2022). Construction of new utility-scale wind and solar energy facilities is increasing due to increased profitability and to reduce carbon-based electricity generation, which is a goal of the state's electric utilities. First constructed in 2006, Idaho's utility-scale wind energy facilities now provide 16% of in-state generation and more than an estimated 200,000 megawatts of wind energy remain available for development (OEMR 2022). As solar and wind development projects are frequently located in the open sagebrush-dominated landscapes of the Snake River Plain, they often have significant overlap with elk migration routes and winter range. Over 500 miles of new and upgraded transmission lines are also planned to deliver Idaho's renewable energy to in-state and regional markets (OEMR 2022), highlighting the potential for additional impacts to elk.

Global mineral demands are prompting new exploration and industrial-scale mining. Idaho has an extensive mining history dating back to the mid-1800s. Gold was the key mineral that originally attracted prospectors to Idaho. Now, silver and phosphate are the most produced minerals, with Idaho supplying about 45% and 22% of the nation's silver and phosphate, respectively. Idaho mining includes extraction of not only base metals like lead and copper but also other minerals including antimony, gold, silver, cobalt, tungsten, vanadium, molybdenum, and gemstones. Quarrying of sand, gravel, and crushed rock provides crucial raw materials for Idaho's expanding construction sector and transportation system. Infrastructure and mining activities associated with locating, extracting, processing, and transporting of materials have the potential to impact elk habitat in a variety of ways including habitat conversion to other habitat types, degradation from the spread of noxious and invasive weeds, fragmentation due to roads and transmission lines, reduced connectivity, and potential pollution including air, soil, and water-borne pollutants.

These land uses have the potential to adversely affect elk, and infrastructure and project activities (e.g., construction, operations, and maintenance) may have direct, indirect, and cumulative effects on habitat and movement and migration behaviors (e.g., Cox et al. 2009). IDFG provides technical assistance to inform project proponents, land managers, and regulatory decision-makers about potential project effects on elk populations. IDFG technical assistance applies the mitigation hierarchy, recommending ways to avoid or minimize negative project effects with alternative siting, design features, construction and operational BMPs, and habitat restoration. Recommendations can also include voluntary compensatory mitigation for negative project effects not adequately avoided or minimized.

Migration and Movement

Many of Idaho's elk populations are migratory, with some herds traveling over 100 miles between summer and winter ranges. A surge in research and GPS technology over the last decade has greatly expanded our understanding of how, when, where, and why big game animals migrate and the population-level effects of migration. This information is more critical now than ever, as many migratory populations of elk are navigating rapidly changing landscapes. Information about migration and movements is critical for considering effects of natural resource development, transportation, energy infrastructure, agriculture, and other land uses on migratory elk populations.

Migration is believed to have evolved in response to seasonally shifting resources (Rickbeil et al. 2019) and is an important component to healthy, functioning elk herds. Without the ability to move between seasonal ranges, some elk populations may lose their resiliency to changing environmental conditions and potentially suffer over the long-term. Generally, summer ranges are at higher elevations where an abundance of forbs, grasses, and shrubs provide the nutrition needed for elk to regain fat lost over winter, successfully raise calves, breed again in the fall, and reenter winter in good enough condition to survive until spring. Conversely, winter ranges may not provide adequate forage to sustain elk year-round but do provide refuge from deep snow and cold weather.

In addition to affecting elk abundance and distribution directly, the loss of migratory elk herds has the potential to affect predator populations (Stoellinger et al. 2020), disease transmission (Rayl et al. 2021), tag allocations and hunting structures, local economies and cultures, and human-wildlife conflicts. Additionally, growing resident elk herds may be more susceptible to density-dependent effects of resource limitations such as reduced reproductive success or survival rates (Mysterud et al. 2011; Festa-Bianchet et al. 1998).

A suite of transformations across elk habitat has occurred over the last 30 years, including habitat loss and fragmentation, frequent drought conditions, changes in agriculture practices, increasing disturbance on seasonal ranges, the expansion of invasive plant species, and the reestablishment of wolves. These factors may be lessening the advantages gained by migration and could contribute to shifting migration patterns (Merrill et al. 2020). Some elk populations appear to no longer be utilizing traditional migration routes and some historically migratory herds are now year-round residents. This change in elk distribution has, in some cases, led to conflicts between elk, private landowners, and sportsmen, and further complicated elk management.

Consequently, IDFG has made extensive efforts to map migration routes across the state, which is a critical first step to implementing sound, data-driven management. These data are elemental to IDFG's ability to work with state, federal, county, and local partners to prioritize where funding is spent and to inform management actions. Since 2018, IDFG's understanding, and management of big game migration routes and seasonal habitat have been augmented through the Department of Interior's (DOI) Secretarial Order No. 3362 (SO3362). SO3362 directs DOI agencies to assist western tribes, private landowners, state fish and wildlife agencies, and state highway departments with managing and conserving priority big game winter ranges and migration habitat, focusing on mule deer, pronghorn, and elk.

To sustain elk populations at harvestable levels into the future, IDFG and stakeholders must understand, conserve, and manage the complete breadth of annual habitat requirements, including seasonal ranges and migration habitat. IDFG routinely works with state, federal and non-profit partners, and private landowners to implement habitat improvement projects aimed at facilitating wildlife movement (e.g.,

wildlife-friendly fencing, highway overpasses and underpasses, and conservation easements) along mapped migration routes. The purpose of Idaho's SO3362 Action Plan (IDFG 2023b) is therefore to focus and facilitate ongoing and future cross-jurisdictional and landscape-scale conservation of big game winter range and migration habitat. Idaho elk migration routes are available in Ungulate Migrations of the Western United States, Volume 2 (Kaufmann et al. 2022) and Ungulate Migrations of the Western United States, Volume 3 (Kaufmann et al. 2023), which includes many migrations mapped to date with GPS telemetry data. IDFG will continue to update statewide analyses to improve the mapping of seasonal ranges, migration habitat, and stopover locations for elk and will integrate the guidance provided by the SO3362 Action Plan into elk management activities at the statewide and zone-level**.**

Travel Management

Travel management is a challenging and multifaceted topic, with both direct and indirect implications for elk management. Road and trail density, location, traffic volume, season, and mode of travel are important considerations. Elk have been shown to avoid roads as traffic increases (Edge and Marcum 1991; Johnson et al. 2000). Elk have also been shown to avoid areas of trail-based recreation at levels similar to avoidance of open, motorized roads on public forests (Wisdom et al. 2018). Research examining elk response to different types of recreational activity found that exposure to all-terrain vehicles (ATV) caused the largest reduction in time spent feeding and resting, and the greatest increase in movement by elk, followed by mountain biking, hiking, and horseback riding (Naylor et al. 2009; Wisdom et al. 2018). The recent but dramatic increase in the number of people participating in both motorized and non-motorized recreation on public land throughout Idaho has highlighted the need for thoughtful travel management that balances the requirements of elk populations and hunter access with other land uses.

The IDFG directly manages a relatively small portion of elk habitat in the state through IDFG Wildlife Management Areas. The bulk of elk habitat in the state is managed by the U.S. Forest Service (USFS; 20.4 million acres), the Bureau of Land Management (BLM; 12 million acres), and the Idaho Department of Lands (IDL; 6 million acres). Both the USFS and BLM manage under a multi-use mandate, meaning they must consider the needs of several stakeholder groups. IDL manages to maximize revenue to fund Idaho schools, which is generally accomplished through grazing lease fees, timber sales, or energy development leases. While IDFG does not have direct authority over travel management on lands it does not manage, IDFG is a stakeholder in travel management planning on federal and IDL lands and provides input on how a plan or project may impact elk populations. IDFG uses a combination of scientific research, elk population data (such as survival and movement data from GPS radio-collars, abundance and composition data from aerial surveys, and hunter harvest information), as well as feedback from sportsmen and women (provided throughout the year, but particularly during season-setting and public surveys) to inform recommendations to land management agencies.

Travel management recommendations for elk vary by habitat type (forested vs open) and season but should be approached at the landscape-level for elk and other wildlife species that require large, intact landscapes to survive and thrive throughout the year. The effects of roads, trails, and traffic on elk management can be grouped into three broad, but inter-related categories, with effects on elk populations varying greatly by season: 1) physiologic and energetic effects, 2) distribution and habitat use, and 3) vulnerability to hunter harvest and mortality. Since elk utilize different areas and habitats to complete their annual life cycles, the remainder of this section will be divided into seasons, which allows for clarity on 1) the population demographic that is most sensitive to recreation at that time, 2) the research that is being referenced, and 3) the recommendations that IDFG suggest land managers consider when developing travel management plans.

Winter

The most important travel management consideration for elk in winter is relief from human disturbance. While elk are resilient to winter conditions, with population-level declines rarely occurring because of harsh winters, they still rely on accumulated fat reserves to survive until spring (Cook et al. 2004). The cumulative impact of repeated disturbance and limited forage resources can reduce survival of elk, particularly elk calves which are more vulnerable to starvation due to their smaller body size and reduced body fat (Parker et al. 2009). The energetic cost of moving away from disturbance associated

with roads and trails may be substantial (Cole et al. 1997) and could limit population productivity or reduce an elk's ability to survive winter by depleting fat reserves (Cook et al. 2004). Rost and Bailey (1979) found that elk strongly avoided well-traveled roads on winter ranges that had less security cover. Hayden-Wing (1979) found that elk distribution in southeastern Idaho during winter was primarily driven by human activity, followed by snow depths and forage availability.

Spring

As discussed previously, many elk populations are migratory to take advantage of spatially and temporally dynamic food resources. During migration, elk utilize areas called "stopovers." Stopover locations are areas of high-quality forage that provide valuable resources to animals going in to or coming out of winter. A significant portion of the migration period for ungulates is spent foraging at stopover locations. Disturbance at these sites was found to correlate with changes in animal movement rates and locations (Lendrum et al. 2012; Sawyer et al. 2013), with elk moving more rapidly, or avoiding entirely, these high-quality habitat areas.

Additionally, cow elk give birth to calves in May and June. Disturbance on calving grounds has been linked to population-level declines in some areas. Phillips and Alldredge et al. (2000) found that when cow elk were disturbed 10 times throughout the parturition period, the population would experience no growth because of calf mortality. Kuck et al. (1985) found that elk cow/calf pairs abandoned traditional calving areas when exposed to repeated disturbance from people.

Summer

Quality of summer and autumn ranges largely determines the condition of an elk heading into winter, and thus whether that elk can survive until spring (Cook et al. 2004). A relatively small difference in forage quality in summer and autumn can have very strong effects on fat accretion, timing of conception, pregnancy rates of lactating cows, calf growth, yearling growth, yearling pregnancy rates, and winter survival rates. Likewise, fairly small changes in percent body fat can have significant effects on the fitness of adult cow elk. Cook et al. (2001) found that cow elk with less than 13% body fat may delay breeding, and at 9%, pregnancy rates declined. Cow elk with less than 6% body fat had poor survival.

Roads can have a disproportionate effect on habitat quality of the surrounding area (Jackson 2000), meaning the total loss of functional habitat is greater than that of just the road itself (Forman 2000). Lyon (1983) found that at road densities exceeding 2 miles/mi^2, habitat effectiveness (i.e., percent of expected use relative to available habitat) declined rapidly (loss of 55-80% habitat effectiveness). Therefore, conserving undeveloped areas that provide high-quality forage and security cover is important for ensuring elk can accumulate enough body fat for survival and reproduction. Displacement of elk into lower quality habitat might be equally or more detrimental than increased energetic costs caused by movements (Hobbs 1989). When elk are displaced into lower quality habitats, they may be forced to use poorer quality forage and expend more energy on thermoregulation (Cassirer et al. 1992). Additionally, lactating females that more strongly avoided roads entered winter in poorer nutritional condition (Spitz et al. 2019).

Fall

Harvest vulnerability is of primary concern in the fall, particularly for bull elk. Road density has been shown to affect bull:cow ratios and the number of mature bulls on the landscape (Leptich and Zager 1991), both of which are important for an elk population to function properly. Unsworth and Kuck (1991) concluded that bull elk in high-density road habitats were more than twice as likely to be killed

during hunting seasons as those in areas with few roads. Gratson et al. (1997) analyzed bull survival in three different treatment areas (high-density roads, no roads, and managed access). They found that bull survival in the roadless and managed access areas were similar and 20% higher than bull survival in the high-density road site. Additionally, Gratson and Whitman (2000) found that hunter success was higher in the roadless and managed access areas (both ~25%) than the high-density site (~15%), supporting the idea that bulls selected for low-density to roadless areas. In a landscape characterized by a matrix of public and private ownership, Proffitt et al. (2013) found that the density of roads open to motorized use was an important predictor of adult cow elk distribution during the rifle season and that adult cow elk moved from areas of high road density on public lands to areas with less disturbance on private lands.

Tools and Strategies

IDFG encourages state and federal land managers to continue to develop comprehensive access management programs that include provisions for maintaining high-quality elk habitat.

- Avoid the highest-priority elk habitats when planning recreation infrastructure, wherever possible (Frair et al. 2008).
  - Calving areas
  - Winter range
  - Stopover locations or migration route bottlenecks
  - Areas of exceptionally abundant, high-quality summer and fall forage

- Maintain overall motorized route densities that are within the 0.7-1.7mi/mi^2 "moderate" range as well as large areas that are within the "low" range (<0.7mi/mi^2) as described in Wisdom et al. (2000).
  - Low-density = <0.7 mi/mi^2
  - Moderate-density = 0.7–1.7 mi/mi^2
  - High-density = >1.7mi/mi^2

- Seasonal closures should be considered to benefit elk in the winter months and during calving when they are most vulnerable (Shively et al. 2005). Dates shown below are approximate and vary based on specific location and seasonal environmental conditions.
  - May 15 – June 30 = calving
  - December 15 – April 15 = winter

The IDFG recognizes the challenge land managers face, now more than ever, when managing landscapes for public use and enjoyment while simultaneously conserving natural resources. IDFG will continue to work with, and support, partners tasked with accommodating a variety of recreational users to also improve elk habitat.

Diseases and Parasites

Elk are subject to a number of diseases and pathogens. This section presents information about the diseases that are currently a risk to Idaho elk populations and whether they are currently present in or introduced to Idaho.

Brucellosis

Brucellosis is a transmissible bacterial disease caused by *Brucella abortus*. In most ruminants, the disease results in arthritis, birth of weak calves, or abortion. Brucellosis is a zoonotic disease that can infect humans. The disease was introduced to the U.S. by infected cattle from Europe at the time of settlement. Brucellosis was introduced to the greater Yellowstone area when bison (*Bison bison*) that were being reintroduced into Yellowstone National Park were exposed to infected cattle, and from bison it spread to elk (Thorne et al. 1997). The primary concern with brucellosis is transmission of the organism from elk to cattle (Thorne and Morton 1976) and the associated economic and logistical consequences to domestic livestock producers.

In 1998, IDFG found the first evidence of brucellosis infection in eastern Idaho elk. A task force was assembled to formulate a plan to deal with the disease in elk and minimize the risk of transmission to cattle. Based on epidemiology and DNA, elk appear to have spread the disease to cattle, resulting in the loss of Idaho's Cattle Brucellosis-Free Status in 2005. In addition, elk are suspected of spreading the disease to cattle herds in eastern Idaho in 2009 and 2012. Yearly hunter surveillance is focused on GMUs within or near the Designated Surveillance Area (DSA) determined by Idaho State Department of Agriculture (ISDA) or where there are increased interactions with cattle. IDFG also tests all live adult elk handled by agency staff. In recent years (2018- 2022), elk with B. *abortus* antibodies (sero-positive) have been detected in GMUs 29, 45, 49, 59, 60, 60A, 61, 62, 66A and 67 (Figure 4).

Management of brucellosis in free-ranging elk is challenging. Gross et al. (1998) found that although infection with brucellosis can negatively affect reproductive performance in cows through abortions and stillborn calves, and possibly bulls through orchitis (swelling of the testicles), the population impact is relatively low given the low detection rate (seroprevalence). There is no effective vaccine for elk and no way to easily vaccinate elk even if an effective vaccine were available. When needed, IDFG may trap, test, and remove seropositive elk in eastern Idaho, especially at feed sites that are used repeatedly or if elk interact with cattle during the risk period (January-June).

A cooperative brucellosis plan between IDFG and ISDA was developed in 2006 and serves as the basis for management of elk in proximity to cattle in the brucellosis-affected area. Most of the joint effort between IDFG and ISDA is to minimize likelihood for potentially infected elk to intermingle with cattle in winter by fencing haystacks, hazing elk away from cattle feedlines, fencing cattle feeding areas, and development of alternative wintering areas. In these areas, brucellosis management is a significant factor, considered alongside other management concerns in the development of elk population objectives. The cooperative brucellosis plan has 4 primary objectives:

1. Manage elk populations within carrying capacity of available winter habitat and provide for a harvestable surplus.
2. Monitor elk and livestock for exposure to and infection with brucellosis and reduce brucellosis prevalence in elk.
3. Improve habitat to ensure adequate areas of high-quality winter and spring range

necessary to support a stable and harvestable elk population.

4. Maintain separation between elk and cattle during high-risk periods.

Obtaining adequate harvest of elk in brucellosis-affected zones can be a difficult challenge due to seasonal elk movements that may not correspond to established elk harvest seasons. Some elk that winter in the Upper Snake Region spend the summer in Yellowstone National Park, Grand Teton National Park, or in other parts of Montana or Wyoming. Some elk do not return to Idaho until late fall or early winter, after or late in the hunting season, which may limit access to these animals by Idaho hunters. Implementing harvest season frameworks that target these elk is a dynamic and adaptive process. IDFG may adjust season length, season timing, tag numbers, and other variables to modify hunter distribution to address cattle-elk interactions.

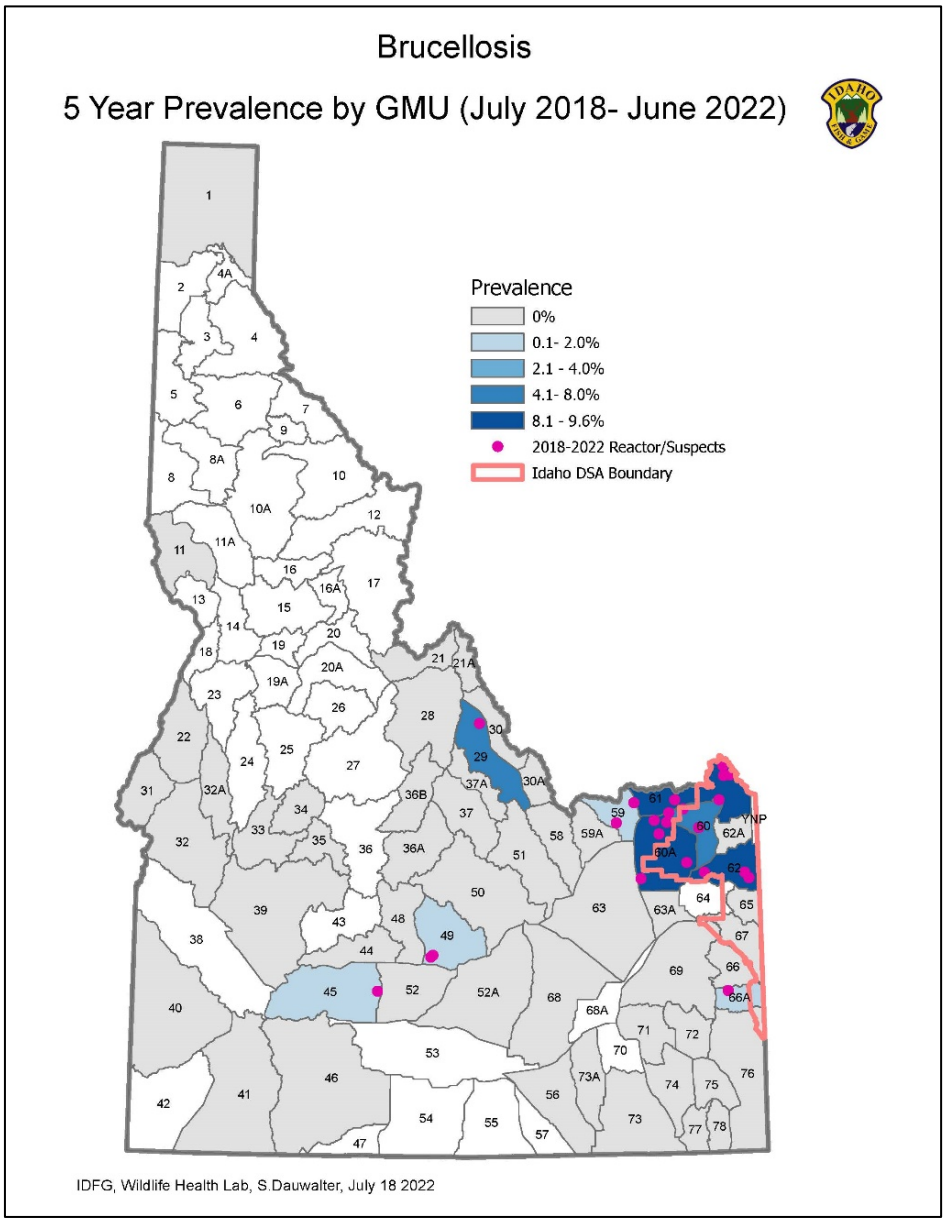


Figure 4. Five-year brucellosis prevalence in Idaho, 2018-2022.

Chronic Wasting Disease

First detected in Idaho in 2021, chronic wasting disease (CWD) is known to occur in mule deer, white-tailed deer, elk, and moose in the U.S. The original endemic area was confined to a small portion of Wyoming, Colorado, and Nebraska. Over time, CWD has been found in wild or captive mule deer, white-tailed deer, elk, and moose in an expanding number of locales, which at the time this plan was written included 31 U.S. states, 4 Canadian Provinces, Norway, and South Korea.

The IDFG CWD Strategy (2021) recognizes CWD as an infectious disease of cervids caused by misfolded proteins (prions) that are transmitted by ingestion of prions from contaminated environmental components or directly from contact with infected animals. The disease has a long incubation period and a long period of prion shedding. The disease is always fatal in cervids and is preceded by prolonged neurological degeneration and dysfunction. Prions cannot be treated or controlled with conventional measures and there is no known cure for an animal suffering from CWD. There are ways to decrease the infectivity of prions, but environmental treatments are not practical for large-scale use.

Multiple studies have shown that heavily infected cervid populations do not thrive in the long term (Almberg et al. 2011, Monello et al. 2014, Williams et al. 2014). A study in Wyoming focusing on a local population of mule deer estimated a 21% annual decline and extinction within 40 years due to high CWD prevalence (24%; DeVivo et al. 2017). A similar Wyoming study of white-tailed deer with high CWD prevalence (33%), estimated extinction in 48 years at the current level of mortality and fecundity (Edmunds et al. 2016).

A review of CWD management practices concluded most actions were too little, too late, too restricted, too passive, or of insufficient duration to be successful. Based on lessons learned from past CWD management actions, the critical need is for states to set realistic CWD control objectives that incorporate existing and prospective field data and to apply any management action with sufficient spatial and temporal coverage to be effective (Miller and Fischer 2016).

Public engagement will be essential to build necessary public support for the management actions required to effectively contain and control CWD expansion. The importance of communicating with and being responsive to the public was evidenced in Wisconsin in the years following the detection of CWD.

Wisconsin took rapid action after the initial detection, but neglected stakeholder concerns and did not fully utilize the human dimensions resources they had available which led to an erosion of support and undermined their progress towards achieving their biological and social goals (Heberlein 2004). Any attempt at controlling CWD will require decades of effort, time, and money to achieve results that can be sustained.

Many management actions center on suppressing the CWD-affected population to prevent further spread. Such actions are achieved by combinations of agency culling, hunter harvest, predator management, cessation of agency management practices (e.g., winter feeding and translocations), and in extreme cases, experimentation with controlled burning of contaminated environments. A recent study in Colorado indicated that harvesting mule deer with sufficient hunting pressure could control CWD when prevalence is low (Miller et al. 2020). The development of models incorporating CWD prevalence analysis have allowed some agencies to estimate the amount of hunting pressure, predation, and CWD risk a population can withstand without threat of extinction (Dulberger et al. 2010, Galloway et al. 2017, Miller et al. 2008).

IDFG has conducted CWD surveillance since 1997 using a combination of targeted and general surveillance. Over 28,000 wild deer, elk, and moose have been sampled. While 55 deer (47 white-tailed deer, 8 mule deer) have tested positive for CWD since focused testing began in the area surrounding the initial 2021 detection, as of this writing only one elk has tested positive for CWD in Idaho. The detection was located in GMU 14 near the town of White Bird and is included in the outer radius of detections to date. Prevalence in white-tailed deer and mule deer was estimated to be <2% based on hunter harvested animals sampled in GMU 14 during 2023. Due to the currently low prevalence in elk, management actions in the current CWD management zone have been focused on deer and are consistent with actions outlined in the CWD Strategy (2021).

Treponeme-Associated Hoof Disease

Treponeme-associated hoof disease (TAHD) is a relatively new condition in elk. Elk with hoof problems were first recognized in southwestern Washington in about 2000 with a dramatic increase in the number of affected animals reported by 2008. Since 2008, extensive surveillance by Washington Department of Fish and Wildlife has confirmed TAHD in elk in 14 counties in western Washington, with scattered but unconfirmed cases in eastern Washington. TAHD was found in a cluster of northwest Oregon elk in 2014. Since then, confirmed cases have been found in several areas of western Oregon, with scattered unconfirmed cases in eastern Oregon. In December 2018, an adult female elk killed by a hunter near White Bird in GMU 14 was found to have obvious foot abnormalities. The lower leg was submitted for diagnostic testing and TAHD was confirmed. To date, TAHD has been confirmed in elk GMUs 6, 8, 10A, 13, 14, 18, 21, 31 and 39. Management of TAHD is difficult as information about transmission, reservoirs, and population impacts are limited. Washington has culled elk for humane reasons, diagnostic efforts, and in an attempt to prevent the establishment of TAHD in Klickitat County. Oregon has done similar humane removals and diagnostic efforts but has not attempted control efforts to date. IDFG will continue to work with Washington State University, neighboring state wildlife agencies, and TAHD working groups to share and compile the latest findings on TADH research and management. Monitoring for TAHD will be accomplished through observations during aerial surveys, reports from hunters and landowners, check stations, and necropsies.

Other Diseases and Parasites

Several other pathogens, such as giant liver fluke *(Fascioloides magna)*, meningeal worm *(Parelaphostronglylus tenuis)***,** bovine tuberculosis (TB), and Epizootic Hemorrhagic Disease (EHD) can cause underlying impacts to elk herds but are not currently a population level issue and have infrequently been detected in Idaho elk populations in recent years.

Giant liver fluke — Giant liver flukes (*Fascioloides magna*) are trematode parasites found in the liver of white-tailed deer and elk in a patchy distribution in North America (Pybus 2001). To date, giant liver flukes have been documented in one wild elk from the Lochsa area, two deer from the Clearwater Basin, and two moose that were harvested by hunters in the Panhandle Region in 2020. There are large numbers of susceptible wild cervid hosts and suitable aquatic snails which are intermediate hosts. Infected animals shed giant liver fluke larvae into the environment through their feces. When the larvae enter an aquatic system, they infect aquatic snails and are later released once mature, continuing on to infect deer, elk, and moose upon ingestion of contaminated aquatic vegetation. If an introduction did occur, the parasite would be very difficult to manage without severe damage to aquatic ecosystems, since a potential method of controlling the parasite would require the treatment of impacted streams and waterbodies with implications for other aquatic species.

Meningeal worm — White-tailed deer are the natural reservoir host of *Parelaphostrongylus tenuis*, a nematode parasite that occurs over much of the central and eastern parts of North America. To date, meningeal worm has not been documented in Idaho. If the parasite were introduced, it could have very severe consequences for wild cervids, other than white-tailed deer. In addition, control of the parasite would be very difficult as the intermediate hosts, which include several species of snails and slugs, are difficult to control in the environment and there is no viable treatment for infected cervid hosts.

Bovine tuberculosis — Bovine tuberculosis (TB) is a bacterial disease (*Mycobacterium bovis*) distributed worldwide and introduced in North America to wild deer and elk by infected cattle (Thoen et al. 1992, Hunter 1996). There have been no known cases of bovine TB in wild cervids in Idaho. Among challenges for dealing with bovine TB in wildlife is that there is no vaccine or treatment. The only management options would be to reduce elk populations, ban winter feeding and baiting, and enforce temporal and spatial separation of elk and livestock.

Epizootic Hemorrhagic Disease — Epizootic hemorrhagic disease (EHD) is a viral disease of white-tailed deer that is spread by *Culicoides* midges. EHD is known to occur in deer, generally as small outbreaks on an irregular basis. The disease is rare in elk, although based on serology, elk are exposed to EHD. In the last EHD outbreak (2021), one wild elk was confirmed to have EHD. Management of EHD is generally not feasible, since there is no vaccine or treatment. The only way to stop the disease is to either remove all susceptible hosts or wait for a killing frost to significantly reduce gnats.

Other Management Influences and Challenges

Technology

Technological advances create unique challenges for wildlife managers. Managers must consider how advances in technology improve harvest success rates and subsequently impact the amount of hunting opportunity that is biologically sustainable. For example, “primitive weapons” that had limited range and required greater amounts of skill resulted in lower success rates historically (3% for archers and 6% for muzzleloaders in 1982 Harvest Data) compared to rifle hunters (14%). Lower success rates allow for more liberal seasons, both in terms of numbers of tags and length of season, for those weapon types. Modern hunting bows and muzzleloaders shoot faster, farther, and with greater accuracy than their predecessors, resulting in success rates nearly equal to rifle hunts in some elk zones of Idaho (Figure 5). This example as well as other technological advances raise questions about what constitutes a ‘primitive’ weapon and what is “fair chase,”

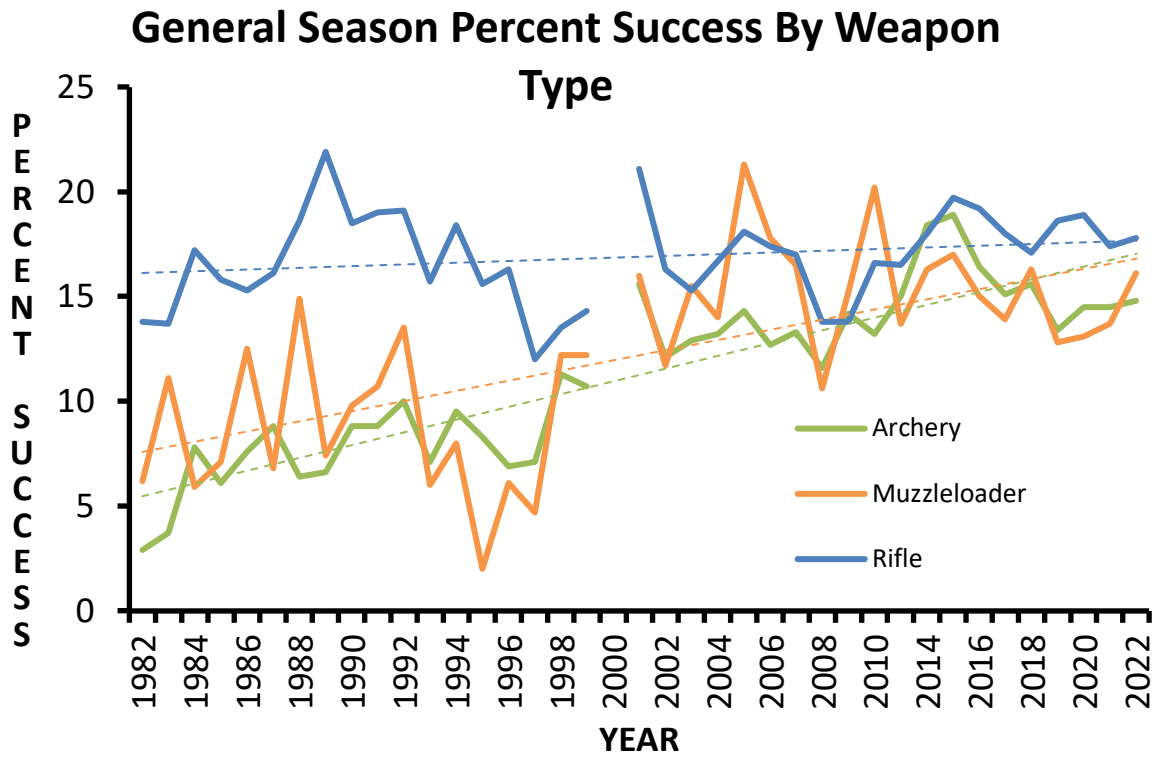


Figure 5. General season elk harvest success rates by weapon type in Idaho, 1982-2022.

The Commission regularly reviews the use of technology for hunting and collects public input when considering modifying or adding regulations. The following list is representative of the types of technological improvements that managers and the commission hear about related to elk harvest and overall hunting experience.

- Hunting tools and equipment - range finders, high-tech scopes, ballistic calculators, thermal optics, weather and wind instruments, mapping/navigation/scouting programs, and trail cameras.
- Communication devices – two-way radios, satellite phones, satellite message devices and others.
- Improved methods of access – ATVS, UTVS, motorcycles, tracked machines, watercraft, and even aircraft access have all seen dramatic improvements over the years, both in reliability and capability.
- Social media and sharing of information – the ability to gather and share information has never been easier and the availability of information can potentially influence hunter numbers, harvest, and ultimately hunter experience.

These advances offer some kind of an advantage to hunters that may impact harvest, hunter density, and ultimately the quality of experience. All of these factors influence the types, length, and timing of seasons offered to elk hunters.

Hunting Access

Varying motorized access, terrain types, and landownership patterns across Idaho provide numerous elk hunting opportunities and experiences. Hunters can choose from frontcountry options where hunting can be found within easy driving distances from urban areas to more backcountry hunts that require significant effort and planning to enter remote areas by foot, horseback, or aircraft.

Idaho is fortunate to have 53.4 million acres of public land that provide wildlife habitat and hunting opportunity. Private lands throughout the state also provide high quality habitat and support healthy elk populations. As discussed previously in this plan, elk distribution and abundance has changed over time, with more elk interacting with private lands than ever before. Many landowners embrace public hunting on their property while others allow very little hunting. Elk have quickly adapted to the different levels of hunting pressure on public and private lands, which can be challenging for wildlife managers wanting to promote harvest opportunity and access for all hunters. IDFG, private landowners, and hunters recognize the value of private lands for wildlife and hunting. IDFG has sought ways to provide meaningful hunting access with the Access YES! Program, the Large Tracts Program, and an agreement on State of Idaho Endowment Lands. Through these programs, approximately 3.6 million acres are accessible to Idaho hunters. IDFG will continue to look for innovative ways to promote public access for elk hunting.

Contact Between Wild and Domestic Elk

IDFG generally regulates private possession of wildlife, excluding domestic cervids. In 1999, jurisdiction of domestic Cervidae—defined as elk, reindeer (*Rangifer tarandus*), and fallow deer (*Dama dama*)—was transferred to ISDA. ISDA developed rules for fencing, identification, licensing, fees, and disease testing for importation, all of which have been updated or modified over time.

As of 2023, there were 41 domestic cervidae producers, mostly in eastern and northern Idaho (Figure 6). Currently, the ISDA State Veterinarian leads the investigation and inspection of domestic cervidae farms and facilities with regards to the presence of wild cervids. Risk assessment includes evaluating the number of animals involved, extent and time of contact, record keeping, and previous presence or absence of disease. A herd management plan is to be developed, with cooperation from IDFG, for removal of entrapped wild cervids on existing farms and facilities. In general, wild elk that ingress onto a

domestic elk farm are lethally removed but response depends on a risk assessment conducted by the ISDA.

Disease transmission between domestic elk and wild elk is of concern to IDFG. Several diseases are known to occur in domestic elk, but not in free-ranging elk in Idaho. These include but are not limited to giant liver fluke, meningeal worm, and bovine TB. The detection of CWD in wild Idaho cervids is a concern to the domestic cervid farm industry. Prevention and detection of new and novel diseases cervids will continue to be a joint effort of IDSA and IDFG. Maintaining a good working relationship and promotion of mutually beneficial practices will help ensure the future of healthy elk populations.

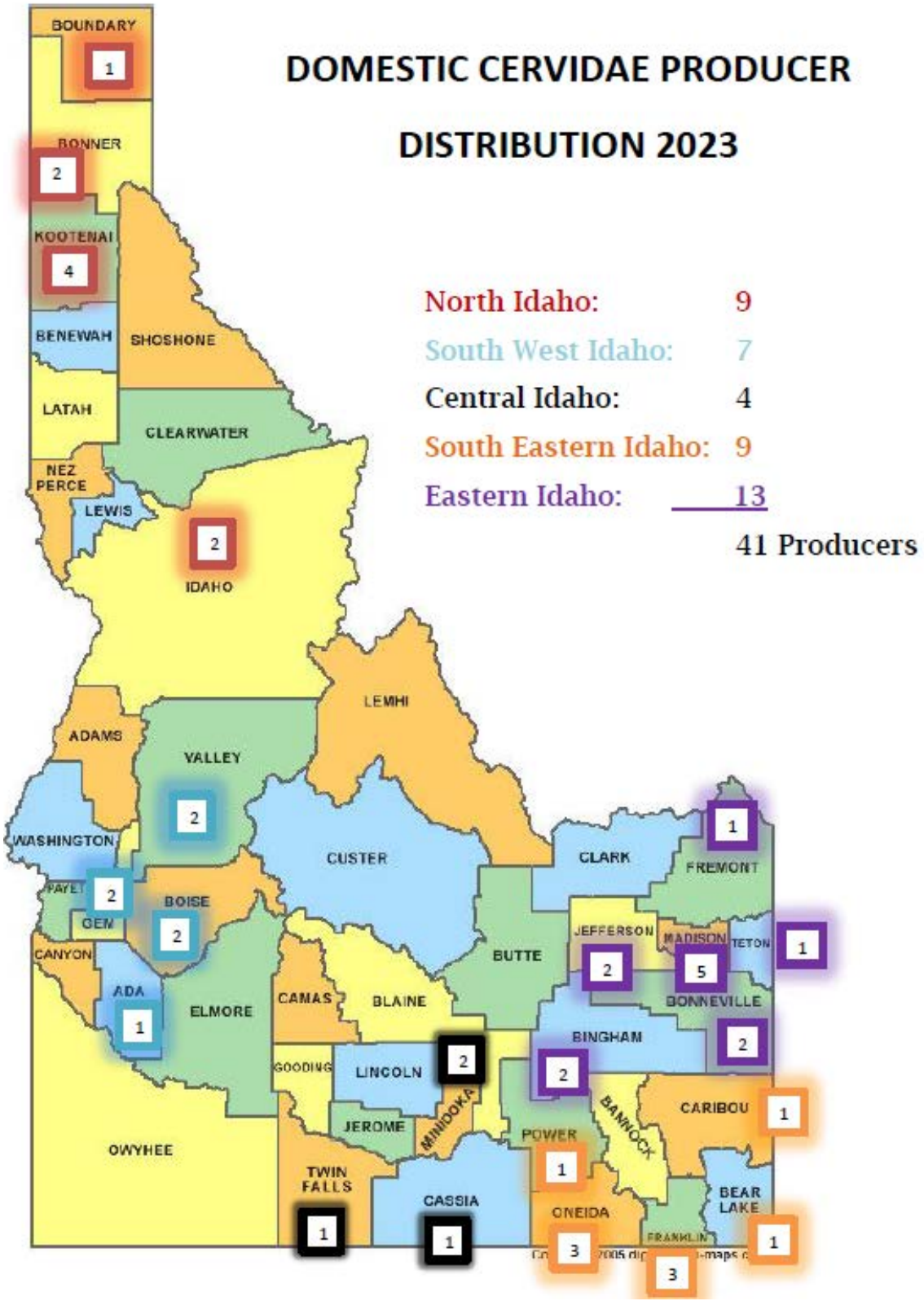


Figure 6. Geographic distribution of domestic cervid farms in Idaho, 2023 (ISDA).

Winter Feeding

Winter feeding of big game animals conducted by IDFG follows Idaho statute, administrative rule, and IDFG policy. In general, Idaho deer and elk population are to be maintained on natural forage. When conditions result in threats to human safety or property or will likely result in significant mortality events, IDFG may implement feeding operations. Regional winter-feeding advisory committees make recommendations to IDFG about the need to feed wintering deer or elk based on temperature, snow depth, assessment of animal condition, and anthropogenic concerns. If feeding is recommended, IDFG will feed animals a diet that is appropriate for the stage of winter, amount of native browse in the diet, and observed body condition of animals to be fed. With adoption of the IDFG CWD Strategy (2021), IDFG also considers CWD risk when planning winter feeding operations. At the time of this writing, there were only 2 elk feeding sites remaining, one located in the Magic Valley Region and the other in the Upper Snake Region.

Elk and Deer Interactions

Elk interact with a suite of other species that share their preferred habitats; in Idaho, this includes significant interactions with mule deer. Numerous studies have been completed over the past 5 decades investigating interactions between these two species and whether there are effects on deer populations (Mackie 1970, Monteith 2023). Most of the concern has focused on the correlation between expanding and increasing elk populations overlapping with declining mule deer populations throughout the western U.S. (Mule Deer Working Group 2004). Research conclusions have varied across studies to date, with some documenting direct competition between elk and mule deer and one suggesting winter competition may be dependent on winter severity (Atwood 2020). Using GPS technology, the most recent research conducted on the topic suggests mule deer avoided elk at finer scales than previous studies documented (University of Wyoming, unpublished data). Atwood (2020) documented some diet overlap between elk and mule deer but found that deer have more specialized, higher quality nutritional needs than elk. If elk displace deer from their preferred habitat, then elk could reduce the productivity and survival of mule deer. So far, no research has indicated any negative effect of deer on elk.

Elk Research

Research conducted since the last elk plan has primarily focused on understanding the effects of predators and winter weather on elk survival, managing elk-agricultural conflicts, developing new population estimation techniques, and modeling and mapping seasonal habitat selection, migration routes, and seasonal ranges. Work on mapping migration routes and seasonal ranges is an ongoing effort as additional data is accumulated in under-sampled or newly sampled areas of Idaho. The development of new population monitoring techniques will broaden the array of methods available for elk population monitoring, particularly in areas where current methods are difficult to implement (e.g., northern forested landscapes) and provide more frequent population estimates to improve dynamic elk management. Additional objectives include reducing the costs of monitoring and increasing safety for IDFG personnel by reducing the amount of time in fixed-wing planes and helicopters. The development of these approaches, detailed below, is ongoing. Research is also being conducted to improve our understanding of human dimensions issues associated with elk hunting (e.g., hunter crowding, access, and satisfaction).

Predator-Prey and Winter Weather Interactions

To better understand important drivers of cow and juvenile calf mortality and the implications of predator management, IDFG conducted a survival study of 1,244 adult female elk and 806 6-month-old calves from 29 populations distributed throughout Idaho from 2004 to 2016 (Horne et al. 2019). Researchers developed predictive models of mortality that related mortality risk to wolf pack size, winter conditions, and characteristics of individual elk. Annual mortality rates (excluding harvest) for adult females and calves were 0.09 and 0.40, respectively. Calf mortality was predicted best by chest girth at time of capture, the average size of surrounding wolf packs, and snow depth. Adult female mortality was predicted best by female age, the average size of surrounding wolf packs, and snow depth. Based on a sensitivity analysis, chest girth had the largest effect on risk of mortality for calves followed by pack size and snow depth. Other than the effect of senescence in the oldest (>15 yr.) individuals, pack size and snow depth had the largest effect on risk of mortality for adult females. Researchers estimated cause-specific mortality and predation was the dominant cause of known-fate mortalities for adult females (excluding harvest) and calves. Wolves preferentially selected smaller calves and older adult females, whereas mountain lions showed little preference for calf size or age class of adult females. This study indicated that managers could increase elk survival by reducing wolf pack sizes on surrounding winter ranges, especially in areas where, or during years when, snow is deep. Additionally, managers interested in improving over-winter calf survival can implement actions to increase the size of calves entering winter by increasing summer and early fall forage resources. Although this study was prompted by management questions related to wolves, mountain lions killed more elk than wolves and differences in selection of individual elk indicate mountain lions may have more of an effect on elk population dynamics than wolves. Although study findings were unable to relate changes in mountain lion populations to elk survival, future research should seek a better understanding of multi-predator systems, including how management of one predator affects others and ultimately how these interactions affect elk survival.

Managing Elk-Agriculture Conflicts

IDFG conducted research on elk-agricultural conflicts in two study areas, Magic Valley (Big Desert, Smoky-Bennett, and Pioneer Zones) and Weiser (Brownlee and Weiser River zones; Figure 7; Guthrie 2020). We used GPS-collar data from 60 adult female elk. Researchers first examined elk use of agricultural lands and then tested two deterrents (targeted lethal removal and modified fencing) to

potentially deter elk from using agricultural lands. As anticipated, elk used agricultural lands most during night-time hours, beginning at dusk and declining before morning. Agricultural land use by elk increased throughout the growing season (Figure 8), and elk also selected for areas closer to forest cover. Researchers theorized that risk avoidance, whether by predators or humans, explained the reduced selection of agricultural lands in spring, when young calves were most vulnerable, and selection for forest cover, which might limit visibility of elk from predators.

Approximately 53% of the collared elk received deterrent treatments, while the remaining 46% did not receive treatments and were used as control animals. Habitat selection patterns of GPS-collared treatment elk (e.g., elk treated with sharpshooting) and control elk were compared at the summer home-range and movement-step scale to quantify the effect of sharpshooting. Camera trap data was used to evaluate the effectiveness of the pasture fence modification treatment. Results showed that a portion of elk herds that were treated with sharpshooting reduced their selection of fields where sharpshooting occurred. The pasture fence modification treatment showed that elk moderately reduced use of treatment fields but results across treatment sites varied. Both deterrents tested were most effective in areas where elk densities were low and alternative agriculture food sources were abundant, suggesting that deterrents were more effective in displacing elk from specific locations than deterring elk from using agricultural lands more generally.

