HUNTER CROWDING

Preliminary Report on the Idaho Resident Elk and Deer General Seasons (2019)

2019 GENERAL SEASONS

University *of* **Idaho**

Department of Natural
Resources and Society

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EXECUTIVE SUMMARY

Crowding

Wildlife agencies strive to identify and establish empirical indicators of crowding to best set seasons, resolve conflict, and improve stakeholder experience. In Idaho, changing demographics, population growth, and the sustained popularity of big game hunting for elk and deer throughout the state and in specific regions motivates Idaho Fish and Game to explore resident hunters' perceptions of crowding and related experiences.

The concept of crowding used in the human dimensions of wildlife originates in outdoor recreation research, which distinguishes the concept of crowding from that of density[1]. Whereas density is an objective measure of users per unit area, crowding is an individual, subjective perception and evaluation of density or encounters in a specific setting among a specific user group.

In March 2020, researchers at the University of Idaho, in partnership with Idaho Fish and Game, initiated a four-year study on Idaho resident hunter crowding. During the first year of the study, over 37,000 general season hunters were surveyed — 16,400 elk tag purchasers, 13,386 regular deer tag purchasers, and 7,376 white-tailed deer tag purchasers. This report presents the main findings of the first year of the multi-year study of big game hunter crowding in Idaho. Please note, this report presents results that distinguish between "*regular mule deer*" and "*regular white-tailed deer*" based on participants indicating their preference to hunt mule deer or white-tailed deer on their regular deer tag.

Findings

Idaho resident hunters of elk, mule deer, and white-tailed deer perceived crowding at slight to moderate levels in the region they hunted in 2019 (Table 1, Fig. 1). Levels of perceived crowding, based on a 1-9 rating of the most crowded day experienced, varied based on the species pursued and the region where an individual hunted (based on a selected elk management zone or game management unit). Please note, some regions and units are not displayed as too few responses were collected from these areas (<15 responses).

Table 1
Perceptions of crowding (1 not crowded – 9 extremely crowded) by region hunted and tag

	Elk		Reg. Mule		Reg. White-tailed		White-tailed	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Statewide	5.6	2.6	5.9	2.5	4.9	2.8	4.5	2.7
Panhandle	5.4	2.6	5.6	2.7	5.0	2.7	4.5	2.8
Clearwater	4.8	2.6	4.2	2.7	4.7	2.8	4.6	2.7
Southwest	5.7	2.6	6.0	2.5	5.2	3.2	5.0	2.6
Magic Valley	6.6	2.4	6.1	2.5	*	*	*	*
Southeast	5.7	2.4	6.0	2.5	*	*	*	*
Upper Snake	5.6	2.6	5.7	2.5	3.8	2.3	4.3	2.7
Salmon	5.4	2.7	6.1	2.5	3.7	3.0	3.8	2.5

*Too few responses were collected to conduct valid analyses

QUICK REFERENCE

Mean: average

SD: standard deviation (distance from the mean)

n: sample size or number of respondents per response

N: total size of the population to be sampled

%: percent of respondents per response.

Perceptions of crowding can be affected by several factors and associated with the habits of the species pursued and where hunters choose to hunt. Crowding is also assumed to be directly affected by the number of hunters. Results from each survey showed hunters tend to concentrate in specific zones and units based on species. For example, hunters who purchased a white-tailed deer tag tended to hunt in units in northern Idaho and purchasers of a regular deer tag who stated they hunted white-tailed deer on that tag also tended to hunt in northern Idaho (Table S1).

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[1] Vaske, J. J. & Shelby, L B. Crowding as a descriptive indicator and an evaluative standard: Results from 30 years of research. *Leisure Sciences*, *30*(2), 111-126. https://doi.org/10.1080/01490400701881341

We would, therefore, generally expect whitetail hunter crowding issues to occur in northern Idaho. But, in terms of that expectation and the interpretation of crowding scores, we must also weigh those with the fact that there are fewer hunters who exclusively pursue white-tailed deer as compared to elk or mule deer and that whitetail hunters tend to hunt in relatively less populated regions with more varied, forested, and mountainous terrain. That is, while crowding among whitetail hunters is likely to occur in northern Idaho (given the natural history of the species and the regional landscape), crowding is unlikely to be as large an issue among whitetail hunters compared to hunters who pursue elk and mule deer or who hunt in southern Idaho regions. In general, this pattern held; crowding was rated higher, on average, by elk and mule deer hunters and higher in southern Idaho regions in 2019.

In addition to crowding, another important factor the study considered was the perception of how the number of hunters has changed over the past 10-years. Results indicate that, unlike perceptions of crowding, there was consensus perception among all hunters, regardless of species or geography: there are more hunters. This finding has important implications for the management of hunters' expectations and the on-the-ground reality they are likely to experience (Table 2).

Figure 1
Crowding scores by tag/species and the region participants hunted in 2019
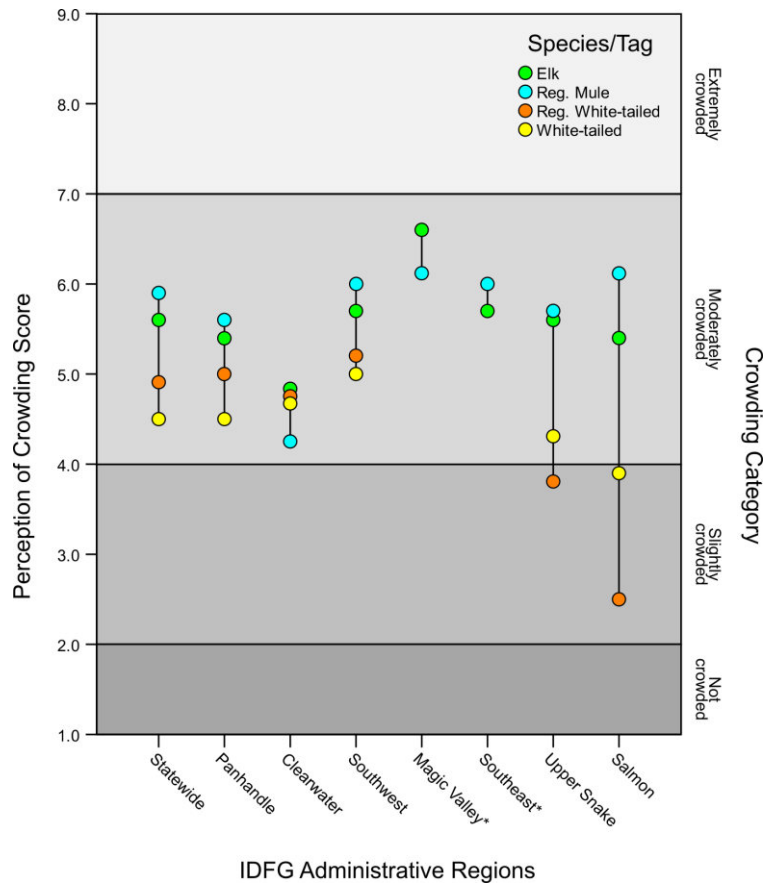
Table 2
Perceptions of hunter number change (1 fewer – 9 more) in the past 10-years by region hunted and tag