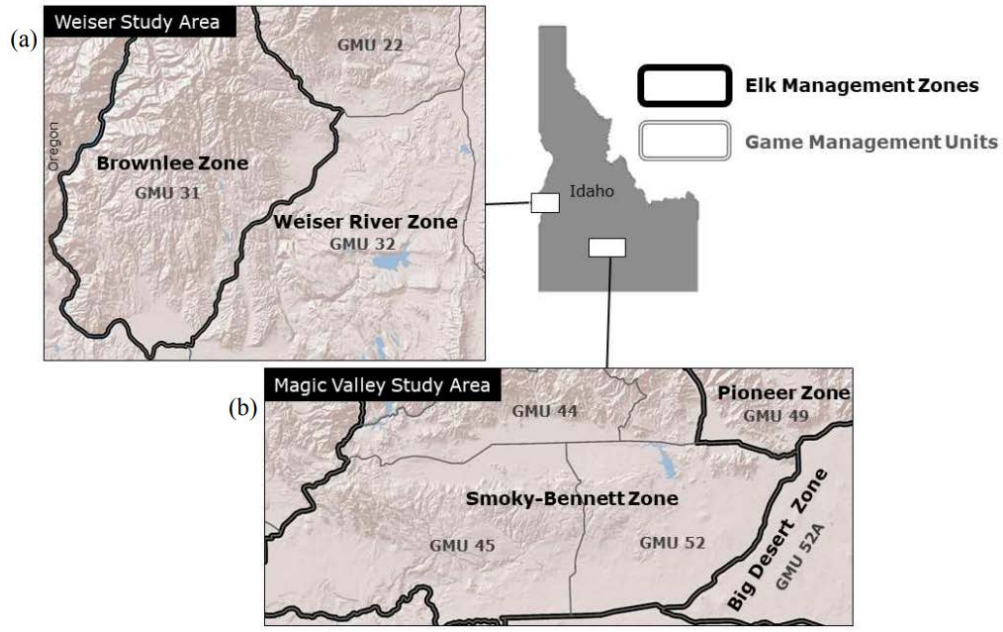


Figure 7. Elk-agriculture conflict project study areas located near a) Weiser and b) in IDFG's Magic Valley Region, Idaho (Guthrie 2020).

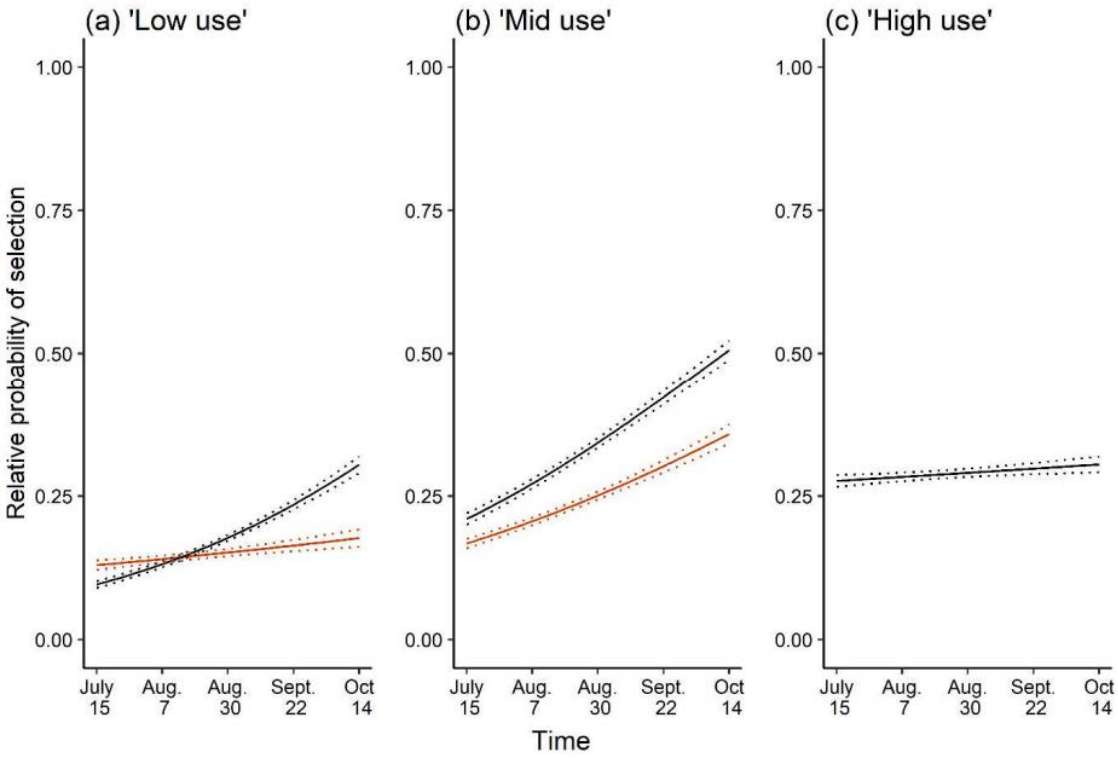


Figure 8. Predicted probabilities (± 95% CI) of agriculture selection during night hours for a) low-use, b) mid-use, and c) high-use elk. Use (low-, mid-, and high-use) was based on the amount of agricultural lands within elk home ranges. Magic Valley study elk are shown in black and Weiser study elk are shown in red (Guthrie 2020).

Migration and Seasonal Habitats

In 2021, IDFG completed a research project predicting parturition (i.e., calving) habitat of elk. Output from the models displays the predicted relative probability that an area on the landscape would be selected as a parturition site (Figure 9). Researchers built models using GPS locations collected from 1,091 adult (>2 years old during previous breeding season) cow elk during 1 May to 31 July from 2007-2020 (Figure 10). Researchers identified parturition sites based on movement behavior and evaluated habitat selection by comparing characteristics of parturition locations with habitat available on the broader landscape. Habitat selection was evaluated at 2 scales using a broad-scale analysis to determine characteristics of the general area that elk chose as a parturition site and a local-scale analysis to identify local characteristics of parturition sites. Estimated resource selection functions were used to predict the relative probability that an area would be chosen as a parturition site. Because habitat characteristics vary substantially and elk in different parts of the state may behave differently, researchers developed separate models for 6 populations based on similar ecoregional characteristics within a population. Of 314 parturition events identified, most (64%) birth dates occurred during the last week of May through the first week of June. Statewide, mean parturition date was 2 June with no substantial differences among populations. While there was substantial variation in habitat characteristics that were important for each population, most showed a strong preference for shrub landcover at both the broad and fine scales.

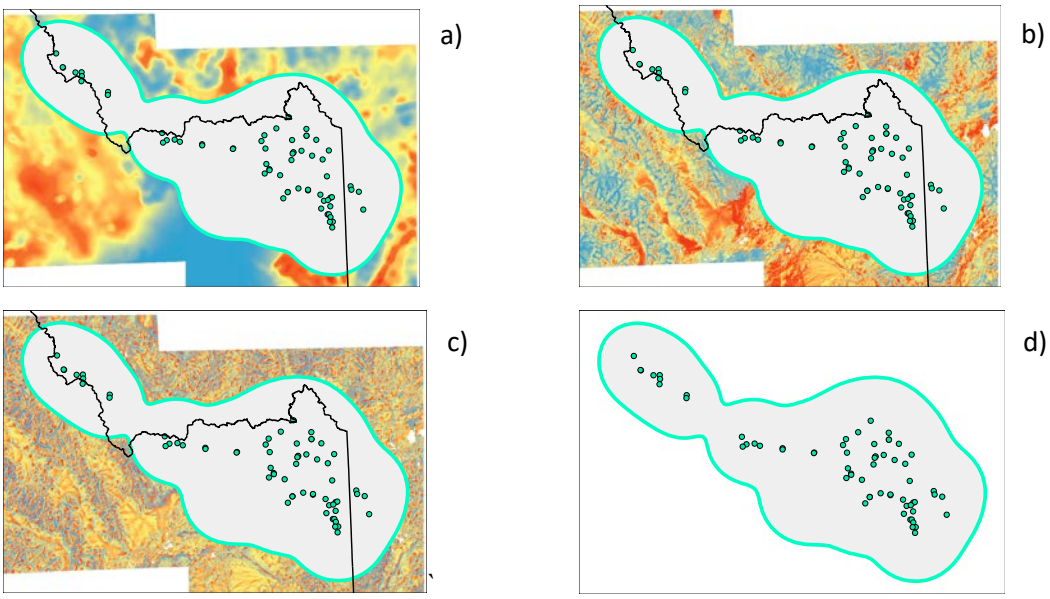


Figure 9. Predicted a) broad-scale selection, b) local-scale selection, c) relative local-scale selection conditional on having selected the general area at the population-scale, and d) relative selection considering both broad and local scale calving habitat selection for elk in the Southeast Dry Forest population, Idaho. Relative probability ranges from 0 (blue) to 1 (red), blue outline is the population boundary, and blue circles are the documented parturition locations.

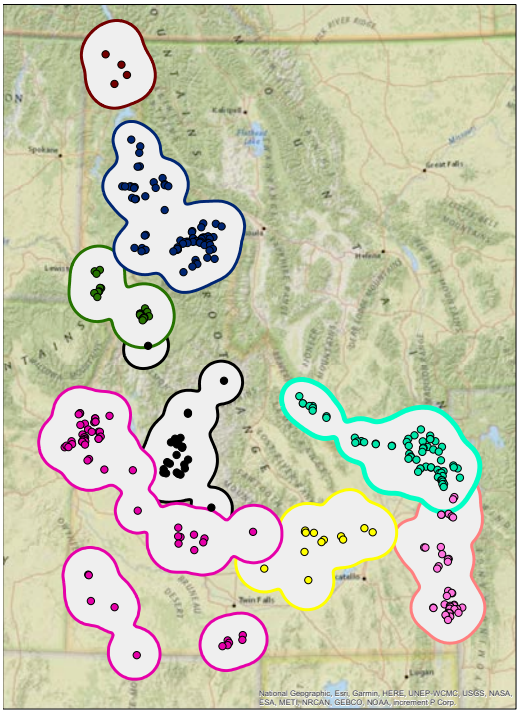


Figure 10. Parturition locations (dots) and boundaries of 8 populations used to model elk calving habitat, Idaho.

IDFG is currently building statistical models to predict summer and winter ranges for elk in areas of Idaho where there are a sufficient number of individuals to fit a reliable model. For summer, staff are evaluating movement patterns to determine if elk behavior warrants a separate model for early summer versus late summer seasons. Both summer and winter models include pertinent vegetation classes and annually varying summer (time-integrated normalized difference vegetation index) and winter covariates (snow duration, median and max snow depth). Once built, researchers plan to use these models to identify important habitat for elk but also better understand how elk habitat use changes annually based on climate and through time based on landscape change.

Elk Monitoring Techniques

IDFG continues to develop and refine the use of trail cameras to estimate elk population composition and abundance. To date, the approach to estimating composition falls into two categories depending on whether or not a population demonstrates a strong seasonal migration. For migratory populations, cameras are placed along previously identified migration routes (see Mapping Migration Routes and Seasonal Ranges) for the duration of the migration. Given that elk are moving through these areas on migration, we can reasonably assume that a simple count of bulls, cows, and calves in the pictures taken provides an unbiased estimate of calf:cow and bull:cow ratios (i.e., most animals aren't captured multiple times on the same camera). For non-migratory populations, investigators deployed cameras as a spatially balanced random sample and on the nearest dirt-bottomed road or trail near randomly selected locations. Researchers are still examining how these two types of deployments (random versus roads/trails) influence composition estimates. Preliminary results from the >750 camera deployments suggest that we get more elk images in late summer and a greater number of elk images on roads and trails. Setting cameras on roads and trails, however, might bias the estimates as a result of differences in habitat selection among age and sex classes. A potential bias might also be introduced by differences in movement rates among age and sex classes, since animals that move more will be more likely to cross in front of a camera than those that move less. Researchers are working to account for these biases and develop a standard protocol for implementing cameras to estimate elk age and sex structure.

IDFG's research on the development of camera-based methods to estimate elk density has focused on statistical model testing and viewshed estimation (i.e., the area that each camera is sampling). Using images from random camera deployments set to take an image every 10 minutes, we've examined differences between space-to-event and instantaneous sampling models (Moeller et al. 2018). At each 10-minute timestep, space-to-event models randomly order cameras and then sequentially count through picture viewsheds until an elk is observed. The total viewshed areas sampled before an elk is detected is used to estimate the population density. Alternatively, instantaneous sampling models estimate density by averaging the number of individuals observed/amount of area sampled during each 10-minute timestep. Density is then estimated by determining the mean value of individuals/area sampled across all timesteps. For both space-to-event and instantaneous sampling models, density can be multiplied by the area of inference (e.g., GMU) to obtain an estimate of abundance. Researchers are still working on refining the most appropriate approach for accurately estimating viewshed areas as conditions change and calculating confidence intervals for estimates from both of these models.

Both predation and human harvest can limit elk population abundance but yearly differences in weather (e.g., drought, snow, etc.) can also have a large influence on elk populations (Lukacs et al. 2018; Wang et al. 2002). Elk calves are particularly vulnerable to severe winter weather conditions (Horne et al. 2019; Lukacs et al. 2018). IDFG staff are building survival models for elk calves from 6–12 months of age to identify the most informative weather covariates. These covariates include multiple indices of severe winter weather and vegetative growing conditions from the previous summer. Winter covariates tested

to date include median and max snow depth, snow duration, and several winter severity metrics that incorporate snow depth and temperature (Baccante et al. 2010; DelGuidice et al. 1995). Summer covariates include several indices meant to capture variation in the growing season, mainly by quantifying attributes of curves fitted to weekly values of the normalized difference vegetation index (NDVI; Hurley et al. 2014). Initial modeling results indicate that no single winter weather metric effectively captures the influence of weather on elk calf survival. Researchers are now building more complex models with multiple interacting covariates to increase our ability to predict elk calf survival.

In collaboration with Speedgoat, a software development company (Nowak et al. 2017), IDFG is developing an integrated population model (IPM) for elk (Besbeas et al. 2002; White and Lubow 2002). An IPM links multiple data sources within a population model. Thus, there is a level of dependency among data sources in that vital rates, such as survival and recruitment, must be congruent with changes in abundance and population growth. Inevitably, some amount of observation error (i.e., the difference between an estimate of a measurement based on a sample and the true measurement) occurs for every data source IDFG collects, but the IPM framework is able to identify and correct for some of that error. As researchers continue to develop the structure of the IPM, IDFG staff have focused extensively on improving our methods to estimate important population parameters needed to fit the model. These include improving estimates of composition (age and sex structure) and abundance in forested landscapes using cameras, building models to understand the influence of annual changes in weather on calf and cow survival, and better understanding the effects of hunting and other species on elk population dynamics.

Multi-predator, Multi-prey Dynamics

Investigators are continuing research on predator-prey dynamics in the Panhandle and Clearwater regions as a part of a collaboration with the University of Idaho and University of Montana. The objectives of this research are to evaluate potential indirect effects between prey species, such as apparent competition, and direct effects between predator species, with potential cascading effects on prey populations. Preliminary results indicate that mountain lions are the primary predator of white-tailed deer in northern Idaho and that wolf predation on deer is relatively small. However, given the abundance of deer in northern Idaho, wolves might still rely on deer as their primary food source, and deer might maintain wolf abundance at a level that leads to high predation of less numerous (in comparison to deer) elk. IDFG researchers are currently examining wolf and other predator (mountain lion, black bear, coyote, and bobcat) diets to evaluate the contribution of deer, elk, and other prey species to predator diets. Researchers are also working to understand how predator species influence each other and the downstream effects of predator-predator interactions on prey, including elk. Ultimately, IDFG plans to combine these different sources of information in a community model to better understand multi-predator, multi-prey dynamics in northern Idaho.

Human Dimensions

IDFG regularly conducts hunter opinion surveys to provide wildlife managers with improved knowledge on the preferences and desires of Idaho sportsmen and women. Since the development of Idaho's previous Elk Management Plan, IDFG and the University of Idaho have partnered to conduct a number of surveys and produced findings that provide new and meaningful insight into elk hunting seasons and hunters opinions, preferences, and satisfaction. IDFG researchers made significant contributions to these efforts with investigations that will directly improve elk management and hunting opportunities.

Hunter Congestion — Since 2019, IDFG has partnered with the University of Idaho to conduct statewide surveys with resident elk hunters about crowding and congestion (Wallen 2021, Wallen 2022, and Wallen 2022a). In total, 10,886 resident hunters who purchased an over-the-counter elk tag for the general season were surveyed (4,841 in 2019; 3,634 in 2020; 2,411 in 2021). For elk hunters, the average rating of crowding across all three years was 5.7 on a 9-point rating scale (1 = not at all to 9 = extremely), with no significant difference between years or A/B tag hunters. Elk hunters rate crowding higher than white-tailed deer (4.7) hunters but lower than mule deer hunters (6.1). From another perspective, 18% of elk hunters believe crowding is not an issue. Of those who believe it is an issue, 60% believe it is caused by other hunters and 22% by access challenges.

Consistent across all survey years and hunter demographic categories, was a belief that there are more hunters on the landscape now than in the past. Similarly, across all survey years and demographic categories, was a perception that public lands are more crowded than private lands. In relation to satisfaction, findings suggest there is a slight negative correlation between crowding and satisfaction. In other words, as crowding goes up, satisfaction slightly goes down. Moreover, satisfaction was higher among hunters who harvested game but the relationship between crowding and satisfaction did not change based on whether the hunter harvested.

Satisfaction — As part of IDFG's crowding and congestion surveys (2019-2022), researchers also asked hunters about their opinions, preferences, and satisfaction. Resident elk hunters' satisfaction with their overall elk hunting experience remained consistent during the current survey (2019-2022) compared to the 2012 statewide elk hunter survey. From 2019-2022, satisfaction ranged from 2.9-3.1 on a 5-point scale (*very dissatisfied* 1 - 5 *very satisfied*) while satisfaction averaged 3.1 on a 5-point scale in 2012.

In addition, an important component of satisfaction is the alignment of expectations; in this case, hunters' opinions about important features of a hunting experience and to what extent they experienced those features of the hunting experience. For the 2019-2021 elk general seasons, an analysis was conducted to understand the relationship between the experiences hunters rated as important (*not at all important* 1 - 5 *extremely important*) and the extent to which they actually experienced those features (*not at all* 1 - 5 *very much*). Findings suggested a majority of features hunters rated as important to their satisfaction were not often experienced when they elk hunt; these include seeing legal bulls in the field, seeing cow elk in the field, seeing trophy bulls in the field, shooting at a legal bull, shooting at an adult bull, and filling my tag. These findings were consistent across the 2019, 2020, and 2021 general elk seasons, with little to no variation observed across seasons. The results of this research provide a starting place for managers in their conversations with the public during the season setting process and has aided in the development of the elk zone population objectives established in this plan.

Access — As part of IDFG's access research from 2019 to 2023, multiple data collection efforts have been conducted to understand hunters' perceptions of and experiences with access. Based on surveys of the 2019-2021 elk general seasons, hunters perceive their access to huntable lands has declined slightly, rating access to public land at 2.5 and private land 2.2 on average (*much less access* 1 - 5 *much more access*). These findings informed a policy brief published by the University of Idaho, Policy Analysis Group and initiated a large-scale qualitative study to understand hunters' experiences with access and connotations of access (Wilson and Wallen 2021). Results of that study indicate Idaho big game hunters view access in similar and contrasting ways, and further define the diversity of Idaho's *access landscape* to better inform on-the-ground management and planning (Robinson and Wallen 2023).

Economics of Elk Hunting

Elk provide significant value to the state's economy. Elk hunting directly benefits the state's economy and elk management and habitat conservation benefit the outdoor recreation and tourism industries. In 2020, Idaho hunters spent $666 million on hunting-related purchases (Sportsmen's Alliance Foundation 2020). This resulted in a multiplier effect on the state's economy of $981 million and provided $442 million to Idaho's GDP, generated 9,300 jobs, and provided $50 million in state and local tax revenue.

IDFG's mission is to preserve, protect, perpetuate, and manage all of Idaho's fish and wildlife resources for the benefit of Idaho's citizens. IDFG does not receive general fund tax dollars and the sale of licenses and tags provide critical funding to carry out its conservation mission. Elk hunting is a primary revenue generator for IDFG that in turn supports the management of many other species. Elk are one of IDFG's most highly sought after big game species, second only to deer, but is the highest revenue-generating species. Each year, approximately 107,000 hunters spend $10 million on elk tags. This accounts for 49% of all tag-revenue and 18% of all license-and-tag-revenue generated by IDFG.

Nonresident hunters play an important role in this funding. While nonresident elk hunters represent only 13% of Idaho's elk hunters, they generate 83% of the elk tag-revenue. Overall, the sale of nonresident licenses and tags account for 55% of the IDFG's license-and-tag-revenue (FY2022). In recent years, nonresident demand for elk tags has exceeded the number of tags available to nonresidents, while resident demand has remained stable with a slight upward trend. This demand is expected to continue.

IDFG's programs to conserve habitat and manage elk populations also benefit other wildlife species. Travel and tourism is Idaho's third largest industry and outdoor recreation is a primary draw for tourists to Idaho. Wildlife and healthy wildlife habitat are critical to the outdoor recreation experience. While it is difficult to quantify, Idaho's outdoor recreation and tourism industry benefit from IDFG's wildlife, habitat, conservation, and access programs. Every 5 years, the U.S. Fish and Wildlife Service and U.S. Census Bureau produce a summary report on the economics associated with *Wildlife Watching*. In the latest report containing state-specific summaries released in 2011, an estimated 281,000 nonresident tourists and 439,000 Idahoans participated in wildlife watching activities across the state and spent over $432 million in trip expenditures (U.S. Department of the Interior 2011). This does not account for inflation or the growth experienced by the Idaho tourism industry since the report's publication. In part, this aided Idaho tourism to have its highest revenue generating year (FY2022) on record with a 39% increase year-over-year for its 2% lodging tax. These numbers are expected to continue and are critically important to Idaho's economy—especially in rural communities.

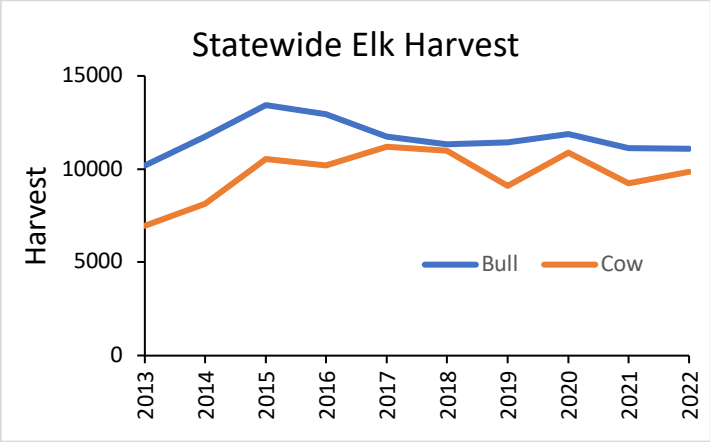
Elk hunting also benefits rural Idaho communities, and supports Idaho's economy, through the outfitting industry. Idaho outfitters provide an important service to elk hunters, especially nonresident hunters, and contribute a vital economic stimulus to the state. Annually, outfitted elk hunters spend more than $1.3 million on hunting licenses and elk tags. The Idaho Outfitting and Guides Licensing Board is the agency responsible for regulating the outfitting and guiding industry. Currently 117 outfitters are licensed for elk hunting in 83 of the state's 99 GMUs.

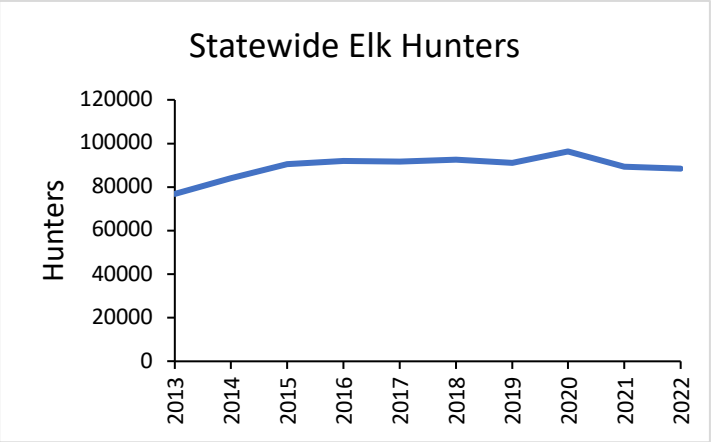
Statewide Management Direction

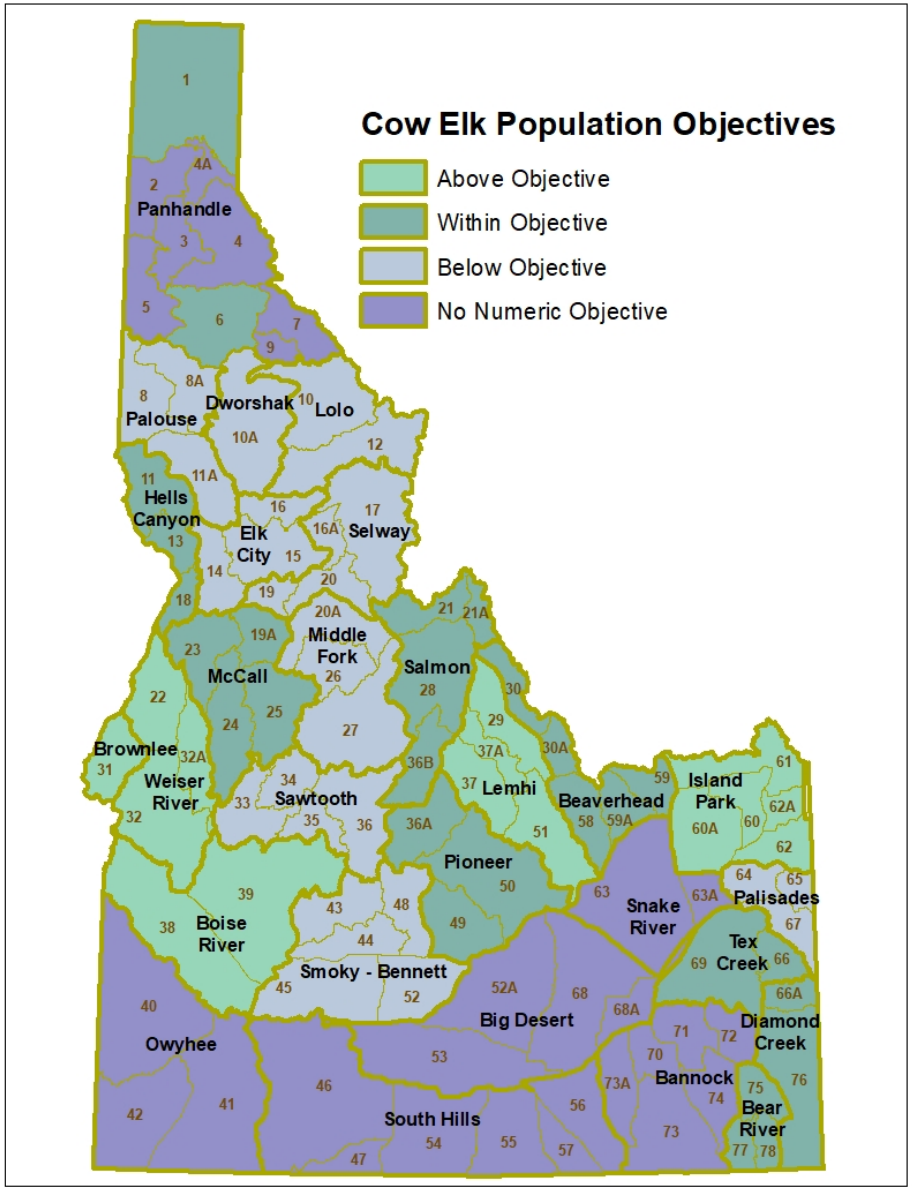
Proposed 6-year Statewide Management Direction:

- Continue to offer general-season elk hunting opportunities where sustainable by managing elk populations, predator populations, and improving elk habitat.
- Work with partner organizations and interested private landowners to support the movement of elk between seasonal ranges, improve forage resources, and manage disturbance.
- Implement measures to reduce elk-caused crop and property damage.
- Manage disease impacts on elk and livestock.
- Increase public knowledge and understanding of elk ecology and management by enhancing outreach and education efforts.
- Pursue methods to improve public participation and the use of public survey data in the elk management process.

Statewide elk management direction (Table 6) is tiered down from the 2015 IDFG Strategic Plan and provides higher resolution for management objectives, accounting for stakeholder desires, agency resources, and resource opportunities and challenges. Current status of each elk zone population objective is pictured in Figure 11. The management direction tables in each of the proceeding elk zone summaries detail important strategies to fulfill management directions that are most influential in each respective elk zone. These strategies will form the foundation for future annual work plans, performance evaluations, and budget requests.







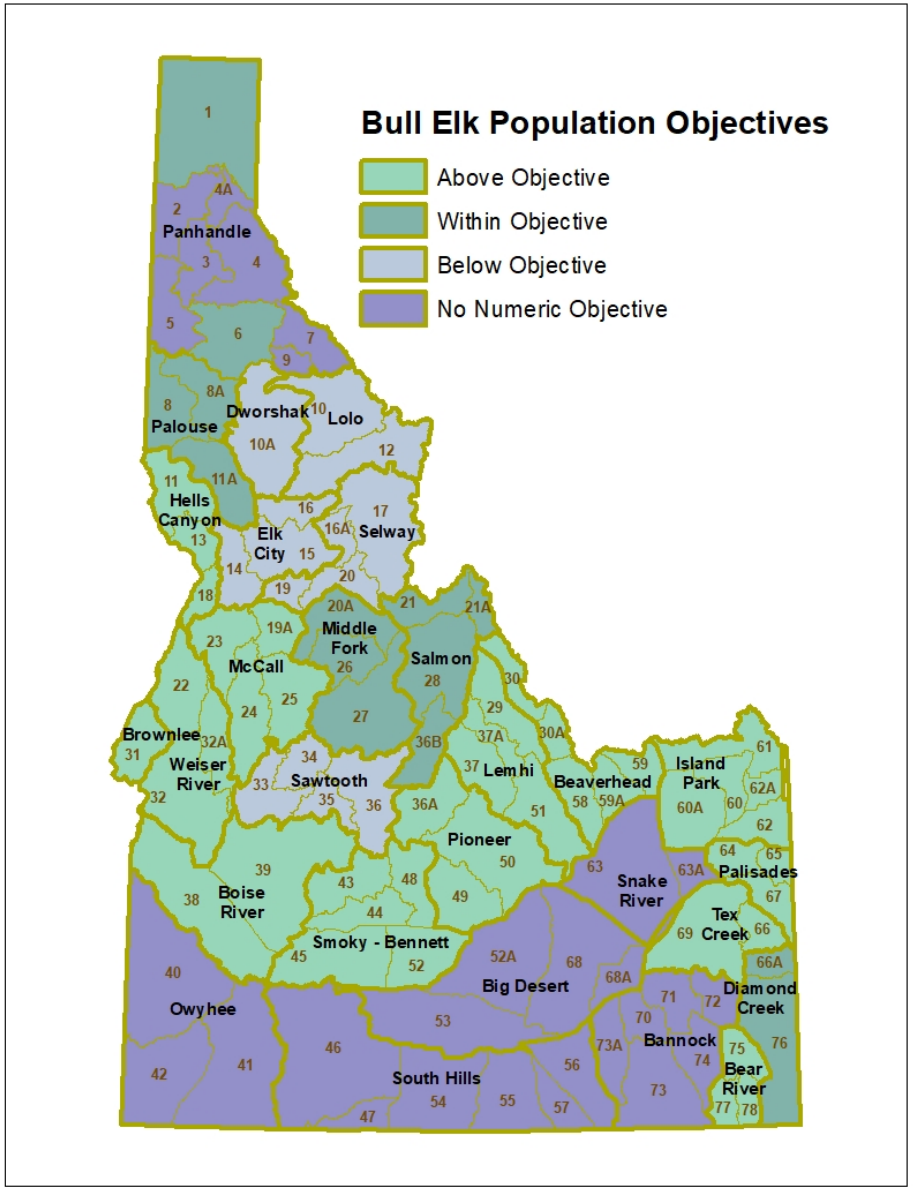


Figure 11. Population objective status by Idaho elk zone, 2023.

Table 6. IDFG Strategic Plan (2015) objectives and corresponding elk management directions.

Objective	Elk Management Direction
Maintain or improve elk populations to meet the demand for elk hunting.	When zones are meeting objectives, actively manage elk populations commensurate with habitat capabilities to maximize reproductive performance and overall herd health. When zones are exceeding objectives provide additional harvest opportunity. When zones are below objectives, identify limiting factors and when appropriate implement management actions or efforts to address the identified limiting factors. Develop an elk monitoring program that includes modeling or monitoring zone population abundance during years between surveys. Develop biological studies to improve population, predator, and habitat management capabilities. Implement measures to minimize, eliminate, or compensate for elk depredations.
Provide a diversity of elk hunting opportunities.	Assess hunter desires for different types of elk hunting opportunities. Provide annual elk hunting opportunities. Provide a diversity of hunting opportunities, including socially desirable and biologically sustainable levels of antlerless and mature bull opportunity. Enhance and maintain access for elk hunting.
Improve citizen involvement in the decision-making process.	Pursue methods to increase and improve public participation in the elk management process. Improve implementation and use of human dimension and public survey data to inform elk management decisions. Provide timely feedback on decisions to the public.
Increase the capacity of habitat to support elk.	Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives. Improve awareness and inclusion of elk habitat effectiveness in land management activities on public and private lands.

Objective	Elk Management Direction
	Find new ways to efficiently and effectively monitor habitat. Integrate habitat assessments in the development of elk population goals. Continue IDFG involvement in long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve elk habitat. Collaborate with federal and state agencies, Native American tribes, counties, nonprofit organizations, private landowners, and others to incorporate important elk habitat and migration routes into management decisions.
Work towards minimizing the impacts of wildlife diseases on elk populations, livestock, and humans.	Minimize the influence of disease as a limiting factor in elk populations by instituting management actions to limit disease spread and prevalence. Collaborate with ISDA, state and federal agencies, and private producers to minimize interactions between elk and livestock. Minimize artificial concentrations of wintering elk and translocation of elk from areas that are positive for chronic wasting disease.
Increase public knowledge and understanding of elk populations, hunting, and management.	Increase public understanding of elk ecology and management by improving or enhancing outreach and education efforts.

Elk Management Zones

Statewide direction and guidance for elk is shown in Table 6. However, elk management strategies and priorities may be different at the zone level due to variation in population dynamics, agricultural considerations, habitat condition, hunter characteristics, and social attitudes. This elk plan provides population management direction for each zone based on hunter preferences, elk conflict concerns, and status of elk populations. IDFG has drafted elk management zone objectives for the next 6 years based on hunter input, harvest trends, recent aerial survey results, current elk population status, damage and depredation issues, and biological potential for herd growth when considering primary limiting factors. As part of IDFG's evaluation, staff considered factors such as weather, predation, social carrying capacity, and habitat that might limit the ability to maintain or increase elk numbers in each zone. IDFG also evaluates harvest and hunter trends both at the statewide level and zone level.

The following zone-specific management tables provide specific priorities, management directions, and strategies to be implemented and/or focused on at the zone level. Proposals to manage populations are based on elk movement and other biological data, similar habitat types, and similar management priorities. The zone management system has been in place since 1998. Included in this revision of the elk plan are several modifications to zone boundaries which were made to address emerging issues and to facilitate more effective management. Zones affected by these modifications include the Big Desert, Snake River, Boise River, and Owyhee Zones. These changes maintain a total of 28 elk management zones (Figure 12).

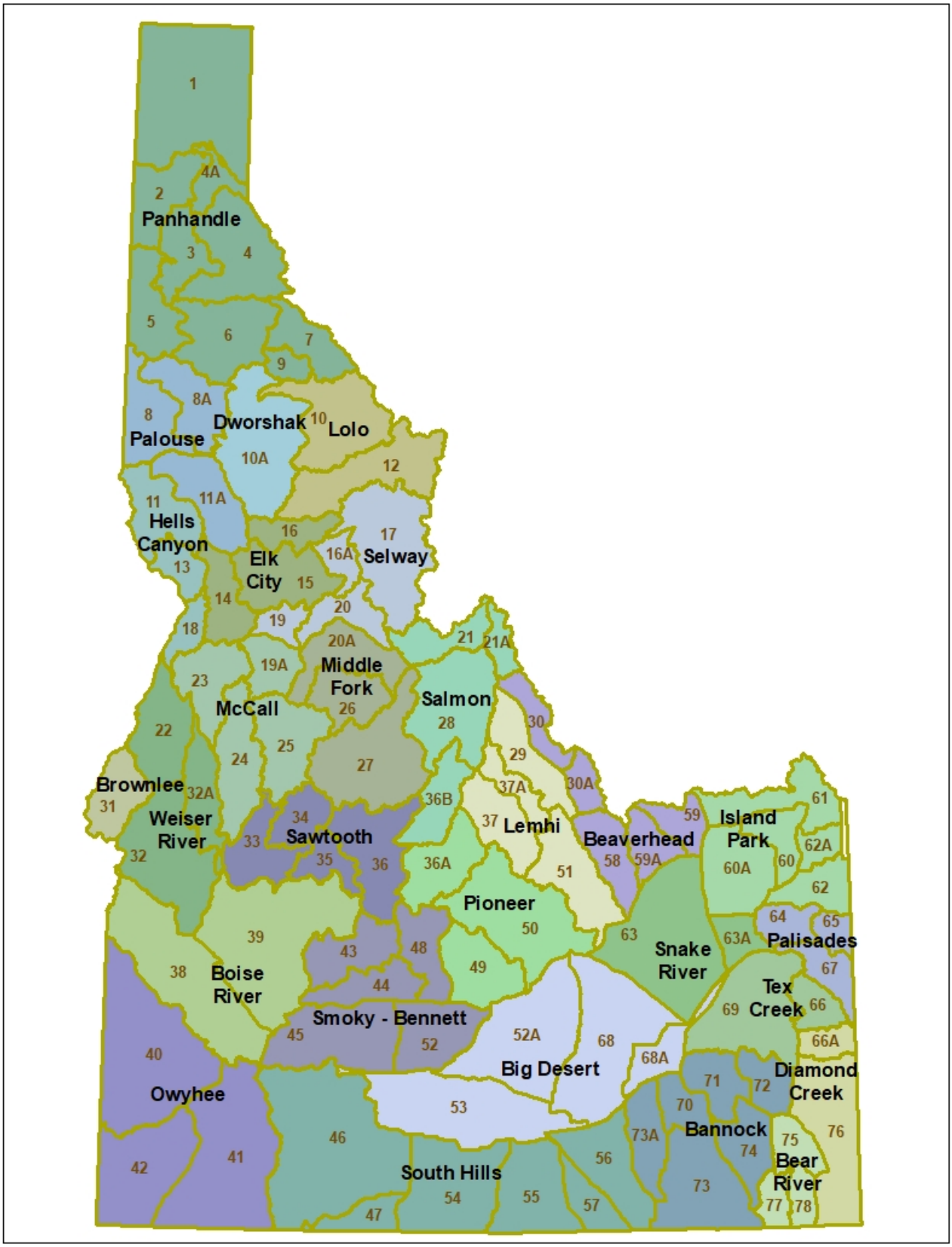


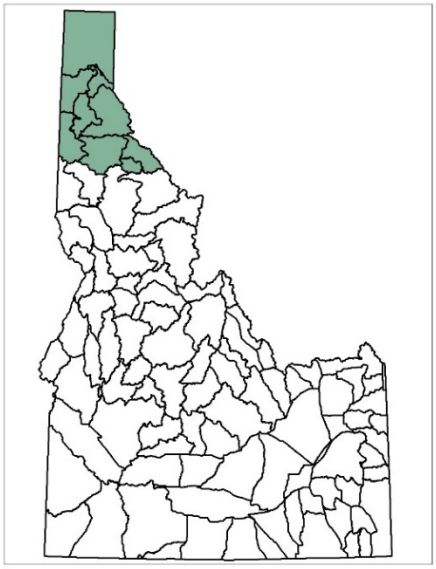
Figure 12. Elk management zones, Idaho, 2023.

Panhandle Zone

Game Management Units 1, 2, 3, 4, 4A, 5, 6, 7, and 9

Administered by IDFG's Panhandle Region

Proposed Six-Year Management Direction:



- The performance and management of the Panhandle Zone is influenced by landscape-level habitat trends, predation, and depredation issues, although the impact of these limitations vary among GMUs.
- The current population management direction in the Panhandle Zone is to stabilize and maintain elk populations on private lands while continuing to address depredation issues as they arise. On public lands, management direction is to increase elk populations commensurate with available habitat.

Description: The Panhandle Zone is the largest elk zone in the state, encompassing 9 GMUs. Much of the zone is characterized by closed-canopy forest dominated by fir, hemlock, cedar, pine, larch, and spruce species. While much of the habitat is under federal management, private timber companies and the State of Idaho also own a significant portion of the Zone. Agricultural fields are common throughout lower elevations of the Kootenai Valley, Silver Valley, Minaloosa Valley, the Palouse, and the Rathdrum Prairie while suburban developments continue to expand through the zone.

The following 6-year population goals for Panhandle Zone units were developed through review of harvest data, demographic trends, and population estimates from remote cameras where available. For more information on how estimates were calculated, see the Population Monitoring section (pg. 69).

GMU 1: This unit leads the zone in agricultural depredation issues and management is focused on addressing those issues through harvest, while encouraging the growth of elk on public lands. Elk on federal lands within the GMU are likely impacted by declines in habitat quality in certain areas. Predation also has an impact on population performance in this unit. Elk harvest has fluctuated with changes to general and controlled hunt structure over the past decade. The 6-year goal is to retain a stable population on private lands and continue to address landowner conflicts as they arise, while encouraging an increase on public lands as habitat availability and quality allows.

GMUs 2 and 5: These units encompass substantial amounts of private land, which results in agricultural depredation issues that limit the potential for significant elk population growth and expansion. The amount of private land also complicates hunter access in some areas. Elk harvest trends indicate a stable population. The 6-year goal is to maintain the elk population at near-current levels, while addressing landowner conflicts where they arise.

GMU 3: This unit is a mix of private land and USFS lands which support a high density of hunters and harvest. High hunter numbers make it a priority to maintain elk herd productivity while managing agricultural conflicts. The 6-year goal is to maintain elk numbers on private lands while encouraging herd productivity on public lands.

GMUs 4 and 4A: A portion of GMU 4 was surveyed between 1998 and 2012 to monitor trends in population size. While this trend data is no longer collected on an annual basis, a portion of the trend area was surveyed in 2023 and found a calf ratio of 31:100 cows. Harvest data indicate Units 4 and 4A elk populations have likely declined in recent years. Predation, especially mortality attributed to mountain lions, has had a significant impact on elk calf survival in parts of

Units 4 and 4A. The 6- year goal is to increase population levels in these units. Effecting a population increase will also require addressing habitat quality as decreasing forage production, due largely to the predominance of closed canopy forest, has likely contributed to elk population suppression and declines. These GMUs are largely made up of public land with the majority managed by the USFS.

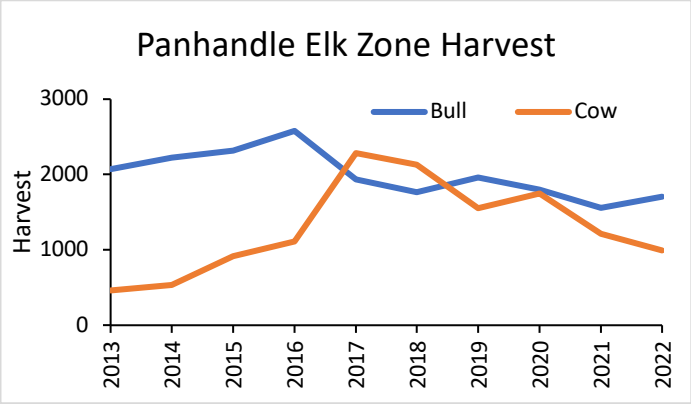
GMU 6: This unit includes extensive private timber lands in the western portion and predominantly USFS lands on the eastern end. Large tracts of actively managed forests on private timber lands tend to be more productive for elk populations when compared to older forest stands often occurring on USFS lands. The high road density and prevalence of clear cuts on the private timber lands contribute to high elk vulnerability. The GMU has relatively high hunter density and harvest. Percent 6+ pts in the harvest has declined over the last 10 years while overall harvest has shown a slight increasing trend. The 6-year goal is to maintain elk numbers.

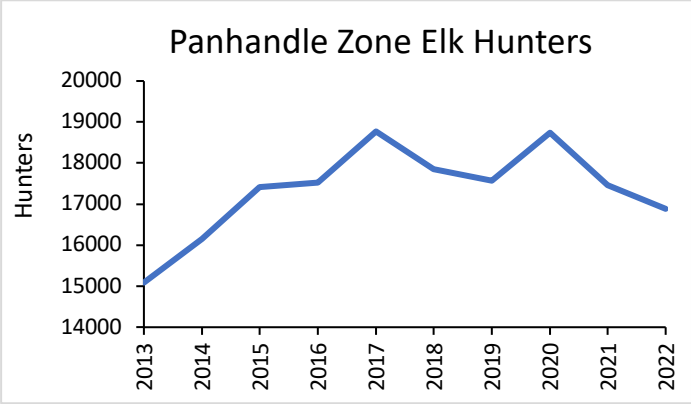
GMUs 7 and 9: These units are the most remote, roadless units in the zone. As timber harvest on USFS lands has slowed in recent decades, habitat has trended towards less productive mature stands, which have likely contributed to declines in elk numbers. Additionally, predation from black bears, mountain lions, and wolves affect elk survival. IDFG's goal is to increase the elk populations in Units 7 and 9 significantly; however, change will be a slow process due to the low calf ratios observed in the most recent surveys and the fact that habitat quality is a primary factor in the decline of elk densities. The 6-year goal is to increase elk numbers in these units.

Inter-Zone and Intra-Zone Dynamics: Due in part to the large nature of the Panhandle Zone and the relatively localized seasonal movements of our elk herds, there are not significant interactions between Panhandle herds and herds in adjacent elk zones. However, if general hunting seasons are capped in adjacent elk zones, the potential impact to hunter distribution within the region may need to be addressed. Additionally, while seasonal movements are limited in scale, exchange of animals across the Montana border raises potential disease concerns as CWD has been detected in adjacent Lincoln County, MT. Within the zone, management needs vary due largely to differences in land use and the resulting challenges and opportunities each present as detailed above in the GMU descriptions. Focusing antlerless opportunity on areas experiencing depredations has been a useful response tool for managers to address within-zone variation.