	Elk		Reg. Mule		Reg. White-tailed		White-tailed	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Statewide	**6.8**	**2.2**	**7.1**	**2.1**	**6.4**	**2.4**	**6.2**	**2.4**
Panhandle	6.7	2.2	6.4	2.6	6.4	2.4	6.1	2.5
Clearwater	6.1	2.4	5.9	2.7	6.6	2.4	6.1	2.4
Southwest	7.0	2.1	7.2	2.0	6.2	2.9	6.4	2.3
Magic Valley	7.4	1.9	7.2	2.1	*	*	*	*
Southeast	7.0	2.0	7.1	2.0	*	*	*	*
Upper Snake	6.9	2.1	7.0	2.1	5.5	2.5	6.2	2.4
Salmon	6.8	2.2	7.2	2.0	5.8	2.7	6.0	2.5

*Too few responses were collected to conduct valid analyses

Perceptions of crowding can be influenced by a number of smaller scale factors and experiences related to the day-to-day, on-the-ground experiences of hunters. To account for these factors, the study asked hunters to report how difficult or easy it was for them to hunt at preferred locations (difficulty), how they encountered other hunters (encounters), and how often they were forced to move to another location because of other hunters (displacement) (Table 3).

Table 3
Perceptions of difficulty (difficult – easy), encounters (never – always), and displacement (never – always) by region and tag

	Elk			Reg. Mule			Reg. White-tailed			White-tailed		
	Difficult[a]	Encounter[b]	Displace[b]	Difficult	Encounter	Displace	Difficult	Encounter	Displace	Difficult	Encounter	Displace
Statewide	2.8	3.4	2.8	2.9	3.6	2.9	3.1	3.1	2.6	3.2	3.0	2.4
Panhandle	2.8	3.3	2.8	2.7	3.3	2.7	3.1	3.1	2.6	3.3	2.9	2.4
Clearwater	3.0	3.1	2.5	2.9	2.8	2.3	3.1	3.1	2.6	3.2	3.0	2.5
Southwest	2.7	3.4	2.8	2.8	3.6	3.0	2.5	3.5	2.9	2.9	3.2	2.6
Magic Valley	2.6	3.7	3.2	2.9	3.7	3.1	3.2	2.7	2.7	*	*	*
Southeast	2.8	3.5	2.8	2.8	3.7	3.0	2.7	3.1	2.8	*	*	*
Upper Snake	2.8	3.4	2.7	2.9	3.6	2.8	3.4	2.6	2.4	3.0	2.9	2.3
Salmon	2.7	3.4	2.8	2.9	3.7	3.0	3.5	2.7	1.9	3.1	2.7	2.3

[a]Response scale: 1 (very difficult), 2 (difficult), 3 (neither), 4 (easy), 5 (very easy)
[b]Response scale: 1 (never), 2 (seldom), 3 (half the time), 4 (most times), 5 (always)
*Too few responses were collected to conduct valid analyses

Two general statewide trends emerged. First, whitetail hunters reported more difficulty hunting in a preferred location but reported fewer encounters and displacement compared to elk and mule deer hunters. Second, elk and mule deer hunters reported similar levels of difficulty, encounters, and displacement, which revealed higher levels of encounters and displacement than whitetail hunters.

Regionally, areas in southern Idaho reported higher levels of encountering other hunters among elk and mule deer hunters. In terms of difficulty and displacement, no distinct patterns emerge across or among regions; levels of difficulty and displacement are similar statewide and by species. The Southwest, Magic Valley, Southeast, Upper Snake, and Salmon regions tend to report higher levels across all three measures compared to the Panhandle and Clearwater.

The study also asked hunters to report the reasons for the crowding they reported. Given the many possible reasons, the study limited the initial choice to two categories — other hunters and access — or to state they were not crowded in 2019. Based on that answer, a follow-up question asked hunters to specify their response; if "other hunters" was selected, respondents specified resident hunters, non-resident hunters, or non-hunters; if "access" was selected, respondents specified trail designation, environmental conditions, or personal issues.

Table 4
Perceptions of what factor contributed most to the crowding experienced by region and tag.

	Elk			Reg. Mule			Reg. White-tailed			White-tailed		
	Hunters	Access	N/A	Hunters	Access	N/A	Hunters	Access	N/A	Hunters	Access	N/A
Statewide	58%	22%	20%	62%	17%	20%	48%	19%	33%	42%	21%	37%
Panhandle	59	19	22	59	14	27	50	19	31	45	17	38
Clearwater	46	20	33	42	12	47	44	20	35	41	21	37
Southwest	55	28	17	64	18	18	25	35	40	44	22	34
Magic Valley	64	25	11	62	18	20	67	—	33	—	—	—
Southeast	58	26	16	57	26	17	40	20	40	—	—	—
Upper Snake	61	20	18	63	16	21	42	16	42	37	27	36
Salmon	61	18	21	71	9	20	38	13	50	35	19	46

Finally, the relationship between perceptions of crowding and satisfaction was analyzed to determine if any significant or substantial associations exist. Satisfaction levels with the 2019 season were based on a 5-point scale of very dissatisfied (1) to very satisfied (5). Generally, overall satisfaction with the 2019 season was at or above the mid-point: elk (2.9), regular mule deer (2.5), regular white-tailed deer (3.1), and white-tailed deer (3.3). There was a statistically significant, moderately positive correlation (r) between satisfaction and perception of crowding, meaning that more dissatisfaction was associated with a higher perception of crowding, but the relationship is not necessarily strong nor 1-to-1: elk (r = .25, p<.01), regular mule deer (r = .27, p<.01), regular white-tailed deer (r = .37, p<.01), and white-tailed deer (r = 32 (p<.01).