Future Needs: IDFG has developed preliminary camera-based elk abundance estimates in GMUs 1 & 6. In these two GMUs, we used trail cameras to estimate summer (August 1) elk abundance (2021-2022; see Elk Monitoring Techniques). We estimated that there were ~8,000 elk in GMU1 and ~11,000 elk in GMU6. These estimates are summer, pre-harvest abundances and, consequently, are not directly comparable to winter aerial survey abundance estimates seen in other regions because elk die from both harvest and natural causes in between those two survey time periods. This camera-based methodology for producing abundance estimates, however, is currently in the research and development phase. As the camera-based population estimation method is further refined, IDFG will continue to expand monitoring efforts to unsampled units. Efforts in support of land management practices beneficial to elk productivity will also continue. See the following Panhandle Elk Zone Population Management Objectives table for GMU-specific objectives. We developed these preliminary, pre-harvest objectives using harvest information, survival data, and the available camera-based population estimates.

Panhandle Elk Zone Population Management Objectives	
GMU	**Total Population**
1	6,500 – 9,700
6	9,300 – 11,000


Panhandle Elk Zone Harvest
Bull
Cow
Harvest
3000
2000
1000
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022


Panhandle Zone Elk Hunters
Hunters
20000
19000
18000
17000
16000
15000
14000
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022

Panhandle Elk Zone Management Table	
Management Direction	Strategy
When zones are below objectives, aggressively manage elk and predator populations, and improve habitat capabilities.	Where predation is a prominent limiting factor, manage lions, wolves and black bears near the low densities indicated within those respective species management plans and the Panhandle Zone Predation Management Plan and encourage habitat management actions to benefit elk through improved forage resources and reduced vulnerability.
Develop an elk monitoring program that includes modeling or monitoring zone population abundance during years between surveys.	Use remote camera-based methods to develop abundance estimates and expand to unsampled units to establish a long-term monitoring rotation.
Develop biological studies to improve population, predator, and habitat management capabilities.	Continue development and expansion of camera-based methods of ungulate abundance and composition estimation and predator abundance, and the influence of silvicultural practices on elk habitat quality. Utilize abundance estimates generated by camera-based methods to develop numeric population management objectives for the Zone.
Provide a diversity of hunting opportunities, including socially desirable and biologically sustainable levels of antlerless and mature bull opportunity.	Provide general either-sex hunting opportunity where sustainable.
Improve key summer, winter, and transitional habitat on public and private lands that provide for elk populations to meet statewide objectives.	Contribute funding/in-kind to implement treatments of elk summer or transitional range to early successional habitat including: • 5,000 acres of vegetation treatments through natural or prescriptive burning in the greater Snow Peak area within and cooperatively with St. Joe Ranger District Encourage, engage with, and provide technical support to USFS, BLM and IDL as well as larger landowners and private timber companies on vegetation management projects that benefit elk habitat, such as prescribed fire, forest stand thinning, variable retention harvest, the creation of early seral habitat, and noxious weed control projects. Engage with public land management agencies to encourage allowing wildland fires to burn, where elk habitat is improved and when compatible with other land use priorities and management objectives.
Increase IDFG involvement in long and short-term land-use planning efforts by providing information, analysis,	Maintain a map of area priorities for elk habitat improvement projects on public ownerships. Incorporate

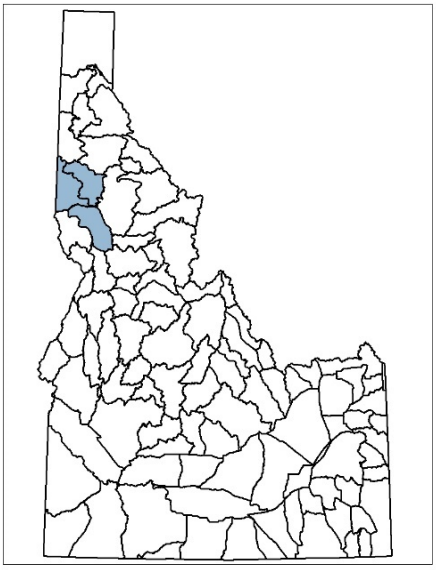
and recommendations to improve and preserve elk habitat.	new products, such as elk nutrition models and fine scale vegetation mapping to refine the priority map. Continue IDFG involvement in all aspects of long-term, landscape-level projects that affect elk habitat on public lands within the Panhandle Zone. With an emphasis on summer and transitional range, promote timber harvest, prescribed burns, and wildland fire use on public and private corporate lands and focus management efforts in areas that would most benefit elk habitat.
Work to enhance and maintain access for elk hunting.	Assist landowners enrolled in Large Tracts Access Program and corporate timber managers to maintain some motorized access while providing elk security. Continue to provide enforcement of the companies' motorized access management plan on Large Tracts and Forest Legacy parcels under Idaho Code 36-126.
Collaborate with federal and state agencies, Native American tribes, counties, nonprofit organizations, private landowners, and others to incorporate important elk habitat and migration routes into management decisions.	Continue to implement the Idaho Action Plan with a focus on Priority Areas within the zone. Provide technical assistance to partners regarding impacts of proposed projects on elk habitat and movement and migration routes. Collaborate with county, state, federal, tribal, and NGO partners, as well as private landowners to improve movement and migration habitat and mitigate barriers as opportunities arise.

Palouse Zone

Game Management Units 8, 8A, 11A

Administered by IDFG's Clearwater Region

Proposed Six Year Management Direction:



- The performance and management of the Palouse Zone is currently limited or influenced by social tolerance and agricultural impacts.
- Current population management direction in the Palouse Zone is to maintain elk populations within management objectives.

Description: A majority of the landownership in the Palouse Zone is private and characterized by two major land uses: agriculture and timber production. Interspersed publicly held lands managed by the State of Idaho, BLM, and USFS provide moderate opportunities for public access and are most prevalent along the northeastern portion of the zone adjacent to Dworshak Reservoir. Road densities are high and contribute to moderate-to-high big game vulnerability to harvest throughout the zone, particularly on public lands. Habitat conditions are favorable for elk due to high-quality agricultural crops and timber harvest, at the expense of increased depredation issues and harvest vulnerability.

Historical Perspective: In the early 1800s, records from Lewis and Clark noted few elk scattered along the Clearwater River reach. During the early 1900s, wildfires burned vast portions of the region converting dense forests into brush fields. These brush fields provided greater forage resources for elk and stimulated increases in elk populations which peaked around 1950. Following this peak, landscape changes resulted in elk population declines. Brush field maturation and reduction in forage quality and quantity, timber harvest and associated road construction increasing elk vulnerability to hunter harvest, and loss or conversion of winter range habitats resulted in declining elk populations. Population declines triggered the replacement of an either-sex elk hunting season with an antlered-elk only season beginning in 1976. This change, the productive nature of the Palouse Zone, and expanding agricultural resources contributed to elk population rebounds. Elk numbers reached a new peak in the late 2000s and have gradually decreased since that time. Because of the high levels of agricultural production in the Palouse Zone, elk are intensively managed to reduce depredation conflicts with private landowners. The Palouse Zone has and continues to provide general hunting opportunities for the public, in addition to an early-season, antlerless-only hunt focused on private agricultural lands to help alleviate depredation conflicts.

Management Challenges and Opportunities: Elk population objectives for this zone include maintaining cow and bull objectives while balancing social tolerance for elk associated with agricultural depredations. Since 2009, reducing the Palouse elk populations to minimize conflicts stemming from agricultural depredations has been the objective. To manage agriculture depredations, we plan to maintain harvest opportunity and continue long elk hunting seasons to sustain dispersed pressure on elk in agricultural areas. Overall harvest will continue to be closely monitored to ensure populations do not fall below objectives. Additionally, Fish and Game staff will work closely with area landowners to develop and implement collaborative approaches to addressing elk depredation problems.

Inter-Zone and Intra-Zone Dynamics: Although this zone provides productive habitat for elk population growth, management efforts will continue to be directed at minimizing agricultural depredations. The most recent elk aerial survey (2016) suggested a significant decline from the previous aerial survey in 2009 (2,041 to 1,101 total elk). However, that decline was not reflected in the fairly stable trend in bull elk harvest over that same timeframe and bull elk abundance from the 2016 aerial survey does not equate with bull elk harvest the subsequent hunting season. Possible

explanations for the discrepancy between the aerial survey and harvest include elk movements in/out of the zone created a mismatch between elk available for harvest in fall and abundance estimation in winter, winter conditions and/or elk distribution (e.g., more elk in dense timber or more widely distributed) led to an underestimate of elk during the aerial survey, or some combination of both.

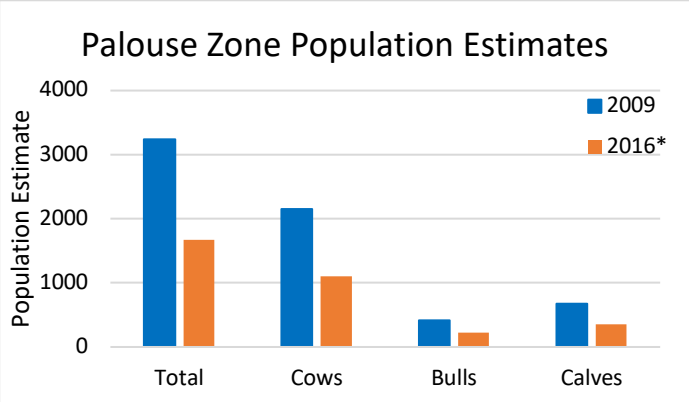
Future Needs: Over the next six years habitat improvements will be targeted to produce high quality nutritional resources located further from the agricultural interface and open motorized access. Treatments will be prioritized by methods designed to result in high nutritional response. A priority for this zone is to assess how silvicultural practices and land-use planning influence elk populations. Additionally, we will continue to work to improve our understanding of elk dynamics in this area and improve population estimates for this landscape.

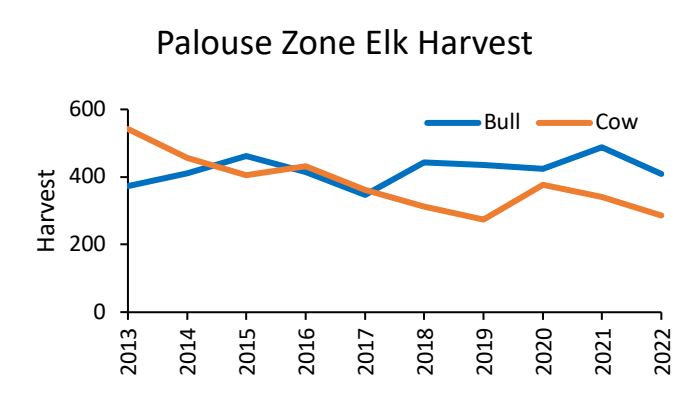
Palouse Elk Zone Population Management Objectives			
	Cows	**Total Bulls**	**Branch Antlered Bulls**
Management Objective Range	**1,125 – 1,725**	**115 - 415**	**NA**
Current Status (2016)	**1,101**	**220**	**98**

Color indicates where survey estimates are relative to management objectives:

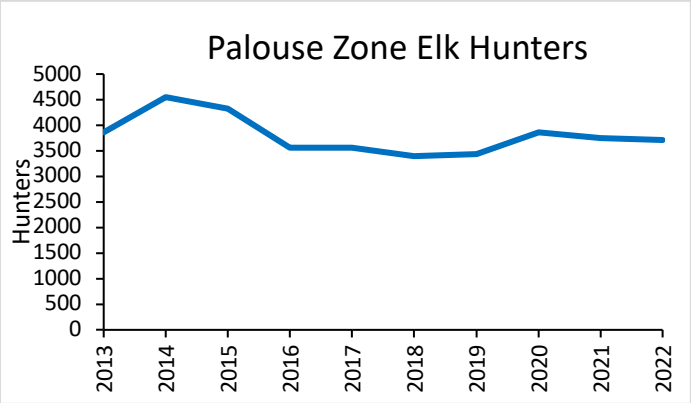
black = within; red = below; blue = above

Palouse Zone Population Survey Estimates (Units 8 and 8A Only)										
Year	**Cows**	**Calves**	**Total Bulls**	**Spikes**	**Raghorn Bulls**	**Mature Bulls**	**Unclassified Elk**	**Total Population**	**Calves per 100 Cows**	**Bulls per 100 Cows**
2016	**1,101**	**353**	**220**	**122**	**85**	**13**	**289**	**1,963**	**32**	**20**
2009	**2,041**	**642**	**364**	**247**	**94**	**23**	**42**	**3,089**	**31**	**18**





***Survey from 2016 only includes Game Management Units 8 and 8A. Game Management Unit 11A was not included in the 2016 survey.**



Palouse Elk Zone Management Table	
Management Direction	Strategy
Implement measures to minimize, eliminate, or compensate for elk depredations.	Maintain harvest opportunity with long elk hunting seasons to sustain dispersed pressure on elk in agricultural settings. Work collaboratively with area landowners to prevent and/or minimize elk depredations on agricultural areas through the Fish and Game depredation program. Continue using standard procedures to monitor and estimate big game damage on agricultural products. Work with professionally licensed crop adjusters to ensure the accuracy of big game damage measurements.
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Develop a method to prioritize habitat management activities based on summer elk nutrition potential. Promote well-designed, early seral habitat improvement projects using information on elk use and seasonal movements. Work with land managers to improve post-harvest treatments to maintain early seral habitat communities in moderate to high nutritional capacity areas.
Improve awareness and inclusion of elk habitat effectiveness in land management activities on public and private lands.	Develop a method to prioritize habitat management activities based on elk habitat effectiveness. Work with the Nez Perce-Clearwater National Forests to create landscapes that produce high nutritional resources for elk away from open motorized access routes and agricultural lands. Treatments should be accomplished with methods designed to result in high nutritional response.
Increase IDFG involvement in long- and short-term land-use planning efforts by providing information, analyses,	Seek opportunities to use Good Neighbor Authority and other shared stewardship programs to support

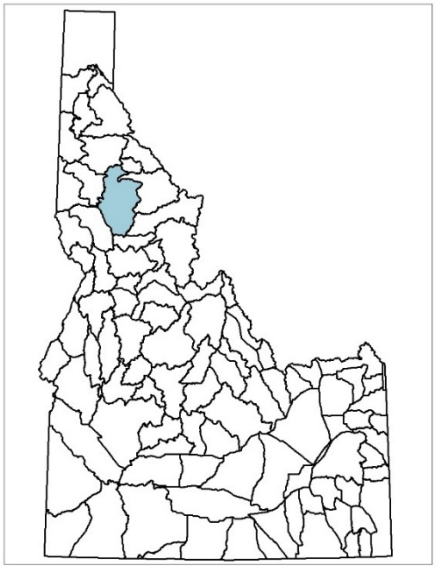
and recommendations to improve and preserve elk habitat.	restoration activities on federal forests and adjacent lands. Maintain participation on Nez Perce-Clearwater National Forests interdisciplinary teams to provide technical assistance and guide vegetation management projects to improve elk habitat. Assess how silvicultural practices and land-use planning influence elk forage resources and habitat use.

Dworshak Zone

Game Management Unit 10A

Administered by IDFG's Clearwater Region

Proposed Six Year Management Direction:



- The performance and management of the Dworshak Zone is currently limited or influenced by predation, vulnerability to harvest, and habitat.
- Current population management direction in the Dworshak Zone is to increase elk populations to meet management objectives.

Description: The Dworshak Zone is characterized by mixed landownership, high road densities, and correspondingly high elk vulnerability to harvest. The Dworshak Zone is approximately 75% timberland and 25% open or agricultural lands and is bisected by canyons leading to the Clearwater River. High road densities and heavy ORV use provide unique and popular hunting opportunities in the Clearwater Region.

Historical Perspective: Historically, elk were scattered, and numbers were low in this area. In the early 1800s, Lewis and Clark found few big game animals along the Clearwater River. Low elk density was at least in part due to the dense, unbroken forest canopy that covered most of the area, leading to low elk forage availability and quality. Wildfires burned over vast expanses near the beginning of the twentieth century, creating vast brush-fields that provided abundant forage for elk. Elk numbers increased following this habitat improvement, with elk abundance peaking around 1950. Elk abundance then declined into the 1970s, partially due to maturation of brush-fields and declines in forage availability, logging and road-building activity that increased vulnerability of elk to harvest under the liberal hunting seasons of the time, and loss of some significant winter range habitat due to the creation of Dworshak Reservoir. In response to declines in elk numbers, either-sex hunting was replaced with an antlered-only general hunting season in 1976. The elk population rebounded and then remained relatively stable, despite the addition of wolves to the predator suite in this zone and relatively high elk harvest. Elk abundance in the Dworshak zone peaked again in 2011 with an estimated 5,787 elk. An early controlled antlerless hunt with 25 tags was added in 2010 to manage increasing agriculture depredations by elk. In 2019, these controlled hunts were combined and converted to a Landowner Permission Hunt (LPH) as an extra elk tag with a total of 75 tags. In 2021, those tags were reduced (75 to 40) and the extra elk designation was removed. Additionally, a similar controlled hunt was added with 40 tags. These changes were made to incentivize harvest where there were ongoing depredations and provide opportunity outside of the LPH framework.

Management Challenges and Opportunities: Corporate timber lands make up a significant portion of the elk habitat in the Dworshak Zone. Regional staff will continue to work with corporate timber managers to retain adequate motorized public access, while enhancing elk security. Habitat improvements will be targeted to produce high quality nutritional resources located further from open motorized access. Treatments will be prioritized by methods designed to result in high nutritional response. Additionally regional staff will work with land managers to improve post-harvest treatments to maintain early seral habitat communities in moderate to high nutritional capacity areas.

Agricultural impacts are relatively minor on a zone-wide scale but have increased over the past 10 years due to changes in landownership that reduced access for hunting opportunities. Depredation issues are being addressed through existing depredation strategies.

Inter-Zone and Intra-Zone Dynamics: Between 2013 and 2017, fall and spring female body condition and pregnancy data were collected within the Dworshak Zone. Female elk within the Dworshak Zone had 8% body fat and a pregnancy rate of 78% when entering winter. In general, females with < 6% body fat have inadequate summer range and experience limitations in reproductive success and productivity (Cook et al. 2018). In contrast, females with ≥ 12% body fat and ≥ 90% pregnancy rates have good to excellent summer range and have little to no limitations in reproductive success and productivity (Cook et al. 2018). Vegetation surveys were also completed to determine the existing nutritional conditions of the Dworshak Zone in 2016 and 2017. These surveys found that 49% of the zone met basic nutritional requirements to support a lactating cow elk (Monzingo et al. 2023). Surveys also found that 82% of the zone has the nutritional potential to produce continuous abundant high-quality forage if maintained for early seral vegetation (Monzingo et al. 2023). These current habitat conditions depict the zone as having adequate forage for the current population, but the potential to support more forage and thus the potential for a larger elk population if vegetation management efforts are implemented in areas that elk will use.

The most recent elk aerial survey (2022) suggested a significant decline in the Dworshak elk population since the previous aerial survey in 2011 (5,787 to 3,500 total elk). However, that decline is not reflected in the fairly stable trend in elk harvest over that same timeframe and bull elk abundance from the 2022 aerial survey is not consistent with bull elk harvest the subsequent hunting season. We used trail cameras to estimate summer (August 1) elk abundance in the Dworshak Zone each year during 2020-2022 as part of a research project (see Elk Monitoring Techniques on pg. 59). Those summer, pre-harvest estimates were substantially higher (>7,000 elk). Summer camera and winter aerial survey abundance estimates are not directly comparable because elk die from both harvest and natural causes in between those two survey time periods. Therefore, abundance during summer (after calves are born and before hunting season) is expectedly higher than it is during winter (after hunting season and early calf mortality). However, an elk population closer to what was estimated in summer by cameras is more biologically reasonable when compared to the harvest number and trend. Possible explanations for the discrepancies between the survey estimates and between the aerial survey and harvest include: elk moved out of the zone to winter so that they were present for the summer camera estimate and the hunting season but not the winter aerial survey; the camera-based estimate overestimated the summer elk population; winter conditions and/or elk distribution (e.g., more elk in dense timber or more widely distributed) led to an underestimate of elk during the aerial survey; or some combination of multiple factors. We will continue to work on improved survey techniques for this and similar landscapes.

Future Needs: This zone will continue to be managed primarily for hunting opportunity. Current elk population objectives for this zone recognize high bull elk vulnerability to harvest and a public desire to maintain general hunting opportunity. We will continue our engagement with hunters and stakeholders, and find ways to improve that engagement, to better understand opinions and desires for management of this elk zone. Future assessments of how silvicultural practices and land-use planning influence elk populations would be beneficial to management of this elk population. The continued development of improved abundance estimation methods is also a priority.

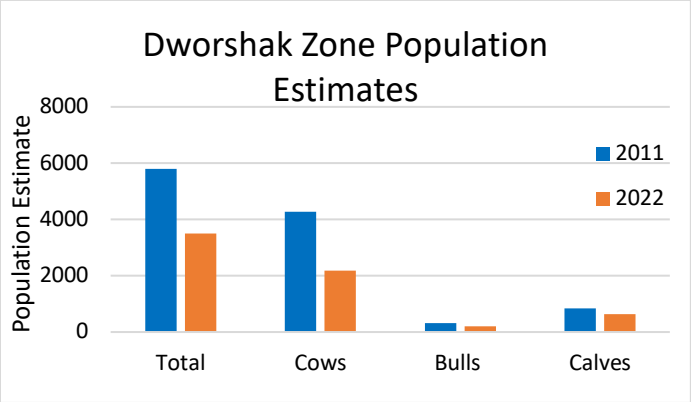
Dworshak Elk Zone Population Management Objectives			
	Cows	**Total Bulls**	**Branch-Antlered Bulls**
Management Objective Range	**2,900-4300**	**600 - 900**	**350 – 500**
Current Status (2022)	**2,176**	**204**	**82**

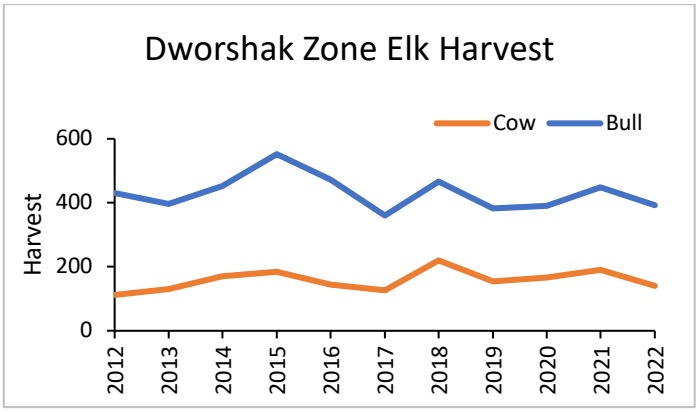
Color indicates where survey estimates are relative to management objectives:

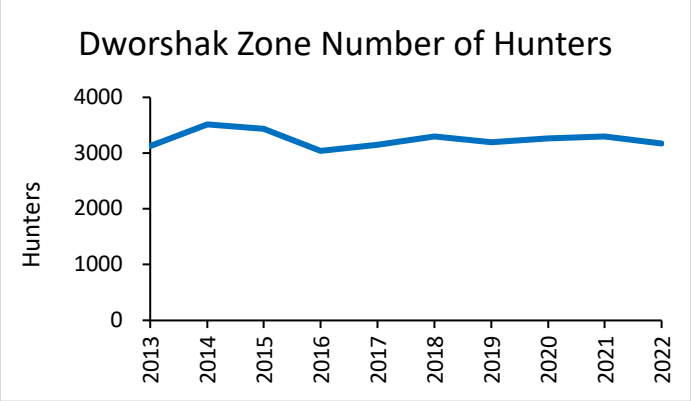
black = within objective; red = below objective; blue = above objective

Dworshak Elk Zone Population Survey Estimates

Year	Cows	Calves	Total Bulls	Spikes	Raghorn Bulls	Mature Bulls	Unclassified Elk	Total Population	Calves per 100 Cows	Bulls per 100 Cows
2022	2,176	640	204	122	57	25	480	3,500	29	9
2011	4,280	850	315	210	47	58	342	5,787	20	7







Dworshak Elk Zone	
Management Direction	Strategy
When zones are below objectives, identify limiting factors and when appropriate implement management actions or efforts to address the identified limiting factors.	Evaluate current wolf and mountain lion harvest levels relative to elk population performance and adjust efforts and approach accordingly. Maintain liberal predator seasons and bag limits. Explore opportunities to increase wolf and mountain lion harvest
Develop an elk monitoring program that includes modeling or monitoring zone population abundance during years between surveys	Complete development of an elk IPM to better predict and access population performance between aerial surveys.

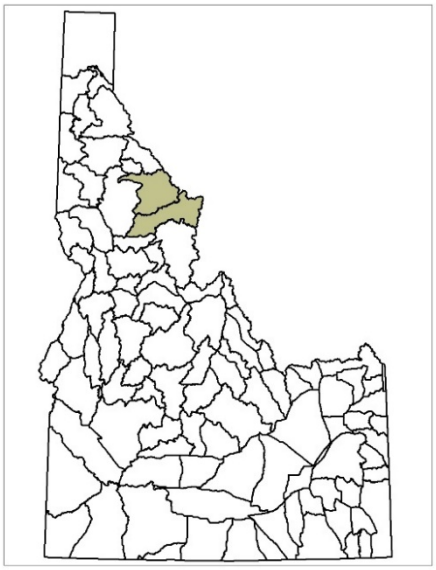
Implement measures to minimize, eliminate, or compensate for elk depredations.	Work collaboratively with area landowners to prevent and/or minimize elk depredations on agricultural areas through the Fish and Game depredation program. Continue using standard procedures to monitor and estimate big game damage on agricultural products.
Provide a diversity of hunting opportunities, including socially desirable and biologically sustainable levels of antlerless and mature bull opportunity.	Provide hunting opportunities among established weapon types where biological conditions warrant.
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Develop a method to prioritize habitat management activities based on summer elk nutrition potential. Promote well-designed, early seral habitat improvement projects incorporating information on elk use and seasonal movements. Work with land managers to improve post-harvest treatments to maintain early seral habitat communities in moderate to high nutritional capacity areas.
Improve awareness and inclusion of elk habitat effectiveness in land management activities on public and private lands.	Develop a method to prioritize habitat management activities based on elk habitat effectiveness. Work with the Nez Perce-Clearwater National Forests to create a landscape that has between 10-15% of the frontcountry producing high nutritional resources for elk away from open motorized access. Early seral habitat will be targeted to produce high quality nutritional resources located farther than ½ mile from open motorized access. Treatments should be accomplished with methods designed to result in high nutritional response.
Increase IDFG involvement in long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve elk habitat.	Increase the pace and scale of restoration activities on federal forest, and adjacent lands, using Good Neighbor Authority and other shared stewardship programs. Maintain participation on Nez Perce-Clearwater National Forests interdisciplinary teams to provide technical assistance and suggestions for improving elk habitat within proposed vegetation management projects. Assess how silvicultural practices and land-use planning influence elk nutrition and habitat use.

Lolo Zone

Game Management Units 10, 12

Administered by IDFG's Clearwater Region

Proposed Six Year Management Direction:



- The performance and management of the Lolo Zone is currently limited by predation and habitat.
- Current population management direction in the Lolo Zone is to increase elk populations to meet management objectives.

Description: The land base within this zone is almost entirely publicly owned and managed by the U.S. Forest Service. The majority of the zone is characterized by dense forests or areas that have experienced commercial logging activities. The southern portion of the zone is within the Selway-Bitterroot Wilderness Area. Approximately one-third of the zone has good access for motorized vehicles with medium road densities. The remaining portion has low road densities with good trail access contributing to medium-to-low big game vulnerability.

Historical Perspective: Historically, elk herds were scattered, and numbers were low in this area. Few big game animals were found by Lewis and Clark in the early 1800s in the Lochsa River drainage, likely due in part to the dense, unbroken canopy of forest that covered the entire area. Wildfires burned over vast expanses near the beginning of the twentieth century, creating vast brush-fields that provided abundant forage areas for elk. Elk numbers increased following the creation of these brush-fields, and elk populations increased rapidly, peaking in the 1950s and 1960s. Elk herds declined into the 1970s, due largely to declines in forage availability and lack of nutrition from maturation of brush-fields, logging and road-building activity that increased vulnerability of elk to harvest under the then more liberal hunting seasons, and loss of some major winter ranges. In response to declines in elk numbers an either-sex hunting structure was replaced in 1976 with an antlered-only general hunting season. To address low recruitment levels, declining bull numbers, and high over-winter mortality in 1996-97, IDFG capped B-tag numbers at 1,600 and closed cow elk controlled hunts beginning with the 1998 hunting season. This B-tag cap represented a 60-65% reduction in any-bull rifle hunting opportunity. In 2010 the B-tag cap was further reduced to 1,088 and A-tag cap of 404 imposed. However, with declining elk numbers, hunter participation has also declined. Low recruitment and low adult cow survival remain a concern in this zone.

Poor calf recruitment since the late 1980s, winter losses in 1996-97, and recent population declines have contributed to dramatically decreased elk herds within this zone. Predation by wolves has affected elk numbers since their reintroduction to Idaho (1995-96) and reestablishment in the Lolo Zone (early 2000s). Winter 1996-97 was marked by severe conditions, including extremely deep snow exceeding 200% of average snowpack in some areas. These conditions resulted in higher-than-normal over-winter mortality, leading to a dramatic decline in the GMU 10 population (-48%). In addition, a survey was conducted in GMU 12 during winter 1996-97 and those results suggested a 30% decline at that time. These data, in combination with overwhelming anecdotal information, suggests that catastrophic winter losses occurred in GMUs 10 and 12. Calf productivity and/or recruitment have declined substantially since the late 1980s. Prior to that, winter calf:cow ratios often exceeded 30:100 and occasionally exceeded 40:100. From 1989-1999, ratios dwindled continuously down to levels below 10:100. This level of recruitment is inadequate to replace natural mortality, even in the absence of hunting. Between 2002 and 2004, population surveys and composition surveys revealed recruitment levels between 27 and 30 calves:100 cows in GMU 12, and 19-26 calves:100 cows in GMU 10. However, the 2005 age composition surveys showed declines from recent levels. Most notable was the decline in GMU 12 where there were 13.9 calves per 100 cows. The 2010 aerial survey for the Lolo Zone showed a 57% decline from the 2006 survey,

from 5,098 elk to 2,178. Calf:cow ratios in 2010 for GMUs 10 and 12 were estimated at 17.4 and 6.9 calves:100 cows respectively. Extreme declines in cow numbers resulted in a high bull:cow ratio of 44 bulls:100 cows in 2010. In 2017, the elk population declined to an estimated 1,893 elk; however, calf:cow ratios for GMUs 10 and 12 increased to 32 and 19 calves:100 cows respectively. The adult bull population declined from 352 in 2010, to 71 in 2017; however, yearling and raghorn bulls increased from 243 in 2010 to 354 in 2017 resulting in 37 bulls:100 cows. Cow numbers declined slightly from 1,358 to 1,137.

Management Challenges and Opportunities: Historically, habitat productivity was high in this zone but has decreased following decades of intensive fire suppression and reduced timber harvest. Many forested areas across the zone have become overgrown with late-seral species. Elk summer nutrition is lacking across much of the zone; however, the existing forested habitat types have the potential to provide abundant high-quality forage if managed for early seral vegetation. Additionally, elk predation by mountain lions, black bears, and wolves continue to contribute to elk declines in the Lolo. Increasing elk populations within the Lolo Zone will require improvements in elk habitat at a landscape scale through collaborative partnerships with the USFS and continued liberal predator harvest through hunting and trapping seasons, as well as predator control actions.

Inter-Zone and Intra-Zone Dynamics: Between 2013 and 2017 fall and spring female body condition and pregnancy data were collected within the Lolo Zone. It was found that female elk within the Lolo Zone ranged from 8-11% body fat and ranged in pregnancy rates from 74-89% when entering winter. In general, females with < 6% body fat have inadequate summer range and experience limitations in reproductive success and productivity (Cook et al. 2018). In contrast, females with ≥ 12% body fat and ≥ 90% pregnancy rates have good to excellent summer range and have little to no limitations in reproductive success and productivity (Cook et al. 2018). Additionally, vegetation surveys were completed in 2016 and 2017 to determine the existing nutritional conditions of the Lolo Zone and found that 64% of the zone is essentially nonforaging area and does not meet basic nutritional requirements to support a lactating cow elk (Monzingo et al. 2023). Surveys also found that 70% of the zone has the nutritional potential to produce continuous abundant high-quality forage if maintained for early seral vegetation (Monzingo et al. 2023). These current habitat conditions depict the zone as having adequate forage for the current population, but there is also the potential to support more forage and thus the potential for a larger elk population, if vegetation management efforts are implemented in areas elk will utilize. After evaluating existing habitat conditions and habitat potential, regional staff have identified new objectives for the Lolo Zone. The potential nutritional carrying capacity was used to develop relative population estimates to support these objectives (see Appendix A for details). Achieving, maintaining, or improving nutritional capacity on the landscape will require a long-term strategy to implement several thousand acres of habitat improvements annually.

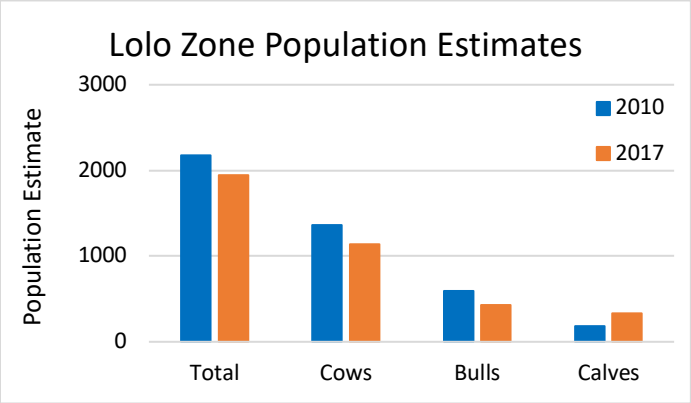
Future Needs: Focus for this zone will involve increasing elk population growth rates, followed by steps to stabilize population productivity. Restructuring population objectives from those laid out in the previous management plan as long-term goals is an effort to manage elk in this zone on a sustainable level. Revisiting population objectives is necessary because major landscape changes have occurred since peak elk populations were observed in the 1980s. This is adaptive management based on current and foreseeable habitat conditions and outside factors that influence elk population levels. Over the next six years regional staff will partner with the Nez Perce-Clearwater National Forests, IDL, and the Nez Perce Tribe to increase the pace and scale of restoration activities on federal forest lands in the Lolo Zone. Vegetation management efforts will focus on well-designed, early seral habitat improvement projects using existing and historical information on elk use and seasonal movements, and landscape nutritional capacity. Efforts will emphasize habitat improvements in backcountry roadless areas, to increase forage while maintaining elk security.

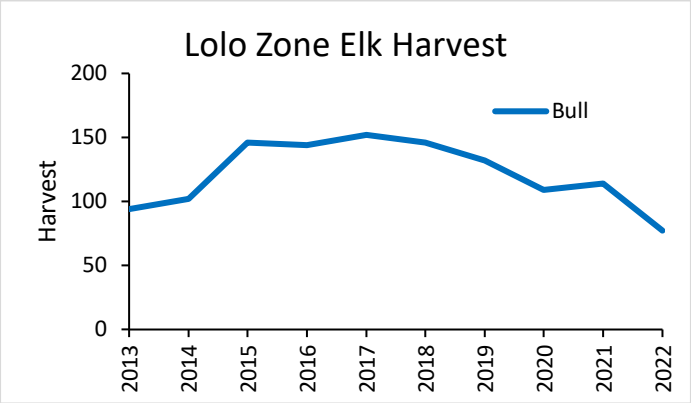
Lolo Elk Zone Population Management Objectives			
	Cows	Total Bulls	Branch-Antlered Bulls
Management Objective Range	1,500 – 2,200	550 – 800	NA
Current Status (2017)	1,137	425	286

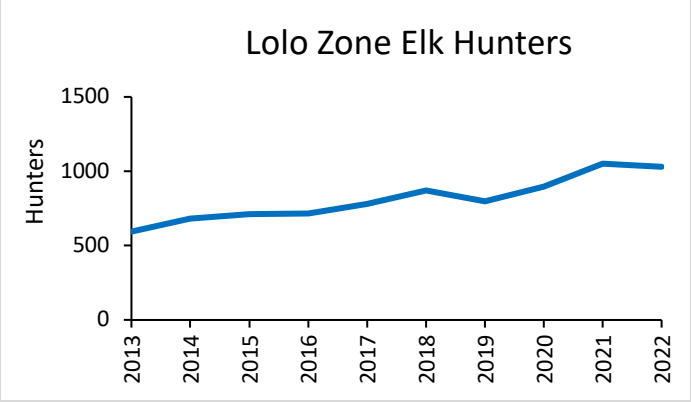
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

Lolo Elk Zone Population Survey Estimates										
Year	Cows	Calves	Total Bulls	Spikes	Raghorn Bulls	Mature Bulls	Unclassified Elk	Total Population	Calves per 100 Cows	Bulls per 100 Cows
2017	1,137	331	425	139	215	71	54	1,947	29	37
2010	1,358	182	594	23	229	352	46	2,180	13	44







Lolo Elk Zone Management Table	
Management Direction	Strategy
When zones are below objectives, identify limiting factors and when appropriate implement management actions or efforts to address the identified limiting factors.	Manage wolf populations at the specified level defined in the Wolf Management Plan for the Lolo Zone to address wolf predation on elk.

	Continue liberal wolf season structure (harvest level) and removal efforts relative to elk population performance. Continue use of control actions (WS, IDFG personnel) as necessary to manage predators. Explore opportunities to increase wolf hunter, trapper, and outfitter client effectiveness. Continue to offer long seasons, second tags, and reduced-price nonresident tags for black bears and mountain lions.
Develop an elk monitoring program that includes modeling or monitoring zone population abundance during years between surveys.	Complete development of an elk IPM to better predict and access population performance between aerial surveys.
Provide annual elk hunting opportunities	Maintain elk tag levels at a sustainable level to provide continued annual hunting opportunities.
Provide a diversity of hunting opportunity, including socially desirable and biologically sustainable levels of antlerless and mature bull opportunity.	Continue to offer A and B tags for a variety of hunting experiences
Improve key summer, winter, and transitional habitats on public and private lands that provide for elk populations to meet statewide objectives.	Use Good Neighbor Authority and other shared stewardship programs to design and implement vegetation treatment projects that will benefit elk. Develop a method to prioritize habitat management activities based on summer elk nutrition potential. Promote well-designed, early seral habitat improvement projects using information on elk use and seasonal movements. Work with land managers to improve post-harvest treatments to maintain early seral habitat communities in moderate to high nutritional capacity areas.
Improve awareness and inclusion of elk habitat effectiveness in land management activities on public and private lands.	Develop a method to prioritize habitat management activities based on elk habitat effectiveness. Work with the Nez Perce-Clearwater National Forests to create a landscape that has between 10-15% of the frontcountry producing high nutritional resources for elk away from open motorized access. Early seral habitats will be targeted to produce high quality nutritional resources located farther than ½ mile from open motorized access. Treatments should be accomplished with methods designed to result in high nutritional response.

	Increase proactive efforts to emphasize and actively manage elk habitat in backcountry areas.
Increase IDFG involvement in long- and short-term land-use planning efforts by providing information, analyses, and recommendations to improve and preserve elk habitats.	Increase the pace and scale of restoration activities on federal forest, and adjacent lands, using Good Neighbor Authority and other shared stewardship programs. Maintain participation on Nez Perce-Clearwater National Forests interdisciplinary teams to provide technical assistance and suggestions for improving elk habitat within proposed vegetation management projects.
Minimize the influence of disease as a limiting factor in elk populations.	Continue to monitor for diseases in the Lolo Zone and manage as necessary. Specifically, continue to monitor for CWD by collecting opportunistic samples whenever possible.

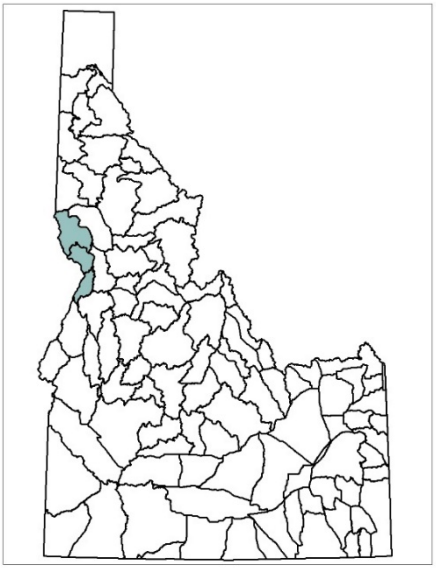
Hells Canyon Zone

Game Management Units 11, 13, 18

Administered by IDFG's Clearwater Region

Proposed Six Year Management Direction:

- The performance and management of the Hells Canyon Zone is currently limited or influenced by land use change, harvest vulnerability, and habitat.
- Current population management direction in the Hells Canyon Zone is to maintain elk populations within management objectives.



Description: The Hells Canyon Zone is characterized by steep canyon grasslands with mixed shrubs and coniferous forests interspersed across north facing aspects and higher elevations. Landownership within this zone is variable by Game Management Unit. Craig Mountain Wildlife Management Area provides almost all public access in Unit 11. Unit 13 is almost exclusively private lands, with the exception of small blocks of land managed by the State of Idaho, BLM, and USFS. A large portion of Unit 18 is managed by the USFS as part of the Nez Perce National Forest or Hells Canyon Wilderness area.

Historical Perspective: Historically, elk herds were scattered, and numbers were low in this area. By the turn of the 20th century elk production in areas adjacent to this zone increased and elk repopulated this zone by the 1960s. Maturation of brush-fields and declines in forage availability, road-building activity that increased vulnerability of elk to hunters under the then more liberal hunting season, and loss of some major winter ranges caused declines in elk herds in the 1970s. In response to declines in elk numbers, an either-sex hunting structure was replaced in 1976 with an antlered-only general hunting season. Elk populations improved with changes in season structure. By 1991, elk populations had grown rapidly in the Hells Canyon Zone. Cow populations had increased from 865 in 1991 to 3,633 in 2013. Bull elk populations had also shown tremendous growth, increasing from 299 bulls in 1991 to 1,059 bulls in 2013. However, during the 2013 survey, there were 184 fewer calves estimated (despite the increase in cow numbers) and calf recruitment decreased to 21 calves:100 cows. In order to address a potential density-dependence issue, an additional 150 cow tags were added (total 525) to the 2013 hunt and bull tags were reduced from 151 to 80. Since the mid-2010s, elk populations in GMU 11 have declined resulting in corresponding reductions in controlled hunt tags and removal of cow hunting opportunity. Aerial surveys in GMU 13 documented increases in elk populations over the last ten years; however, this unit is comprised largely of private lands providing limited public access and hunting opportunity. The most recent survey in Unit 18 showed elk populations declined since their peak in the early 2010s. Because elk populations are functioning discretely amongst units, IDFG has implemented a controlled hunt structure in the Hells Canyon Zone to better address elk population needs and accessibility.

Management Challenges and Opportunities: Differences in landownership and use, public desires, and accessibility within GMUs (11, 13, and 18) comprising the Hells Canyon Zone have resulted in variability among elk populations and distributions across the zone. Road density is moderate, and access is restricted in many areas. This results in medium to low vulnerability of big game to hunters; however, increased permit numbers have likely increased vulnerability of cow elk. Additionally, habitat productivity varies widely throughout the zone from steep, dry, river-canyon grasslands having low annual precipitation to higher elevation forests with good habitat productivity and greater precipitation. Many grassland cover types have been invaded by various weeds and non-native grasses, including cheatgrass and yellow star thistle. GMU 11 has experienced multiple, high severity wildfires over the last decade, which has exacerbated noxious

weed issues and hindered the recovery of important habitat components including shrub composition and wooded riparian zones.

Inter-Zone and Intra-Zone Dynamics: Between 2013 and 2017 fall and spring female body condition and pregnancy data were collected within the Hells Canyon Zone, primarily in GMU 11. Female elk within the zone had 6% body fat and a pregnancy rate of 89% when entering winter. In general, females with < 6% body fat have inadequate summer range and experience limitations in reproductive success and productivity (Cook et al. 2018). However, the Hells Canyon Zone females had a high pregnancy rate. A possible explanation is that extensive fall green-up could mask the low body fat conditions in these herds and lead to higher pregnancy rates than expected from body condition alone (Cook et al. 2013, 2018). Vegetation surveys were also completed to determine the existing nutritional conditions of the Hells Canyon Zone in 2016 and 2017. These surveys found that 90% of the zone met basic nutritional requirements to support a lactating cow elk (Monzingo et al. 2023). However, of that 90%, 64% barely met basic nutritional requirements to support a lactating cow elk (Monzingo et al. 2023). These current habitat conditions are common in canyon grasslands and can affect populations by delaying breeding in adults, reducing calf growth, delaying sexual maturity, and reducing probability of calf survival. GMU 11 is also highly accessible and a popular recreation destination. A combination of these factors makes elk in GMU 11 more vulnerable to declines from stressors such as severe or elongated winters, disease, predation, disturbance, and hunter harvest.

Future Needs: Population objectives in the Hells Canyon Zone will continue to focus on maintaining bull and cow population objectives while improving calf elk recruitment rates. Harvest opportunities will remain regulated through controlled hunt structures to achieve desired outcomes at the unit and zone level. A priority management goal for the zone is early detection and monitoring of disease presence, primarily CWD.

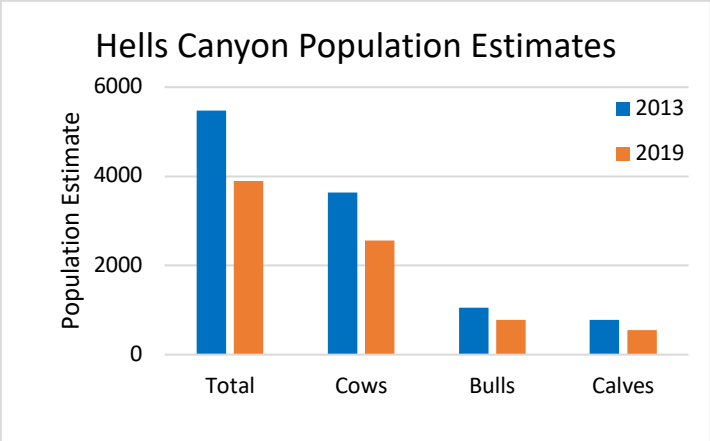
Habitat objectives will focus on restoring desirable grass/forb communities on elk winter range in canyon grassland habitat where yellow star thistle, annual grasses, and other noxious weeds are heavily dispersed. Methods may include biological, chemical, and cultural treatment, prescription burning, and revegetation. Improving elk nutrition and habitat effectiveness on summer and transitional range in the higher elevation forest, wet meadows, and riparian draws is also a priority. Techniques may include thinning, mastication, timber harvest, replanting, and prioritizing areas that will produce high quality nutritional resources located further from open motorized access.