Overall, perceptions of crowding were consistently reported at slight or moderate levels throughout Idaho by elk and deer hunters. There is a clear distinction between the crowding perceived by elk and mule deer hunters in comparison to whitetail hunters. Concentrations of hunters in specific units and zones, a factor contributing to both crowding and density, were also noticeable in regions with metropolitan areas. In addition, approximately one-fifth of elk and mule deer and one-third of whitetail hunters report not being crowded in 2019. Together, these facts reveal crowding is a complex issue that will require consistent study and a multi-faceted management strategy.

Takeaways

- Crowding is not a one-dimensional issue caused by a single factor; crowding is a multi-dimensional phenomenon experienced by individuals and groups differently.

- Crowding is a larger issue in southern Idaho compared to northern Idaho, but specific elk management zones and game management units have higher than average crowding scores, regardless of geography.

- Hunters who purchased a regular deer tag to pursue mule deer experienced the highest average level of perceived crowding during the 2019 season.

- Elk hunters (A/B tag) in the Magic Valley region and the Smoky-Bennett zone perceive the highest levels of crowding, on average, in 2019.

- Exclusive whitetail hunters (those who purchased a white-tailed deer tag) perceive the lowest levels of crowding, on average, in 2019.

- Hunters who pursue elk and mule deer are likely to report higher levels of crowding relative to hunters who pursue other big game species.

- All hunters, regardless of tag or species, perceive more hunters now than in the past 10-years.

- All public land hunters perceive higher levels of crowding than private land hunters.

- Satisfaction is not necessarily associated with perceptions of crowding.

Figure 2
Hunters' perceptions of crowding in 2019 by species and tag. Scores are reported as slight if less than 4.8 (blue), moderate-low at 4.8 - 5.4 (light blue), moderate at 5.4 - 5.7 (orange), moderate-high if greater than 5.7 (red)
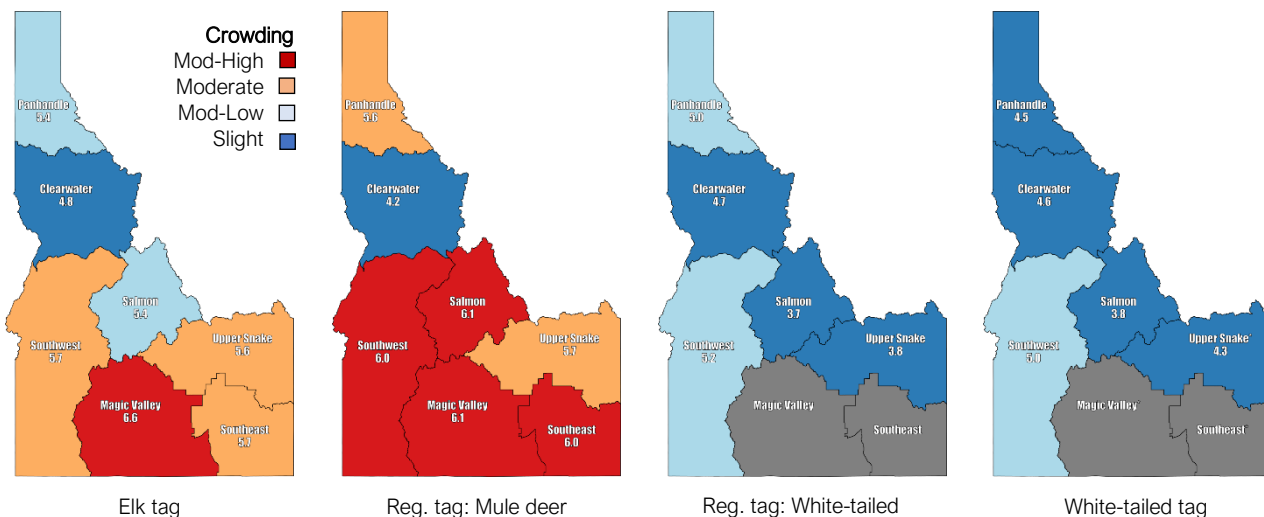
INTRODUCTION

Segments of the Idaho deer and elk hunter public have expressed concern about what they perceive as too many hunters on the landscape. Many feel the quality of their experience has been compromised by hunter crowding. The Idaho Department of Fish and Game and the Idaho Fish and Game Commission have committed to examine the issue of hunter crowding (also called "congestion")

That commitment includes prioritizing additional statewide and region-specific assessments of perceived crowding and its potential adverse effects on deer and elk hunters' experiences in the field. A significant component of the Idaho Mule Deer Management Plan 2020 – 2025 is dedicated to investigating potential *human dimensions* approaches to remedy the issue. Human dimensions refers to a problem orientation that places human behavior and social processes at the forefront of wildlife management issues and solutions.

Accordingly, Idaho Fish and Game and the University of Idaho have partnered to conduct a multi-year study and survey resident deer and elk hunters beginning with the 2019 hunting season and running through the 2023 season. The overall objectives of this 5-year collaborative study include understanding (1) how changes to big game seasons and rules influence perceptions of crowding and hunter expectations and (2) what elements of season structure hunters may be willing to trade in exchange for reduced hunter density and crowding.

This preliminary report summarizes the 2020 survey of Idaho resident deer and elk hunters' experiences and crowding perceptions during the 2019 general big game seasons. Summary results of elk, mule deer, and white-tailed deer hunters are provided in this report and additional details are presented in the appendix sections.

Readers are advised that this preliminary report represents only a single year of a multi-year investigation, and results should be interpreted accordingly. Idaho Fish and Game and the University of Idaho anticipate that analyzing results across the planned 5-years of the study will provide more insightful and meaningful results than assessing a single year on its own. However, keeping hunters up to date on human dimensions research activities from season to season is a priority. As such, a preliminary report on hunter crowding will be made available for the 2019, 2020, 2021, and 2022 big game seasons.

Potential changes to big game season structures, if any, as a result of the multi-year investigation on hunter crowding would occur only after all surveys and analysis are completed and thorough public scoping conducted.

HUNTER DENSITY

The number of hunters per a specific unit area.

PERCEIVED CROWDING

The negative evaluation of density. It is an individual belief or value judgment made a hunter.

CROWDING RATING

The standard measure of crowding used in the context of hunting and angling is a 1-9 rating scale: 1 indicates a person believes it is not at all, crowded and 9 that it is extremely crowded. This standard measure allows for comparisons across locations and seasons.