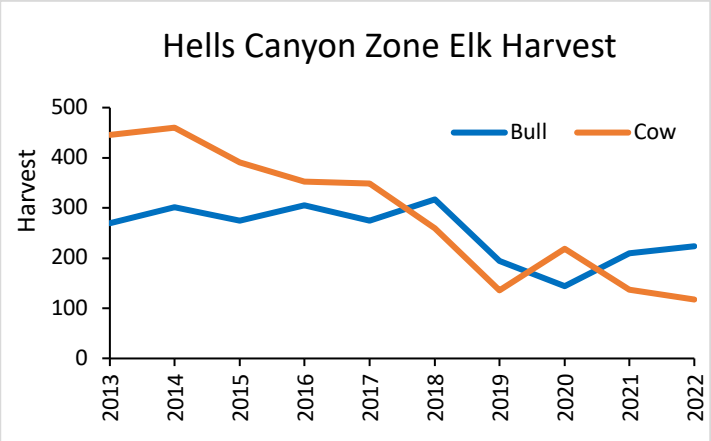
Hells Canyon Elk Zone Population Management Objectives			
	Cows	**Total Bulls**	**Branch-Antlered Bulls**
Management Objective Range	**2,000 – 2,900**	**420 – 610**	**240 – 348**
Current Status (2019)	**2,556**	**779**	**580**

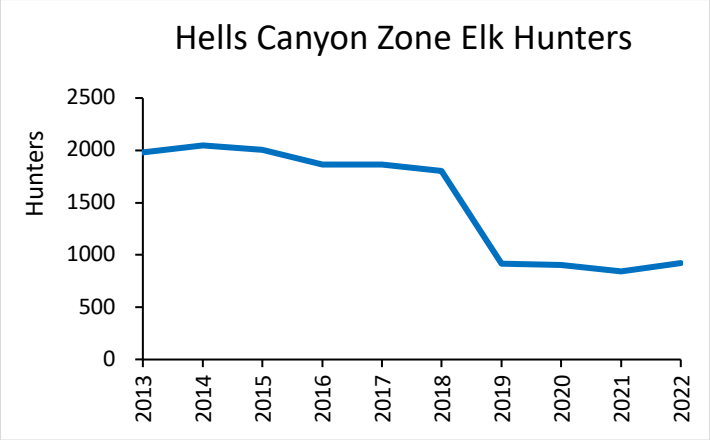
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

Hells Canyon Elk Zone Population Survey Estimates										
Year	**Cows**	**Calves**	**Total Bulls**	**Spikes**	**Raghorn Bulls**	**Mature Bulls**	**Unclassified Elk**	**Total Population**	**Calves per 100 Cows**	**Bulls per 100 Cows**
2019	**2,556**	**557**	**779**	**199**	**282**	**298**	**22**	**3,914**	**22**	**31**
2013	**3,633**	**781**	**1,059**	**374**	**396**	**300**	**13**	**5,486**	**22**	**29**







Hells Canyon Elk Zone Management Table	
Management Direction	Strategy
Provide a diversity of hunting opportunities, including socially desirable and biologically sustainable levels of antlerless and mature bull opportunity.	Continue to permit harvest of antlerless and antlered elk under controlled hunt framework established within each GMU. Increase hunting opportunities proportionally among established weapon types where biological conditions warrant.
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Focus on restoring desirable grass/forb communities on elk winter range in canyon grassland habitat. Methods may include biological, chemical, and cultural treatments for noxious weeds, prescription burning, and revegetation.

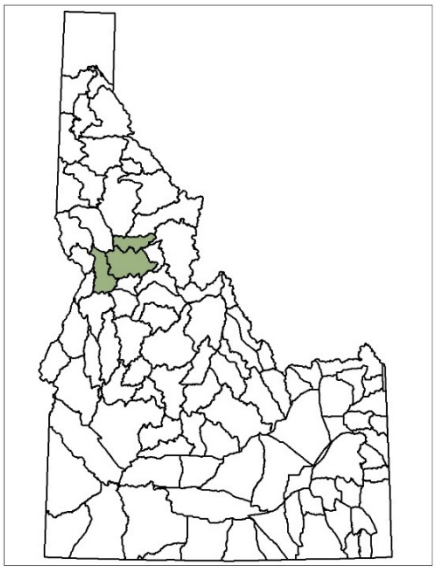
	Improve elk nutrition and habitat effectiveness on summer and transitional range in higher elevation forests, wet meadows, and riparian draws. Develop a method to prioritize habitat management activities based on summer elk nutrition potential.
Improve awareness and inclusion of elk habitat effectiveness in land management activities on public and private lands.	Prioritize habitat improvements in areas that will produce high quality nutritional resources located further than ½ mile from open motorized access.
Minimize the influence of disease as a limiting factor in elk populations.	Continue to monitor for diseases in the Hells Canyon Zone and manage as necessary. Specifically, continue to monitor for CWD and TAHD by collecting samples during CWD management actions and opportunistic samples whenever possible.

Elk City Zone

Game Management Units 14, 15, 16

Administered by IDFG's Clearwater Region

Proposed Six Year Management Direction:



- The performance and management of the Elk City Zone is currently limited by predation, habitat, and agricultural impacts.
- Current population management direction in the Elk City Zone is to maintain the elk population within proposed objectives and continue surveillance of Chronic Wasting Disease.

Description: Landownership in this zone is approximately 80% public with the remaining 20% private. Approximately 8% of this zone is wilderness. A majority of the forested areas in the zone are managed by the USFS. Privately-owned portions are located at lower elevations along the Clearwater and Salmon rivers. Both open and closed road densities are high within the zone, contributing to big game vulnerability during hunting seasons.

Historical Perspective: Historically, elk herds were scattered, and numbers were low in this area. Few big game animals were found along Clearwater River by Lewis and Clark in the early 1800s, probably due in part to the dense, unbroken canopy of forest that covered the entire area. Wildfires burned over vast expanses of landscape in the early 1900s. These fires created vast brush-fields that provided abundant forage areas for elk and populations expanded. Over time, these brush-fields matured, and forage availability declined. These habitat changes in combination with road-building activities that increased vulnerability of elk to hunters and the loss of some major winter ranges caused declines in elk herds in the 1970s. In response to declines in elk numbers, an either-sex hunting structure was replaced in 1976 with an antlered-only general hunting season. The elk population rebounded and then remained relatively stable until the mid-2000s.

Historically, calf recruitment in GMUs 14 and 15 was high, averaging 38 calves:100 cows from 1987–1993. However, the 2000 survey documented 25 calves:100 cows, indicating a decline in calf survival and recruitment. This trend in low calf ratios continued through 2022, when 21 calves:100 cows were estimated in GMU 15 during the 2015 and the 2022 survey. A pattern of low calf:cow ratios is also a concern in GMU 16, which averaged 19 calves:100 cows from 1990 – 2000, then dropped to 17 calves:100 cows in both 2008 and 2015 and remained low at 18 calves:100 cows in 2022 survey.

Beginning with the 2002 hunting season B-tag sales were capped in the Elk City zone. This cap was initiated after seeing increased harvest and participation when the Lolo zone was capped in 2000. After the 2015 survey suggested declines, particularly in GMU's 15 and 16, a cap was then initiated on the A-tag in 2019 and use of second nonresident tags was eliminated to address population concerns in this zone. Each game management unit within this zone performs differently and current observations indicate that elk have declined in GMUs 15 and 16 but are up in GMU 14. The most recent aerial survey (2022) found that the population had reached management objectives for both cows and bulls, albeit with continued declines in GMU 15 and to a lesser extent in GMU 16. These survey results brought about season changes to allow for additional cow harvest in GMU 14 and the elimination of cow harvest in GMU 15.

In 2021 Chronic Wasting Disease (CWD) was discovered in GMU 14. One elk tested positive in the White Bird area, indicating the need for increased surveillance of CWD in elk in the area. Season changes were adopted in 2022 to

increase Landowner Permission Hunt tags in the area where deer and elk have tested positive for CWD to obtain more samples for evaluating CWD prevalence.

Additionally, in 2018, Treponeme-Associated Hoof Disease (TAHD) was discovered in the Elk City Zone. The Department continues to monitor the disease by prioritizing the distribution, prevalence, impacts to elk survival and productivity, and transmission of the disease across the state.

Management Challenges and Opportunities: Historically habitat productivity was high in this zone but has decreased following decades of intensive fire suppression and reduced timber harvest. Many forested areas across the zone have reverted to closed canopy stands of lodgepole pine and grand fir. Elk summer nutrition is lacking across much of the zone; however, the existing forested habitat types have the potential to produce abundant high-quality forage if managed for early seral vegetation. Increasing elk populations within the Elk City Zone will require improvements in elk habitat at a landscape scale through collaborative partnerships with the USFS.

With the discovery of both CWD and TAHD in the Elk City Zone, it is incumbent on IDFG to continue to monitor the prevalence and spread of these diseases. Monitoring of CWD will be accomplished primarily through testing of deer and elk harvested by hunters in GMUs 14 and 15 and changes to management direction will be implemented where warranted by increased CWD prevalence. Currently, TAHD is monitored by hunter-harvest sampling and public reports. The effects of TAHD on elk vital rates are currently unknown, thereby complicating potential disease management strategies.

Elk abundance has varied between GMUs within the zone and hunters have responded by shifting focus. Hunter numbers in GMUs 15 and 16 have declined in response to declining elk abundance. Conversely, elk populations have performed well in GMU 14 and hunter numbers have increased to the point that hunter crowding has become a concern. IDFG will continue to monitor hunter satisfaction and manage hunter numbers in this zone to ensure they are commensurate with elk populations. Additionally, depredations have increased within the past 10 years in this zone due to increases in both deer and elk populations and changes in landownership that reduced access for hunting opportunities. Livestock operators are concerned with elk use of pasture and rangeland forage during spring months prior to release of livestock on these lands. Some damage to grain crops occurs during summer. Several past fencing projects have helped to reduce concerns of elk damaging stored hay during winters with heavy snow accumulation.

Inter-Zone and Intra-Zone Dynamics: Between 2013 and 2017 fall and spring female body condition and pregnancy data were collected within the Elk City Zone. Female elk within the Elk City Zone ranged from 6-8% body fat and pregnancy rates ranged from 70-92% when entering winter. In general, females with < 6% body fat have inadequate summer range and experience limitations in reproductive success and productivity (Cook et al. 2018). GMU 14 herd females had a high pregnancy rate, similar to other populations in Hells Canyon, a possible explanation being extensive fall green-up could mask the low body fat conditions in these herds and lead to higher pregnancy rates than expected from body condition alone (Cook et al. 2013, 2018). Vegetation surveys were also completed to determine the existing nutritional conditions of the Elk City Zone in 2016 and 2017. These surveys found that 38% of the zone met basic nutritional requirements to support a lactating cow elk (Monzingo et al. 2023). Surveys also found that 64% of the zone has the nutritional potential to produce continuous abundant high-quality forage if maintained for early seral vegetation (Monzingo et al. 2023). These current habitat conditions depict the zone as having semi-adequate forage for the current population, but the potential to support more forage and thus the potential for a larger elk population if vegetation management efforts are implemented in areas utilized by elk.

Future Needs: Over the next six years regional staff will partner with the Nez Perce-Clearwater National Forests, IDL, and the Nez Perce Tribe to increase the pace and scale of restoration activities on federal forests and adjacent lands in the

Elk City zone. Vegetation management efforts will focus on well-designed, early seral habitat improvement projects using existing and historical information on elk use and seasonal movements, and landscape nutritional capacity.

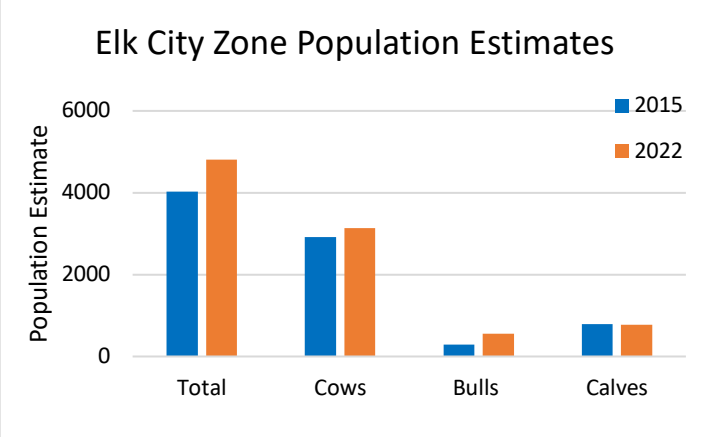
Continued monitoring of CWD and TAHD and its effects on populations will be an IDFG priority in the Elk City zone. Additionally, regional staff will need to address unequal hunter distribution and hunt structure by GMU.

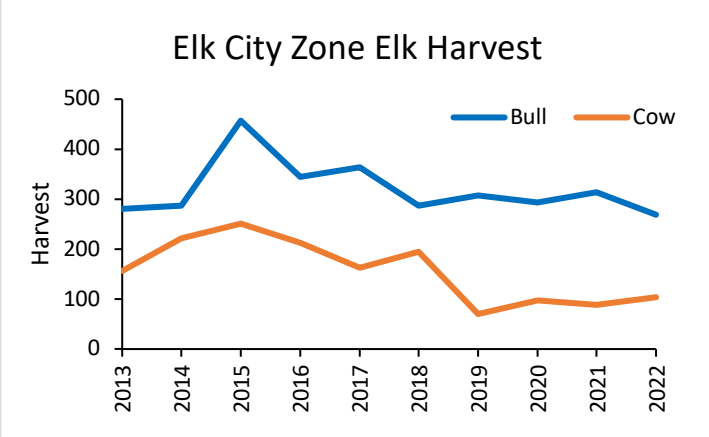
Elk City Elk Zone Population Management Objectives			
	Cows	Total Bulls	Branch-Antlered Bulls
Management Objective Range	3,150 – 4,650	675 – 1,000	350 – 575
Current Status (2022)	3,135	565	348

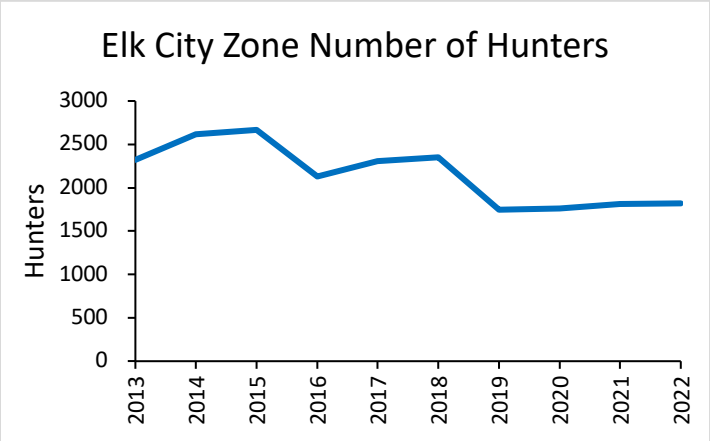
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

Elk City Elk Zone Population Survey Estimates										
Year	Cows	Calves	Total Bulls	Spikes	Raghorn Bulls	Mature Bulls	Unclassified Elk	Total Population	Calves per 100 Cows	Bulls per 100 Cows
2022	3,135	769	565	217	201	147	339	4,808	25	18
2015	2,915	793	288	133	114	41	38	4,034	27	10






Elk City Zone Number of Hunters
Hunters
3000
2500
2000
1500
1000
500
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022

Elk City Elk Zone Management Table	
Management Direction	Strategy
When zones are below objectives, identify limiting factors and when appropriate implement management actions or efforts to address the identified limiting factors.	Evaluate current wolf and mountain lion harvest levels relative to elk population performance and adjust efforts and approach accordingly. Maintain liberal predator seasons and bag limits. Explore opportunities to increase wolf and mountain lion hunter, trapper, and outfitter client effectiveness
Develop an elk monitoring program that includes modeling or monitoring zone population abundance during years between surveys.	Complete development of an elk IPM to better forecast and assess population performance between aerial surveys.
Implement measures to minimize or compensate for elk depredations.	Work collaboratively with area landowners to prevent and/or minimize elk depredations on agricultural areas through the Fish and Game depredation program. Continue using standard procedures to monitor and estimate big game damage on agricultural products.
Provide a diversity of hunting opportunity, including socially desirable and biologically sustainable levels of antlerless and mature bull opportunity.	Increase hunting opportunities proportionally among established weapon types where biological conditions warrant.
Improve key summer, winter, and transitional habitats on public and private lands that provide for elk populations to meet statewide objectives.	Use Good Neighbor Authority and other shared stewardship programs to design and implement vegetation treatment projects that will benefit elk. Develop a method to prioritize habitat management activities based on summer elk nutrition. Promote well-designed, early seral habitat improvement projects using information on elk use and seasonal movements. Work with land managers to improve post-harvest treatments to maintain early seral habitat communities in moderate to high nutritional capacity areas.
Improve awareness and inclusion of elk habitat effectiveness in land management activities on public and private lands.	Develop a method to prioritize habitat management activities based on elk habitat effectiveness. Work with the Nez Perce-Clearwater National Forests to create a landscape that has between 10-15% of the front country producing high nutritional resources for elk away from open motorized access. Early seral habitats will be targeted to produce high quality nutritional resources located farther than ½ mile from open motorized access. Treatments should be accomplished with methods designed to result in high nutritional response.

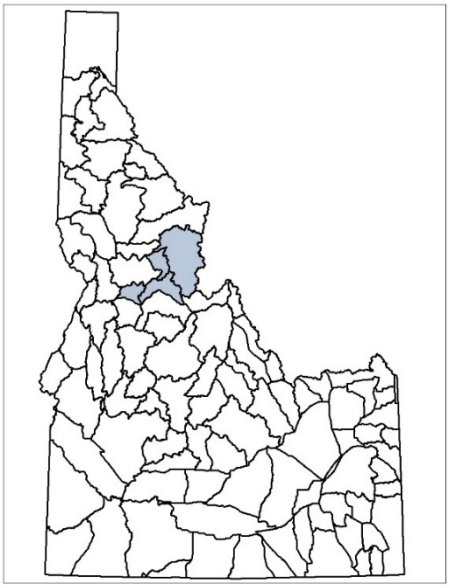
	Increase proactive efforts to emphasize and actively manage elk habitat in backcountry areas.
Increase IDFG involvement in long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve elk habitats.	Increase the pace and scale of restoration activities on federal forest and adjacent lands using Good Neighbor Authority and other shared stewardship programs. Maintain participation on Nez Perce-Clearwater National Forests interdisciplinary teams to provide technical assistance and suggestions for improving elk habitat within proposed vegetation management projects.
Minimize the influence of disease as a limiting factor in elk populations	Continue to monitor prevalence rate and geographic extent of both CWD and TAHD through increased surveillance. Use hunter participation and existing hunt structures where and when feasible in the implementation of the CWD management strategy. Continue to implement carcass transport rules in the CWD management zone and restrict carcass disposal to prion approved county landfills.

Selway Zone

Game Management Units 16A, 17, 19, 20

Administered by IDFG's Clearwater Region

Proposed Six Year Management Direction:



- The performance and management of the Selway Zone is currently limited by predation and habitat.
- Current population management direction in the Selway Zone is to increase elk populations to meet management objectives.

Description: Habitat characteristics vary through the Selway Zone from high-precipitation, forested areas along the lower reaches of Selway River to dry, steep, south-facing ponderosa pine and grassland habitat along Salmon River. Many areas along Salmon River have a good mix of successional stages due to frequent fires within the wilderness areas found there. Road densities are low, which leads to large portions of the zone being remote, with limited access. Land management in the Selway Zone is primarily (99.6%) under management of the USFS.

Historical Perspective: Historically, elk herds were scattered, and numbers were low in this area. Few big game animals were found by Lewis and Clark in the early 1800s along what is now Lolo Pass between Montana and Idaho (in the Lolo Zone just north of the Selway Zone), likely due in part to the dense, unbroken canopy of forest that covered the area. Wildfires burned over vast expanses near the beginning of the twentieth century, creating vast brush-fields that provided abundant forage areas for elk. Elk numbers increased following the creation of these brush-fields, and elk populations increased rapidly, peaking in the 1950s and 1960s. Elk herds began declining into the 1970s, due in part to declines in forage availability and lack of nutrition from maturation of brush-fields, logging and road-building activity that increased vulnerability of elk to harvest under the then more liberal hunting seasons, and loss of some major winter ranges. In response to declines in elk numbers, an either-sex hunting regime was replaced in 1976 with an antlered-only general hunting season. Elk numbers increased and reached a second, short-lived peak in the mid-1990s. Shortly thereafter, however, seasons were restructured to compensate for low calf recruitment and an overall decreasing population. Existing information suggests the decline in elk populations was the result of the interaction of habitat limitations and predation.

Management Challenges and Opportunities: Over the next six years regional staff will focus on partnerships with the Nez Perce-Clearwater National Forests and the Nez Perce Tribe to increase the pace and scale of restoration activities on federal forest and grasslands in the Selway Zone. Additionally, staff will work with partners to increase proactive efforts to emphasize and actively manage elk habitat in backcountry roadless areas, specifically GMU 16A, to increase forage while maintaining security.

Inter-Zone and Intra-Zone Dynamics: Vegetation surveys were completed in 2016 and 2017 to determine the current nutritional conditions of the Selway Zone. Surveys measuring existing vegetation found that 55% of the Selway Zone met the minimum basic nutritional requirements to support a lactating cow elk (Monzingo et al. 2023). However, of that 55%, 15% barely qualified (Monzingo et al. 2023). Analysis of habitat requirements within the Selway Zone also found that 39% of the zone has the nutritional potential to produce continuous abundant high-quality forage if maintained for early seral vegetation (Monzingo et al. 2023). These current habitat conditions depict the zone as having the potential to support more forage, and thus the potential for a larger elk population, if vegetation management efforts are implemented in areas utilized by elk.

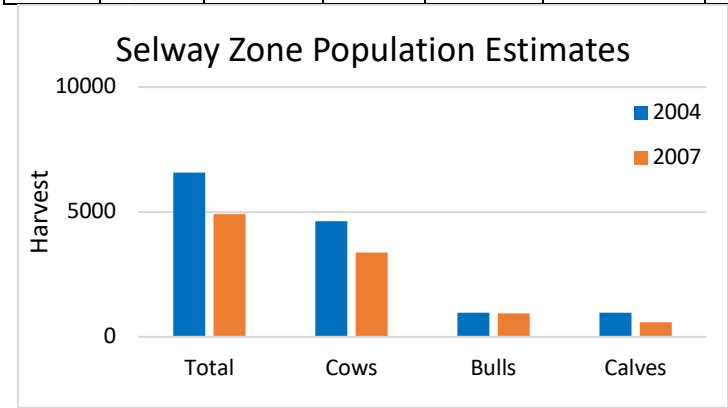
Future Needs: A focus for this zone will involve stabilizing elk populations, followed by steps to realize positive growth rates. IDFG is retaining population objectives laid out in the previous management plan as long-term goals (despite the current reduced elk population) to show the potential to ultimately restore this population to levels achieved in previous decades. To achieve this, IDFG will closely monitor overall harvest. Additionally, completing an elk abundance survey is a high priority during the lifespan of this plan.

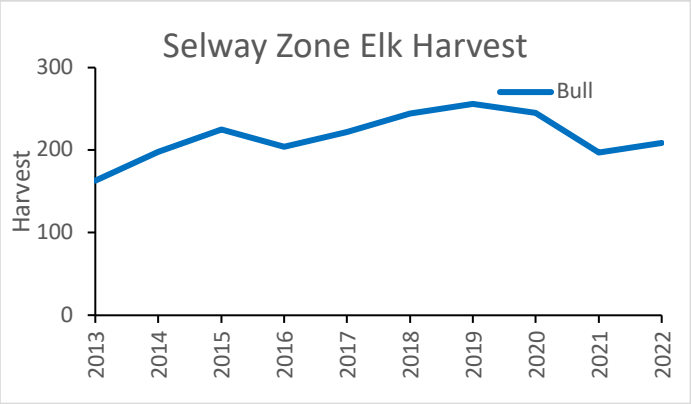
Selway Elk Zone Population Management Objectives			
	Cows	Bulls	Branch-Antlered Bulls
Management Objective Range	4,900 – 7,300	1,050 – 1,550	600 – 900
Current Status (2007)	3,381	934	340

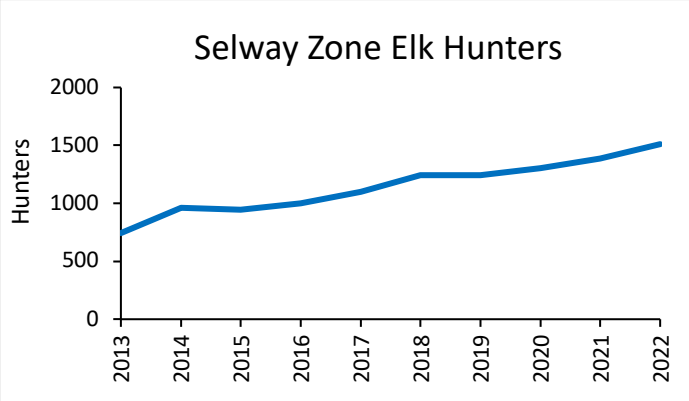
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

Selway Elk Zone Population Survey Estimates										
Year	Cows	Calves	Total Bulls	Spikes	Raghorn Bulls	Mature Bulls	Unclassified Elk	Total Population	Calves per 100 Cows	Bulls per 100 Cows
2007	3,381	589	934	206	386	340	0	4,902	17	28
2004	4,637	976	960	336	334	290	15	6,588	21	21







Selway Elk Zone Management Table	
Management Direction	Strategy
When zones are below objectives, identify limiting factors and when appropriate implement management actions or efforts to address the identified limiting factors.	Manage wolf populations at the specified level defined in the Wolf Management Plan for the Selway Zone to address wolf predation on elk. Continue liberal wolf season structure (harvest level) and removal effects relative to elk population performance. Continue use of control actions (WS, IDFG personnel) as necessary to manage predators. Explore opportunities to increase wolf hunter, trapper, and outfitter client effectiveness. Continue to offer long seasons, second tags, and reduced-price nonresident tags for black bears and mountain lions.
Develop an elk monitoring program that includes modeling or monitoring zone population abundance during years between surveys.	Complete development of an elk IPM to better forecast and assess population performance between aerial surveys.
Assess hunter desires for different types of elk hunting opportunities.	Continue to propose seasons and gather public input on hunting preferences and desires.
Provide annual elk hunting opportunities.	Maintain elk tag levels at a sustainable level to provide continued annual hunting opportunities.
Provide a diversity of hunting opportunities, including socially desirable and biologically sustainable levels of antlerless and mature bull opportunity.	Continue to offer A and B tags for a variety of hunting experiences.
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Use Good Neighbor Authority and other shared stewardship programs to design and implement vegetation treatment projects that will benefit elk. Develop a method to prioritize habitat management activities based on summer elk nutrition. Focus on noxious weed treatment and restoration of desirable grass/forb communities. Promote wildland fires to burn where community and infrastructure are not threatened.
Improve awareness and inclusion of elk habitat effectiveness in land management activities on public and private lands.	Develop a method to prioritize habitat management activities based on elk habitat effectiveness. Increase proactive efforts to emphasize and actively manage elk habitat in backcountry areas.

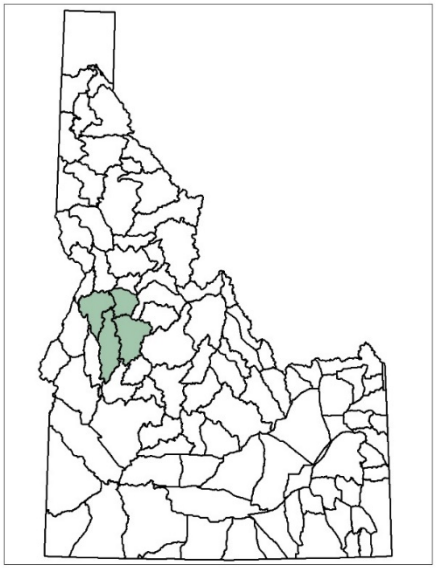
Increase IDFG involvement in long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve elk habitat.	Increase the pace and scale of restoration activities on federal forest, and adjacent lands, using Good Neighbor Authority and other shared stewardship programs. Maintain participation on Nez Perce-Clearwater National Forests interdisciplinary teams to provide technical assistance and recommendations for improving elk habitat within proposed vegetation management projects.
Minimize the influence of disease as a limiting factor in elk populations	Continue to monitor for diseases in the Selway Zone and manage as necessary. Specifically, continue to monitor for CWD by collecting opportunistic samples whenever possible.

McCall Zone

Game Management Units 19A, 23, 24, and 25

Administered by IDFG's Southwest Region

Proposed Six Year Management Direction:



- The performance and management of the McCall Zone is currently limited by depredation issues occurring in the western portion of the zone and by changes in habitat along the South Fork Salmon
- Current population management direction in the McCall Zone is to maintain the elk population within current objectives while increasing CWD surveillance.

Description: Over 70% of the McCall Zone is in public ownership and management. The Little Salmon River and the North Fork Payette River valley bottoms comprise most of the private ownership. Private land in this zone is predominantly agricultural or rural subdivision in nature. Much of the zone is comprised of mixed conifer forests transitioning into sage steppe/grassland rangelands at lower elevations.

Historical Perspective: Elk were abundant in the McCall Zone prior to European settlement in the late 1800s. The proliferation of mining due to the gold rush in the late 1800s and early 1900s led to widespread harvest to supply meat and hides for mining camps. As a result, elk became increasingly rare and, at one time, were thought to be eliminated from the area. Remnant populations relegated to the more remote, rugged portions of the zone did survive. Translocation of elk from Yellowstone to places in the McCall Zone such as New Meadows occurred in the late 1930s. Liberal either-sex hunting seasons kept population numbers of elk suppressed well into the 1970s. The implementation of bull-only hunting in 1976 spurred an increase in elk populations in the McCall Zone. The McCall elk population performed well from the mid-1980s through most of the 1990s, but calf production declined throughout the early 2000s. Calf:cow ratios improved beginning with the 2010 survey and have remained $\geq$ 30:100 through 2022. Bull:cow ratios have remained consistent around 30:100 since 2014. In 2023 CWD was detected in a mule deer harvested on the border between GMU 23 and 32A.

Management Challenges and Opportunities: The McCall zone is managed under a general opportunity framework with several controlled hunts available aimed at addressing depredation concerns. Winter ranges occur primarily on public land. However, most of the elk/human conflicts in this zone happen during summer and fall months when elk enter private agricultural fields in higher elevation valley bottoms to forage. The number of depredation issues have been reduced substantially over the last several years, but reimbursements remain high due to the area's high value commodity production. In addition, recent private land purchases adjacent to the agricultural ground in GMUs 23 and 24 have noticeably restricted hunting access in those areas.

Much of the central and eastern portions of the McCall Zone have experienced large wildfires over the last 20 years leaving vast areas of dead and downed timber that are difficult for wildlife to move through. In addition, these fires have exposed much of the winter range to noxious weed invasion.

The 2023 detection of CWD on the border of GMUs 23 and 32A may prove to be a management challenge during the life of this plan, but initial efforts will focus on increased sampling to better determine prevalence and geographic distribution of CWD in this zone.

Inter-Zone and Intra-Zone Dynamics: It is thought that elk from neighboring areas move into GMUs 24 and 25 to summer but, at present, little information exists on non-winter elk movements and distribution.

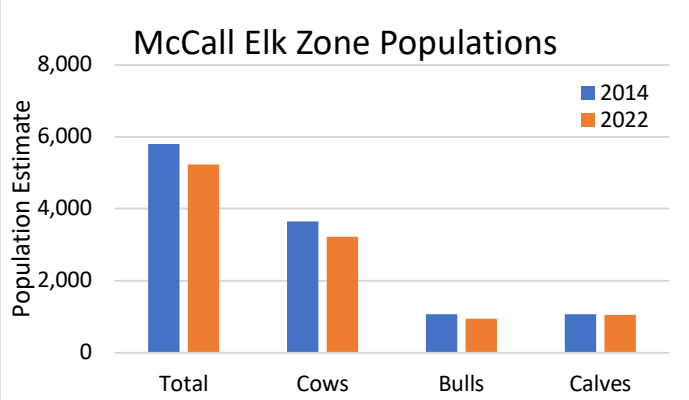
Future Needs: Many of the elk management zones surrounding the McCall elk zone have tag quotas and there is some concern that this may lead to increased hunter congestion as hunters unable to get tags in those zones switch to hunt McCall because they are assured of a tag. IDFG will monitor hunter participation and may consider adjustments to season or tag structure if necessary. Currently, little information exists on elk migration and habitat use in the zone. Future research should be aimed at determining seasonal elk distribution and movements to better aid management efforts. Improved knowledge about CWD prevalence and geographic distribution within the zone may result in management changes to discourage disease spread and manage local prevalence.

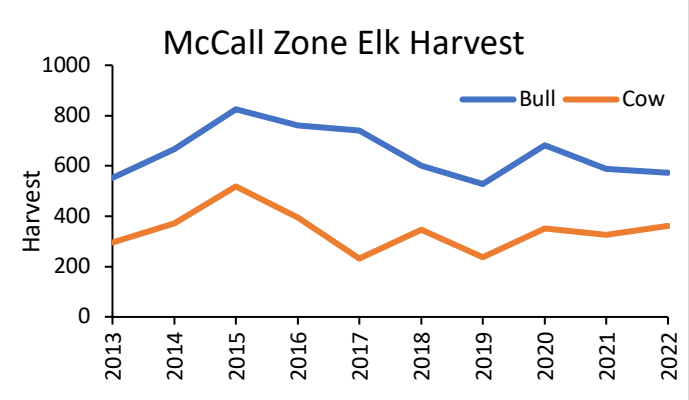
McCall Elk Zone Population Management Objectives and Status			
	Cows	Total Bulls	Branch-Antlered Bulls
Management Objective Range	2,500-3,700	525 - 800	300 – 450
Current Status (2022)	3,222	953	624

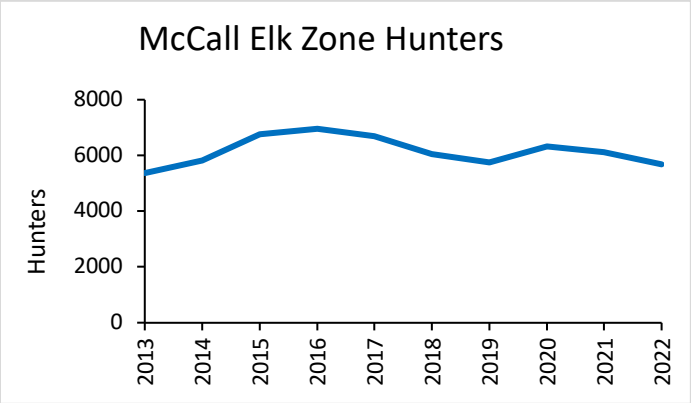
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

		McCall Elk Zone Population Survey Estimates								
Year	Cows	Calves	Total Bulls	Spikes	Raghorn Bulls	Mature Bulls	Unclassified Elk	Total Population	Calves per 100 Cows	Bulls per 100 Cows
2022	3,222	1,062	953	329	332	292	0	5,237	33	30
2014	3,652	1,071	1,077	369	381	327	8	5,808	29	30







McCall Elk Zone Management Table	
Management Direction	Strategy
Develop an elk monitoring program that includes modeling or monitoring zone population abundance during years between surveys.	Collect population data for current models and inform ongoing development of integrated population models
Develop biological studies to improve population, predator, and habitat management capabilities.	Pursue research activities designed to provide improved information on seasonal movements and survival
Implement measures to minimize, eliminate, or compensate for elk depredations.	Continue to maintain hunt structures that allow for depredation prevention, actively pursue preventative and mitigation measures such as Continued Use Agreements (CUA), Depredation Release Agreements (DRA) and Proactive Landowner Assistance in Depredations (PLAID) agreements, continue to implement reactive measures to prevent elk depredations such as depredation hunts and depredation kill permits and provide fair compensation when damages are unavoidable
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Coordinate with USFS Burned Area Emergency Response (BAER) teams to implement post-fire rehabilitation. Ensure IDFG staff in each region are certified as Resource Advisors via USFS. Work with land management agencies and private landowners to expand and improve aspen stands and enhance or develop early to mid-successional habitat in climax conifer forest areas. Prioritize these projects in GMUs 19A and 25. Treat invasive weeds along the South Fork Salmon River in GMUs 19A and 25 in elk winter range using chemical and biocontrol methods.
Increase IDFG involvement in long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve elk habitat.	Continue to provide input on forest collaborative processes such as PFC and SFRAMP to ensure that wildlife habitat and security are incorporated in planning processes

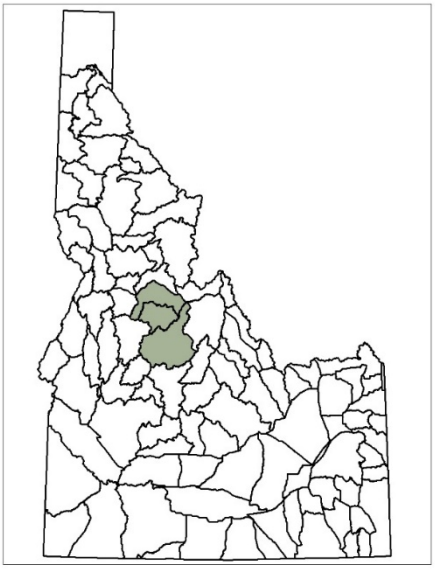
Minimize the influence of disease as a limiting factor in elk populations.	Assess CWD prevalence rate and geographic extent through increased surveillance. Use hunter participation and existing hunt structures where and when feasible in the implementation of the CWD management plan.

Middle Fork Zone

Game Management Units 20A, 26, and 27

Administered by IDFG's Southwest and Salmon Regions

Proposed Six Year Management Direction:



- The performance and management of the Middle Fork Zone is currently influenced by habitat and predation.
- Current population management direction in the Middle Fork Zone is to increase cow populations towards objectives.

Description: The Middle Fork Zone exhibits steep and rugged terrain within the Frank Church River of No Return Wilderness. Much of the zone is comprised of mixed conifer forest transitioning to sage steppe/grassland rangelands in the canyons at lower elevations.

Historical Perspective: Elk were in low abundance in Middle Fork Zone through the early part of the twentieth century. Populations began to grow under regulated hunting seasons and liberal either-sex opportunity was offered due to the remote wilderness character of this zone. In 1976, hunting seasons were changed to antlered only as it was suspected that the long, either-sex seasons had led to population declines. By 1982, populations had recovered sufficiently so that antlerless opportunity could again be added with limited controlled hunts**.** Elk populations in this zone peaked in the mid-1990s and have since declined. The Middle Fork Zone is currently managed as capped hunt with A and B tag any-weapon hunting opportunities for antlered elk only. Antlerless harvest was eliminated after 2010. Access is very limited in this elk zone and over 50% of the hunters are nonresidents which supports a large outfitting presence in this elk zone.

Management Challenges and Opportunities: Over half of the Middle Fork Elk Zone has burned since the early 2000s with several large tracts having burned twice. These recent, repeated fires have caused a successional shift from shrub dominated landscapes, allowing noxious weeds and invasive annual grasses to expand, decreasing the overall habitat quality. Weed control measures and habitat improvement project opportunities are limited because most of the landscape is federally designated wilderness.

Predation is likely exacerbating the effect the lower quality habitat has on the population decline. Incentives have been put in place to increase predator harvest in this elk zone. In 1999, a reduced-price bear and lion tag was made available for nonresidents that have already purchased a deer or elk tag. In the years following, second bear and lion tags were made valid in this elk zone. In addition, wolf seasons have been liberalized to allow year-round hunting with no tag limits and the trapping season has been extended to seven months. Limited access in this elk zone restricts the harvest of predators, especially in winter.

Inter-Zone and Intra-Zone Dynamics: Limited collar data indicate that elk from adjacent zones including the Sawtooth Zone, Salmon Zone, and McCall Zone winter at lower elevations throughout the Middle Fork Zone.

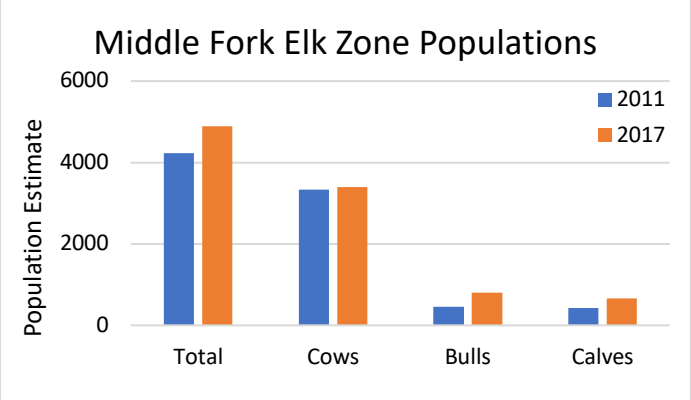
Future Needs: Short-term management goals involve stabilizing the elk population while providing antlered elk only hunting opportunities. Long-term management goals involve working with federal partners to improve both winter and summer range for elk.

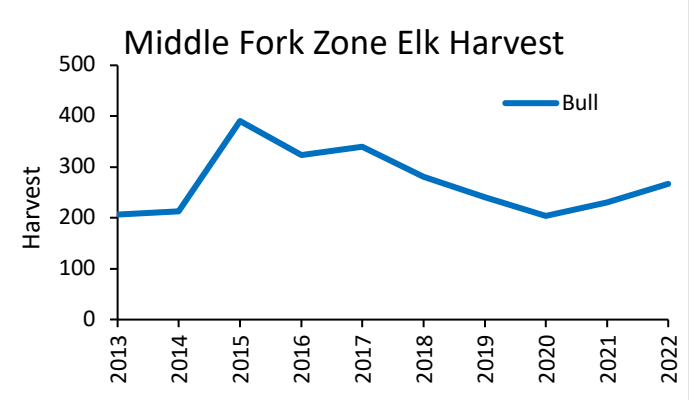
Middle Fork Elk Zone Population Management Objectives			
	Cows	Total Bulls	Branch-Antlered Bulls
Management Objective Range	3,850 – 5,750	690 – 1,030	390 – 810
Current Status (2017)	3,395	805	530

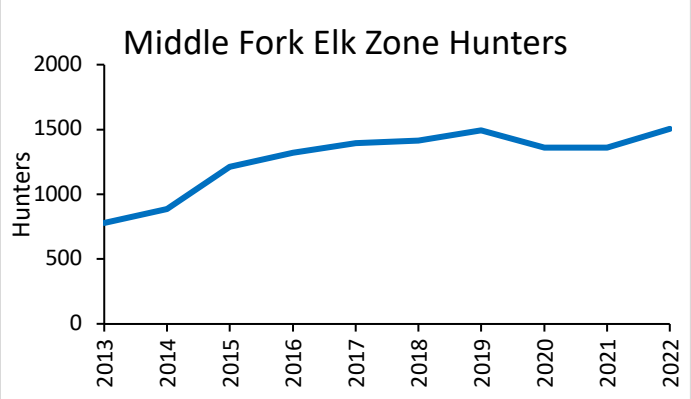
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

	Middle Fork Elk Zone Population Survey Estimates									
Year	Cows	Calves	Total Bulls	Spikes	Raghorn Bulls	Mature Bulls	Unclassified Elk	Total Population	Calves per 100 Cows	Bulls per 100 Cows
2017	3,395	660	805	275	335	195	32	4,892	19	24
2011	3,341	420	462	186	159	117	6	4,229	13	14







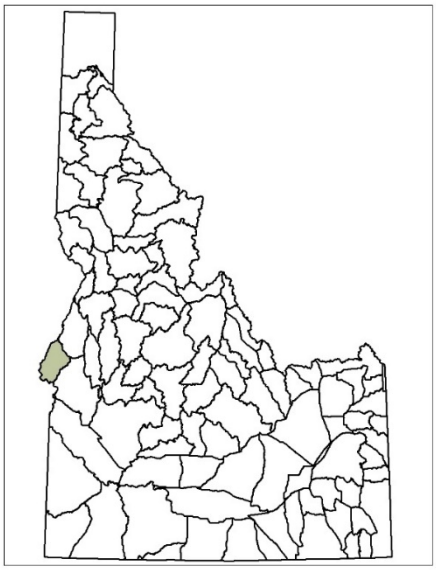
Middle Fork Elk Zone Management Table	
Management Direction	Strategy
When zones are below objectives, identify limiting factors and when appropriate implement management actions or efforts to address the identified limiting factors.	Continue to implement IDFG's Predation Management Plan for The Middle Fork Elk Zone and explore additional strategies to increase predator harvest. Implement actions identified in the 2023-2028 Gray Wolf Management Plan to reduce wolf predation on ungulate populations that are not meeting management objectives
Develop biological studies to improve population, predator, and habitat management capabilities.	Reengage with USFS concerning the implementation of research and monitoring activities in the wilderness that will contribute to the elk IPM
Work to enhance and maintain access for elk hunting.	Inform and support USFS efforts to maintain and improve existing trail systems and airstrips. Emphasis should be placed on maintaining trail systems that provide access from existing airstrips and road systems to facilitate hunter distribution and opportunity. Continue to work with USFS and Idaho Aeronautics to open and maintain the Big Creek 4 airstrips.
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Engage with USFS to identify and support habitat mitigation and enhancement efforts with an emphasis on noxious weed control
Integrate habitat assessments in the development of elk population goals.	Pending development of the fine-scale vegetation map, reevaluate zone objectives under differing potential habitat scenarios to determine if objectives are appropriate

Brownlee Zone

Game Management Unit 31

Administered by IDFG's Southwest Region

Proposed Six Year Management Direction:



- The performance and management of the Brownlee Zone is currently limited by depredation issues stemming from agricultural production and private land refugia.