OBJECTIVES

The 2020 Idaho resident hunter crowding study used rigorous science to provide high-quality data that informs Idaho big game management. Rigorous science is defined as empirical methods undertaken in a way that enhances confidence in the veracity of the findings, with veracity defined as truth or accuracy[2].

The objective of the study was to evaluate Idaho resident elk and deer hunters' perception of crowding—based on where they hunted—during the 2019 general season. Whereas density is an objective measure of hunters per unit area, crowding is a subjective, contextual assessment made by a hunter that a certain density in a certain location is judged by them as crowded. Various factors can influence that judgment. Crowding is defined as a subjective, psychological perception and negative assessment of hunter density in a specific context among a specific hunter segment.

The study was designed to answer the following primary research question:

- What level of crowding did Idaho resident elk and deer hunters perceive during the 2019 general hunt season in their primary hunting region and unit/zone?

The study was designed to ask several supporting research questions* to inform interpretation of hunters' perceptions of crowding in the areas they hunted in 2019:

o Do hunters think the number of other hunters is changing?
o Are hunters experiencing more ease or difficulty in hunting (at their preferred location)?
o Are hunters experiencing displacement (because of other hunters)?
o How often do hunters encounter other hunters?
o Who or what do hunters think contributes to the crowding they experience?

*Secondary objectives include assessments of resident elk and deer hunters' 2019 harvest and satisfaction and several hunt trip characteristics, e.g., when, where, and how they hunted.

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[2] Casadevall, A., Fang, F.C. (2016). Rigorous science: a how-to guide. *mBio*, *7*(6), e01902-16. https://doi.org/10.1128/mBio.01902-16

METHODS

Sampling

Sampling is a process to select a subset of individuals from within a target population to estimate characteristics of the whole population. It is often infeasible or unrealistic to gather information from every member of a population. So, we draw a sample from the population(s) of interest, study that sample, and then generalize the findings back to the population from which they were chosen. The hunter crowding study used a simple random sample (SRS) procedure within defined strata for each target population.

Target Populations

The hunter crowding study had three target populations: 2019 resident, general season elk, mule deer, and white-tailed deer hunters. Three separate surveys were designed to evaluate these hunters' experience with crowding.

Stratification

The state of Idaho has diverse landscapes and habitats in which elk and deer populations occur and are dispersed. Hunters and hunting opportunities are likewise diverse and dispersed. The Clearwater region, for example, is known more for whitetail hunting than mule deer and therefore has a higher concentration of white-tailed deer hunters and tag purchases than other regions. This creates unique hunting contexts and hunter experiences that a rigorous study must capture to improve precision and reduce error. To account for those differences, a stratified sampling design was used to divide the target populations into separate groups, or strata. These strata were based on the seven IDFG administrative regions: Panhandle (PH1), Clearwater (CW2), Southwest (SW3), Magic Valley (MV4), Southeast (SE5), Upper Snake (US6), and Salmon (SA7). An SRS was drawn from these seven strata for each target population. Stratification by region of residency allows analysis of results that are region-specific and statewide.
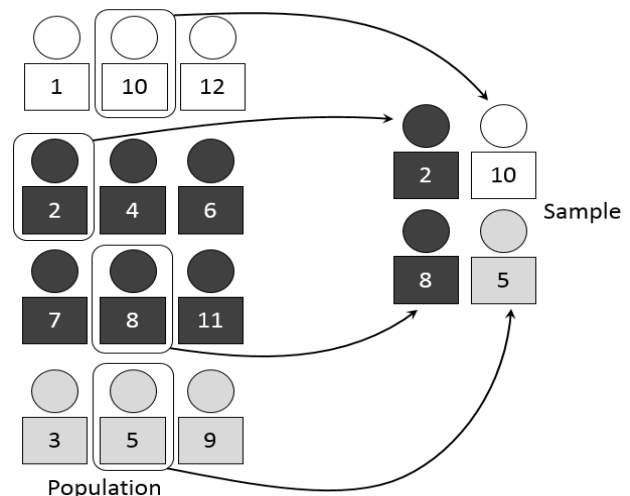
Figure 3
Illustration of a stratified sample of elk (black), mule deer (gray), and whitetail (white) hunters reflects proportion in the population

Sample Size Estimates

Formal sample size estimates were calculated to assure that a statistically valid sample was obtained from which to make inferences about the target populations[3]. The parameters of the sample size estimate were target population size (*N*), margin of error (E = .03), normal distribution at 95% confidence level (Z = 1.96), population proportion (p = .5), and expected response rate (RR = .15).

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[3] Bartlett, J. E., Kotrlik, J. W., & Higgins, C. C. (2001). Organizational research: Determining appropriate sample size in survey research appropriate sample size in survey research. *Information Technology, Learning, & Performance Journal*, *19*(1), 43-50.

The following formula was used to determine an adequate sample size:

$$n = \left((Z^2)(p(1-p)/(E^2))\right) / \left(1 + (Z^2)(p(1-p))/(E^2(N))\right)$$

The following formula was then used to determine the size of the random sample drawn the sample frame based on an expected response rate of 15%:

$$n(1/RR)$$

Sample size estimates were elk (n = 16,511), general deer (n = 13,919), and white-tailed deer (n = 7,822). Sample size estimate tables are available.

Participants

Sampling Frame

A sample frame is the source used to select a sample from the target population. The target population was 2019 Idaho resident elk, deer, and white-tailed deer hunters. The sample frame used to select the sample for each target population was IDFG's license database of resident elk tag (A and B tags), adult deer: regular, and adult deer: white-tailed purchasers in 2019 who provided an email contact.