- Current population management direction in the Brownlee River Zone is to reduce the elk population to within the current objectives and to manage for quality bull opportunities.

Description: Landownership within the zone is split almost 50/50 between public and private holdings. Public land in the northern portion of the zone consists primarily of USFS and State of Idaho properties that are largely one contiguous property with reasonable public access This northern portion constitutes a majority of the summer range within the zone. The transitional and winter range within the zone is largely private with interspersed BLM parcels that limit public access. Habitat type is a roughly 80/20 split of sage steppe/grassland rangelands and mixed coniferous forests.

Historical Perspective: Elk were likely in the Brownlee Zone prior to European settlement in the mid-1800s. Native American tribes hunted elk for food in the Weiser River drainage. As in other areas of Idaho, the proliferation of mining due to the gold rush in the late 1800s and early 1900s likely led to year-round harvest of these animals to supply meat and hides for mining camps. Subsequent heavy livestock grazing degraded habitat in the zone. Translocation of elk from Yellowstone to places in the Weiser River and McCall Zones occurred in the late 1930s to bolster dwindling elk populations. Regulated livestock grazing occurred during the same era. Transient elk from these populations probably repopulated the Brownlee Zone. Liberal either-sex hunting seasons kept population numbers of elk suppressed well into the late 1960s. GMU 31 was closed to elk hunting in 1968 due to suppressed elk population numbers. It reopened to controlled hunting in 1976 and a portion of the GMU was opened to general archery opportunity in 1977. Elk populations in this zone have performed well since the 1980s but reached their sociological tolerance level in the early 1990s. The population objective draws a balance between depredation concerns and providing quality elk hunting opportunities.

Management Challenges and Opportunities: Recent radio-collaring projects indicate that a portion of the population are non-migratory elk that do not leave private lands, associated with agriculture, in areas considered to be winter range. These non-migratory elk are included in the population estimates but are not typically available to the public and are responsible for a large proportion of the depredation damages within the zone. Additionally, many of the elk get pushed off public land with the onset of hunting season which complicates management.

Inter-Zone and Intra-Zone Dynamics: Radiolocation data show some interchange with elk in the Weiser River zone primarily in the southern end of each zone.

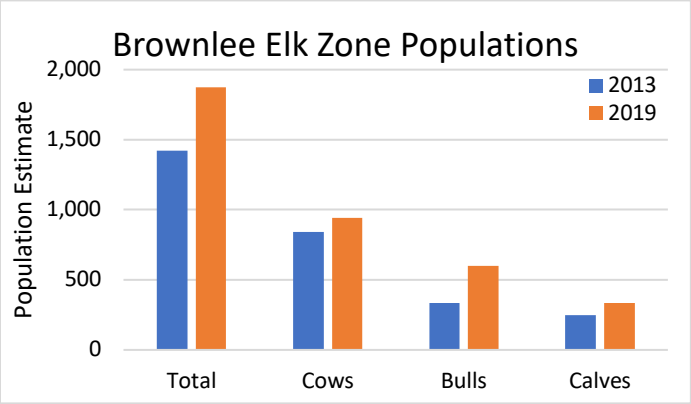
Future Needs: Maintaining or improving wintering habitat for these elk has been and should continue to be a priority to sustain or bolster tolerance and capacity for high density elk populations. Another priority is developing methodology to estimate the proportion and distribution of elk that are non-migratory which will aid future management efforts.

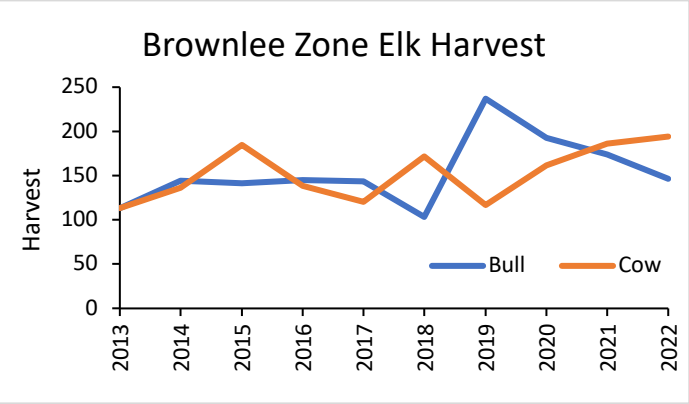
Brownlee Elk Zone Population Management Objectives			
	Cows	Total Bulls	Branch-Antlered Bulls
Management Objective Range	550 - 850	150 - 200	75 – 125
Current Status (2019)	942	600	466

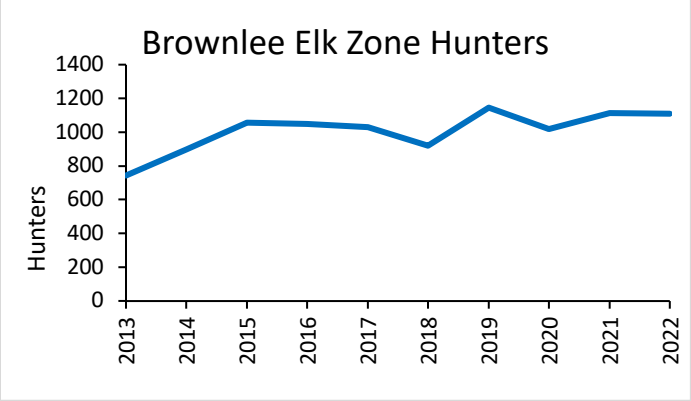
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

	Brownlee Elk Zone Population Survey Estimates									
Year	Cows	Calves	Total Bulls	Spikes	Raghorn Bulls	Mature Bulls	Unclassified Elk	Total Population	Calves per 100 Cows	Bulls per 100 Cows
2019	942	334	600	134	202	264	0	1,876	35	64
2013	841	249	334	135	99	100	0	1,424	30	40







Brownlee Zone Management Table	
Management Direction	Strategy
Develop an elk monitoring program that includes modeling or monitoring zone population abundance during years between surveys.	Continue to collect annual population data for current models and inform ongoing development of integrated population models. Develop methodology to estimate proportion of Brownlee Zone elk that are non-migratory depredating elk.
Implement measures to minimize, eliminate, or compensate for elk depredations.	Continue to maintain hunt structures that allow for depredation prevention, actively pursue preventative and mitigation measures such as Continued Use Agreements (CUA), Depredation Release Agreements (DRA) and Proactive Landowner Assistance in Depredations (PLAID) agreements, continue to implement reactive measures to prevent elk depredations such as depredation hunts and depredation kill permits and provide fair compensation when damages are unavoidable. Pursue novel ideas and approaches for incentivizing hunter access on private lands
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Work cooperatively with land management agencies, private landowners, and the Lower Weiser River Cooperative Weed Management Area to treat noxious weeds and invasive annual grasses using biocontrol, chemical, and cultural methods. Immediately following wildfires on BLM or IDL lands where elk habitat has been impacted, ensure IDFG staff are included on the Emergency Stabilization and Burned Area Rehabilitation (ESR) team in accordance with the 2020 MOU (BLM MOU ID-SO-2020-03) to assist in providing recommendations to effectively rehabilitate elk habitat. Similarly, IDFG staff will coordinate with USFS Burned Area Emergency Response (BAER) teams to accomplish the same. IDFG will ensure staff in each region are certified as Resource Advisors via USFS.

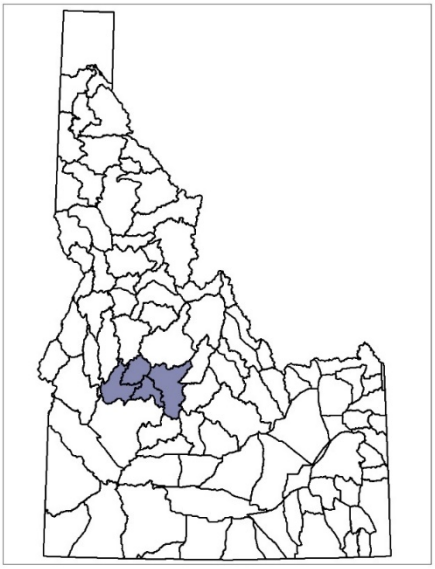
Sawtooth Zone

Game Management Units 33, 34, 35, and 36

Administered by IDFG's Southwest and Salmon Regions

Proposed Six Year Management Direction:

- The performance and management of the Sawtooth Zone is currently limited or influenced by habitat limitations and predation issues.
- Current population management direction in the Sawtooth Zone is to increase the population to be within current objectives.



Description: The Sawtooth zone is comprised of some of Idaho's most rugged and remote country. Four wilderness areas fall within this zone: the Sawtooth, Cecil D. Andrus-White Clouds, Hemingway-Boulders, and Jim McClure-Jerry Peak Wilderness. The Zone is over 95% public with large contiguous portions under USFS management that provide excellent public access. Habitat type is a roughly 90/10 split of mixed coniferous forests and sage steppe/grassland rangelands.

Historical Perspective: Elk were likely present in the Sawtooth Zone prior to European settlement in the mid-1800s. As in other areas of Idaho, the proliferation of mining due to the gold rush in the late 1800s and early 1900s likely led to year-round harvest of these animals to supply meat and hides for mining camps. Subsequent heavy livestock grazing degraded habitat in the zone. The lack of big game in the area resulted in the Idaho Legislature establishing the South Fork Game Preserve (now Unit 35) in 1909. This was the first game preserve in Idaho and remained in place until 1977. No hunting was allowed in the preserve until 1945. The elk herd increased to over 1,000 head by 1940 and approximately 2,000 head by the early 1950s. The population increased rapidly in the late 1970s peaking around 1989 with approximately 8,300 elk. The population steadily decreased from 1990 until 2009, to approximately 3,500 elk, when the commission responded by implementing a cap on general season tags. The cap was phased in over a 3-year period, reaching a 74% reduction of A-tag hunters and a 54% reduction of B-tag hunters upon full implementation in 2011. A slight increase to the general-season tag allocation was implemented in 2019 along with additional changes to how Sawtooth tags were vended in an effort to satisfy the overwhelming public demand. These efforts have stabilized the population decline, but the Sawtooth Zone remains below population objectives for bulls and cows and the public demand for opportunity to hunt the Sawtooth Zone remains high.

Management Challenges and Opportunities: The Sawtooth Predation Management Plan was implemented in 2012. Since 2012, predation on calves has declined but may continue to limit population growth potential. Calf predation mortality risk from 2008 through 2011 was roughly 43%. Since 2013, calf predation mortality risk has remained stable at a decreased but likely impactful level (18-19%). Cow predation mortality risk has largely remained unchanged since cause-specific mortality monitoring efforts began (3-7%). The proliferation of invasive annual vegetation on limited winter range, increased habitat fragmentation, and changes in land use likely limit herd growth potential. Maintaining or improving habitat for elk has been, and should continue to be, a priority to increase elk numbers to within zone population objectives.

Inter-Zone and Intra-Zone Dynamics: The Sawtooth Zone presents unique challenges for elk management due to varied movement and migration patterns that complicate population monitoring and harvest management. GMU 36 contains few overwintering elk, yet the majority of the harvest in the zone comes from GMUs 36 and 33. Collar monitoring efforts have shown that a large proportion of elk that use summer range in GMU 36 migrate to winter ranges in at least 11 surrounding GMUs that comprise parts of five elk zones. This disparity between elk distribution during the hunting season and during winter aerial surveys limits IDFG's ability to obtain winter population estimates that represent the

hunted population. As described in the following management directions and strategies, developing an improved understanding of elk movement ecology in and around this zone and evaluating additional methods to estimate populations prior to the hunting season (e.g., cameras on summer range) could facilitate redistribution of hunter numbers to match elk availability at the GMU level within this zone.

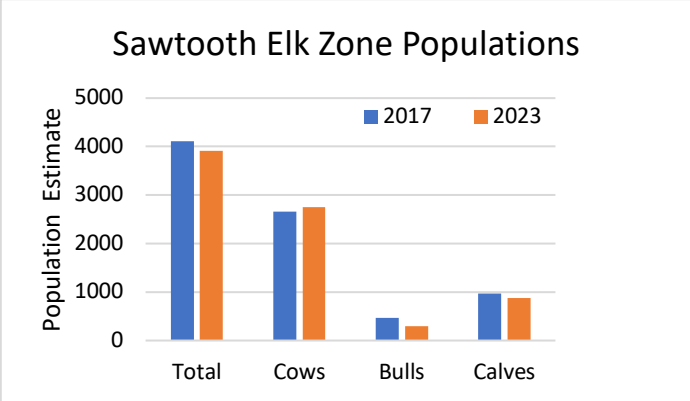
Future Needs: IDFG will continue to manage the entire zone to improve elk populations and provide a variety of quality hunting opportunities near a large human population center (Boise, Idaho) while keeping the elk population within carrying capacity of limited winter range and minimizing agricultural crop and property damage complaints on private land. IDFG will focus on working with partners to increase the capacity of habitat to support elk and elk calving across the zone. Additionally, IDFG will continue to iteratively adjust management to address the challenges of understanding elk populations in a zone that contains distinct summer range units and winter range units.

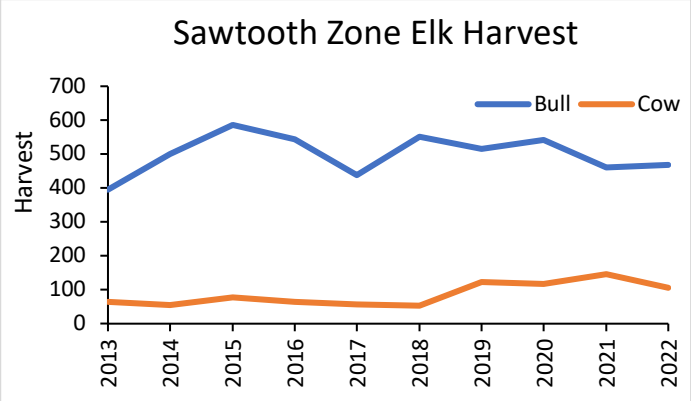
Sawtooth Elk Zone Population Management Objectives			
	Cows	Total Bulls	Branch-Antlered Bulls
Management Objective Range	3000 – 4,500	630 - 945	360 – 540
Current Status (2023)	2,754	292	165

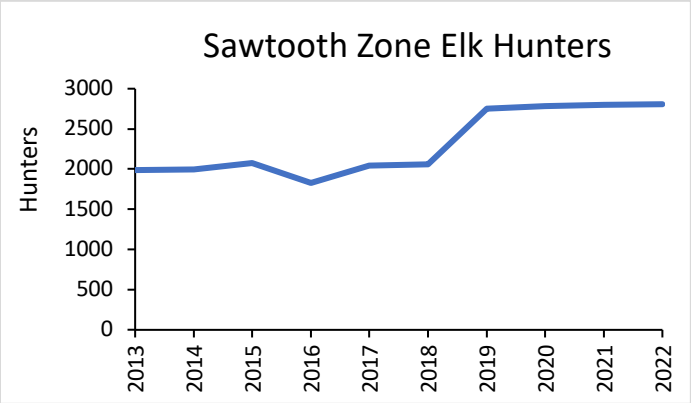
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

	Sawtooth Elk Zone Population Survey Estimates									
Year	Cows	Calves	Total Bulls	Spikes	Raghorn Bulls	Mature Bulls	Unclassified Elk	Total Population	Calves per 100 Cows	Bulls per 100 Cows
2023	2,754	870	292	127	83	82	0	3,916	32	11
2017	2,659	967	472	200	171	101	8	4,106	36	18







Sawtooth Elk Zone Management Table	
Management Direction	Strategy
When zones are below objectives, identify limiting factors and when appropriate implement management actions or efforts to address the identified limiting factors.	Implement the current predator management plan and adjust hunt structures as appropriate
Develop biological studies to improve population, predator, and habitat management capabilities.	Assess methods of estimating carrying capacity accounting for noxious weeds and exotic annuals Develop a working model of elk movement ecology in the Zone for the purposes of appropriate tag allocation. Examine the efficacy of camera-based population modeling and implement if warranted.
Implement measures to minimize or compensate for elk depredations.	Continue to maintain hunt structures that allow for depredation prevention, actively pursue preventative and mitigation measures such as Continued Use Agreements (CUA), Depredation Release Agreements (DRA) and Proactive Landowner Assistance in Depredations (PLAID) agreements, continue to implement reactive measures to prevent elk depredations such as depredation hunts and depredation kill permits and provide fair compensation when damages are unavoidable.
Improve key summer, winter, and transitional habitats on public and private lands that provide for elk populations to meet statewide objectives.	Assist private landowners and government land management agencies with the treatment of invasive weeds with a focus on invasive annual grasses and re-establishment of native perennial plants on winter range. Work with land management agencies and private landowners to expand and improve aspen stands and enhance or develop early to mid-successional habitat in climax conifer forest areas.

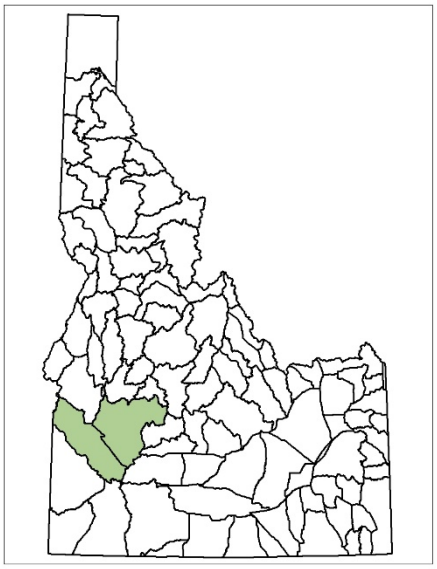
	Collaborate with USFS on Southwest Idaho Landscape projects to refine management actions to maximize benefits to elk populations. Immediately following wildfires on BLM or IDL lands where elk habitat has been impacted, ensure IDFG staff are included on the Emergency Stabilization and Burned Area Rehabilitation (ESR) team in accordance with the 2020 MOU (BLM MOU ID-SO-2020-03) to assist in providing recommendations to effectively rehabilitate elk habitats. Similarly, IDFG staff will coordinate with USFS Burned Area Emergency Response (BAER) teams to accomplish the same. IDFG will ensure staff in each region are certified as Resource Advisors via USFS.
Maintain IDFG involvement in long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve elk habitats.	Participate in Forest Collaboratives and interactions with local federal biologists and planning efforts.

Boise River Zone

Game Management Units 38 and 39

Administered by IDFG's Southwest Region

Proposed Six Year Management Direction:



- The performance and management of the Boise River Zone is currently limited or influenced by depredation issues, habitat fragmentation and habitat loss on winter range.
- Current population management direction in the Boise River Zone is to continue to allow for general season hunting opportunities while reducing the population to meet objectives and reducing non-migratory populations causing agricultural conflict.

Description: GMU 39 is over 70% public with large contiguous portions of USFS and BLM property that provide excellent public access. Habitat is roughly a 60/40 split of mixed coniferous forests and sage-steppe/grassland rangelands. On summer and winter range, conversion to exotic annual grasses and forbs has decreased the habitat value for elk. GMU 38 takes in most of the Treasure Valley and is comprised of a 60/40 private/public landownership split. The public land is primarily BLM that has largely degraded into monoculture stands of exotic species and provides limited elk habitat. Private lands are primarily irrigated agriculture and residential development. Currently, GMU 38 contains no suitable elk habitat that is not directly tied to agricultural crop production.

Historical Perspective: Elk were likely present in the Boise River Zone prior to European settlement in the mid-1800s. As in other areas of Idaho, the proliferation of mining due to the gold rush in the late 1800s and early 1900s likely led to year-round harvest of elk to supply meat and hides for mining camps. Subsequently, heavy livestock grazing degraded habitat in the zone. Sparse elk herds were later bolstered with translocated elk from the Yellowstone area in the late 1930s. Relatively liberal either-sex seasons were maintained in this zone until the early 1970s, suppressing the elk population well below habitat potential. In 1975, antlered-only hunting was implemented. In 1988 a small number of controlled antlerless hunts were added back into the zone and the antlerless opportunity has slowly increased since then. Since the early 2000s, elk populations have increased. Most of the transitional and summer ranges used by migratory elk within the zone are on public lands.

Management Challenges and Opportunities: Habitat degradation remains a concern, but habitat quality and availability on winter range is the primary limiting factor for this population. Currently, there is no suitable elk habitat not directly tied to agriculture in GMU 38. Therefore, grouping this unit with the Boise River Zone will allow for general hunting opportunities on a growing number of non-migratory elk and allow for management to continue to address depredations on private property during the winter months.

Inter-Zone and Intra-Zone Dynamics: During summer, elk populations are distributed geographically throughout GMU 39. Transitioning to the winter months, most elk move within the zone to lower elevations with some elk coming to these same wintering areas from the Sawtooth and Smoky-Bennett Zones. These elk migrating into the Boise River Zone for the winter would likely be available to hunters only during late season hunts. A small number of elk reside exclusively on private property and cause agricultural depredations but most elk within the zone are available to the public during the general hunting seasons.

Future Needs: Continuing to address conflicts as they arise across the zone and working to ensure that wintering habitat remains functional and available will continue to be a priority. Involvement in fire rehabilitation efforts, particularly in

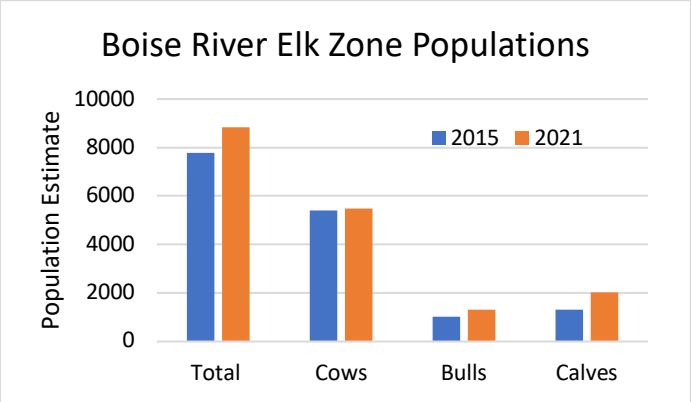
low elevation areas with lower resistance to invasive annual plant expansion should be prioritized to ensure the habitat outcomes described above.

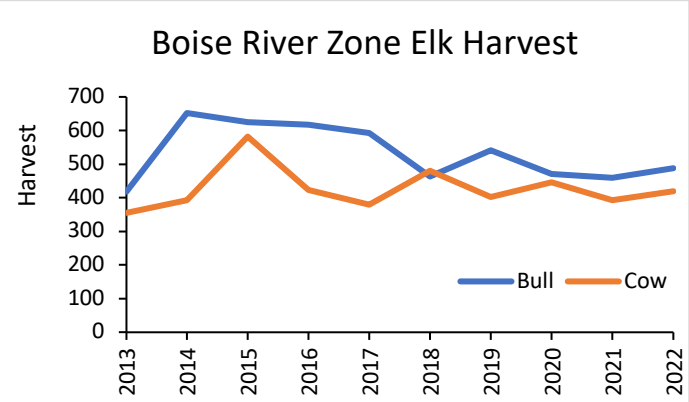
Boise River Elk Zone Population Management Objectives			
	Cows	Total Bulls	Branch-Antlered Bulls
Management Objective Range	3,200 – 4,800	650 – 950	375 – 575
Current Status (2021)	5,480	1,313	865

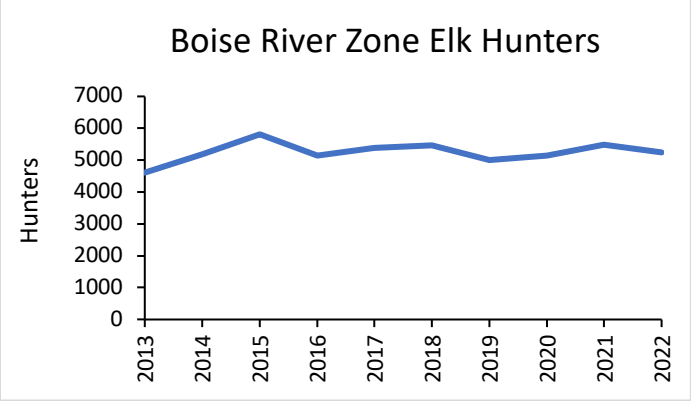
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

		Boise River Elk Zone Population Survey Estimates								
Year	Cows	Calves	Total Bulls	Spikes	Raghorn Bulls	Mature Bulls	Unclassified Elk	Total Population	Calves per 100 Cows	Bulls per 100 Cows
2021	5,480	2,037	1,313	448	362	503	2	8,832	37	24
2015	5,417	1,317	1,035	448	240	347	0	7,769	24	19







Boise River Elk Zone Management Table	
Management Direction	Strategy
Develop an elk monitoring program that includes modeling or monitoring zone population abundance during years between surveys.	Continue to collect annual population data for current models and inform ongoing development of integrated population models
Implement measures to minimize or compensate for elk depredations.	Continue to maintain hunt structures that allow for depredation prevention, actively pursue preventative and mitigation measures such as Continued Use Agreements (CUA), Depredation Release Agreements (DRA) and Proactive Landowner Assistance in Depredations (PLAID) agreements, continue to implement reactive measures to prevent elk depredations such as depredation hunts and depredation kill permits and provide fair compensation when damages are unavoidable.
Improve key summer, winter, and transitional habitats on public and private lands that provide for elk populations to meet statewide objectives.	Immediately following wildfires on BLM or IDL lands where elk habitat has been impacted, ensure IDFG staff are included on the Emergency Stabilization and Burned Area Rehabilitation (ESR) team in accordance with the 2020 MOU (BLM MOU ID-SO-2020-03) to assist in providing recommendations to effectively rehabilitate elk habitats. Similarly, IDFG staff will coordinate with USFS Burned Area Emergency Response (BAER) teams to accomplish the same. IDFG will ensure staff in each region are certified as Resource Advisors via USFS. Assist private landowners, BLM, and IDL to maintain existing fuel breaks associated with BLM's Paradigm Project. Regularly evaluate the need for additional fuel breaks and implement projects as funding and resources permit. Assist private landowners and government land management agencies with the treatment of invasive weeds with a focus on invasive annual grasses and re-establishment of native perennial plants. Where human disturbance associated with winter recreational use of roads, trails, or lands are observed to negatively impact wintering elk, work with land management agencies to develop mitigating measures (e.g., seasonal closures, trail rerouting, user type restrictions, etc.). As funding and resources permit and within areas identified as movement routes, cost share with private landowners to replace fences posing an impediment or otherwise injurious to migrating elk with wildlife-friendly fencing or crossing structures. Work with land management agencies and private landowners to expand and improve aspen stands and enhance or develop early to mid-successional habitat in climax conifer forest areas.

Maintain IDFG involvement in long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve elk habitats.	Participate in Forest Collaboratives and interactions with local federal biologists and planning efforts
Minimize the influence of disease as a limiting factor in elk populations.	Continue annual disease monitoring efforts for current and emerging diseases within existing elk populations
Collaborate with federal and state agencies, American Indian tribes, counties, nonprofit organizations, private landowners, and others to incorporate important elk movement and migration habitat and routes into management decisions.	Continue to implement the Idaho Action Plan with a focus on Priority Areas within the zone. Provide technical assistance to partners regarding impacts of proposed projects on elk habitat and movement and migration routes. Collaborate with county, state, federal, tribal, and NGO partners, as well as private landowners to improve migration habitat as opportunities arise.

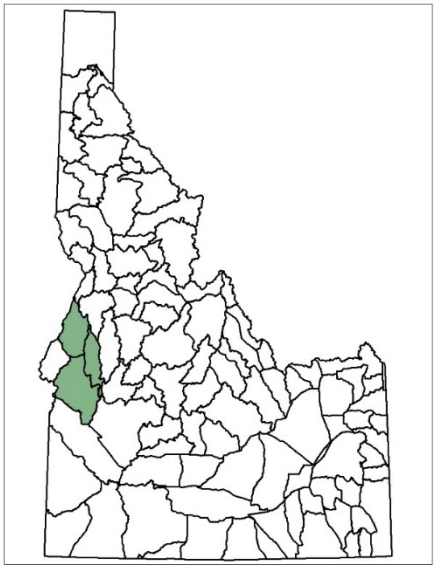
Weiser River Zone

Game Management Units 22, 32, and 32A

Administered by IDFG's Southwest Region

Proposed Six Year Management Direction:

- The performance and management of the Weiser River Zone is currently limited by depredation issues stemming from agricultural production and private land refugia.
- Current population management direction in the Weiser River Zone is to reduce the elk population to within the current objectives while increasing surveillance of Chronic Wasting Disease.



Description: Landownership within the zone is split around 50/50 between public and private. Public ownership within GMUs 22 and 32A are largely contiguous parcels of USFS and BLM that provide reasonable public access. Public ownership within GMU 32 is largely BLM, much of which is disconnected or difficult to access due to private land holdings. Habitat type is a roughly 60/40 split of sage-steppe/grassland rangelands and mixed coniferous forests.

Historical Perspective: Elk were likely present in the Weiser River Zone prior to European settlement in the mid-1800s. As in other areas of Idaho, the proliferation of mining due to the gold rush in the late 1800s and early 1900s likely led to year-round harvest of these animals to supply meat and hides for mining camps. Subsequent heavy livestock grazing degraded habitat in the zone. Translocation of elk from Yellowstone to places in the McCall Zone on the periphery of the Weiser River Zone occurred in the late 1930s to bolster sagging elk populations. Regulated livestock grazing began during the same era. Transient elk from these populations likely repopulated the Weiser River Zone. Liberal either-sex hunting seasons kept elk populations suppressed well into the 1970s. Unit 22 became a controlled either-sex hunt in 1971. This unit reopened to general bull-only hunting in 1977, spurring an increase in elk populations.

The elk population in the agricultural area of the west half of Unit 32 consisted of transient elk prior to 1980. Following several hard winters, elk herds started moving into this area more consistently. Most elk were winter residents with a few groups becoming year-round residents. The population of elk in the Weiser River Zone continued to see dramatic increases through the 1990s through the early 2010s, jumping from an estimated 3,800 head in 1993 to 10,500 in 2013. Over the next 10 years IDFG implemented aggressive antlerless take within the zone such that the current population is likely hovering around the upper objective range. The Weiser River elk population estimates are derived from elk that are counted during the winter on lower elevations in portions of GMUs 22 and 32. In 2023 CWD was detected in a mule deer harvested on the border of GMUs 23 and 32A.

Management Challenges and Opportunities: Maintaining a population that is within the objective range but that is also available to the general public is a high priority. Summer habitat for the Weiser River Zone is primarily located on federal lands, but occupied winter habitat is largely private land in GMU 32 and a mix of private and public lands in GMU 22.

Recent collaring studies and fixed-wing surveys indicate that a sizeable portion of the population are non-migratory elk that do not leave private lands associated with agriculture and in areas considered to be winter range in GMU's 22 and 32. These non-migratory elk are included in the population estimates but are not typically available to the public and are responsible for a large proportion of the depredation damages within the zone.

Inter-Zone and Intra-Zone Dynamics: Collaring efforts show some interchange with elk in the Brownlee Zone, primarily in the southern end of each zone. Additionally, Weiser River Zone elk share summer range with McCall Zone elk along the border of GMUs 24 and 32A.

Future Needs: Maintaining or improving wintering habitat for these elk has been, and should continue to be, a priority to sustain or bolster tolerance and capacity for high density elk populations. Increased collaboration with land management agencies is needed to improve access management and decrease disturbance on winter range with the goal of facilitating elk security and use of public lands. Involvement in fire rehabilitation efforts, particularly in low elevation areas with lower resistance to invasive annual plant expansion should be prioritized to ensure the habitat can support this high-density elk population. Another priority is to develop methodology to estimate the proportion and distribution of elk that are non-migratory, which will aid future management efforts in the zone.

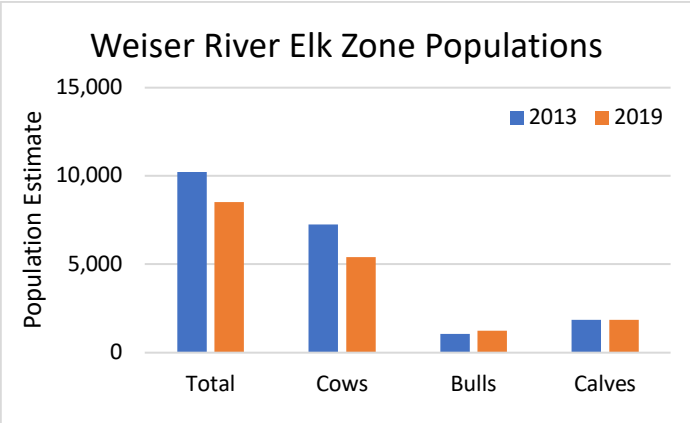
Improved knowledge about CWD prevalence and geographic distribution within the zone may result in management changes to discourage disease spread and manage local prevalence.

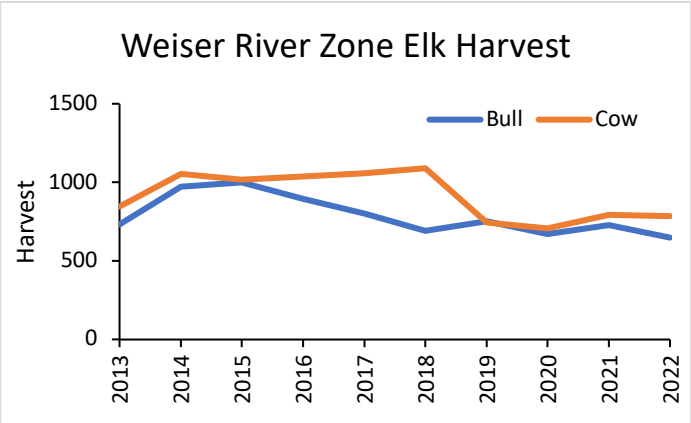
Weiser River Zone Population Management Objectives and Status			
	Cows	Total Bulls	Branch-Antlered Bulls
Management Objective Range	3,300 – 5,000	670 – 1,000	325 – 500
Current Status (2019)	5,410	1,234	598

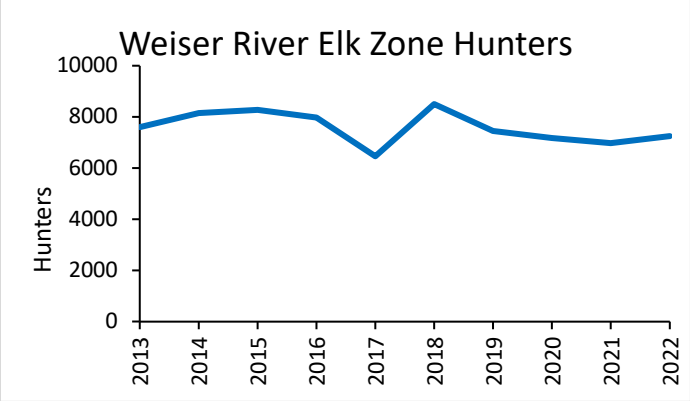
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

	Weiser River Elk Zone Population Survey Estimates									
Year	Cows	Calves	Total Bulls	Spikes	Raghorn Bulls	Mature Bulls	Unclassified Elk	Total Population	Calves per 100 Cows	Bulls per 100 Cows
2019	5,410	1,863	1,234	636	348	250	0	8,507	34	23
2013	7,273	1,867	1,074	537	319	218	0	10,214	26	15







Weiser River Elk Zone Management Table	
Management Direction	Strategy
Develop an elk monitoring program that includes modeling or monitoring zone population abundance during years between surveys.	Continue to collect annual population data for current models and inform ongoing development of integrated population models. Develop methodology to estimate the proportion and distribution of Weiser Zone elk that are non-migratory depredating elk.
Implement measures to minimize, eliminate, or compensate for elk depredations.	Continue to maintain hunt structures that allow for depredation prevention, actively pursue preventative and mitigation measures such as Continued Use Agreements (CUA), Depredation Release Agreements (DRA) and Proactive Landowner Assistance in Depredations (PLAID) agreements, continue to implement reactive measures to prevent elk depredations such as depredation hunts and depredation kill permits and provide fair compensation when damages are unavoidable. Pursue novel ideas and approaches for incentivizing hunter access on private lands
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Immediately following wildfires on BLM or IDL lands where elk habitat has been impacted, ensure IDFG staff are included on the Emergency Stabilization and Burned Area Rehabilitation (ESR) team in accordance with the 2020 MOU (BLM MOU ID-SO-2020-03) to assist in providing recommendations to effectively rehabilitate elk habitat. Similarly, IDFG staff will coordinate with USFS Burned Area Emergency Response (BAER) teams to accomplish the same. IDFG will ensure staff in each region are certified as Resource Advisors via USFS. Work cooperatively with land management agencies, private landowners, and the Lower Weiser River Cooperative Weed Management Area to treat noxious

	weeds and invasive annual grasses using biocontrol, chemical, and cultural methods. Work with land management agencies and private landowners to improve range conditions in areas with chronic elk depredations.
Maintain IDFG involvement in long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve elk habitat.	Participate in Forest Collaboratives and interactions with local federal biologists and planning efforts.
Minimize the influence of disease as a limiting factor in elk populations.	Assess CWD prevalence rate and geographic extent through increased surveillance. Use hunter participation and existing hunt structures where and when feasible in the implementation of the CWD management plan.

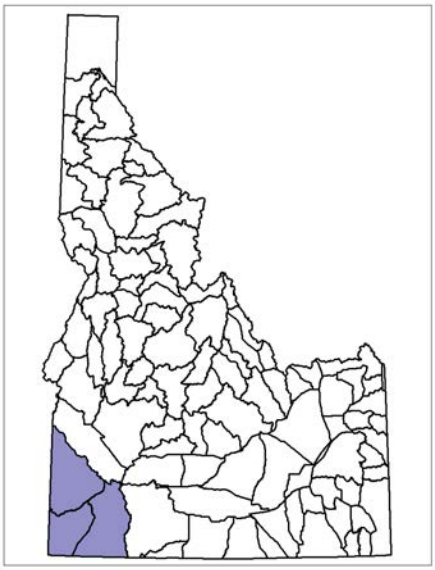
Owyhee Zone

Game Management Units 40, 41 and 42

Administered by IDFG's Southwest Region

Proposed Six Year Management Direction:

- The performance and management of the Owyhee Zone is currently limited by depredation issues and habitat.
- Current population management direction in the Owyhee Zone is to maintain the population in some areas, and to reduce elk numbers overall.



Description: Landownership within the Owyhee Zone is approximately 85% public land and 15% private. Six federally designated wilderness areas constitute approximately 13% of the total land use area. Habitat in the Owyhee Uplands and Canyonlands are primarily composed of a mix of sage-steppe and grassland rangelands with encroaching juniper woodlands. Despite the large proportion of public land within the zone the rugged canyonlands, wilderness areas and geographical distribution of private property present some access challenges.

Historical Perspective: Little is known about elk in the Owyhee Zone pre-European settlement, but current elk presence in the zone was established by a translocation effort conducted in 1944. From 1990 to 1996 the Nevada Department of Wildlife and the Rocky Mountain Elk Foundation conducted a reintroduction program, releasing around 200 elk in the Bruneau/Jarbidge River drainages in Nevada south of the Idaho border. This reintroduction was very successful. Currently, there are a large number of migratory elk that winter in GMU 41 east of Highway 51 moving south to summer ranges in Nevada, with a portion of that population residing in Idaho year-round.

Historically, elk densities were low in the Owyhee Zone and aerial surveys were not conducted due to the expansive land area, dispersed groups of elk, poorly understood winter range, difficult winter access, and interstate migratory patterns. The population has been monitored using harvest data, occasional fixed wing flights, and other observations.

Hunting seasons in the 1950s through 1965 were offered through limited controlled hunts. From 1966 through 1972 a 2-day general hunt season was held. No elk hunting was authorized in the zone from 1973 through 1991. In 1992 a 5-tag controlled hunt was authorized in GMU 40 and in 1994 GMU 42 was added to the hunt area. Hunting opportunity has steadily increased since then to current levels. The first GMU 41 antlered elk tags were authorized in 2010 and since then tag allocations have increased to include antlerless opportunity.

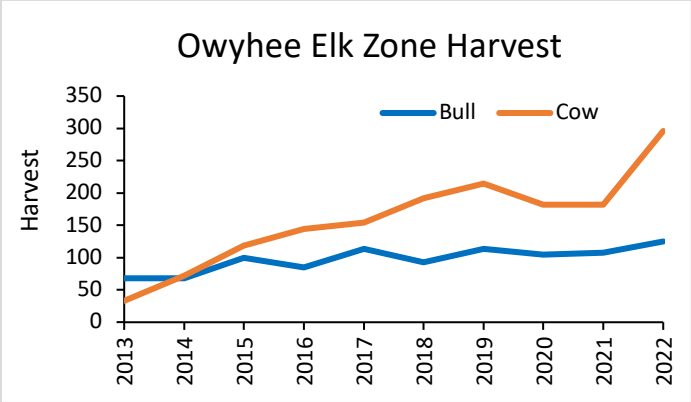
Management Challenges and Opportunities: Increases in elk numbers were inevitable from natural reproduction, limited predation, hunter access limitations, and continued ingress of interstate elk. Conflicts between elk and landowners have had a major influence on elk management in portions of Owyhee County. The BLM manages most of the elk habitat in Owyhee County. However, parcels of private property include habitat that receives substantial elk use, due, in part, to their disproportionate availability of higher quality habitat. Landowners' major depredation concerns are damage to fences, loss of private rangeland forage, and increased elk use on irrigated hay meadows.

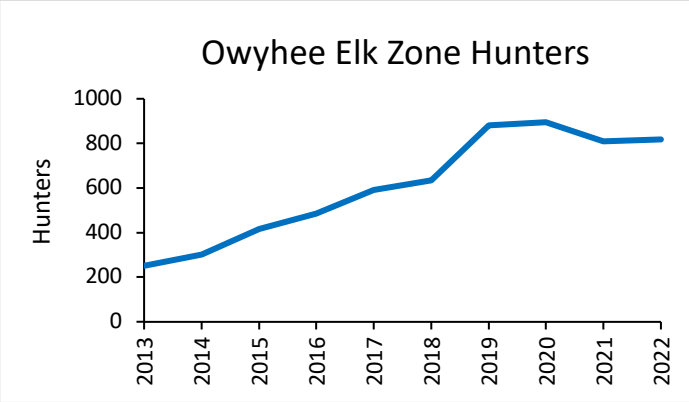
Habitat degradation due to juniper encroachment, wildfire, and invasive annual grasses, particularly on public land, may also affect elk land use, depredations, and population limitations. On portions of private and public land in GMUs 40 and 42, efforts are underway to remove encroaching juniper from sagebrush, aspen, and riparian habitats using mechanical

treatments and prescribed fire. The purpose of these projects is to return large swaths of the area to an early successional state by reducing the amount of juniper cover, improving aspen stand health, and increasing the amount of grasses, forbs, and shrubs available for wildlife.

Inter-Zone and Intra-Zone Dynamics: Most elk movement to and from the Owyhee Zone is between neighboring states, while movement across zone boundaries is limited due to topography. This tri-state population includes elk that summer in Idaho and winter in Oregon, others that summer in Nevada and winter in Idaho, and elk that are year-round Idaho residents. Idaho resident elk within the zone make shorter migrations between summer and winter range than many of their interstate counterparts but can also be displaced between hunt areas with uneven pressure.

Future Needs: New projects are in development to attempt to address invasive annual grasses, juniper encroachment, and to rehabilitate wildfire areas.





Owyhee Elk Zone Management Table	
Management Direction	Strategy
Develop an elk monitoring program that includes modeling or monitoring zone population abundance during years between surveys.	Develop sightability survey proposal based on collared elk location and flight observation data with the intent to begin surveying populations.
Implement measures to minimize or compensate for elk depredations.	Collaborate with the BLM during grazing permit renewal processes to assure range conditions provide adequate forage for elk in areas prone to depredation. Provide technical and/or financial assistance to land management agencies toward invasive annual grass treatments and removal of encroaching juniper meant to create more forage for wildlife adjacent to private lands experiencing elk depredation. Develop project proposal to evaluate effectiveness of fence marking methods to reduce fence damage by elk. If effective, provide fence markers to landowners to reduce the amount of fence damaged by elk. Provide technical and/or financial assistance to landowners for converting existing fences to wildlife-friendly design.

Improve key summer, winter, and transitional habitats on public and private lands that provide for elk populations to meet statewide objectives.	Work with the interagency Bruneau Owyhee Sage-Grouse Habitat project planning team regarding juniper removal in elk habitat. Participate in BLM travel management planning within the Bruneau and Owyhee Field Offices. Immediately following wildfires on BLM or IDL lands where elk habitat has been impacted, ensure IDFG staff are included on the Emergency Stabilization and Burned Area Rehabilitation (ESR) team in accordance with the 2020 MOU (BLM MOU ID-SO-2020-03) to assist in providing recommendations to effectively rehabilitate elk habitats. Work with BLM ESR and IDL to identify historic wildfires that have not recovered adequately, and initiate follow-up restoration projects. Work with IDL foresters to maximize elk habitat benefits for future commercial timber sales on South Mountain Use collared elk movement data to identify and develop or recommend potential habitat treatment projects to benefit elk, such as prescribed fire, juniper removal, aspen stand improvement, and riparian and wet meadow restoration. Use seasonal elk movement data to inform prescribed fire burn timing on South Mountain. Use seasonal elk movement data to recommend future prescribed fire locations. Provide locally sourced shrub seed for restoration efforts when possible. Incorporate early successional shrubs and drought tolerant grass/forb species into seed mixes that are more likely to persist in hotter and drier conditions. Identify and develop habitat projects that allow sportsmen and non-profit groups to partner on habitat projects such as post-fire reseeding, winter range shrub planting, juniper removal, riparian and wet meadow restoration, and aspen stand improvements.

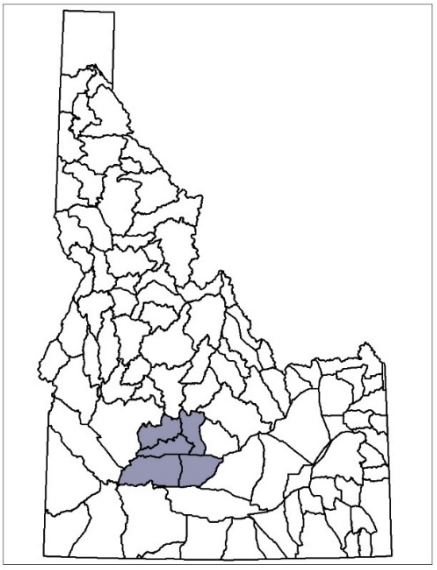
Smoky-Bennett Zone

Game Management Units 43, 44, 45, 48, 52

Administered by IDFG's Magic Valley Region

Proposed Six Year Management Direction:

- The performance and management of the Smoky-Bennett Zone is limited by depredations.
- The current population management direction for the Smoky-Bennett Zone is to maintain cow elk populations at current (2022-23) levels while reducing bull numbers to levels consistent with population objectives.