Sampling procedure

A simple random sampling (SRS) procedure was used to draw a sample from each of the seven strata. A random (probability) sampling procedure eliminates bias by assuring everyone listed in the sample frame have an equal chance of being chosen to be invited to participate in the survey. More specific, the statistical procedures (frequentist) used to analyze the data collected assume a random sample.
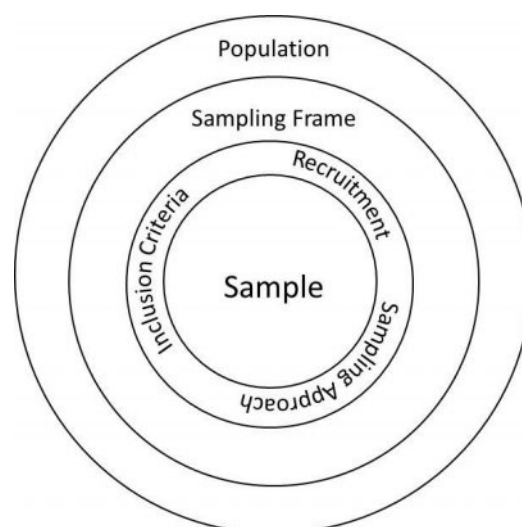
Figure 4
The relationship between a population, sample frame, and sample

Data Collection

Resident hunters randomly selected from the sample frame were contacted via email. Coverage (percent of licensees who provide an email compared to all licensees) as of February 2020 for each tag type by region of residency are indicated in Table 4. Response mode was a web-based questionnaire hosted by Qualtrics. Data collection began on 20-Mar-2020. Three subsequent reminders were sent at four-day intervals: 23-Mar-2020, 26-Mar-2020, 30-Mar-2020. Email invitations to participate were sent to 37,162 hunters: elk (16,400), deer (13,386), whitetail (7,376).

Table 5
Email contact coverage by region of residency

Tag	PH1	CW2	SW3	MV4	SE5	UP6	SA7
Elk	45%	52%	64%	67%	66%	62%	64%
Deer	42%	50%	54%	50%	50%	51%	59%
Whitetail	41%	45%	58%	63%	59%	57%	60%

Response Rate

An effective response rate was calculated as completed questionnaires divided by eligible respondents. More detailed standard definitions provided by the American Association for Public Opinion Research (AAPOR) can also be used to calculate response rates[4]:

Table 6
Sample size and response rate per survey

Tag	n*	RR†	Sent	Fail	Bounce	Duplicate	Eligible	Started	Completed	Excluded†
Elk	4,989	34%	16,400	21	223	66	16,090	6,061	5,448	459
Deer	3,512	30%	13,386	11	204	509	12,662	4,330	3,831	319
Whitetail	2,003	33%	7,376	6	126	436	6,808	2,463	2,216	213

*Sample size eligible for analysis based on completes minus exclusions.
†Effective response rate calculated as completed divided by eligible.
‡Exclusion criteria was a respondent indicating they were <18-years old or a respondent who completed <70% of the questionnaire.

Table 7
Sample size obtained from population by residency region

	Elk		Deer		Whitetail	
Region	n	%	n	%	n	%
Panhandle	722	15	648	18	389	19
Clearwater	709	14	204	6	587	30
Southwest	786	16	692	20	622	31
Magic Valley	656	13	562	16	63	3
Southeast	622	12	599	17	42	2
Upper Snake	774	16	545	16	219	11
Salmon	720	14	263	7	81	4
Statewide	4,989	100	3,513	100	2,003	100

Margin of Sampling Error

Margin of sampling error is a statistical measure of difference between survey results (the sample) and the target population. The margin of sampling error is an indicator of how accurately the survey results can be interpreted to reflect the views of the overall population. Low margin of sampling error is one indicator of rigor and confidence in statistical results.

Margin of sampling error is affected by sample size, population size, and a predetermined confidence level. Based on those factors, an acceptable margin of sampling error by most survey research standards is <4-8% at a 95% confidence level. For example, a +/- 3% margin of sampling error at a 95% confidence level means that if this crowding survey were administered 100 times, we can expect the results to be within 3% of the true value 95 of those times.

Based on 2019 license sales as the population size (N), the sample sizes (n) reported in the previous section, and a 95% confidence level, the margin of sampling error for each survey are:

- Elk: +/- 2% (N = 66736, n = 4989)
- Regular deer: +/- 2% (N = 67969, n = 3513)
- Whitetail: +/- 3% (N = 18701, n = 2003)

[4] The American Association for Public Opinion Research (AAPOR). (2016). Standard definitions: Final dispositions of case codes and outcome rates for surveys (9th ed.). AAPOR. https://www.aapor.org/Standards-Ethics/Standard-Definitions-(1).aspx

Measures

The questionnaires (survey instruments) for each target population are available in Appendix A. The primary measures* encompassed the topics of: (1) perception of crowding, (2) experience and expectations, (3) general hunting experience, (4) 2019 hunting experience, and (5) perception of IDFG.

For the purposes of this report some measures/results are excluded.

Crowding Perceptions and Congestion Experiences

A standard measure of crowding perception was used; a single-item indicator on a 9-point unipolar response scale (*1-2 indicates not at all, 3-4 slightly, 5-7 moderately, and 8-9 extremely crowded*). This standardized form allows for comparisons across space and time. The question asked participants to rate the most crowded day they experienced in 2019 specific to a unit/zone and land type.

Additional questions asked: (a) how the number of other hunters have changed in the past 10-years or since you started hunting, if less (*9-point unipolar response scale, fewer hunters – more hunters*), (b) what contributed the most to the crowding you experienced (*other hunters or access*), and follow-up question to specify (c) who/what aspects of other hunters or access contributed most to the crowding experienced.

Related Hunt Trip Experiences

Measures of participants' hunting experience and expectations asked: (a) how difficult or easy was it for you to hunt at locations you preferred (*5-point bipolar response scale, very difficult – very easy*), (b) how often did you encounter other hunters, and (c) how often did you move to another location because of other hunters (*5-point unipolar response scale, never – always*).

Hunt Outcomes and Hunter Characteristics

Measures specific to participants' 2019 hunting experience asked: (a) which weapon did you use to hunt, (b) did you get a chance to hunt, (c) did you harvest, (d) which days did you hunt, (e) what property type did you hunt, and (f) how satisfied were you with experiences specific to 2019.

Measures of participant characteristics included: (a) how many years have you been hunting (species) in Idaho, (b) length of Idaho residency, (c) age, (d) gender, (e) ethnicity, (f) highest level of education, (g) annual gross income, and (h) current employment status.

ELK

Cervus canadensis

Elk: Statewide

Crowding Perceptions

Elk hunters' perceptions of crowding in 2019 varied from a lowest rating in the Clearwater region (4.8 out of 9) to highest in the Magic Valley region (6.6). Perceptions of crowding in the other five regions were comparable to each other and were close to the statewide average of 5.6 out of 9. These patterns reflect anecdotal evidence of increased numbers associated with the Boise metropolitan area and the topography and accessibility of the Clearwater region.

In contrast to that inter-regional variability, elk hunters' perceptions of changing hunter numbers over the past 10-years were similar, statewide; there is a clear pattern of perceiving the number of other hunters is and has been on the rise in Idaho.

Table 8
Elk perception of crowding (2019) and hunter number change ratings (9-pt scales)

	Mean	SD
Perception of crowding (statewide)[a]	5.6	2.6
Panhandle	5.4	2.6
Clearwater	4.8	2.6
Southwest	5.7	2.6
Magic Valley	6.6	2.4
Southeast	5.7	2.4
Upper Snake	5.6	2.6
Salmon	5.4	2.7
Perception of hunter numbers change (statewide)[b]	6.8	2.2
Panhandle	6.7	2.2
Clearwater	6.1	2.4
Southwest	7.0	2.1
Magic Valley	7.4	1.9
Southeast	7.0	2.0
Upper Snake	6.9	2.1
Salmon	6.8	2.2

[a] Response scale: 1-2 (not at all), 3-4 (slightly), 5-7 (moderately), 8-9 (extremely)
[b] Response scale: 1 (fewer hunters) – 9 (more hunters)

Crowding
- Mod-High
- Moderate
- Mod-Low
- Slight

Panhandle 5.4
Clearwater 4.8
Salmon 5.4
Southwest 5.7
Upper Snake 5.6
Magic Valley 6.6
Southeast 5.7
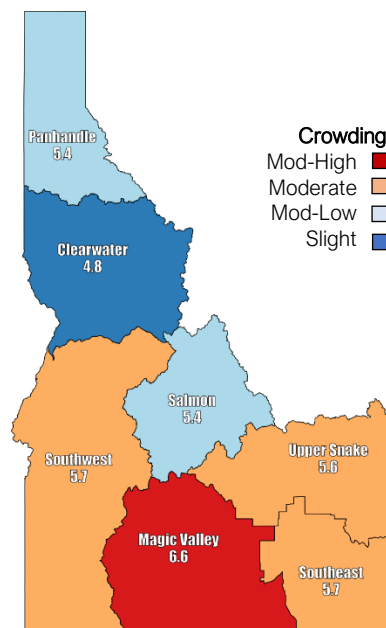
An important element of crowding is land type and associated accessibility. A clear pattern, statewide, of more perceived crowding on public land versus private was observed. Of note, perceptions of crowding in the Magic Valley region remained in the moderate category regardless of public or private land. In contrast, private land in all other regions was perceived as only slightly crowded by elk hunters.

Table 9
Elk perception of crowding (2019) by land type

	Public		Private	
	Mean	SD	Mean	SD
Statewide	5.8	2.5	3.9	2.8
Panhandle	5.7	2.5	4.0	2.8
Clearwater	5.1	2.5	3.7	2.7
Southwest	5.8	2.5	3.3	2.6
Magic Valley	6.6	2.4	5.6	3.0
Southeast	5.9	2.3	3.9	2.4
Upper Snake	5.7	2.5	3.7	3.1
Salmon	5.5	2.7	3.1	2.5

[a] Response scale: 1-2 (not at all), 3-4 (slightly), 5-7 (moderately) 8-9 (extremely)

Table 10
Elk perception of hunter number change by land type

	Public		Private	
	Mean	SD	Mean	SD
Statewide	5.8	2.5	3.9	2.8
Panhandle	5.7	2.5	4.0	2.8
Clearwater	5.1	2.5	3.7	2.7
Southwest	5.8	2.5	3.3	2.6
Magic Valley	6.6	2.4	5.6	3.0
Southeast	5.9	2.3	3.9	2.4
Upper Snake	5.7	2.5	3.7	3.1
Salmon	5.5	2.7	3.1	2.5

[a] Response scale: 1 (fewer hunters) – 9 (more hunters)

Among elk hunters, tag type is an important segmentation variable to consider. Regardless of tag type, all regions were rated as moderately crowded, on average. Variability emerges among elk management zones and higher ratings of crowding were reported by B tag hunters (i.e., more opportunities for centerfire rifle hunters) throughout the state compared to A tag hunters.

Table 11

Elk crowding (2019) ratings by tag type

	A Tag (n = 2616)		B Tag (n = 2373)	
	Mean	SD	Mean	SD
Statewide[a]	5.5	2.6	5.6	2.7
Panhandle	5.6	2.4	5.3	2.7
Clearwater	4.7	2.6	4.8	2.6
Southwest	5.5	2.5	5.9	2.6
Magic Valley	6.2	2.4	6.9	2.4
Southeast	5.7	2.4	5.8	2.4
Upper Snake	5.7	2.6	5.4	2.8
Salmon	5.0	2.7	5.7	2.7