Description: The Smoky-Bennett elk zone encompasses a diverse landscape. The southern portion of the zone is dominated by the Snake River Plain, which is characterized by sagebrush-steppe rangeland, much of which has been converted to agriculture. Vast tracts of native rangeland have been degraded by wildfire and the proliferation of invasive annual grasses. At higher elevations in the northern part of the zone, dry conifer forests and alpine habitat types are common, particularly in the upper reaches of the South Fork Boise River and Big Wood River watersheds.

Historical Perspective: The Smoky-Bennett elk population has changed significantly over the last 100 years. Early accounts from the 1870s indicate that moderate numbers of elk occurred in the zone but were not as numerous as deer. Poor grazing practices, combined with unregulated hunting led to a significant decline in elk numbers by the late 1800s. Subsequently, elk from Yellowstone National Park were translocated between present day Arrowrock Dam and the Big Wood River drainage between 1915 and 1936. Elk numbers steadily increased throughout the zone, and the first controlled hunt opportunity was offered in the 1950s. Depredation concerns began in the late 1970s, prompting IDFG to implement additional harvest opportunities. Elk numbers reached a peak of around 4,871 total animals by 2016 and agricultural depredations had become a major concern. Increasing elk herds and a shift in behavior, with more animals occupying agricultural land during summer and fall, resulted in escalating conflicts on private land. The first B-tag opportunity was offered in 2018, with 2,500 tags available. This hunt structure replaced several controlled hunts and was successful in reducing elk numbers.

Management Challenges and Opportunities: One of the primary management challenges in this zone is reducing depredations on agricultural lands. These issues are somewhat dependent on environmental conditions, with drought years increasing the extent of these conflicts. IDFG will actively work to address these conflicts, and will continue to utilize depredation hunts, landowner permission hunts, Access Yes, and other methods to reduce depredations while providing hunting opportunities.

Summer habitat is generally of high quality across much of the zone; however, winter range is limiting, particularly along the Bennett Mountain front between Mountain Home and Shoshone. Over 120,000 acres of elk winter range has burned in the past decade, converting native sagebrush-steppe to annual grasslands. Degraded native rangeland and nearly year-round recreation (both motorized and non-motorized) has likely contributed to the displacement of elk on to private agriculture. Hunter crowding and conflict with private land becomes a concern in December and January when elk are congregated in large groups, thus most hunting opportunity is offered in the late summer and early fall. Late season hunting is regulated by controlled hunts with a reduced number of hunters accessing areas where there are wintering elk, which is used to address depredation issues.

Inter-Zone and Intra-Zone Dynamics: There appear to be migratory, partially migratory, and resident elk herds in this population, each of which are accompanied by their own set of management needs and challenges. Advancements in GPS radio-collar technology, and a statewide emphasis on mapping elk seasonal ranges and migration routes led to a restructuring of the zone in 2014. This restructuring provided a better representation of the area used by this population of elk throughout the entire year. While most elk in this zone migrate to winter range on the south side of Bennett Mountain and lower elevation habitat in the Big Wood River watershed, a subset of the Smoky-Bennett elk population migrate west to spend winter months on the foothills of the Danskin Mountains and benches above the South Fork Boise River in the Boise River zone. Increased monitoring, via radio-collared elk, will aid in determining the number of elk emigrating from this zone to the Boise River Zone during winter.

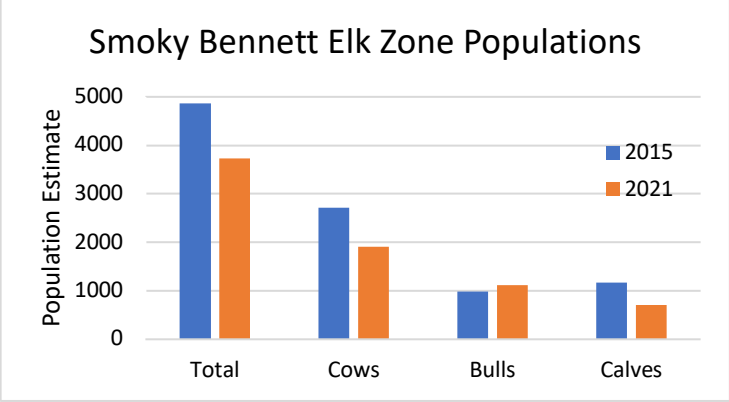
Future Needs: To maintain elk within objectives, IDFG will continue to provide bull and cow harvest opportunities, while adjusting as needed in response to agricultural impacts. Additionally, IDFG will continue to survey this population regularly to evaluate the impacts of harvest regulations. Working with land management agencies to improve native habitat and reduce recreational pressure on elk seasonally will continue to be important. Finally, working with private landowners and communicating with hunters to ensure both stakeholders are involved in management decisions will help ensure that tools such as Access Yes and depredation hunts persist into the future.

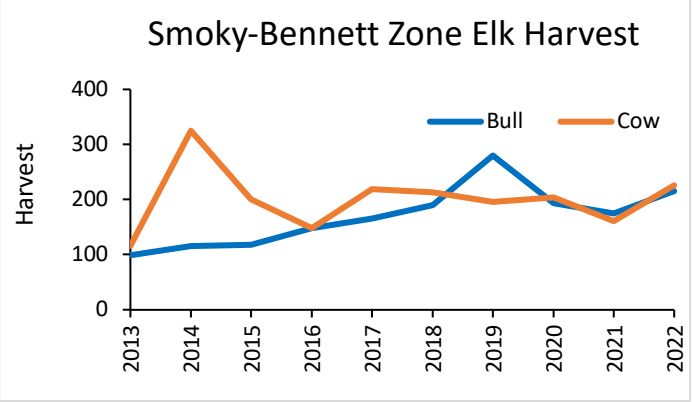
Smoky-Bennett Elk Zone Population Management Objectives			
	Cows	Total Bulls	Branch-Antlered Bulls
Management Objective Range	2,000 – 3,000	62 – 930	400 – 595
Current Status (2021)	1,905	1117	832

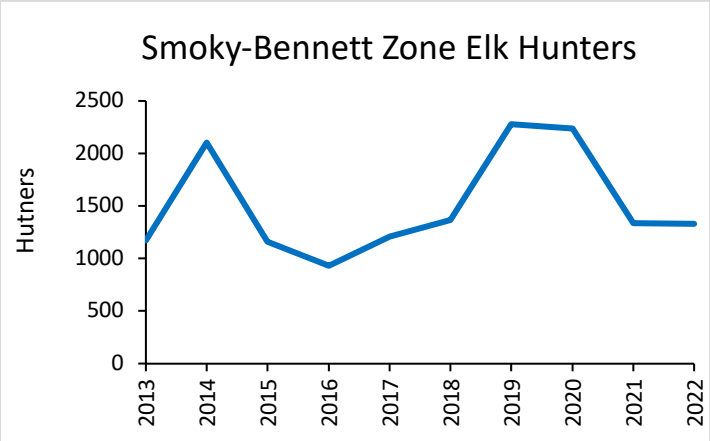
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

Smoky-Bennett Elk Zone Population Survey Estimates										
Year	Cows	Calves	Total Bulls	Spikes	Raghorn Bulls	Mature Bulls	Unclassified Elk	Total Population	Calves per 100 Cows	Bulls per 100 Cows
2021	1,905	700	1,117	285	296	536	160	3,804	37	58
2015	2,712	1,173	986	337	349	300	1	4,872	43	36






Smoky-Bennett Zone Elk Hunters
Hutners
2500
2000
1500
1000
500
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022

Smoky-Bennet Elk Zone Management Table	
Management Direction	Strategy
Implement measures to minimize, eliminate, or compensate for elk depredations.	Maintain over-the-counter, any-weapon antlerless opportunity in southern portions of zone when populations are meeting objectives. If increasing elk populations and depredations warrant, utilize over-the-counter, any-weapon antlerless hunting, targeted hunting seasons, managed hunting on private lands, and targeted lethal removal of elk to maintain the population at levels consistent with plan objectives and management direction
Develop biological studies to improve population, predator, and habitat management capabilities.	Increase radio-collaring efforts of elk wintering in the southeast portion of GMU 39, near the Smoky-Bennett Zone boundary
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Work with the Sawtooth and Boise National Forests to maximize the benefits of fuels treatments to elk habitat via improved forage quantity and quality (referencing the Forest Fuels Management Plan). Work with the Sawtooth National Forest to implement the Forest Invasive Species Project by identifying areas where noxious and invasive plant species are degrading elk habitat. Immediately following wildfires on BLM or IDL lands where elk habitat has been impacted, ensure IDFG staff are included on the Emergency Stabilization and Burned Area Rehabilitation (ESR) team in accordance with the 2020 MOU (BLM MOU ID-SO-2020-03) to assist in providing recommendations to effectively rehabilitate elk habitats. Explore funding mechanisms to continue large-scale rehabilitation and habitat improvement in burned areas after ESR and BAER funding is no longer available. Work with the USFS and BLM on recreation and travel management planning, particularly in sensitive elk habitat (calving grounds, stopover areas, and winter ranges). Work with USFS, BLM, and IDL on grazing management during permit renewals, and explore ways to help land management agencies encourage producers to engage in projects that benefit elk (e.g. virtual fencing, fuels treatments, noxious weed control, riparian restoration). Work with the Big Game Habitat and Migration program to implement durable habitat improvement projects on public and private land that benefit multiple species, including elk.

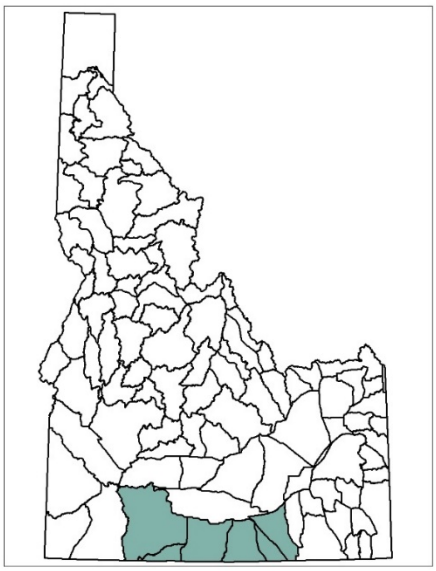
Collaborate with federal and state agencies, American Indian tribes, counties, nonprofit organizations, private landowners, and others to incorporate important elk movement and migration habitat and routes into management decisions.	Continue to implement the Idaho Action Plan with a focus on Priority Areas within the zone. Provide technical assistance to partners regarding impacts of proposed projects on elk habitat and movement and migration routes. Collaborate with county, state, federal, tribal, and NGO partners, as well as private landowners to improve migration habitat and mitigate barriers as opportunities arise. Within identified migration habitat, increase number of miles of wildlife-friendly fence annually. Look for opportunities to conserve elk migration habitat through use of conservation easements. Look for opportunities to work with ITD to mitigate elk mortality on roadways.

South Hills Zone

Game Management Units 46, 47, 54, 55, 56, and 57

Administered by IDFG's Magic Valley Region

Proposed Six Year Management Direction:



- Current population management direction in the South Hills Zone is to maintain elk population numbers.
- Continue to proactively reduce and mitigate elk depredations.

Description: The South Hills Zone encompasses six game management units. The South Hills zone is one of the most diverse elk zones in the state. Along the western edge of the zone, the Jarbidge and Bruneau canyons cut through the northern Great Basin sagebrush steppe, while the Snake River Plain defines the northern border. The South Hills, and Albion, Black Pine, and Sublett mountain ranges are interspersed with aspen stands and dry conifer forests, with higher elevations supporting subalpine fir communities. Along the Utah border, particularly around City of Rocks National Monument, pinyon-juniper mixed with sagebrush is the dominant habitat type. Landownership varies across the zone; however, private land constitutes a large percentage (40-50 %) of Units 54, 55, and 56, while Units 46, 47, and 57 are predominantly public land managed by the BLM and USFS. This zone also borders Utah and Nevada, which provide winter range for a portion of the elk that occupy the South Hills Zone.

Historical Perspective: During the 1800s elk populations in the South Hills Zone were very low. Reintroduction of elk in Unit 54 began in 1916, with the reintroduction of 19 elk (17 cows and 2 bulls). By 1950, there were approximately 60 wintering elk in Unit 54 and IDFG authorized hunting seasons from 1963-1966. Low success rates resulted in a discontinuation of hunting in Unit 54. In the 1980s the Nevada Division of Wildlife (NDOW) began translocating elk with the intent of establishing elk in the northern portion of the state. Multiple translocations occurred (523 total elk), which resulted in elk expanding into ranges in both Nevada and Idaho. Although reliable population estimates in the South Hills Zone are unavailable, in 2002, there was an anecdotal estimate of 250-350 elk in Units 46, 47, 54, 55, and 57, which exceeded population objectives at that time. As a result, IDFG expanded hunting opportunities for antlered and antlerless elk. Prior to the 2014 Elk Plan, this zone included Units 38, 40, 41, and 42 (now a part of the Owyhee Elk Zone) but did not include Unit 56 (previously in the Bannock Elk Zone). Due to geographical barriers, differing objectives, and habitat variability, the South Hills zone was restructured in 2014 to its current extent.

Despite increasing opportunities for harvest, elk populations in the South Hills Zone continued to grow and expand, resulting in an increase in depredation conflict on private land agriculture and rangeland. In 2014, a 'B'-tag "greenfield hunt" was opened zone-wide for 5 months. The hunt produced high elk harvest but resulted in widespread private property conflict. As a result, the season was shortened the following year to one-month and discontinued in 2019. During the winter of 2016-17, the Nevada Division of Wildlife (NDOW) counted nearly 5,000 elk in the Diamond A and Inside Desert portions of Unit 46. In 2019, IDFG implemented two new hunts to provide opportunity for hunters and to continue addressing depredations. In Unit 54, 500 antlerless elk B-tags outside of the Sawtooth National Forest boundary were offered, and in Unit 46 an either-sex A-tag within 1 mile of irrigated private property was offered. During this same period, hunt structures in Nevada were liberalized tremendously to reduce elk numbers along the Unit 46-47 border. The A-tag hunt in Unit 46 and the B-tag hunt in Unit 54 were discontinued in 2021. While elk numbers in units bordering Nevada have been reduced, herds in other portions of the zone continue to grow. IDFG anticipates antlerless harvest will need to be adjusted accordingly to continue to address private land and agricultural conflict.

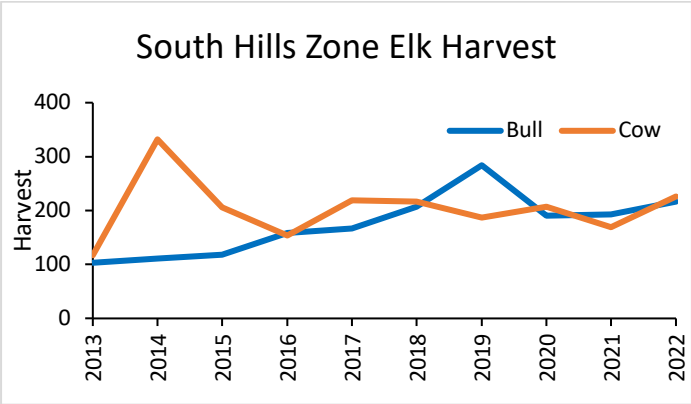
Management Challenges and Opportunities: One primary management challenge in this zone is balancing diverse hunting opportunities while addressing depredations on rangeland and agricultural lands. As depredations continue to rise from resident herds that regularly inhabit agricultural land, IDFG will work with landowners to mitigate damages on private lands using multiple tools such as landowner permission hunts, depredation hunts, Access Yes!, and permanent solutions, such as stackyards.

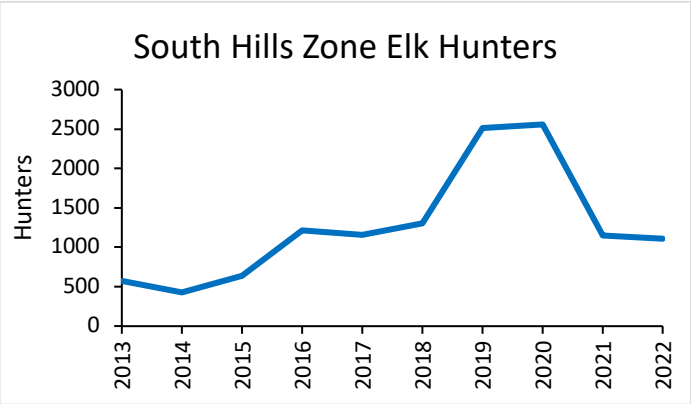
The South Hills Zone shares elk with neighboring states (Utah and Nevada), which poses a management challenge. Elk numbers and behavior can be influenced by bordering states' harvest management. For example, in the late 2010s Nevada implemented aggressive antlerless elk harvest in response to an abundance of elk in the Jarbidge Wilderness and subsequent depredation issues. Conflict was concentrated primarily on winter range, which also included portions of Idaho. The reduction in winter elk populations in Unit 46 can be attributed to harvest in Nevada and IDFG's increase in harvest on resident elk herds in response to a spike in depredations.

Inter-Zone and Intra-Zone Dynamics: The South Hills Zone elk population is one of the few zones where IDFG does not conduct aerial surveys because of the logistical and financial difficulty of accurately surveying a fairly small, highly nomadic, and widely dispersed population of elk across a large area. Additionally, the interstate movement of wintering and summering elk between Idaho, Utah, and Nevada adds another layer of complexity when determining the feasibility of surveying the South Hills zone. Instead, IDFG relies on hunter harvest information (i.e., success rates, age distribution of harvested animals, hunter days, etc.) to monitor the productivity of this population.

Although there is little information on this elk population, we do believe we have resident, partially migratory, and migratory herds of elk based upon a small amount of collar data from elk that were collared in Nevada and ended up in Idaho. While NDOW conducts aerial surveys in Units 46-47 every winter, the majority of these are Nevada elk wintering in Idaho. On the east side of the Zone, there is also some movement between the South Hills Zone (primarily Unit 56) and the Bannock Zone (primarily Unit 73A). Additional movement between Unit 56 and Utah is also likely, as elk are observed near Snowville in winter, but appear to spend summers in Idaho.

Future Needs: The South Hills elk population is monitored using harvest data and managed to minimize elk depredations on agricultural lands, while maintaining hunter opportunity. Elk populations within this zone will continue to be managed at current levels, with adjustments to tag numbers or hunt structures made according to depredation issues. Additional information on the dynamics of this population would assist managers in addressing depredations, setting seasons, and providing technical assistance for proposed development projects within the zone. IDFG will consider opportunities as they arise to collaborate with neighboring states and/or deploy collars to expand our understanding of habitat use and movements of elk in this zone.





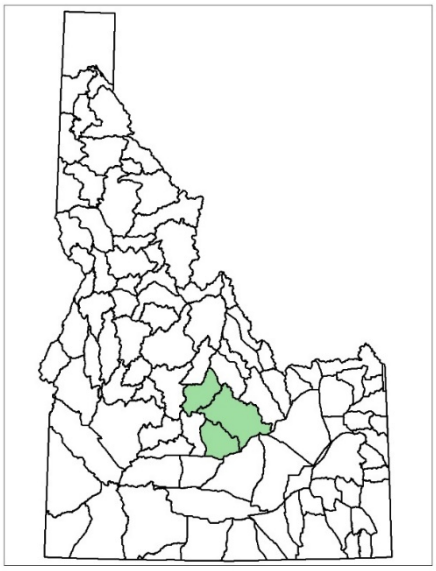
South Hills Elk Zone Management Table

Management Direction	Strategy
Implement measures to minimize, eliminate, or compensate for elk depredations.	Utilize tools available to address depredation complaints quickly and efficiently. Work with landowners to improve hunter access to reduce crop damage. If warranted by increasing elk population and subsequent depredations, utilize any-weapon antlerless hunting, targeted hunting seasons, managed hunting on private lands, and targeted lethal removal of elk to maintain the population at levels consistent with plan objectives and management direction.
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Work with the Sawtooth National Forest to maximize the benefits of fuels treatments to elk habitat via improved forage quantity and quality (referencing the Forest Fuels Management Plan). Work with the Sawtooth National Forest to implement the Forest Invasive Species Project by identifying areas where noxious and invasive plant species are degrading elk habitat. Immediately following wildfires on BLM or IDL lands where elk habitat has been impacted, ensure IDFG staff are included on the Emergency Stabilization and Burned Area Rehabilitation (ESR) team in accordance with the 2020 MOU (BLM MOU ID-SO-2020-03) to assist in providing recommendations to effectively rehabilitate elk habitats. Explore funding mechanisms to continue large-scale rehabilitation and habitat improvement in burned areas after ESR and BAER funding is no longer available. Work with the USFS and BLM on recreation and travel management planning, particularly in sensitive elk habitat (calving grounds, stopover areas, and winter ranges). Work with USFS, BLM, and IDL on grazing management during permit renewals, and explore ways to help land management agencies encourage producers to engage in projects that benefit elk (e.g. virtual fencing, fuels treatments, noxious weed control, riparian restoration). Work with the Big Game Habitat and Migration program to implement durable habitat improvement projects on public and private land that benefit multiple species, including elk.

Pioneer Elk Zone

Game Management Units 36A, 49, 50

Administered by IDFG's Salmon, Upper Snake, and Magic Valley Regions



Proposed Six Year Management Direction:

- The performance and management of the Pioneer Zone is currently limited by elk depredations on agriculture and influenced by winter recreation impacts in GMU 49.
- Current population management direction in the Pioneer Zone is to maintain the elk population within current objectives.

Description: The Pioneer Zone is characterized by alpine and subalpine habitats at higher elevations and sagebrush steppe foothills at lower elevations. Aspen can be found throughout the zone but is commonly restricted to local wetter and more southerly aspects. Elevation ranges from 4,800 ft to >11,000 ft. Landownership is predominantly public (82%), including 3 designated wilderness areas. Private land primarily occurs at lower elevations along major river drainages, including the East Fork Salmon, Big Wood, Little Wood, and Big Lost. Recreation and ranching are the major land uses throughout the zone. Summer habitat is generally of high quality across much of the zone. Winter range quality is generally sufficient in GMU 36A, but somewhat limiting in GMUs 49 and 50, particularly during harsh winters.

Historical Perspective: The Pioneer Elk Zone historically maintained a low abundance of elk through most of the 1900s and was managed under conservative controlled hunt harvest strategies. Elk herds in this zone have expanded dramatically since the 1970s making it the second largest elk population in the state, and thus provides ample and varied hunting opportunities now. It is a productive population and is usually at or above objective for both cows and bulls. In the decade leading up to 2022, the population was above objective and seasons were structured to reduce numbers. The survey conducted in 2022 indicated a reduction in cow numbers that brought the population within objective. The A-tag offers archery and muzzleloader opportunity while the B-tag offers some any-weapon antlerless opportunity. Controlled hunts offer antlered, antlerless, and muzzleloader opportunity. Prior to the reduction in nonresident A-tag opportunity, archery hunter numbers were very high. That has stabilized with approximately 500 fewer archery hunters.

Management Challenges and Opportunities: One of the primary management challenges in this zone is minimizing depredations on agricultural lands and mitigating elk/cattle interaction on winter feedlines. These issues are largely dependent on environmental conditions, with drought years and harsh winters increasing the extent and severity of these conflicts. In addition, elk have found some private lands that provide abundant forage and protection from hunting pressure. These elk refugia can negatively impact neighboring agricultural properties and limit IDFG's ability to mitigate elk damage. IDFG will actively work to address refuge ranch impacts on surrounding landowners and strive to develop new tools to address depredation complaints.

GMU 49 experiences elevated levels of winter recreation compared to the other two units, reducing habitat quality for elk on much of the available winter range and potentially exacerbating the growing residential elk herd in Ketchum and Hailey. Working with federal land management agencies and counties on recreation management and planning will be a priority for maintaining healthy elk populations and reducing conflict in urban areas.

Inter-Zone and Intra-Zone Dynamics: While IDFG strives to manage at the zone-level, elk behavior, distribution, and hunter harvest differ across the three GMUs within this zone, leading to varying levels of success in addressing depredations while maintaining a diversity of hunting opportunities. In 2023, managers began a GPS radio-collar project to assist in developing harvest strategies that better align with elk distribution during the hunting season. In addition to this inter-zone dynamic, previous collaring efforts have indicated a significant migratory relationship between GMU 36A and GMU 36 in the Sawtooth Zone.

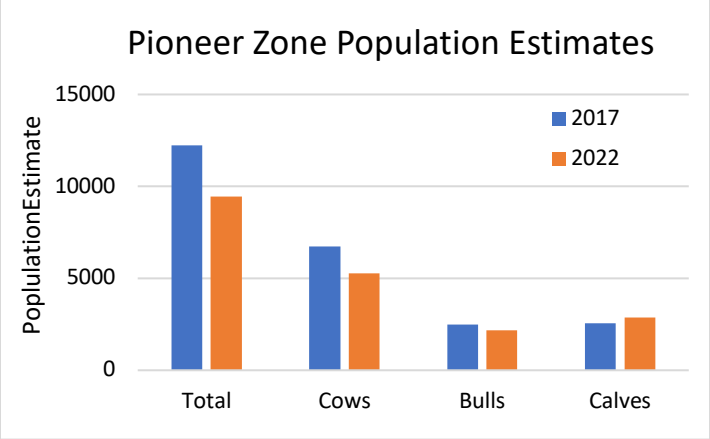
Future Needs: To maintain elk within objective, IDFG will continue to offer bull and cow opportunity and adjust as necessary to balance harvest opportunity with agricultural impacts. Additionally, IDFG will communicate regularly with citizen groups and producers to provide information and receive input. Collaring efforts will continue to further define movements and behavior between and among GMUs.

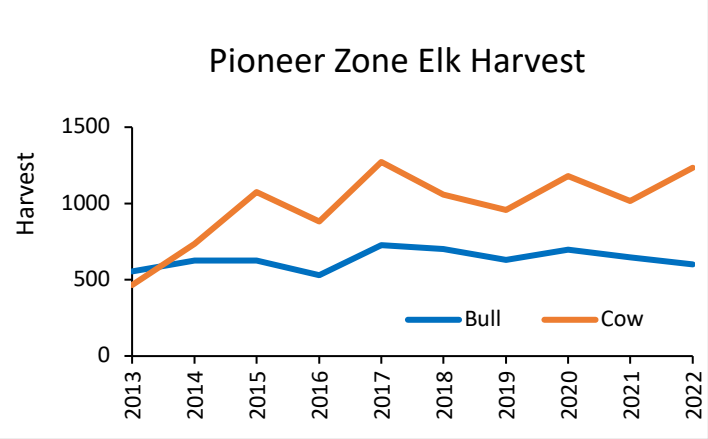
Pioneer Elk Zone Population Management Objectives			
	Cows	**Total Bulls**	**Branch-Antlered Bulls**
Management Objective Range	**3,150 – 5,600**	**1,025 – 1,820**	**630 -1120**
Current Status (2022)	**5,288**	**2,156**	**1,446**

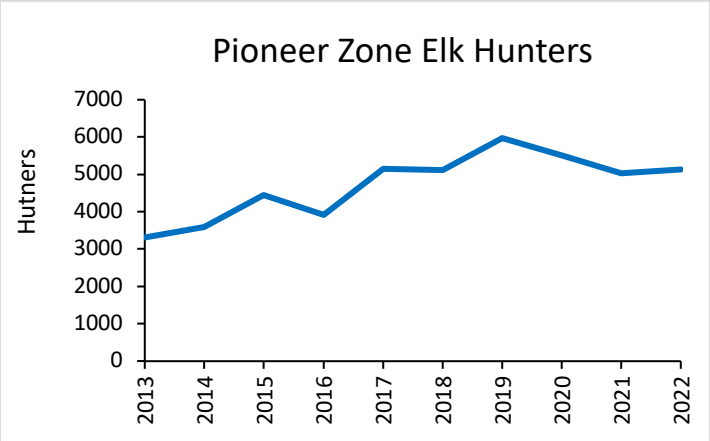
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

Pioneer Elk Zone Population Survey Estimates										
Year	**Cows**	**Calves**	**Total Bulls**	**Spikes**	**Raghorn Bulls**	**Mature Bulls**	**Unclassified Elk**	**Total Population**	**Calves per 100 Cows**	**Bulls per 100 Cows**
2022	**5,288**	**1,866**	**2,156**	**710**	**743**	**703**	**149**	**9,607**	**35**	**39**
2017	**6,722**	**2,565**	**2,481**	**960**	**805**	**716**	**480**	**12,726**	**38**	**37**







Pioneer Elk Zone Management Table	
Management Direction	Strategy
Implement measures to minimize, eliminate, or compensate for elk depredations.	Utilize tools available to quickly and efficiently address depredation complaints. Actively address impacts of elk refugia on surrounding landowners. Use hunting as a primary tool to manage depredation levels. Work with landowners to improve hunter access to reduce crop damage.
Provide annual elk hunting opportunities.	Continue to offer general season hunting opportunities to provide annual hunting. Maximize antlerless opportunity annually and adjust as population performance dictates.

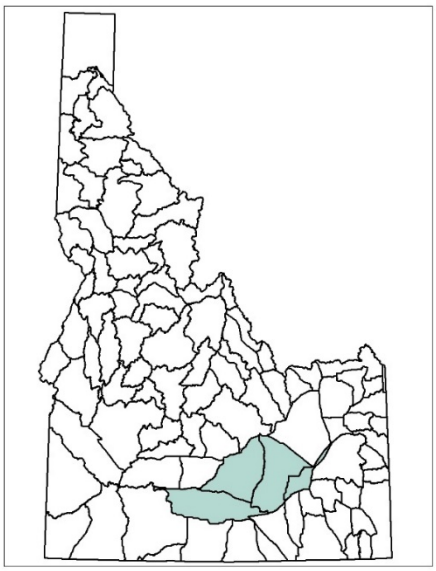
Pioneer Elk Zone Management Table	
Management Direction	Strategy
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Encourage the Challis BLM Field Office to manage feral horses at the Appropriate Management Level (AML) as identified in the Challis Herd Management Area Plan. Collaborate with BLM, FS, and IDL to address invasive annual grass and noxious weed invasions on winter range. Collaborate with BLM, FS, and IDL to provide technical assistance on grazing permit renewals as they pertain to elk summer and winter range needs and impacts. Collaborate with BLM and FS to provide technical assistance on mineral extraction and development as they pertain to elk transitional, summer, and winter range. Coordinate with Forest Service to the extent practicable to actively manage summer range within the wilderness boundary. Focus should be given to invasive and noxious weed management.
Collaborate with federal and state agencies, American Indian tribes, counties, nonprofit organizations, private landowners, and others to incorporate important elk movement and migration habitat and routes into management decisions.	Continue to implement the Idaho Action Plan with a focus on Priority Areas within the zone. Provide technical assistance to partners regarding impacts of proposed projects on elk habitat and movement and migration routes. Collaborate with county, state, federal, tribal, and NGO partners, as well as private landowners to improve migration habitat through actions such as invasive weed control and mitigate barriers as opportunities arise. Determine elk movement, migration, and landscape use within and adjacent to the zone to inform land-use planning efforts.

Big Desert Zone

Game Management Units 52A, 53, 68 and 68A

Administered by IDFG's Magic Valley and Southwest Regions

Proposed Six Year Management Direction:



- The performance and management of the Big Desert Zone is currently limited by depredation issues.
- The current population management direction in the Big Desert Zone is to reduce elk populations while still maintaining a variety of hunting opportunities.

Description: The Big Desert zone is comprised of some of the least productive habitat found in south-central and eastern Idaho, with some areas receiving as little as 9 inches of precipitation per year. Dry desert shrub steppe is the dominant habitat type, which provides limited summer range for elk. Historically, the Snake River plain provided high quality winter range for big game; however, wildfire and the subsequent establishment of annual grasses and invasive noxious weeds (particularly rush skeletonweed) has diminished its capacity to support wildlife. Additionally, much of the southern portion of the zone is irrigated agriculture. Landownership is primarily BLM, which manages the majority of land, and private landowners. Craters of the Moon National Monument is located in Unit 52A and retains some of the largest tracts of intact sagebrush habitat in the zone.

Historical Perspective: It is difficult to determine how many elk occurred in this zone prior to early colonization, although unregulated harvest during the 1800s and 1900s most likely reduced elk numbers. The elk population in the Big Desert Zone has increased substantially since the 1800s where accounts of elk from early trappers suggested numbers were low.

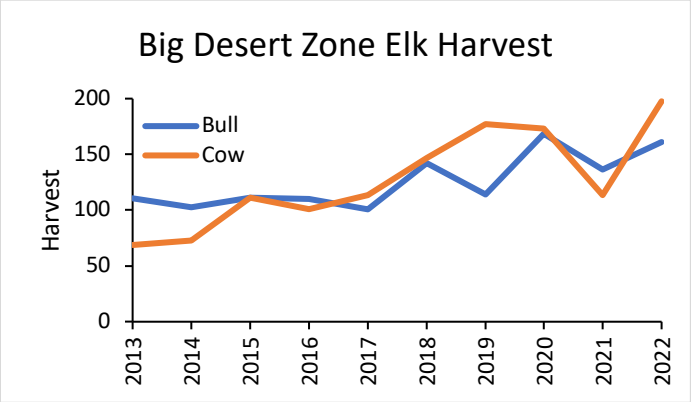
Regulated elk hunting in the Big Desert Zone, which initially was comprised of 6 Units (52A, 53, 63, 63A, 68, and 68A) started in 1983 with 30 either-sex permits available for Unit 63. Elk tags continued to increase steadily as population numbers rose. In 2001, the Big Desert Zone was reduced to two Units (52A and 68) and then restructured in 2023 to 4 Units (52A, 53, 68, and 68A). The majority of the units were managed by controlled hunts from 2001-2007. Beginning in 2008, an archery-only general elk hunt was authorized in this zone. Increases in elk numbers began to result in depredation issues across the zone, prompting IDFG to offer antlerless harvest opportunity. A B-tag structure was introduced in Unit 52A only for antlerless harvest in 2019, and in 2021 Unit 68 was added to allow for general antlerless harvest. General season, short-range-weapon-only, uncapped hunting occurs in Unit 53, and there is a general archery season for any elk in Unit 68A. The Big Desert elk population is one of the few zones where IDFG does not conduct aerial surveys because of the logistical and financial difficulty of accurately surveying a fairly small, highly nomadic, and widely dispersed population of elk across a large area. Although aerial surveys are not conducted in this zone, harvest metrics and instances of conflict suggest that the population is stable. Depredations in the summer have been increasing which could be linked to changing environmental conditions such as drought.

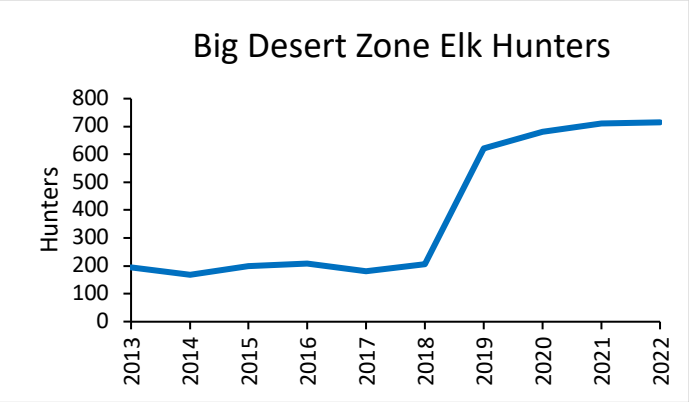
Management Challenges and Opportunities: Elk continue to expand and thrive in many areas across the Big Desert Zone which has resulted in increased conflicts and concern regarding competition among other species such as pronghorn and mule deer. Addressing big game depredations while providing diverse hunting opportunities will continue to be a management challenge in the Big Desert Zone. Finally, wildfires continue to play a major role and have removed sagebrush from large patches of the landscape. Subsequently, much of the public land has been reseeded to

crested wheatgrass or invaded by cheatgrass. Restoration of this landscape is extremely difficult given the low amount of precipitation the area receives. Focusing on areas that have the most potential to provide high quality wintering habitat and that are more resilient to disturbance will be important when considering habitat improvement projects. We currently have limited population and radio collar data for this zone and management relies on harvest data and the level of depredation complaints.

Inter-Zone and Intra-Zone Dynamics*:* Elk within the Big Desert Zone appear to be highly nomadic, and elk are heavily dependent on agriculture in the summer. Guzzlers have been developed in this zone mostly to assist non-game species, upland birds, and pronghorn, and the impact on elk use is unknown. Livestock, mule deer, and pronghorn are the primary ungulates sharing the Big Desert Zone with elk. The impact of increasing elk populations on those species is unknown.

Future Needs: Since elk populations within this zone are currently being managed by harvest statistics and the necessity to decrease elk depredation on agricultural lands, future needs will be focused on harvest management strategies to decrease elk in areas with chronic depredations. The management direction in this zone is to decrease elk populations using a variety of antlerless harvest strategies, seasons, and weapon types. IDFG will consider opportunities as they arise to collaborate with the BLM and other stakeholders on habitat restoration after fire and the influences of water development on elk movement and dispersal.





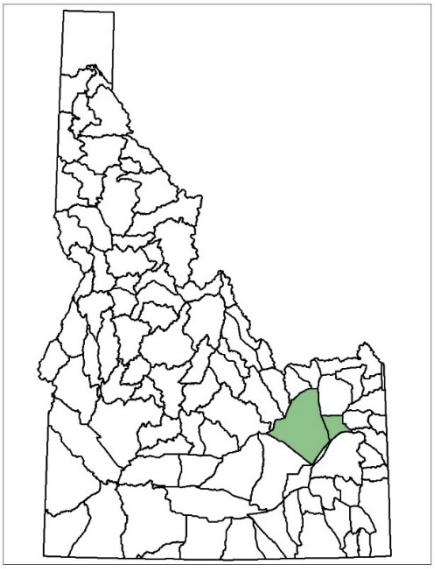
Big Desert Elk Zone Management Table	
Management Direction	Strategy
Implement measures to minimize, eliminate, or compensate for elk depredations.	Implement harvest strategies consistent with management direction to decrease elk damage and depredations to private lands and agricultural crops. Develop strategies to monitor and assess effectiveness of water developments for deterring elk from agricultural fields during hot/dry months.
Provide a diversity of hunting opportunities, including socially desirable and biologically sustainable levels of antlerless and mature bull opportunity.	Implement extra tags, landowner permission hunts, or special weapon hunts as appropriate, consistent with management direction.
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Map and determine status of water developments. Evaluate water developments and how they influence elk behavior and distribution. Explore funding mechanisms to continue large-scale rehabilitation and habitat improvement in burned areas after ESR and BAER funding is no longer available.

Snake River Zone

Game Management Units 63 and 63A

Administered by IDFG's Upper Snake Region

Proposed Six Year Management Direction:



- The performance and management of the Snake River Zone is limited by elk conflict with private property and challenges associated with meeting harvest targets.
- The current population management direction in the Snake River Zone is to reduce elk populations within the zone to address depredations impacting agricultural lands and cattle operations.

Description: The Snake River Zone is characterized by sagebrush steppe habitat intermixed with agricultural lands. Landownership is a mix between Department of Defense, BLM, IDL, and private holdings. Annual precipitation for the area ranges from 9-12 inches and this results in very limited forage resources on non-irrigated habitat during the summer months. Historically this area provided quality winter range for big game; however, wildfire and the subsequent establishment of annual grasses and noxious weeds has diminished its capacity to support wintering wildlife.

Historical Perspective: The elk population in the Snake River Zone has increased substantially from early historical records. Accounts of trappers through the area in the mid-1800s suggest that, although elk were common, buffalo and pronghorn were far more numerous. The unregulated harvest of the late 1800s and early 1900s are thought to be the drivers for significant population declines, to the point where elk only persisted in scattered bands and at small densities.

The Snake River Zone was contained within the Big Desert Zone during the original implementation of the Zone structure management model (1998) but became its own zone in 2000 due to different seasonal distribution patterns and management challenges. GMUs 53 and 68A were removed from the Snake River Zone in the 2023 elk plan revision and placed in the Big Desert Zone due to similar geographical areas, shared elk herds, and conflict issues.

Elk hunting in the Snake River Zone began in 1983 with 30 either-sex permits for Unit 63. Since that time elk numbers, elk conflicts revolving around agricultural damage, and elk harvest have increased significantly. The zone currently has seasons that run from August through mid-February and the focus of these long seasons is to try maintain this elk population at low levels.

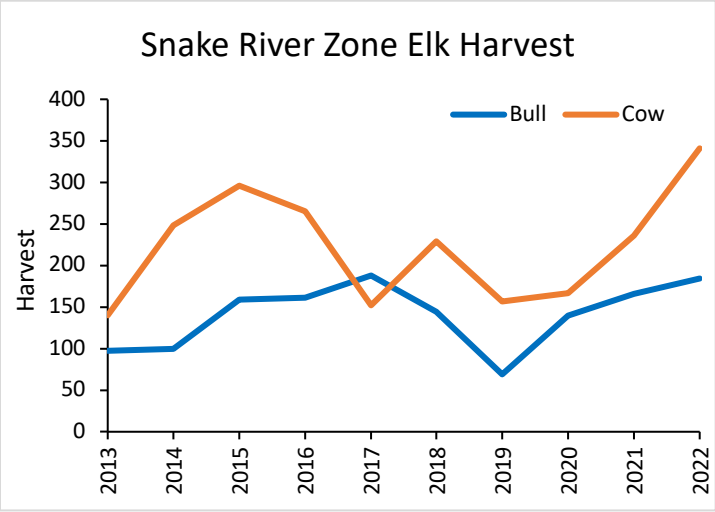
Formal population surveys are not conducted for the zone. Population densities and management recommendations are based on harvest information and counts of observed groups throughout the year.

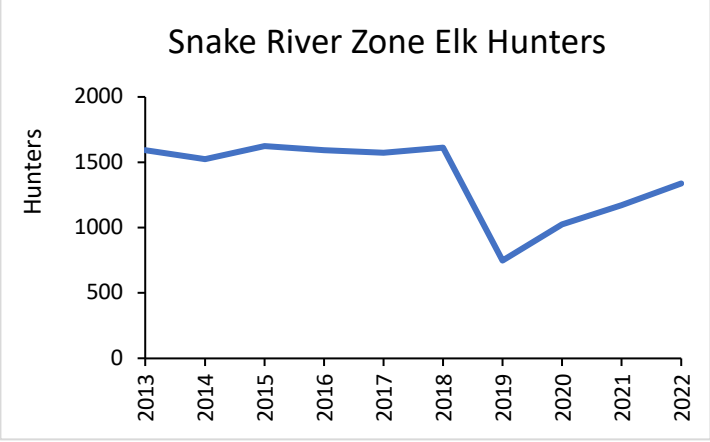
Management Challenges and Opportunities: Agricultural and livestock conflicts are the primary drivers for elk management direction within the zone. Elk began expanding into this area in the 1980s and elk numbers and conflicts have continued to increase over time. The Idaho National Laboratory (INL) is found within the zone and creates a sanctuary from hunting for large numbers of elk in GMU 63. Elk travel from the INL during the night for water and forage found in agricultural fields and return to the INL for security in the morning, often before sunrise. Liberal hunting seasons in the zone aim to reduce the elk population. Obtaining appropriate levels of harvest to reduce the population is

difficult with the sanctuary areas found throughout the zone. Working with the INL and other landowners to increase access and opportunities is paramount for elk management in this zone. Evaluation of management efforts is focused on the number of conflicts responded to and payments made related to crop damage.

Inter-Zone and Intra-Zone Dynamics: Some limited elk research was done in the Snake River Zone in 2010 and this work showed that there is some level of immigration and emigration from GMUs 51, 58, 59, 59A, 60A, and 68. Current collaring and monitoring efforts that began in the summer of 2023 will provide an increased understanding of elk seasonal distributions and habitat use patterns. This updated information will better equip managers to address conflicts in the area, craft appropriate hunting opportunities to meet management objectives, and identify possible source/sink dynamics for this population.

Future Needs: Conflict resolution is currently the key factor driving elk management in this area and will continue to be the guiding priority over the next six years.





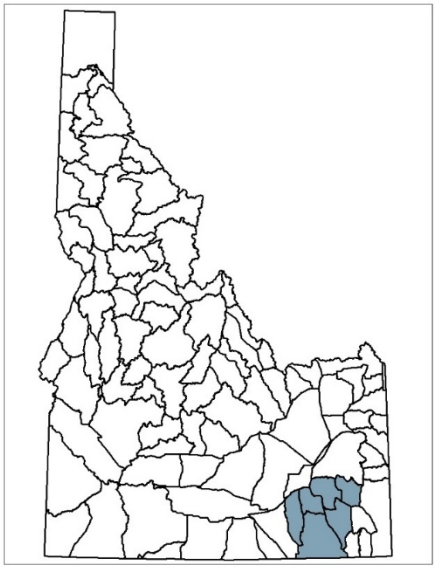
Snake River Elk Zone Management Table	
Management Direction	Strategy
Develop biological studies to improve population, predator, and habitat management capabilities.	Work to identify habitat use and movement patterns for this elk population to inform management decisions.
Implement measures to minimize, eliminate, or compensate for elk depredations.	Continue prioritization and implementation of strategies for excluding elk from stored crops and cattle feed sites. Continue to investigate and implement tools for reducing elk damage on actively growing agricultural fields. Continue to work with the Department of Defense (INL) and Camas National Wildlife Refuge on elk refugia concerns. Use hunting as a primary tool to manage depredation levels. Work with landowners through IDFG access programs to improve hunter access to reduce crop damage
Collaborate with federal and state agencies, American Indian tribes, counties, nonprofit organizations, private landowners, and others to incorporate important elk movement and migration habitat and routes into management decisions.	Work with vehicle collision database and ITD to identify important elk movement routes. Provide technical assistance for wildlife fencing and passage to reduce wildlife/vehicle collisions. Continue to implement the Idaho Action Plan with a focus on Priority Areas within the zone.