[a] Response scale: 1-2 (not at all), 3-4 (slightly), 5-7 (moderately, 8-9 (extremely)
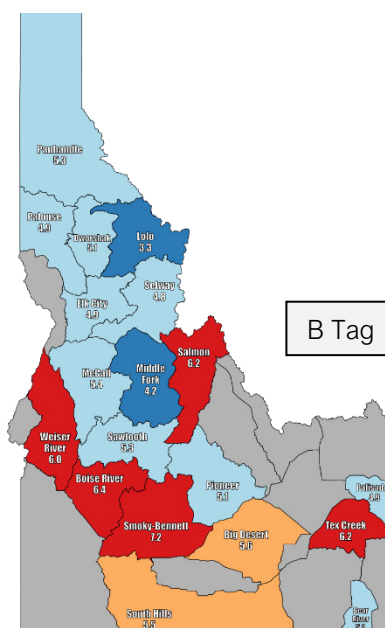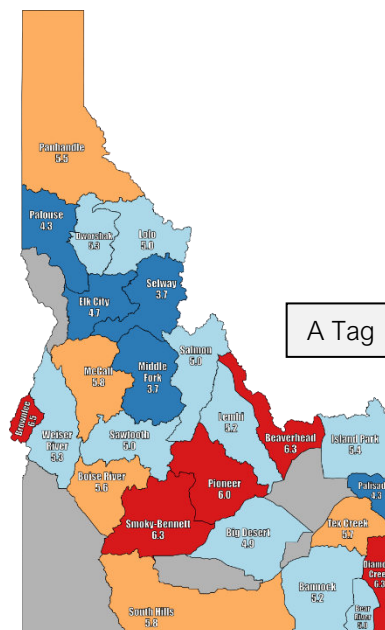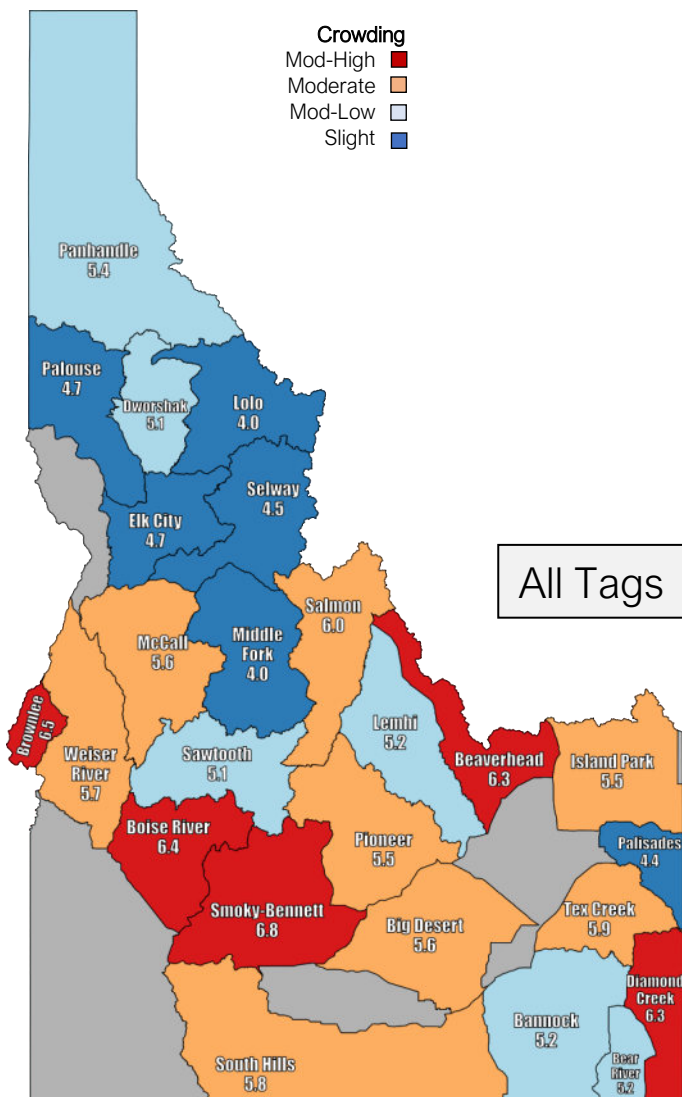
Figure 5

Percentage of elk hunters statewide and by region hunted in each response category of crowding on a standard 9-point rating scale: 1-2 (not at all), 3-4 (slightly), 5-7 (moderately), 8-9 (extremely).

ELK

PERCEPTION OF CROWDING IN 2019 | *not at all crowded - extremely crowded*

■1 ■2 ■3 □4 □5 □6 □7 ■8 ■9

REGION									
Statewide	11	6	8	7	12	13	16	8	19
Panhandle	13	6	7	7	13	13	16	8	16
Clearwater	18	8	9	7	15	12	16	5	10
Southwest	9	7	8	5	13	13	17	9	18
Magic Valley	6	2	4	6	11	12	15	10	33
Southeast	7	7	8	8	13	13	19	8	17
Upper Snake	11	6	9	8	10	14	15	8	19
Salmon	14	7	9	7	12	12	14	7	18

Categorial Response Scale Percentage
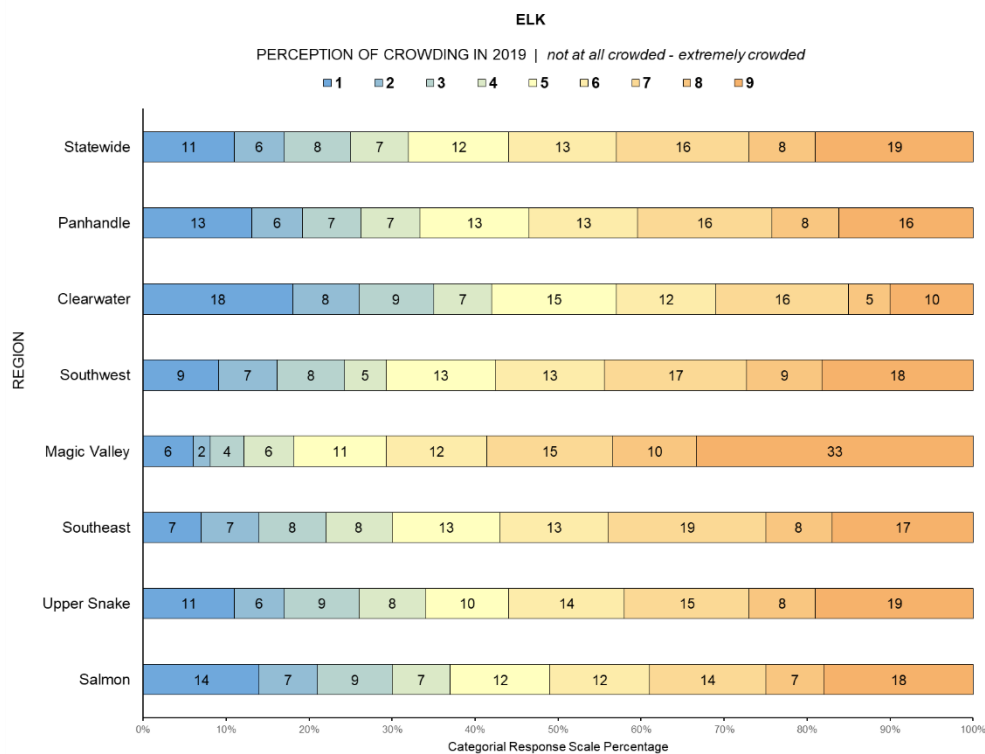
Figure 6

Percentage of elk hunters statewide and by region hunted in each response category of the perceived change in the number of other hunters in the past 10-years, on a 9-point rating scale: 1 (fewer hunters) – 9 (more hunters).