Bannock Elk Zone

Game Management Units 70, 71, 72, 73, 73A and 74

Administered by IDFG's Southeast Region

Proposed Six Year Management Direction:



- The performance and management of the Bannock Zone is currently limited by a lack of population demographic information and agricultural conflicts.
- The current population management direction in the Bannock Zone is to provide a diversity of liberal hunting opportunities and to reduce agricultural crop and property damage.

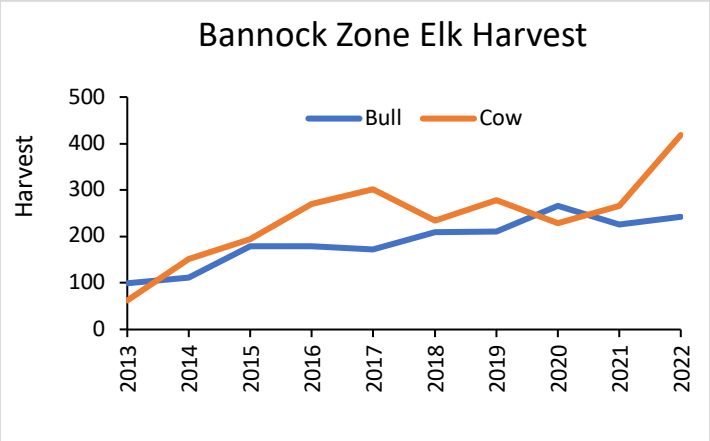
Description: The Bannock Zone is characterized by several small north-south mountain ranges with foothills and valley floors predominantly in private ownership and in agricultural production. Livestock ranching, farming, and recreation are the primary land uses.

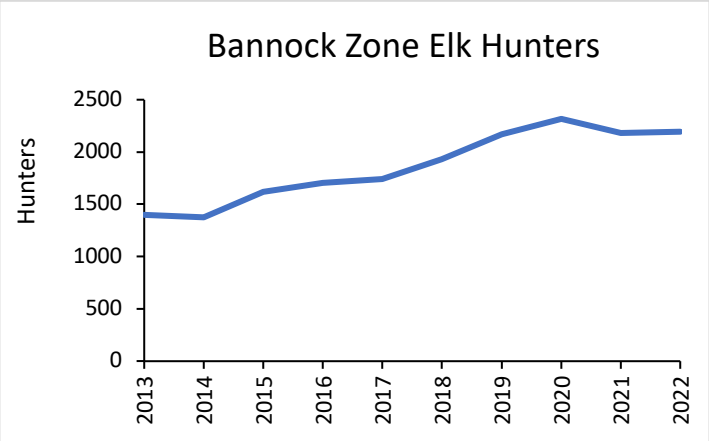
Historical Perspective: It is difficult to determine how many elk occurred in this zone prior to early colonization, but by the early 1900s, both elk and deer were considered rare. In 1916–1917, 35 elk were transported by train from Gardiner, Montana, and released west of Pocatello. Counts in the 1930s and 1940s found 500–600 elk. By 1950, elk were reported to be spreading into the Elkhorn Mountain and John Evans Canyon areas (GMU 73), Blackrock (GMU 71), and Crystal and Midnight creeks (GMU 70). Elk hunts were first offered in the zone in 1933. Elk numbers declined in the 1950s, likely due to overharvest, and seasons were closed. Permit hunts were offered in some GMUs between 1962 and 1968. Populations remained at very low levels into the late 1980s. Since that time, elk have expanded throughout the Bannock Zone, but are generally found in small groups with a sporadic distribution.

Management Challenges and Opportunities: Elk continue to expand and thrive in many areas within the Bannock Zone which has resulted in increased conflicts and concern regarding competition among other species such as mule deer. Elk in this zone utilize some private lands that provide abundant forage and protection from hunting pressure. These private property refugia can negatively impact neighboring agricultural properties and limit IDFG's ability to mitigate elk damage and effectively manage elk populations. IDFG will work to address impacts of elk refugia on surrounding landowners and work to develop new tools to address depredation complaints. Aerial population surveys are not conducted in this zone due to a large geographic area with nomadic, dispersed groups of elk. Harvest metrics and conflict levels will inform management decisions in this zone.

Inter-Zone and Intra-Zone Dynamics: While data from aerial surveys and GPS collars is limited for elk in this zone, seasonal movements from other adjacent zones and Utah do occur. Understanding elk populations, movements, and potential impacts in this zone will better inform future elk management.

Future Needs: Improving our understanding of seasonal elk movements within and around this zone would enhance management. Coordination with the Shoshone Bannock Tribe, federal partners, and private landowners will be important in evaluating this elk herd.





Bannock Elk Zone Management Table	
Management Direction	Strategy
Implement measures to minimize, eliminate, or compensate for elk depredations.	Use hunting as the primary tool to manage depredation levels. Continue to use a variety of hunting season frameworks to reduce depredation. Work with landowners enrolled in IDFG access programs to improve hunter access to reduce crop damage. Explore costs and applicability of innovative long-term techniques such as crop exchanges, land purchases, land exchanges, easements, continued use agreements, use of lure crops, improved range conditions, and permanent fencing around fields. Coordinate with federal land managers to ensure range conditions provide adequate forage for elk in areas prone to depredations. Evaluate travel management with federal partners to inform management strategies to achieve desired elk objectives (e.g., increasing seasonal access in areas of chronic conflict)
Develop an elk monitoring program that includes modeling or monitoring zone population abundance during years between surveys.	Analyze Bannock camera data to evaluate elk abundance, distribution, and herd composition ratios.

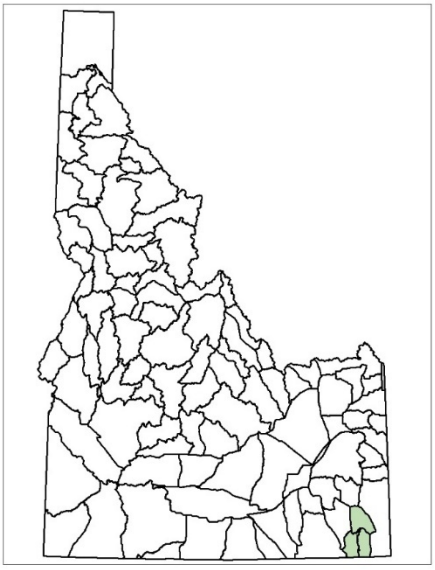
Develop biological studies to improve population, predator, and habitat management capabilities.	Deploy GPS collars to better understand seasonal elk movements. Work with Shoshone-Bannock Tribe to better understand how significant wintering concentrations of elk on Tribal lands contribute to the Bannock Zone population. Annually, coordinate with Utah Division of Natural Resources to evaluate elk data and management across state lines
Increase IDFG involvement in long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve elk habitat.	Provide technical assistance to federal partners and others to maintain and improve elk habitat. Work with federal land managers to evaluate and provide technical assistance on travel management relative to elk behavior and distribution. Engage federal land management agencies regarding drought conditions and emergency drought procedures to inform habitat improvement actions. Work with federal land managers and private landowners to support spring, riparian, and aspen habitat improvement efforts that will benefit elk
Collaborate with federal and state agencies, American Indian tribes, counties, nonprofit organizations, private landowners, and others to incorporate important elk movement and migration habitat and routes into management decisions.	Work with vehicle collision database and ITD to identify important elk movement routes. Provide technical assistance for wildlife fencing and passage to reduce wildlife/vehicle collisions.

Bear River Elk Zone

Game Management Units 75, 77, and 78

Administered by IDFG's Southeast Region

Proposed Six Year Management Direction:



- The performance and management of the Bear River Zone is currently limited or influenced by availability of suitable winter range and depredation concerns.
- Current population management direction in the Bear River Zone is to maintain elk populations within population objectives and provide a diversity of hunting opportunity.

Description: This elk zone encompasses the northern extent of the Bear River Range mountains that extend into Utah to the south. This zone has high quality habitat that can be categorized into 3 primary vegetation types: shrub-grasslands, aspen, and conifer forest. The USFS administers the majority of the upper elevations while the foothills and lower elevations are primarily private lands. Predominant land uses of public land include livestock grazing, timber management, and recreation. The Bear River elk population estimates are derived from elk that are counted during the winter in GMUs 75, 77, and 78.

Historical Perspective: The elk population in the Bear River Zone has increased substantially from that recorded in historical records. Accounts of trappers through this area in the mid-1800s suggest that although elk were common, bison and bighorn sheep were far more numerous. Unregulated harvest of the late 1800s and early 1900s likely reduced populations to relatively low levels. Regulated elk hunting in this zone began in the 1940s with controlled either-sex hunts, was then closed for several years, and reopened again in 1956 with general hunts for either-sex. GMU 75 was closed on and off through the 1960s. From 1968 through 1975, all GMUs were open to general either-sex hunting. Starting in 1976 through the present, all GMUs have been open for general antlered-only opportunity.

Management Challenges and Opportunities: This zone currently has agricultural crop and property damage concerns and winter range limitations which must be balanced with elk population goals and hunter opportunity. Efforts will continue to address agricultural impacts and increase landowner tolerance for elk. Maintaining populations and providing a diversity of hunting opportunities will continue to be the direction for this zone.

Inter-Zone and Intra-Zone Dynamics: Prior to the late 1970s, most elk that summered in this zone wintered in Utah. Since that time, elk wintering in this zone have increased dramatically. However, an unknown but substantial number of elk are believed to still migrate and winter in Utah. A better understanding of these numbers would benefit management recommendations.

Future Needs: Given the significant winter range limitations in this zone and the associated conflict with wintering elk, winter range protection and enhancement remains a priority. Additionally, improving knowledge of elk seasonal movement and densities to address current inconsistencies between winter, summer, and fall elk abundance would enhance management decisions.

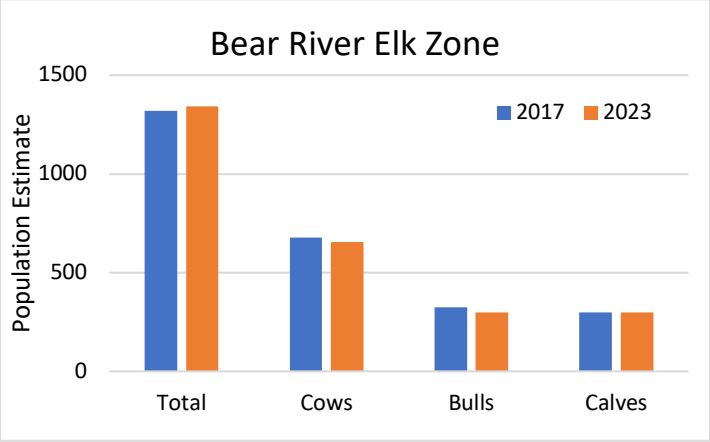
Bear River Elk Zone Population Management Objectives			
	Cows	**Total Bulls**	**Branch-Antlered Bulls**
Management Objective Range	**400 – 700**	**130 – 228**	**84 – 147**

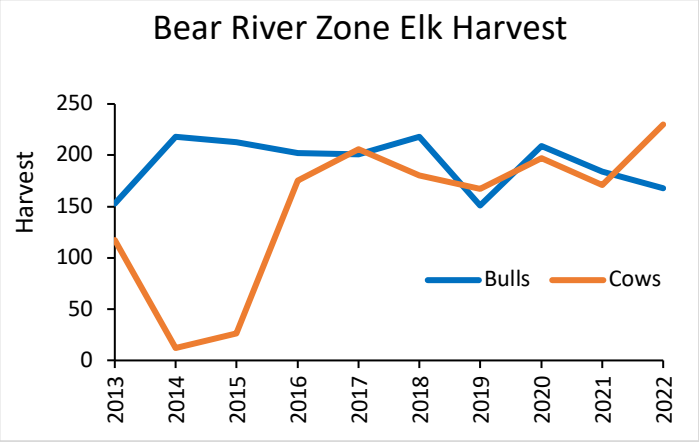
Current Status (2023)	656	300	200

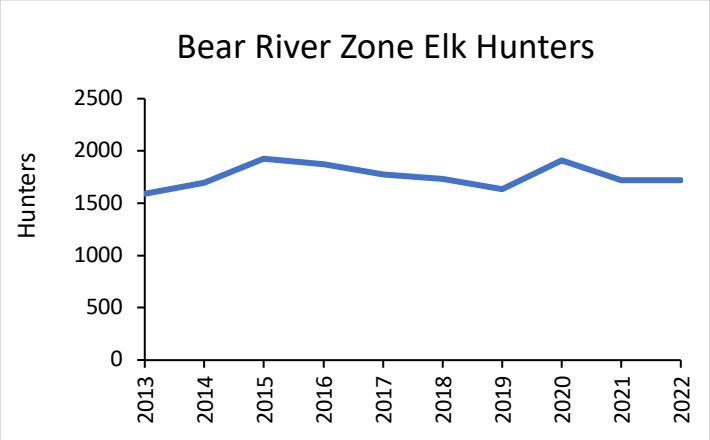
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

Bear River Elk Zone Population Survey Estimates										
Year	Cows	Calves	Total Bulls	Spikes	Raghorn Bulls	Mature Bulls	Unclassified Elk	Total Population	Calves per 100 Cows	Bulls per 100 Cows
2023	656	300	300	100	151	49	86	1,342	46	46
2017	677	300	323	138	109	77	20	1,320	44	48







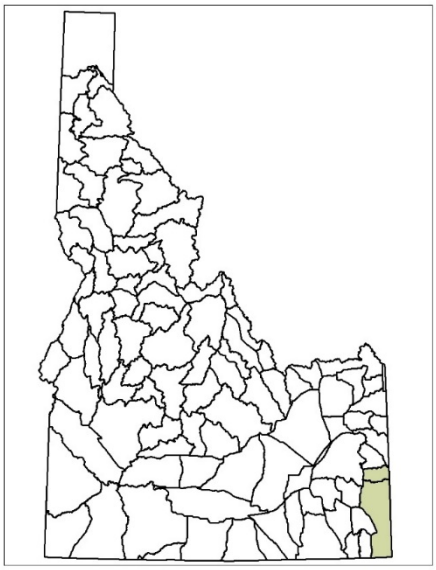
Bear River Elk Zone Management Table	
Management Direction	Strategy
Increase IDFG involvement in long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve elk habitat.	Cooperate with federal, state, and private land managers and owners to provide suitable winter range, including management of disturbance (e.g., travel management) that could displace elk.
Implement measures to minimize, eliminate, or compensate for elk depredations.	Use hunting as the primary tool to manage depredation levels. Continue to use a variety of hunting season frameworks to reduce depredations. Work with landowners through IDFG access programs to improve hunter access to reduce crop damage. Explore costs and applicability of innovative long-term techniques such as crop exchanges, land purchases, land exchanges, easements, continued use agreements, use of lure crops, improved range conditions, and permanent fencing around fields. Cooperate with federal land managers to assure range conditions provide adequate forage for elk in areas prone to depredations. Expand lure crop acres on Georgetown Summit WMA and manage for maximum elk forage value.
Develop an elk monitoring program that includes modeling or monitoring zone population abundance during years between surveys.	Analyze camera data to evaluate elk abundance, distribution, and ratios.
Increase IDFG involvement in long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve elk habitat.	Provide technical assistance to federal partners and others to maintain and improve elk habitat. Work with conservation organizations, elected officials, and land managers to provide long-term conservation measures.
Develop biological studies to improve population, predator, and habitat management capabilities.	Deploy GPS collars to better understand seasonal elk movements. Work with Utah DWR to better understand how wintering concentrations of elk in Utah contribute to the Bear River Zone population

Diamond Creek Elk Zone

Game Management Units 66A, 76

Administered by IDFG's Southeast Region

Proposed Six Year Management Direction:



- The performance and management of the Diamond Creek Zone is currently limited by winter range carrying capacity.
- Current population management direction in the Diamond Creek Zone is to provide quality hunts, maintain elk within population objectives, and diversify proactive measures to address agricultural and private property damage.

Description: The Diamond Creek Zone represents some of the most productive habitat found in southeastern Idaho. Approximately 47% of the land in Diamond Creek Zone is managed by the USFS. Other notable public land managers include the BLM (6%) and the State of Idaho (4%). Approximately 36% of the Diamond Creek Zone is privately owned. The private land is generally used for rangeland pasture and small grain and hay production. Depredation complaints have increased over the last decade. The predominant uses of public land include livestock grazing, timber management, recreation, and phosphate mining. Approximately 35% of the known U.S. reserves of phosphate ore are located in the Diamond Creek Zone.

The Diamond Creek elk population estimates are derived from elk counted during the winter in GMUs 66A and 76. Collar data indicates that significant numbers of elk that winter in adjacent areas (e.g., Wyoming, Tex Creek Zone, Bannock Zone, and the Shoshone Bannock Tribe Reservation) migrate into GMUs 66A and 76 during the summer and fall. As a result, coordinated management across zones and jurisdictions is critical.

Historical Perspective: The elk population in the Diamond Creek Zone has increased dramatically from that described in historical records. Accounts of trappers through this area in the mid-1800s suggest that although elk were common, bison, and bighorn sheep were far more numerous. Unregulated harvest of the late 1800s and early 1900s likely reduced populations to relatively low levels. By 1952 however, elk were believed to be numerous enough again to warrant the first hunting season with 250 tags for either-sex elk in GMUs 66, 66A, and 69. An aerial survey of GMU 76 during February 1952 resulted in 193 elk observed with a total population estimate of 230. The first hunt in GMU 76 began in 1964 with 75 either-sex tags. Hunting opportunity has gradually increased since that time. In 2009, a cap was implemented on the archery-only A-tag to address concerns with hunter congestion. The capped A-tag is currently extremely popular, with demand exceeding availability and tags selling out rapidly.

Management Challenges & Opportunities: The Diamond Creek Zone has rich veins of elemental phosphate within its boundaries. This has been and continues to be a habitat concern given the number of forested tracks converted into grassland, and the number of mines that are either currently in operation or planned to be developed over the next 30 years. Additionally, the impact of elk feeding on these sites with high selenium concentrations in the forage is not entirely understood.

This zone currently has agricultural crop and property damage concerns and winter range limitations which must be balanced with elk population goals and hunter opportunity. Efforts will continue to address agricultural impacts and increase landowner tolerance for elk. Maintaining populations and providing a diversity of hunting opportunities will continue to be the direction for this zone.

Inter-Zone and Intra-Zone Dynamics: Elk that summer in the Diamond Creek zone spend winters in several adjacent areas such as the Bannock Zone, Tex Creek Zone, Shoshone Bannock Reservation, and in Wyoming. Population and GPS collar data for this zone is robust and has greatly improved our understanding of this large inter-mixing population of elk. Continued refinement on how this elk populations uses the landscape will further enhance IDFGs ability to provide opportunities and address conflicts commensurate with management objectives.

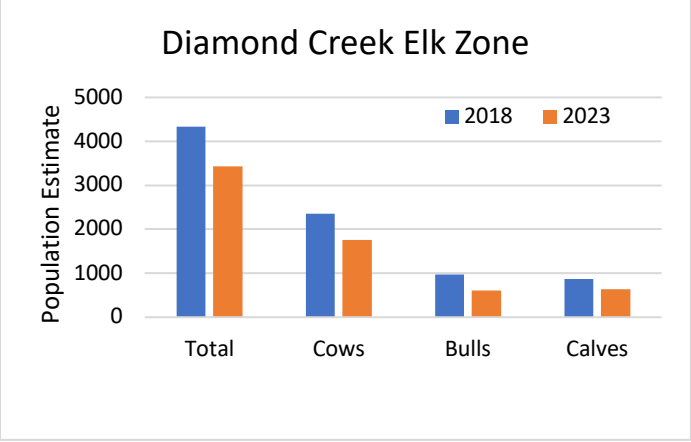
Future Needs: The goal for the Diamond Creek Zone is to maintain quality elk hunting opportunities and elk populations within management objectives. While landowners in this zone experience agricultural crop and property damage, increasing and diversifying proactive measures to address these concerns should allow for healthy elk populations and quality hunting opportunities to persist. Working with partners to maintain and improve winter range, mitigate for habitat loss, and coordinate management across jurisdictions will remain a priority for this zone.

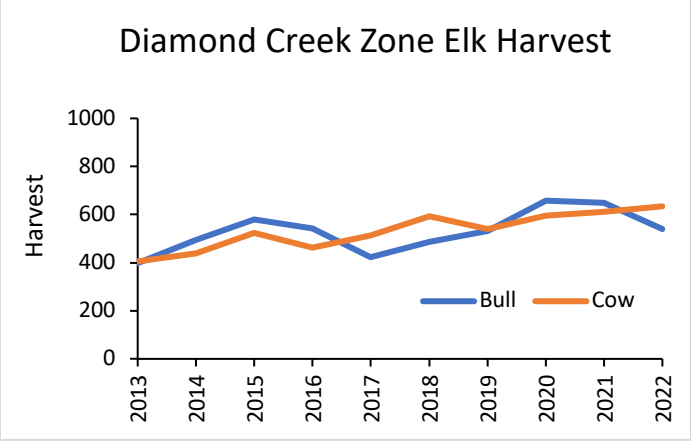
Diamond Creek Elk Zone Population Management Objectives			
	Cows	**Total Bulls**	**Branch-Antlered Bulls**
Management Objective Range	**1,500 – 2,200**	**488 - 715**	**315 – 462**
Current Status (2023)	**1,764**	**602**	**413**

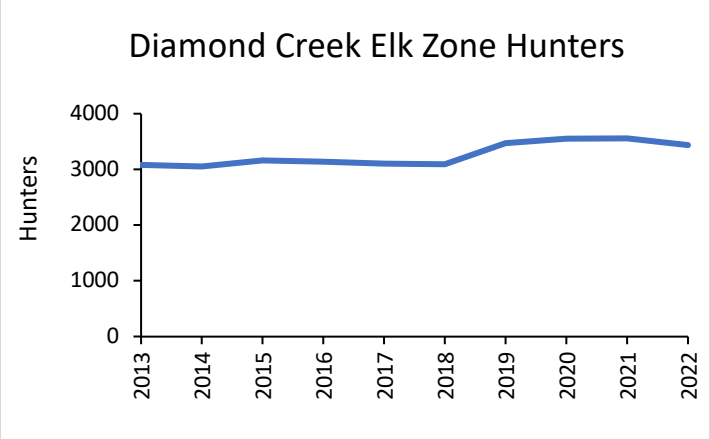
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

Diamond Creek Elk Zone Population Survey Estimates										
Year	**Cows**	**Calves**	**Total Bulls**	**Spikes**	**Raghorn Bulls**	**Mature Bulls**	**Unclassified Elk**	**Total Population**	**Calves per 100 Cows**	**Bulls per 100 Cows**
2023	**1,764**	**640**	**602**	**189**	**287**	**126**	**420**	**3,426**	**36**	**34**
2018	**2,357**	**874**	**973**	**292**	**405**	**275**	**134**	**4,338**	**37**	**41**







Diamond Creek Elk Zone Management Table	
Management Direction	Strategy
Implement measures to minimize, eliminate, or compensate for elk depredations.	Use hunting as the primary tool to manage depredation levels. Continue to use a variety of hunting season frameworks to reduce depredation. Work with landowners through IDFG access programs to improve hunter access to reduce crop damage. Explore costs and applicability of innovative long-term techniques such as crop exchanges, land purchases, land exchanges, easements, continued use agreements, use of lure crops, improved range conditions, and permanent fencing around fields. Coordinate with federal land managers to assure range conditions provide adequate forage for elk in areas prone to depredations. Evaluate impacts of phosphate mining on depredation trends. Work with mining industry to explore measures to offset depredations caused by displaced elk.
Increase IDFG involvement in long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve elk habitat.	Cooperate with federal, state, and private land managers and owners to provide suitable winter range, including management of disturbance that could displace elk. Engage federal land management agencies regarding drought conditions and emergency drought procedures. Provide technical assistance to federal partners and others to maintain and improve elk habitat.

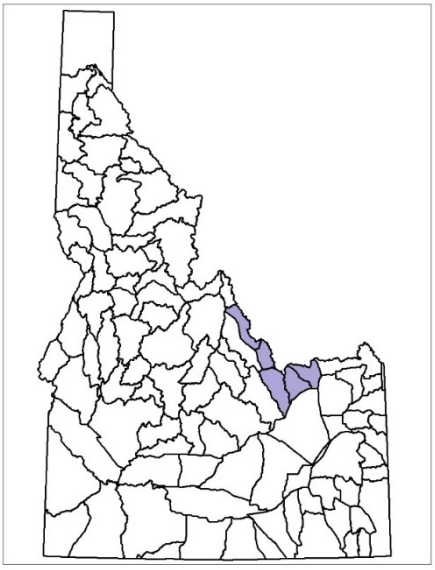
	Work with private landowners, mining companies, power companies and public land managers to restore or mitigate disturbed and degraded areas to improve elk habitat. Work with conservation organizations, elected officials, and land managers to provide long-term conservation measures. Continue aspen habitat treatments and improve grazing infrastructure to support grazing across the entire Blackfoot River WMA to improve forage availability and quality for elk.
Develop biological studies to improve population, predator, and habitat management capabilities.	Deploy GPS collars to better understand seasonal elk movements. Work with Shoshone-Bannock Tribe to better understand how significant wintering concentrations of elk on Tribal lands contribute to the Diamond Creek Zone population
Collaborate with federal and state agencies, American Indian tribes, counties, nonprofit organizations, private landowners, and others to incorporate important elk movement and migration habitat and routes into management decisions.	Continue to implement the Idaho Action Plan with a focus on Priority Areas within the zone. Provide technical assistance to partners regarding impacts of proposed projects on elk habitat and movement and migration routes. Collaborate with county, state, federal, tribal, and NGO partners, as well as private landowners to improve migration habitat and mitigate barriers as opportunities arise. Work with vehicle collision database and ITD to identify important elk movement routes. Provide technical assistance for wildlife fencing and passage to reduce wildlife/vehicle collisions. Pursue research to further refine movement and migration routes in need of conservation.

Beaverhead Zone

Game Management Units 30, 30A, 58, 59, and 59A

Administered by IDFG's Upper Snake and Salmon Regions

Proposed Six Year Management Direction:



- The performance and management of the Beaverhead Zone is currently influenced by agriculture damage in Idaho and Montana and seasonal habitat carrying capacities.
- Current population management direction in the Beaverhead Zone is to maintain current elk populations. It is recognized that the 2016 population estimate showed elk above management objectives, but harvest metrics, hunter reports, and decreased depredations suggest that populations are near or within management objectives.

Description: The Beaverhead Zone consists mostly of public land with some private agricultural land at lower elevations. Terrain is variable and mountainous with sagebrush-steppe at lower elevations and coniferous forests on north slopes at higher elevations. Cattle ranching and recreation are the predominant land uses.

Historical Perspective: Elk abundance was low in the Beaverhead Zone through much of the 20th century. Elk numbers were apparently low enough to warrant a translocation of elk from Horse Prairie and Yellowstone National Park to GMUs 30 and 30A around 1918. Units 30 and 30A were closed to hunting through the 1940s, managed as general hunts during the 1950s, and changed to general hunts with harvest quotas in the 1960s. Units 30 and 30A were managed with very conservative controlled hunts from the 1970s and into the 1990s when expanding elk populations allowed for more liberal harvest. Controlled antlerless hunts were initiated in units 59 and 59A in 1979 and in Unit 58 in 1988. In 1991, units 58, 59, and 59A changed from general any-bull management to general hunting for spike bulls with controlled any-bull permits. With the implementation of the dual tag system in 1998, the Beaverhead Zone has generally offered archery and muzzleloader opportunity on the A-tag; however, controlled hunts took the place of any B-tag opportunity.

Traditionally, elk wintering in units 30 and 30A would migrate to summer ranges in Montana, whereas elk summering in units 58, 59, and 59A would move to Montana to winter. In the 1980s more elk began wintering on the Idaho side in units 58, 59, and 59A. Over time these changes in seasonal distributions continued to expand and become less consistent resulting in significant numbers of elk wintering and summering in both states with some elk readily changing seasonal use patterns.

Management Challenges and Opportunities: The Beaverhead Zone is moderately limited by agricultural depredations. Elk have also found some private lands that provide abundant forage and protection from hunting pressure. These private property refugia can negatively impact neighboring agricultural properties and limit IDFG's ability to mitigate elk damage and effectively manage elk populations. IDFG will work to address refuge area impacts on surrounding landowners and work to develop new tools to address depredation complaints.

IDFG will collaborate with state and federal partners, NGOs, and private landowners to implement habitat improvement projects and to address impacts on elk such as noxious weeds, proposed mineral extraction, motorized travel, and grazing management.

Elk near livestock production activities in winter and spring present disease transmission concerns, particularly brucellosis. Although the Beaverhead Zone is not within a designated surveillance area (DSA) for brucellosis, there is a DSA in southeast Idaho and southwest Montana. IDFG will continue to test elk for brucellosis and actively use available tools to separate elk and cattle during high-risk periods.

Inter-Zone and Intra-Zone Dynamics: A large portion of the Beaverhead elk population migrates between Idaho and Montana with a significant, but unknown, proportion of elk summering in Montana and wintering in Idaho. It is thought that this proportion varies in response to factors such as hunting pressure and winter severity.

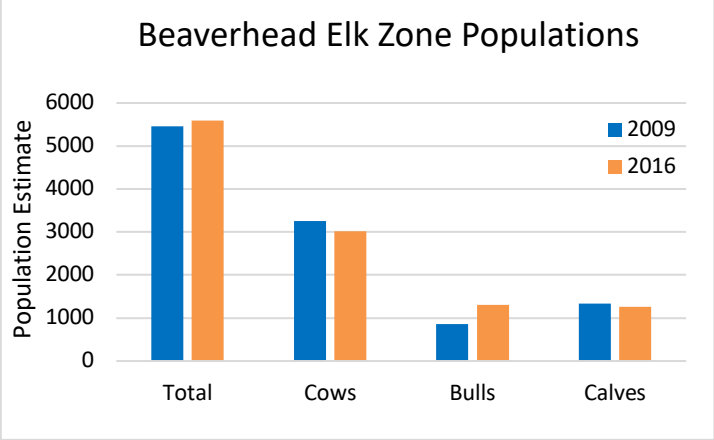
Future Needs: Communication with and incorporation of Montana harvest data into management decisions would be beneficial in managing this elk herd. Completing coordinated joint surveys with Montana would provide the most accurate estimate of population size and trend. Generating an updated and reliable population estimate for the Beaverhead Zone is priority for managers.

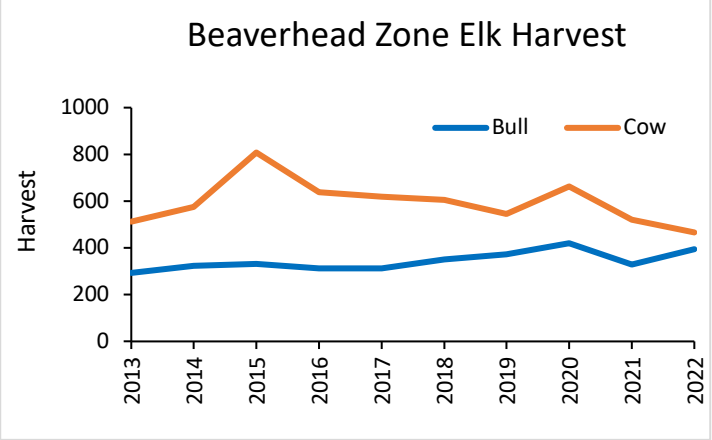
Beaverhead Elk Zone Population Management Objectives			
	Cows	Total Bulls	Branch-Antlered Bulls
Management Objective Range	2,050 – 3,075	555 - 830	330 – 485
Current Status (2016)	3,015	1,306	902

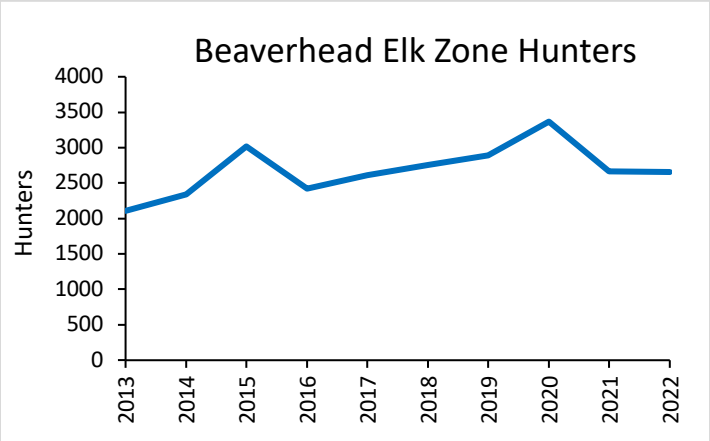
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

Beaverhead Elk Zone Population Survey Estimates										
Year	Cows	Calves	Total Bulls	Spikes	Raghorn Bulls	Mature Bulls	Unclassified Elk	Total Population	Calves per 100 Cows	Bulls per 100 Cows
2016	3,015	1,268	1,306	404	561	341	84	5,757	42	43
2009	3,283	1,341	839	370	328	141	0	5,463	41	26






Beaverhead Elk Zone Hunters
Hunters
4000
3500
3000
2500
2000
1500
1000
500
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022

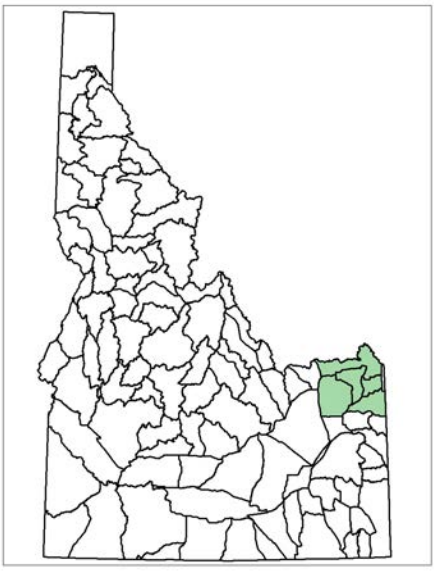
Beaverhead Elk Zone Management Table	
Management Direction	Strategy
Implement measures to minimize, eliminate, or compensate for elk depredations.	Utilize tools available to quickly and efficiently address depredation complaints. Continue prioritization and establishment of exclusionary tools for stored crops and cattle feed sites. Actively address impacts of elk refugia on surrounding landowners. Use hunting as a primary tool to manage depredation levels. Work with landowners through IDFG access programs to improve hunter access to reduce crop damage.
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Collaborate with private, state, and federal partners to address invasive annual grasses and noxious weeds on important elk range. Collaborate with state and federal partners to provide technical assistance on grazing permit management as they pertain to important elk summer and winter range needs and impacts. Collaborate with federal partners to provide technical assistance on mineral extraction and development as they pertain to elk summer and winter range needs and impacts
Collaborate with federal and state agencies, American Indian tribes, counties, nonprofit organizations, private landowners, and others to incorporate important elk movement and migration habitat and routes into management decisions.	Continue to implement the Idaho Action Plan with a focus on statewide priority areas within the zone. Determine elk movement, migration, and landscape use within and adjacent to the zone to inform land-use planning efforts. Collaborate with county, state, federal, tribal, and NGO partners, as well as private landowners to improve migration habitat and mitigate barriers as opportunities arise.
Minimize the influence of disease as a limiting factor in elk populations.	Implement the Brucellosis Management Plan with emphasis on maintaining separation between elk and cattle during high-risk periods.

Island Park Elk Zone

Game Management Units 60, 60A, 61, 62, and 62A

Administered by IDFG's Upper Snake Region

Proposed Six Year Management Direction:



- The performance and management of the Island Park Zone is currently limited by winter range carrying capacity, depredation issues, and livestock interaction concerns.
- Current population management direction for the Sand Creek segment of the population is to continue increased antlerless harvest until the population is back within management objectives and manage towards increasing bull numbers for the Teton Canyon herd while keeping cow numbers stable. IDFG will manage both the Sand Creek and Teton herds with a focus on decreasing depredation and livestock interaction issues.

Description: The Island Park Zone elk population is made up of two distinct herds: the Sand Creek herd, which accounts for approximately 90% of the Island Park population, and the Teton Canyon herd. The productivity, movements, and management of the herds share some common themes, but each has unique challenges and opportunities.

The upper elevations of the Island Park Zone are mostly forested habitat with plentiful water sources. Lower elevations are dominated by a mix of agriculture, rangeland, riparian corridors, and sagebrush-steppe habitat with significant portions of the Teton Canyon area falling under private ownership. Agriculture, ranching, and recreation are the major land uses throughout the zone. Upper elevations are high quality summer habitat. Winter range has become more limited in recent years due to wildfire, development, recreation, and agricultural expansion.

Historical Perspective:

Sand Creek

Elk have been present in varying numbers in portions of the Island Park Zone throughout recorded history. During the early 1900s, hunts in this zone were largely focused on elk that would spend summers in Yellowstone National Park and then migrate to the Sand Creek Desert for winter. More recent elk collaring and monitoring efforts indicated that elk seasonal distributions and habitat use patterns have changed, with fewer elk going to Yellowstone and more elk spending their summer months within Idaho and Montana, while still wintering on Sand Creek. This wintering herd benefits from a winter human entry closure that covers most of their winter range. This closure significantly reduces disturbance and provides meaningful security value for these animals.

In the late 1940s, elk were first observed wintering on the high desert habitat of Unit 60A, with 582 wintering elk recorded in 1952. These wintering populations varied from about 700-1,200 elk until the mid-1970s, at which time the elimination of general either-sex elk hunting resulted in a rapidly increasing winter population. Expanding agricultural activities, livestock operations, and elk populations have led to increased conflicts between private landowners and elk in some winters.

General antlered-only hunts were restricted to spikes-only in 1991 in response to an accelerated timber harvest program on the Targhee National Forest that resulted in poor bull escapement and low bull:cow ratios. Antlerless elk hunting

opportunity has primarily been managed through controlled hunts and, beginning in 1993, any-bull hunting opportunities were also managed through controlled hunts. This was the case until the implementation of the Zone system which allowed for increased archery and muzzleloader opportunity.

Teton Canyon
Reports of elk in the 1800s and early 1900s are inconclusive for this area but it is likely elk were present. General either-sex hunting was allowed until the mid-1970s. At that time, overharvest became a concern and the hunt structure was changed to allow just five days of antlered-only opportunity on the general hunt. Antlerless opportunity was restricted to controlled hunts. The elk population was relatively stable through the 1980s with 30-40 animals wintering along the Teton River in Teton Basin, 40-50 animals being fed at a ranch on Conant Creek, and approximately 100 elk wintering in and adjacent to the Teton River and its tributaries north of State Highway 33. Current elk densities for the zone have expanded slightly, but not to the extent witnessed in other areas.

Winter range in the zone has always been limited by elevation, associated deep snows and by agricultural and livestock production. The area has a history of supplementally feeding elk to address conflicts with local producers and to sustain elk numbers. In the 1990s, three feeding sites were maintained across the zone. After regular discouragement from IDFG and a positive brucellosis test in livestock, the ranch along Conant Creek that had traditionally fed elk ended their feeding operations. The other two sites had been previously shut down. There were no sanctioned winter-feeding efforts from the mid-2000s to 2020.

The winter of 2019-2020 saw a major shift in Teton Canyon elk distribution. Most of the elk in the Teton herd made major movements to the west, where many of them converged around the town of Sugar City before finally crossing highway 20 and ending up far to the west near the Henry's Fork of the Snake River and the desert near Plano. The elk followed the same movement pattern the following winter. This new wintering distribution brought numerous challenges for elk, motorists, managers, and livestock producers. The reason for this change in behavior is not well understood but was likely a mix of a decrease in winter habitat availability and an increase in winter recreation activities across GMU 62.

In response to the new winter distribution of the Teton herd, IDFG worked with private landowners, the Winter Feeding Advisory Committee, and other partners to establish a supplemental feeding program for approximately 300 elk. This feeding effort, in addition to working with private landowners to better manage winter recreation, has minimized the winter conflicts for this segment of the herd. Winter feeding for Teton Canyon herd will likely continue until habitat enhancements and/or herd size reductions lead to significantly reduced winter conflicts.

Management Challenges and Opportunities:

*Sand Creek portion of the population***-**The biggest management challenges for the Sand Creek segment of the herd are conflict and depredation issues. These challenges range from damage to growing and stored crops to problematic livestock interactions. During more mild winters, these issues are manageable but as winter severity increases so do conflicts. A growing concern is the increase in year-round resident elk in GMU 60A which are associated with depredation issues in all seasons.

Another challenge has been elk crossing or spending time on Interstate 15 (I-15), which lies on the western edge of the Island Park elk herd's winter range. Elk from GMU 60A cross I-15 to mingle with GMU 63 elk throughout the year, but elk/vehicle collisions peak in September and the winter months. Approximately 100 elk were struck by vehicles on I-15 in the Hamer area in 2022.

Changes in habitat have also impacted wintering elk in the Sand Creek area. Maintaining productive sagebrush and bitterbrush communities across the Sand Creek winter range is very important for this elk herd and should be a focus for

IDFG and partners. Fire has always been an important part of this landscape, but largescale wildfires have become more common over time. Finding a balance between brush management to prevent wildfire and maintaining high quality winter habitat for wintering big game will remain a key management goal for this zone.

Teton Canyon portion of the population - Agricultural conflicts are a primary driver for this herd. These conflicts are depredation on stored crops, mixing with livestock on feedlines during winter months, and damage to actively growing crops during the summer and early fall.

Winter issues in the Teton Canyon area are primarily due to the loss of functional winter range for this segment of the population. This loss of wintering habitat has largely been driven by development, conversion of native habitat types to agriculture, and winter recreation. Winter range habitat enhancements and conservation should be a priority across this landscape. IDFG continues to work with multiple private landowners and partners across the zone to conserve and improve elk habitat.

Inter-Zone and Intra-Zone Dynamics: The movement and distribution patterns of elk in the Island Park Zone are complex. Elk summering in the western portion of the Centennial Range (Icehouse Creek west) largely migrate to Montana for winter. Elk across the rest of GMUs 61 and 60 move to the Sand Creek Desert where they mingle with elk from GMU 62A and Yellowstone National Park over winter. The bulk of the elk in GMU 62 winter along Teton Canyon and then distribute themselves eastward for the summer, with some of these elk spending the summer and early fall months in Wyoming. The Sand Creek herd interacts with Teton Canyon elk to the southeast and with GMU 63 elk to the west, particularly in the winter months. Mingling between Teton Canyon elk and GMU 64 and 65 elk has also been documented.

Future Needs: Finding solutions to year-round depredations and winter elk/cattle interactions should be a primary focus for work in this zone. Additionally, working to maintain highly functional brush communities will be important for wintering elk in the zone. Discussion and efforts to reduce elk/vehicle collisions on Interstate 15 should remain a priority.

Island Park Elk Zone Population Management Objectives			
	Cows	**Total Bulls**	**Branch-Antlered Bulls**
Management Objective Range	**1,500 – 2,500**	**350 - 625**	**220 – 375**
Current Status (2020)	2,831	805	458

Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

Island Park Elk Zone Population Survey Estimates										
Year	**Cows**	**Calves**	**Total Bulls**	**Spikes**	**Raghorn Bulls**	**Mature Bulls**	**Unclassified Elk**	**Total Population**	**Calves per 100 Cows**	**Bulls per 100 Cows**
2020	2,831	1,344	805	347	324	134	1	4,981	47	28
2016	2,191	817	533	181	238	114	2	3,543	37	24

Island Park Elk Zone Management Table	
Management Direction	Strategy
Implement measures to minimize, eliminate, or compensate for elk depredations.	Continue prioritization and establishment of exclusionary tools for stored crops and cattle feed sites. Use hunting as a primary tool to manage depredation levels. Work with landowners through IDFG access programs to improve hunter access to reduce crop damage. Where appropriate, implement long-term continued use agreements with willing landowners. Work with private landowners and land management agencies to minimize disturbance to wintering elk herds. Cooperate with Federal land managers to assure range conditions provide adequate forage for elk in areas prone to depredations. Establish an emergency winter feeding plan on Sand Creek WMA or adjacent areas for those instances when supplemental feeding is warranted.
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Work with appropriate partners to conserve and enhance habitat quality in key elk wintering areas within the zone.
Increase IDFG involvement in long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve elk habitat.	Cooperate with federal, state, and private land managers and owners to provide suitable winter range, including management of disturbance that could displace elk. Provide technical assistance to federal partners and others to maintain and improve elk habitat. Maintain collaborative relationship with Teton County Planning staff to advise on important fish and wildlife resource issues as they relate to County Land Use Planning. Explore costs and applicability of innovative long-term techniques such as crop exchanges, land purchases, land exchanges, use of lure crops, improved adjacent range conditions, and conservation easements.
Collaborate with federal and state agencies, American Indian tribes, counties, nonprofit organizations, private landowners, and others to incorporate important elk movement and migration habitat and routes into management decisions.	Work with the vehicle collision database and ITD to identify important elk movement routes.

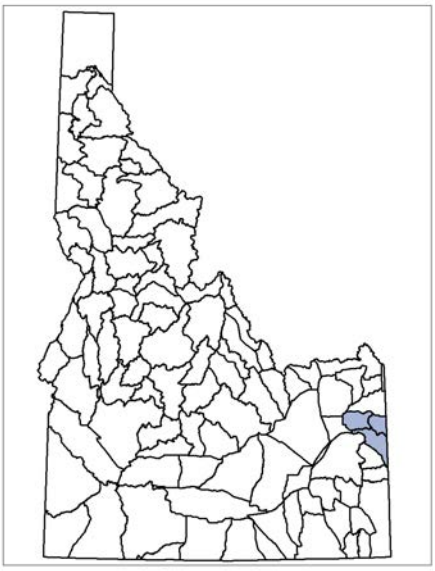
	Provide technical assistance for wildlife fencing and passage to reduce vehicle collisions where elk cross highways. Pursue research to further refine movement and migration routes in need of conservation. Continue to implement the Idaho Action Plan with a focus on Priority Areas within the zone. Provide technical assistance to partners regarding impacts of proposed projects on elk movement and migration routes.
Minimize the influence of disease as a limiting factor in elk populations.	Implement the Brucellosis Management Plan with emphasis on maintaining separation between elk and cattle during high-risk periods.

Palisades Zone

Game Management Units 64, 65, and 67

Administered by IDFG's Upper Snake Region

Proposed Six Year Management Direction:



- The performance and management of the Palisades Zone is currently limited by impacts to agricultural interests (farming and livestock) and limited winter range habitat.
- Current population management direction is to increase the cow segment of the population back to within objectives while maintaining quality bull densities.

Description: Summer habitat for the Palisades Zone is a mix of Douglas fir, aspen, and mountain brush communities with a transition to mountain mahogany, sagebrush, and riparian habitat types on remaining undisturbed winter ranges. Summer range habitat is high quality and quantity, but winter range is increasingly limited and continues to be developed at a rapid pace.

Historical Perspective: Reports of elk in the 1800s and early 1900s are not well documented, but elk were likely present. General-season either-sex elk hunting was allowed until the mid-1970s. At that time overharvest became a concern and harvest opportunity was changed to allow five days of general bull hunting only. Hunting for antlerless elk was restricted to controlled hunts. Elk damage to haystacks in Swan Valley dates back to the mid-1950s, corresponding to the loss of winter range from inundation by the Palisades Reservoir. In the mid-1970s IDFG began feeding elk in Rainey Creek to bait them away from livestock feeding operations. This winter-feeding operation fed approximately 150 elk and was maintained until 2005.

Elk densities have never been considered high for this zone, typically fluctuating between 500 and 800 elk over time. Currently elk in the Palisades zone are comprised of small, scattered herds which are limited by available suitable winter range, associated winter depredations, and disease (brucellosis) conflicts with livestock. Population estimates for the Palisades Zone are derived from elk counts conducted during the winter in GMUs 64, 65, and 67.

Elk summer habitat in the Palisades Zone is primarily located on federal lands within the zone, but winter habitat at lower elevations is a mix of public and private lands. During the 1980s and 90s this population was subsidized through a feeding program at the mouth of Rainey Creek, which was discontinued in the early 2000s. As the feeding program ended, distributions of elk changed across the zone with more elk currently being found in GMU 64.

Management Challenges and Opportunities: Maintaining productive habitat across this zone continues to be a challenge, particularly on winter range. Rural residential development, agricultural expansion, and other forms of development on private lands in combination with increasing outdoor recreation pressures on public lands continue to be challenging for elk management. Therefore, securing winter habitat and providing security cover during the rest of the year is a priority in maintaining or enhancing this population.

Although winter range and conflict management will likely drive elk population levels for the zone, it is important to point out that the zone offers a wide array of hunting experiences. The rugged and remote portions of Unit 67 are treasured by much of the public and these areas continuing to function should be a priority for IDFG.

The Palisades elk zone is within the designated surveillance area (DSA) for brucellosis and this elk population has some of the highest prevalence rates for Brucellosis in the state. Continued monitoring of prevalence rates prevention of elk/cattle mixing is a priority for IDFG and producers.

Inter-Zone and Intra-Zone Dynamics: Elk summering in GMUs 64, 65, and 67 consistently overlap, but there is some interchange between GMUs 62 and 69 as well. The movements and distribution of the Palisades elk population is not well documented or understood.

Future Needs: IDFG will work to minimize and address conflicts between elk and agricultural operations, both crop and livestock production, and to conserve and enhance winter habitat. Updated habitat use and seasonal distribution patterns would help guide management decisions.

Palisades Elk Zone Population Management Objectives			
	Cows	**Total Bulls**	**Branch-Antlered Bulls**
Management Objective Range	**400-600**	**125 – 200**	**75 – 125**
Current Status (2020)	312	267	155

Color indicates where survey estimates are relative to management objectives:

black = within; red = below; blue = above

Palisades Elk Zone Population Survey Estimates										
Year	**Cows**	**Calves**	**Total Bulls**	**Spikes**	**Raghorn Bulls**	**Mature Bulls**	**Unclassified Elk**	**Total Population**	**Calves per 100 Cows**	**Bulls per 100 Cows**
2020	312	130	267	31	82	73	0	709	42	86
2017	428	175	269	57	132	79	8	880	41	63

Palisades Elk Zone Management Table	
Management Direction	Strategy
Implement measures to minimize, eliminate, or compensate for elk depredations.	Continue prioritization and implementation of strategies to exclude elk from stored crops and cattle feed sites. Use hunting as a primary tool to manage depredation levels. Work with landowners with IDFG access programs to improve hunter access to reduce crop damage. Where appropriate, implement long-term continued use agreements with willing landowners. Cooperate with Federal land managers to assure range conditions provide adequate forage for elk in areas prone to depredations
Develop biological studies to improve population, predator, and habitat management capabilities.	Work to identify habitat use, movement patterns and survival for this elk population to inform management decisions.
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Work opportunistically with the Caribou Targhee National Forest and the BLM to increase security habitat in key areas of Unit 65, including the Big Hole Range and the Victor Front. Work with appropriate partners and land management agencies to conserve and enhance habitat quality in key elk wintering areas within the zone.
Collaborate with federal and state agencies, Native American tribes, counties, nonprofit organizations, private landowners, and others to incorporate important elk habitat and migration routes into management decisions.	Continue to implement the Idaho Action Plan with a focus on Priority Areas within the zone. Provide technical assistance to partners regarding impacts of proposed projects on elk habitat and movement and migration routes. Collaborate with county, state, federal, tribal, and NGO partners, as well as private landowners to improve migration habitat and mitigate barriers as opportunities arise. Pursue research to further refine movement and migration routes in need of conservation.
Minimize the influence of disease as a limiting factor in elk populations by instituting management actions to limit disease spread and prevalence.	Implement the Brucellosis Management Plan with emphasis on maintaining separation between elk and cattle during high-risk periods.

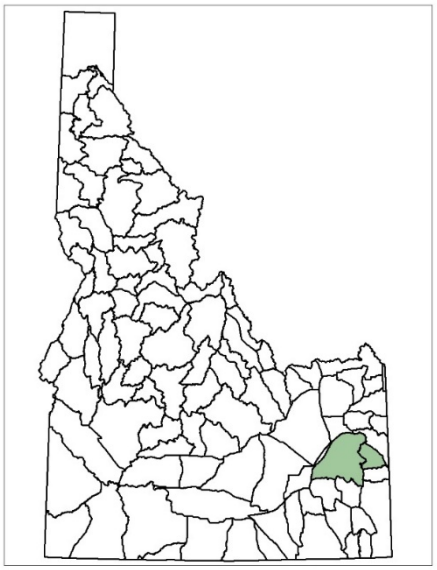
Increase IDFG involvement in long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve elk habitat.	Maintain collaborative relationship with Teton County Planning staff to advise on important fish and wildlife resource issues as they relate to county land use planning. Explore costs and applicability of innovative long-term techniques such as crop exchanges, land purchases, land exchanges, use of lure crops, improved adjacent range conditions, and conservation easements.
Implement measures to minimize, eliminate, or compensate for elk depredations.	Continue prioritization and implementation of strategies for keeping elk excluded from stored crops and cattle feed sites. Use hunting as a primary tool to manage depredation levels. Work with landowners with IDFG access programs to improve hunter access to reduce crop damage. Where appropriate, implement long-term continued use agreements with willing landowners. Coordinate with Federal land managers to assure range conditions provide adequate forage for elk in areas prone to depredations
Develop biological studies to improve population, predator, and habitat management capabilities.	Work to identify habitat use, movement patterns and survival for this elk population to inform management decisions.
Collaborate with federal and state agencies, American Indian tribes, counties, nonprofit organizations, private landowners, and others to incorporate important elk movement and migration habitat and routes into management decisions.	Continue to implement the Idaho Action Plan with a focus on Priority Areas within the zone. Provide technical assistance to partners regarding impacts of proposed projects on elk habitat and movement and migration routes. Collaborate with county, state, federal, tribal, and NGO partners, as well as private landowners to improve migration habitat and mitigate barriers as opportunities arise. Pursue research to further refine movement and migration routes in need of conservation.
Minimize the influence of disease as a limiting factor in elk populations.	Implement the Brucellosis Management Plan with emphasis on maintaining separation between elk and cattle during high-risk periods.

Tex Creek Elk Zone

Game Management Units 66 and 69

Administered by IDFG's Upper Snake Region

Proposed Six Year Management Direction:



- The performance and management of the Tex Creek Zone is currently limited by winter range carrying capacity and high elk population densities that need to be managed within population objectives.
- Current population management direction in the Tex Creek Zone is to reduce elk populations to within population management objectives.

Description: The Tex Creek Zone is a mix of public and private lands. The bulk of GMU 66 is public lands and contains quality spring, summer, and fall habitat types that are primarily made up of mountain brush, aspen, and Douglas fir communities. GMU 69 has significant portions of private land, much of which is in active agriculture, CRP lands, or open rangeland which is managed for livestock grazing. The area is an extremely popular area for motorized vehicle recreation.

Historical Perspective: Elk were present in the Tex Creek area during the late 1840s as reported by Osborn Russel in 1848 (Journal of a Trapper). During the early 20th century, elk were rarely seen according to residents of the area (IDFG Project Report W-170-R-25, April 2022). The elk population increased during the 1940s and by the mid-1950s depredation complaints on winter wheat were common. The first modern hunt was implemented in 1952 and consisted of 50 permits. Beginning in 1955, general hunting was allowed and has continued in some form to the present.

The elk population continued to grow through the following decades to the current count of 5,415 (2023). Controlling the growth of the zone's population and providing sought after hunting opportunities has driven harvest strategies over time. Concerns over bull harvest and underharvest of cows have guided many of the changes to hunt structures implemented over the years.

In August 2016, the Henry Creek fire burned approximately 52,000 acres across much of the prime winter range for elk on Tex Creek. The fire burned almost 66% of Tex Creek Wildlife Management Area (WMA). Grasses and forbs across the area showed a positive response to the burn, but brush communities within the fire scar were negatively impacted. IDFG personnel conducted habitat rehabilitation and monitoring efforts associated with the fire. It does not appear that elk use of the WMA has changed significantly because of the fire, but managers will continue to monitor elk habitat use and vegetation recovery.

Management Challenges and Opportunities: Summer habitat for the Tex Creek Zone is primarily located on federal lands, but winter habitat is a mix of private and public lands. Securing wintering habitat for these elk will continue to be a priority to ensure continued tolerance and capacity for high elk populations.

IDFG staff partnered with the Natural Resources Conservation Service (NRCS) to evaluate forage quantity on winter range within the Tex Creek WMA. According to the analysis prepared by the NRCS, there is adequate forage for the current number of elk wintering on Tex Creek WMA. However, the palatability of forage within the analysis area is variable. Therefore, ongoing WMA habitat management priorities will focus on improving forage quality in areas that are available to wintering elk. Specific treatments may include conversion of smooth brome or intermediate wheatgrass

monocultures to a native grass/shrub/forb mix, vegetation management treatments such as haying or grazing, and sharecropping agreements to provide winter wheat.

The continued monitoring and enhancement of habitat across the Tex Creek Zone will be important, due to the potential of conflict between elk and agricultural interests. Finding ways to mitigate and effectively address these conflicts will be a major factor in the number of elk that can be sustained on this landscape.

Inter-Zone and Intra-Zone Dynamics: A recent development (2021 and 2022) has been the discovery that significant numbers of elk that spend most of the spring, summer and early fall scattered across GMUs 66, 69, 66A, and 76 winter on or near the Shoshone Bannock Tribe Reservation near Fort Hall, ID. The estimated number of elk on Shoshone-Bannock lands was approximately 6,000 in the 2022-2023 winter survey. This number likely fluctuates annually depending on winter severity. Forty-four radio collars have been deployed on wintering Fort Hall elk to gather basic movement and habitat information. This movement and annual distribution data will be important for future management of both the Tex Creek and Diamond Creek elk populations.

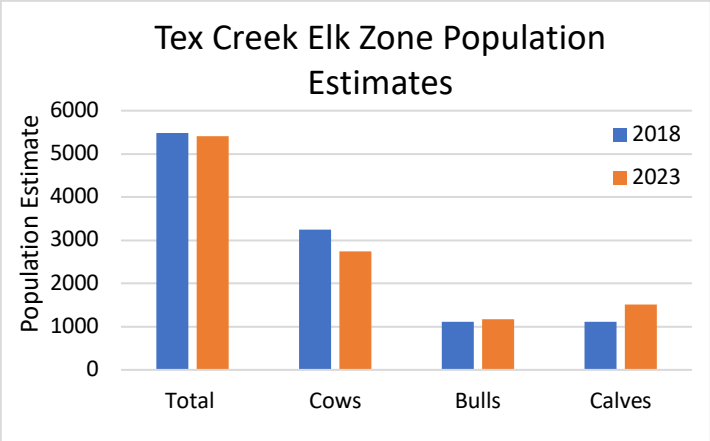
Future Needs: Continued work on methods to mitigate and manage conflicts with agricultural producers, both crop and livestock operations is a priority in this zone. Information on use and response of this elk herd to habitat changes resulting from the Henry Creek fire will also provide value to managers.

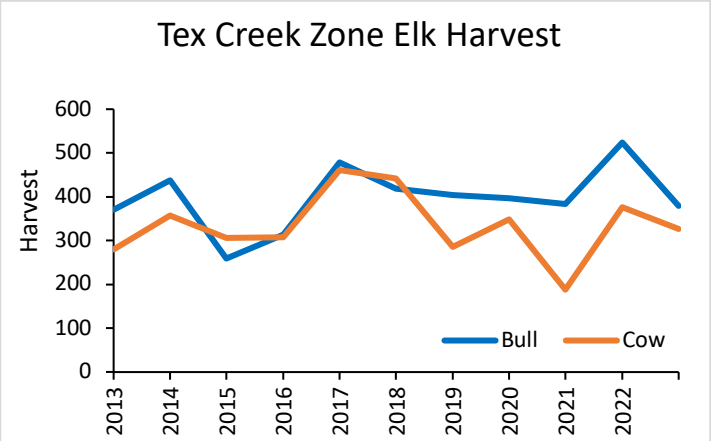
Tex Creek Elk Zone Population Management Objectives			
	Cows	**Total Bulls**	**Branch-Antlered Bulls**
Management Objective Range	**2,000 – 3,000**	**425 - 625**	**250 – 350**
Current Status (2023)	**2,737**	**1,170**	**681**

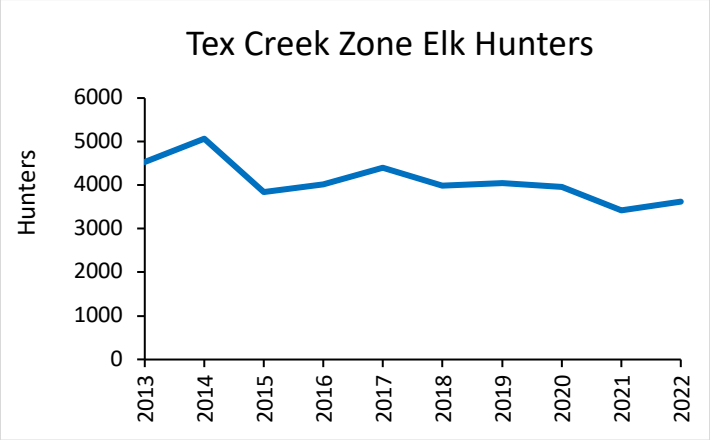
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

Tex Creek Elk Zone Population Survey Estimates										
Year	**Cows**	**Calves**	**Total Bulls**	**Spikes**	**Raghorn Bulls**	**Mature Bulls**	**Unclassified Elk**	**Total Population**	**Calves per 100 Cows**	**Bulls per 100 Cows**
2023	**2,737**	**1,507**	**1,170**	**489**	**536**	**145**	**0**	**5,415**	**55**	**43**
2018	**3,240**	**1,112**	**1,088**	**310**	**581**	**198**	**0**	**5,452**	**34**	**34**







Tex Creek Elk Zone Management Table	
Management Direction	Strategy
Develop biological studies to improve population, predator, and habitat management capabilities.	Continue working with the Shoshone-Bannock Tribes to better understand movement patterns surrounding Fort Hall Reservation and how those movement patterns impact elk within the Tex Creek Zone.
Implement measures to minimize, eliminate, or compensate for elk depredations.	Continue efforts to enhance forage quality in suitable winter range on Tex Creek WMA. Work with IDFG Enforcement, Bonneville County, and other entities to maintain travel/entry closures and security habitat during winter. Pursue key fee-title acquisitions and conservation easements in unprotected elk winter range on the periphery of Tex Creek WMA and within the South Fork Canyon. Establish an emergency winter feeding plan on Tex Creek WMA for those instances when supplemental feeding is warranted.

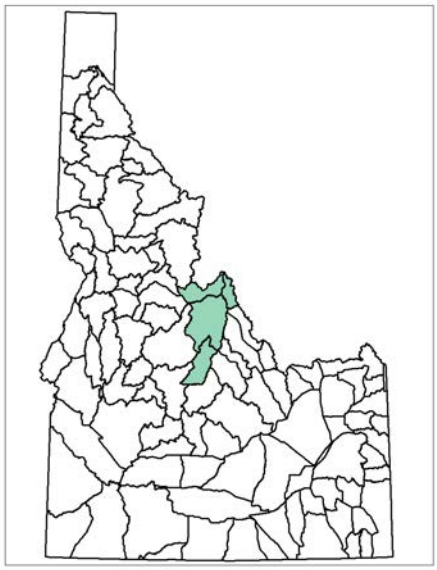
	Use hunting as a primary tool to manage agricultural impacts. Explore costs and applicability of innovative long-term techniques such as crop exchanges, land purchases, land exchanges, use of lure crops, improved adjacent range conditions, and conservation easements.
Improve key summer, winter, and transitional habitat on public and private lands that provide for elk populations to meet statewide objectives.	Pursue strategic fee-title acquisitions and/or conservation easements that reduce development threats from key elk habitat throughout the Zone, particularly around Tex Creek WMA and other opportunities that arise as it relates to maintaining connectivity between Federal public lands and crucial winter ranges. Enhance forage palatability using field conversions and shrub plantings in key wintering areas, such as Tex Creek WMA. Work collaboratively with the Palisades and Soda Springs Ranger Districts on projects that enhance forage quality and quantity on spring transitional and calving habitat and enhance security.
Increase IDFG involvement in long- and short-term land-use planning efforts by providing information, analysis, and recommendations to improve and preserve elk habitat.	Provide technical assistance to Bonneville and Bingham Counties for all commercial or residential development proposals within key elk habitat throughout the Zone.
Minimize the influence of disease as a limiting factor in elk populations.	Implement the Brucellosis Management Plan with emphasis on maintaining separation between elk and cattle during high-risk periods.

Salmon Elk Zone

Game Management Units 21, 21A, 28, 36B

Administered by IDFG's Salmon Region

Proposed Six Year Management Direction:



- The performance and management of the Salmon Zone is influenced by habitat quality and to a lesser extent by elk agricultural depredations. Additionally, a significant portion of this population summers in Montana and is affected by their management.
- Current population management direction in the Salmon Zone is to maintain the elk population within proposed objectives.

Description: The Salmon Zone is large and mountainous with a range of access from abundant to very limited. Southern exposures are predominantly open with grass or shrubs, transitioning to coniferous forests at higher elevations and more northerly aspects.

Historical Perspective: Elk numbers were low for much of the 20th century and portions of GMUs 28 and 36B were designated as no hunting "game preserves'" from 1917-1940s. A total of 62 elk from Yellowstone National Park were released in GMU 28 in 1937. Elk numbers increased since the mid-1970s before liberal cow harvest in the 1990s stabilized the population at around 10,000 elk. Historically, the zone has struggled at times with calf recruitment, especially GMUs 28 and 36B, and thus current harvest opportunity is predominantly for bulls. The Salmon Zone has long been managed to provide general hunting opportunities, providing both archery opportunity on the A-tag and any-weapon opportunity on the B-tag. In 2010, an elk survey showed a decline in cows and bulls, resulting in a B-tag quota of 2,507 tags, which has remained unchanged. The Salmon Zone was last surveyed in 2023 and was within objectives for cows and bulls.

Management Challenges and Opportunities: While bull harvest appears to be relatively stable and sustainable zone wide, some harvest in high participation GMUs may need to be redistributed to maintain adequate bull numbers and hunter satisfaction. Additionally, IDFG will communicate regularly with local citizen groups to provide information and receive input.

Because the majority of the land base is public federal land (~95%), the Salmon Elk Zone is only slightly limited by agricultural impacts, although some winter range overlaps private agricultural land. The majority of elk summer and winter range is on USFS and BLM lands which are managed under a multiple use mandate that provides for mineral extraction, livestock grazing, and outdoor recreation. Additionally, habitat within this zone has been, and will likely continue to be, significantly altered by large landscape-level forest fires.

Inter-Zone and Intra-Zone Dynamics: A significant but unknown proportion of elk in the northern portions of the zone summer in Montana and winter in Idaho. This typically results in a higher abundance of elk in Units 21 and 21A compared to Units 28 and 36B. Simultaneously, recruitment of calves, and subsequently bulls, is lower in these Units.

Future Needs: In order to guide future land management decisions impacting elk and elk habitat, IDFG will collaborate with state and federal partners, NGOs, and private landowners to implement habitat improvement projects, such as aspen restoration and wildfire mitigation, and to address impacts on elk such as noxious weeds, proposed mineral

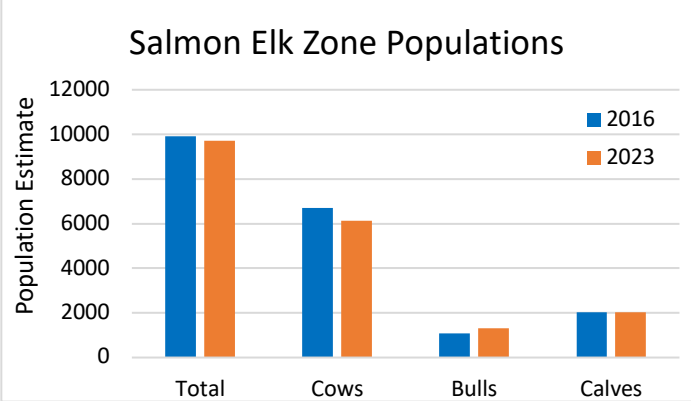
extraction, and grazing management. To maintain elk within objective, IDFG will continue general season bull opportunity with some limited cow harvest when warranted and adjust as necessary.

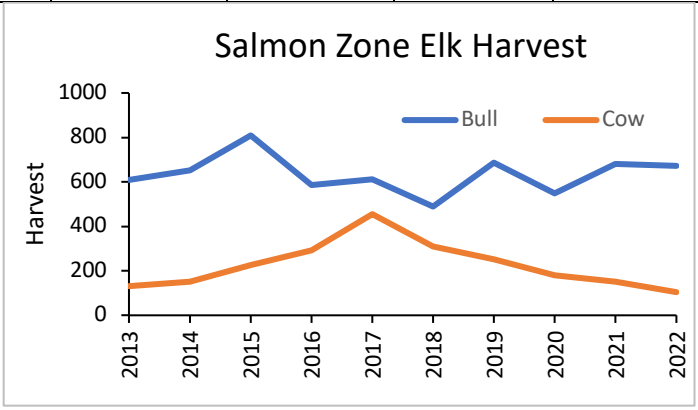
Salmon Elk Zone Population Management Objectives			
	Cows	Total Bulls	Branch-Antlered Bulls
Management Objective Range	4,850 – 7,400	1,020 – 1,560	585 – 885
Current Status (2023)	6,133	1,310	683

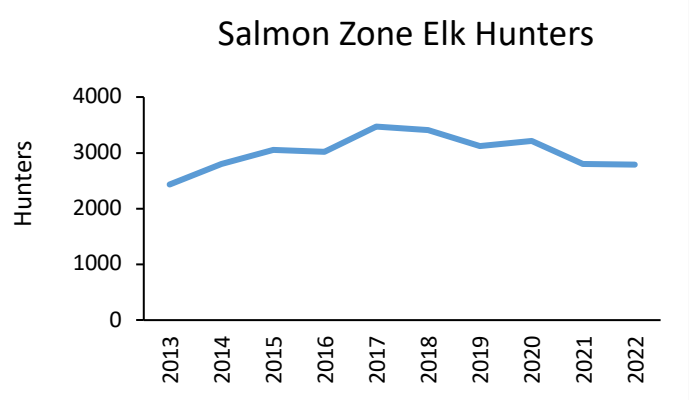
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

Salmon Elk Zone Population Survey Estimates										
Year	Cows	Calves	Total Bulls	Spikes	Raghorn Bulls	Mature Bulls	Unclassified Elk	Total Population	Calves per 100 Cows	Bulls per 100 Cows
2023	6,133	2,024	1,310	627	383	300	254	9,721	33	21
2016	6,729	2,030	1,092	520	340	221	104	9,955	30	16







Salmon Elk Zone Management Table	
Management Direction	Strategy

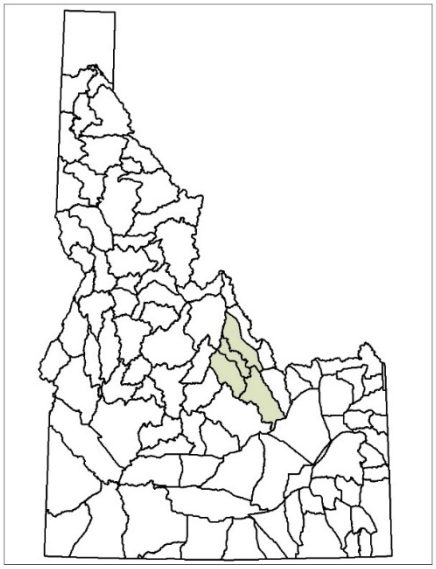
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Collaborate with private, state and federal partners to address invasive annual grasses and noxious weeds on important elk ranges. Collaborate with BLM, USFS, and IDL to provide technical assistance on grazing permit management and as they pertain to important elk summer and winter range needs and impacts. Collaborate with BLM and USFS to provide technical assistance on mineral extraction and development as they pertain to elk transitional, summer, and winter range. Collaborate with federal partners to expand and improve aspen stands throughout the zone. Participate in and support (technical assistance and funding) the Central Idaho Native Plant working group to and Salmon-Challis National Forest to implement riparian and aspen protection and enhancement projects.
Collaborate with federal and state agencies, American Indian tribes, counties, nonprofit organizations, private landowners, and others to incorporate important elk movement and migration habitat and routes into management decisions.	Continue to implement the Idaho Action Plan with a focus on Priority Areas within the zone. Determine elk movement, migration, and landscape use within and adjacent to the zone to inform land-use planning efforts. Provide technical assistance to partners regarding impacts of proposed projects on elk habitat and movement and migration routes. Collaborate with county, state, federal, tribal, and NGO partners, as well as private landowners to improve migration habitat and mitigate barriers as opportunities arise.
Develop biological studies to improve population, predator, and habitat management capabilities.	Collaborate with neighboring states and other partners as needed to improve population monitoring strategies.
Implement measures to minimize, eliminate, or compensate for elk depredations.	Utilize tools available to quickly and efficiently address depredation complaints

Lemhi Elk Zone

Game Management Units 29, 37, 37A, 51

Administered by IDFG's Upper Snake Region

Proposed Six Year Management Direction:



- The performance and management of the Lemhi Zone is currently limited by elk agricultural depredations and weather-related impacts on summer and winter range.
- Current population management in the Lemhi Zone is to maintain the elk population within objectives. Although above objective in 2018, ancillary data indicate the current population is likely within objective.

Description: The Lemhi Zone is primarily public land with some private agricultural land at lower elevations. Terrain is variable and mountainous with sagebrush-steppe at lower elevations and coniferous forests at higher elevations. Cattle ranching and recreation are the predominant land uses.

Historical Perspective: Elk were scarce throughout the Lemhi Zone in the early- to mid-1900s. Elk numbers increased and expanded substantially since the mid-1970s to about 4,600 elk in 2000. The most recent population estimate in 2018 was about 5,100 elk. Although this population is fairly productive and is typically at or above objectives, calf recruitment has been low at times, potentially indicating habitat limitations. Additionally, high elk abundance can cause significant agricultural depredations that are exacerbated by drought and severe winters. The Lemhi Zone was last surveyed in 2018 and was slightly above objective for cows and bulls; however, harvest data and reduced elk depredations indicate the current population is likely within objective. The Lemhi Zone offers general archery opportunity on the A-tag; however, any-weapon bull opportunity has been managed for decades with limited controlled hunts to maintain a higher quality experience.

Management Challenges and Opportunities: The Lemhi Zone is moderately limited by agricultural impacts. These challenges are in the form of stored winter crops and damage during summer/fall growing seasons. In addition, elk have found some private lands that provide abundant forage and protection from hunting pressure. These elk refugia can negatively impact neighboring agricultural properties and limit IDFG's ability to mitigate elk damage. IDFG will actively work to address impacts of elk refugia on surrounding landowners and strive to develop new tools to address depredation complaints.

Summer forage quality and winter forage quantity within the Lemhi Zone are limited to some extent by annual precipitation and other climate variables. In addition, most of the elk summer and winter range across this zone are on BLM and USFS lands with multiple use management goals that include mineral extraction, livestock grazing, and outdoor recreation. IDFG will collaborate with state and federal partners, NGOs, and private landowners to address impacts on elk.

Inter-Zone and Intra-Zone Dynamics: Population dynamics are fairly well contained within the Lemhi Zone, with limited elk movement between zones. As such management is similar across the Zone.

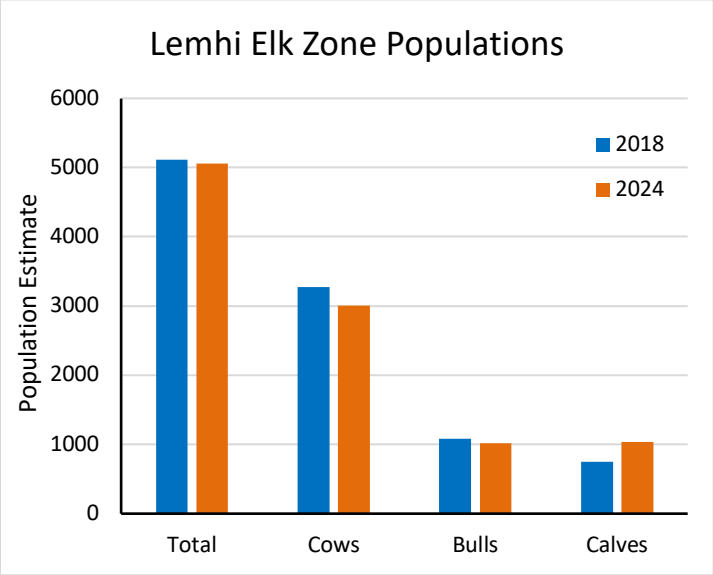
Future Needs: To maintain elk within objective, IDFG will continue to provide bull and cow opportunity and adjust as necessary to balance harvest opportunity with agricultural impacts. Additionally, IDFG will communicate regularly with citizen groups and producers to provide information and receive input.

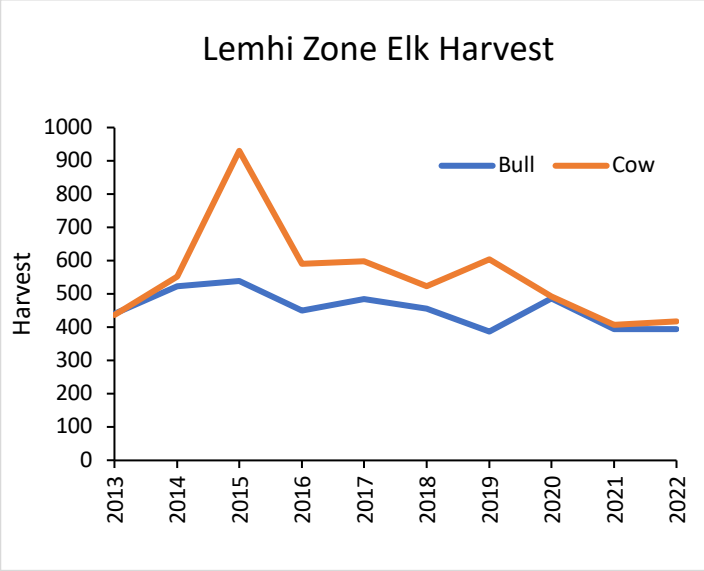
Lemhi Elk Zone Population Management Objectives			
	Cows	Total Bulls	Branch-Antlered Bulls
Management Objective Range	1,850 – 2,950	600 - 960	370 – 590
Current Status (2024)	3,007	1,015	697

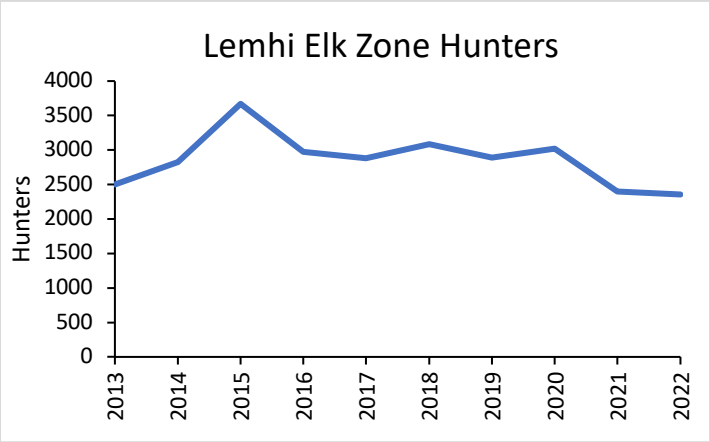
Color indicates where survey estimates are relative to management objectives:

black = within objective; red = below objective; blue = above objective

Lemhi Elk Zone Population Survey Estimates										
Year	Cows	Calves	Total Bulls	Spikes	Raghorn Bulls	Mature Bulls	Unclassified Elk	Total Population	Calves per 100 Cows	Bulls per 100 Cows
2024	3,007	1,032	1,015	318	452	245	1	5,055	34	34
2018	3,270	750	1,081	276	475	330	16	5,118	23	33







Lemhi Elk Zone Management Table	
Management Direction	Strategy
Implement measures to minimize, eliminate, or compensate for elk depredations.	Utilize tools available to quickly and efficiently address depredation complaints. Actively address impacts of elk refugia on surrounding landowners Use hunting as a primary tool to manage depredation levels. Work with landowners with IDFG access programs to improve hunter access to reduce crop damage
Collaborate with public land managers and private landowners to improve key summer, winter, and transitional elk habitat to meet statewide objectives.	Collaborate with private, state and federal partners to address invasive annual grass and noxious weeds on important elk ranges. Collaborate with state and federal partners to provide technical assistance on land management activities as they pertain to important elk summer and winter range needs and impacts.
Collaborate with federal and state agencies, American Indian tribes, counties, nonprofit organizations, private landowners, and others to incorporate important elk movement and migration habitat and routes into management decisions.	Continue to implement the Idaho Action Plan with a focus on Priority Areas within the zone. Determine elk movement, migration, and landscape use within and adjacent to the zone to inform land-use planning efforts. Provide technical assistance to partners regarding impacts of proposed projects on elk habitat and movement and migration routes. Collaborate with county, state, federal, tribal, and NGO partners, as well as private landowners to improve migration habitat and mitigate barriers as opportunities arise.
Minimize the influence of disease as a limiting factor in elk populations.	Implement the Brucellosis Management Plan with emphasis on maintaining separation between elk and cattle during high-risk periods

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Appendix A

Lolo Zone Elk Population Estimates Based on Current Nutritional Carrying Capacity

Background

Work was done in the Clearwater Basin to create predictive models of available forage on the landscape for lactating female elk by individual forest habitat type (Cook et al. 2018; Monzingo 2020; Monzingo et al. 2022, 2023). The forage metric that accounted for both forage quality and forage quantity across the landscape was suitable biomass (kg/ha). This biomass estimate used the FRESH-deer model, a linear program that accounts for the forage quality and forage quantity based on the nutritional requirements of the animal, to calculate amount of forage available to a lactating female elk with calf that satisfies their nutritional needs (Hanley et al. 2012). Suitable biomass can be used to calculate elk numbers by dividing the amount of suitable biomass by the amount of forage these animals require (Hobbs and Swift 1985, Hanley et al 2012). This nutritional carrying capacity was created using forage quality, quantity, and elk forage selection index based on summer nutrition data. Winter nutrition was not accounted for and is not represented in these estimates. The objective of this project was to use our understanding of the current nutritional conditions in the Lolo EMZ to estimate nutritional carrying capacity with the intent to provide a more science-based elk population objective.

Methodology

Model Limitations:

1. These models provide calculations of elk numbers without taking into account other herbivory on the landscape. Failing to account for herbivory by other herbivores results in an overestimation of carrying capacity for elk.

   ***Mitigation*:** We accounted for other herbivores on the landscape by using a low utilization rate (i.e., capping the amount of forage elk in theory could consume). This accounts for other herbivores on the landscape. This approach should be considered to be a crude approximation because we did not have actual estimates of forage used by other herbivores.

2. The model calculates carrying capacity based on daily forage requirement (kg/day of forage on a dry matter basis) of lactating female elk. This model, as currently written, does not take into account that the population supports a mix of bulls and non-lactating females, which have different daily forage needs than lactating cows.

   ***Mitigation*:** We assumed that ALL females were lactating this means that our estimate was an underestimate of true female populations because lactating female elk require more nutritious forage than nonlactating. We accounted for bulls and calves on the landscape within the estimate of utilization rate using the composition percentage of elk surveys. Once lactating females were calculated, we estimated bull and calf numbers based again on those composition percentages and extrapolated them from the lactating female estimate an example of this method is below (Table 1).

Table 1. Example of extrapolating elk population estimates from nutritional carrying capacity (NCC) of lactating female elk.

Prior Information				
	Population Composition	Cows	Bulls	Calves
		60%	10%	30%
	Utilization Rate for Entire Population	20%		
	Utilization Rate (UR) of Lactating Cows	12% (60% of 20%)		
NCC Model Population Estimate				
	Lactating Females Based on 12% UR	50 cows		
Population Extrapolation				
	Bulls	5 (10% of 50 females)		
	Calves	15 (30% of 50 females)		
Population Totals				
	Cows	Bulls	Calves	
	50	5	15	

3. This estimate of carrying capacity is based on summer nutrition. Estimates of elk numbers will be based on a representative day during the summer months.

   ***Mitigation*:** Over this season, forage quality and quantity changes considerably, as do estimates of carrying capacity. In late spring and early summer where forage quality is quite high, broadly above requirements, carrying capacity is also relatively high, and in autumn, when forage quality/quantity is much lower, carrying capacity is lower. By estimating nutritional carrying capacity within the late summer to early autumn time frame we provided a conservative estimate rather than an inflated one if done in the spring. However, fall breeding season is a concern because females nutritional requirements fluctuate. The date selected for estimate needed to be outside the rut period to remove that factor from influencing estimates. By avoiding the extremes represented by early summer and autumn, the estimates reflect an approximate average for each of the ranges.

4. The nutritional requirements selected for the model will directly affect carrying capacity estimates. Determining what requirements are going to be used in the model is needed to understand how well we assume female elk are going to reproduce and succeed in rearing young.

   ***Mitigation*:** We used nutritional requirements that provides the optimal amount of nutrition for female elk. This threshold means there are no limitations for lactating female elk to reproduce, support a calf, and breed at the optimal time for success in the following year (Cook et al. 2004, Monzingo et al. 2023).

5. The model predicts available forage for a 1-day snapshot, meaning the model will create an estimate of the total amount of elk that can survive on the amount of forage in that area for 1 day. This estimate would be an overestimate because elk use and need forage in these landscapes all summer, so we need to account for that use in order to provide a relative population estimate.

   ***Mitigation*:** We account for forage eaten over time by calculating the amount of forage a lactating female needed across the summer months to provide an estimate of the number of elk that can be supported for the entire summer on the forage available.

6. This model was created using 2016 overstory canopy cover estimates. Calculated carrying capacity estimates will be relative to the time period.

   ***Mitigation*:** Population surveys were conducted in 2010 & 2017. Instead of averaging those flights we only used 2017 population survey data.

7. These models are measures of current available forage on the landscape they do not take into account road, predator, human, or accessibility issues that limit the usability of available forage to elk across landscapes.

   ***Mitigation*:** We cannot account for this limitation.

Estimate Assumptions: Above we tried to account for the limitations of these models. However, we had primary assumptions that cannot be addressed until further research is done to provide accurate estimates.

The main assumption that was made was an expert opinion of the utilization rate used by elk. The model calculates the total amount of forage that satisfies nutritional requirements of elk in summer. All of this forage, if not adjusted, are assumed to be available for use by elk. This assumption deviates greatly from reality, because these animals do not eat all of this forage (i.e., down to the dirt), and if they tried to do so, foraging efficiency would fall to low levels as the animals try to find and consume the last few kilograms of forage left in plant communities. Many users of the nutritional carrying capacity model assume that only a certain percentage (typically 50%) of this forage actually contributes to carrying capacity. Our approach was a bit different. Based on a variety of studies, it is clear that elk cannot eat fast enough to satisfy their forage needs each day when accepted forage biomass falls below about 150 kg/ha (Cook et al. 2004, 2016). The upshot is that the more forage that is removed by foraging, the less efficient the foraging will be, and at some point, the animal will no longer be able to satisfy daily nutrient requirements. But without more research, model users have to guess at what amount should be left to provide enough sustainable forage for elk.

Another assumption is the need for digestible protein as a nutritional limitation with the carrying capacity estimate. Currently our models use both digestible energy and digestible protein requirements to calculate available forage and nutritional carrying capacity. Estimates of digestible energy requirements are more reliable, based on published research for elk, than estimates of digestible protein requirements. Researchers speculate that the protein requirement used in model application is perhaps higher than necessary, but additional research is needed to clarify and confirm protein requirements for modeling purposes.

In addition, we are trying to account for use in an area through time based on 1-day estimates. This does not account for animals moving across the landscape or how climate influences the amount of "summer" days available to the animal.

Based on the nature of this data, model limitations, and assumptions, estimates do not represent the true number of elk on the landscape and should only be used as a relative, rather than an absolute index of carrying capacity. Thus, we recommend using these estimates with caution to provide general guidance for management objectives.

Model Covariate Inputs: Based on the limitations above, the following are the input data we used to estimate lactating female elk populations and extrapolate elk population estimates.

- Utilization Rate:
  - Entire Elk Population UR = 20% of the amount of suitable biomass (selected plant species) on the landscape (this means 80% is left for sustainability and other herbivores)
  - Population Composition Percentages (taken from 2017 aerial surveys):

    Cows = 0.584576, Calves = 0.17018, Bulls = 0.218509

- Date of Model Estimation:
  - Date used to estimate elk number = August 30th (before rut & hunting season but during the late summer bottleneck of nutrition)
- Nutritional Requirements:
  - Suitable Biomass Models (DE ≥ 11.72 kJ/g & DP ≥ 6.7 g protein/100 g forage; Monzingo 2020)
  - Lactating females require 7.5 kg of dry matter forage/day.
- Accounting for Consumption:
  - To account for forage being eaten throughout the year 1 lactating female needs 1,350 kg for a 6-month (1 May – 31 October) summer period (i.e., 7.5 kg/day x 180 days)

Minimum Threshold Requirement: To provide a complete picture on elk estimates we estimated cow elk numbers by taking into account pixels that do not provide enough forage to realistically support an elk. For example, if a pixel provides 50 kg/ha of accepted biomass the model will measure the number of elk that can use that pixel. However, we know that 50 kg/ha of accepted biomass does not provide enough forage to meet the minimum threshold to sustain an elk within that pixel because they would use more energy finding forage than they would get from eating it. Prior to calculating suitable biomass with the above Nutritional Requirements, we removed pixels that provided estimates of Digestible Energy < 10.8 kJ/g and pixels that provided estimates of Accepted Biomass < 150 kg/ha (Cook et al. 2004, 2016; Monzingo et al. 2023). We then calculated suitable biomass using the above nutritional requirements for the remaining pixels.

Results

Taking into account the model limitations and assumptions we used the model covariate inputs to calculate estimates of elk populations in the Lolo EMZ. When the 2017 aerial survey was estimated cows, calves, and bulls only made up 97% of the total population estimate (i.e., sum of estimates for cows, calves, and bulls do not equal the total estimated). Because of this variation our estimates when

Table 2. Elk Population Estimates in the Lolo Elk Management Zone.

Estimate Type	Cows	Calves	Bulls	Total
2017 Aerial Survey	1,137	331	425	1,945
2016 NCC Based Elk Estimates	*1,827*	*532*	*683*	*3,125*
*Management Objective Range**	*1,500-2,200*		*550-800*	
*To provide a range for the Elk Plan Objectives we added a ~20% threshold on either side of the estimate.				

added together make up 97% of the total estimated and do not equal the total amount in the last column of the below table.

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Appendix B

Description of Methods Used to Estimate Population Growth Given Survival

This simulation assumes that an elk population can be described using three stages. The first stage represents calves, animals that are approximately 6.5 months old on the model anniversary of December 15. The second stage represents "juvenile" animals that begin the year at 6.5 months of age and finish the stage as 18-month-old animals when their abundance is reported. The last stage accounts for adult animals that are greater than 18 months of age. We used three stages to account for the fact that elk typically don't give birth for the first time until their second birthday.

We assume a model anniversary of December 15 to more closely resemble the time when elk flights are conducted.

We assumed here that the starting population size was 100 calves, 60 juveniles, and 200 adults. These numbers are arbitrary and should not have an effect on model output so long as our focus is on lambda or population growth rate.

The population changed size according to some simple rules. We first considered juveniles. The number of juveniles at time step t is equal to the number of calves at t-1 times the survival of juveniles. Here survival is broken into annual rates of natural and harvest survival. To simplify the outputs and inputs we ran all simulations assuming that adult and juvenile animals experienced the same survival rates. The adult population in year t was thought to be a function of the number of juveniles in the previous year plus the number of adults at t-1 times survival. Again, survival is actually represented by natural and harvested related survival rates. The last piece is the creation of calves. As noted above, data collection typically occurs in the winter and because of this harvest has already happened. Harvesting of juvenile and adult females will increase ratios while harvesting of calves decreases ratios. Ratio or structured abundance estimates cannot or do not discriminate between juveniles and adults and so the ratio is actually decreased from the true rate by the incorporation of these juveniles. This further supports the idea of using 3 stages in the model structure. Then too, harvest data is stored as male and adult without mentioning which age class animals belong to. We did not use observed harvest data in this simulation, but wanted to create a simulation that reflected some of the key data issues and assumptions biologists would face in practice. Considering all of these details we chose to model reproduction as equivalent to the observed ratio post-harvest. We did this by assuming the number of calves was equal to the number of juveniles plus the number of adults times the observed ratio. We then multiplied this number by 0.5 so that only female calves were retained in the model and implicitly made an assumption that the sex ratio at birth is 50:50.