ELK

PERCEPTION OF CHANGING HUNTER NUMBERS (PAST 10 YEARS) | *fewer hunters- more hunters*

■1 ■2 ■3 □4 □5 □6 □7 ■8 ■9

REGION									
Statewide	2	2	4	5	15	12	15	8	36
Panhandle	3	3	5	6	14	13	17	8	33
Clearwater	5	4	7	7	19	12	15	7	24
Southwest	1	1	4	4	15	13	14	9	38
Magic Valley	1	2	3		15	8	17	7	47
Southeast	2	1	2	4	14	14	16	9	36
Upper Snake	2	2	3	5	15	14	15	9	35
Salmon	3	3	4	5	13	12	16	9	36

Categorial Response Scale Percentage

Crowding-Related Experiences

Hunters who perceive or experience crowding (congestion) can often attribute that to one or several factors. To simplify those contributing factors, the study asked if hunters attribute crowding to *other hunters* or *access to hunting lands* (or if they were not crowded in 2019). For those two categories, a follow-up question asked hunters to specify their response. If "other hunters" was selected, respondents specified resident hunters, non-resident hunters, or non-hunters; if "access" was selected, respondents specified trail designation, environmental conditions, or personal issues.

Figure 7
Percentage reporting factors that contribute to elk hunters' crowding experience in 2019:
not crowded, other hunters, and access
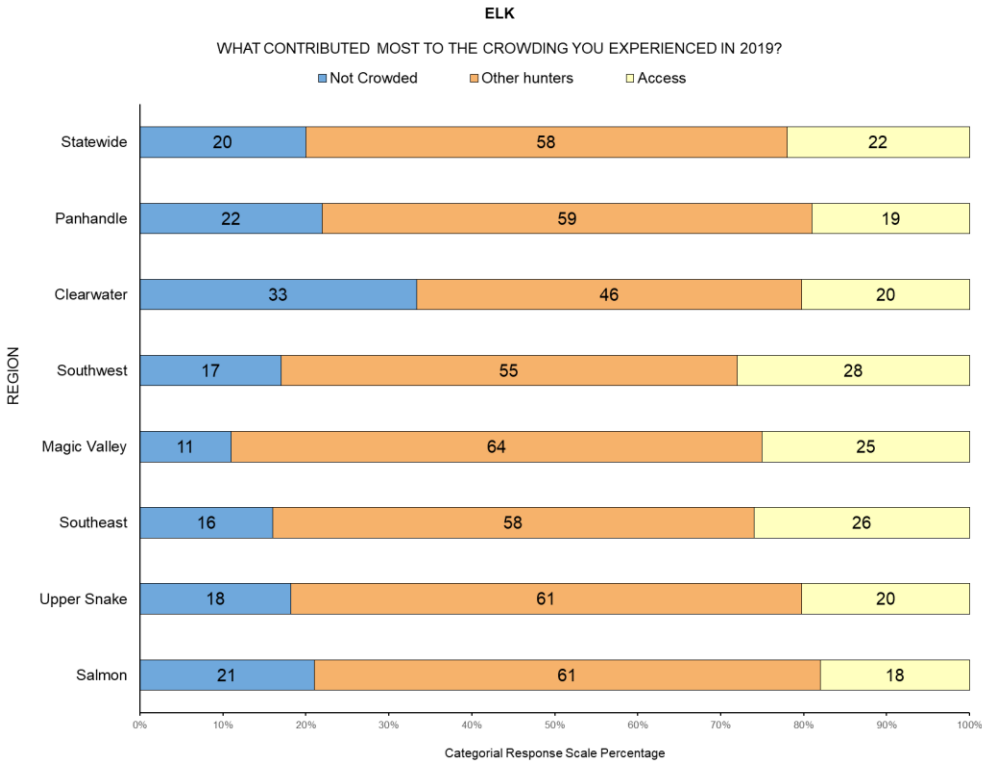
Figure 8
Percentage reporting "other hunters": resident hunters, non-resident hunters, and non-hunters
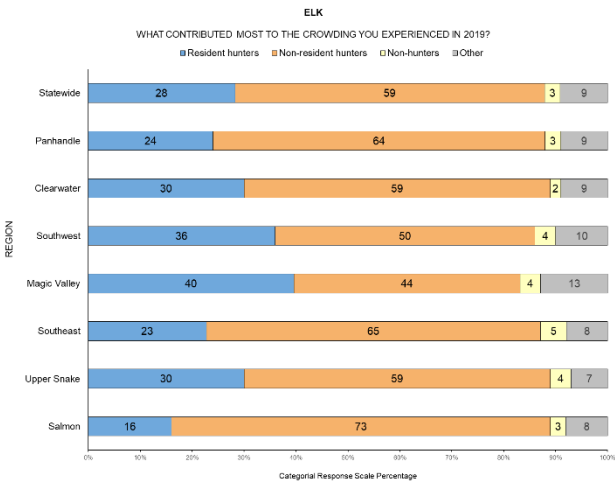
Figure 9
Percentage reporting "access": trail issues, environmental conditions, and personal issues
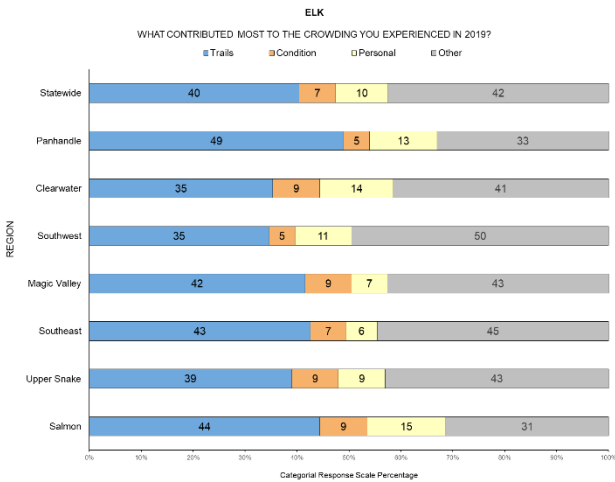
Hunters may also have difficulty hunting in a preferred location, encounter other hunters, or be displaced from a location or their "spot", all of which may contribute to a sense, belief, or experience of crowding.

Figure 10
Percentage reporting ease or difficulty hunting at a preferred location in 2019

ELK
HOW EASY / DIFFICULT TO HUNT AT PREFERRED LOCATION IN 2019?
■Very easy ■Easy □No change □Difficult ■Very difficult

REGION	Very easy	Easy	No change	Difficult	Very difficult
Statewide	5	21	31	33	9
Panhandle	6	19	34	33	8
Clearwater	9	27	29	27	7
Southwest	4	20	32	34	10
Magic Valley	3	18	30	34	14
Southeast	4	23	33	34	7
Upper Snake	6	22	31	32	9
Salmon	5	19	31	34	10

Categorial Response Scale Percentage
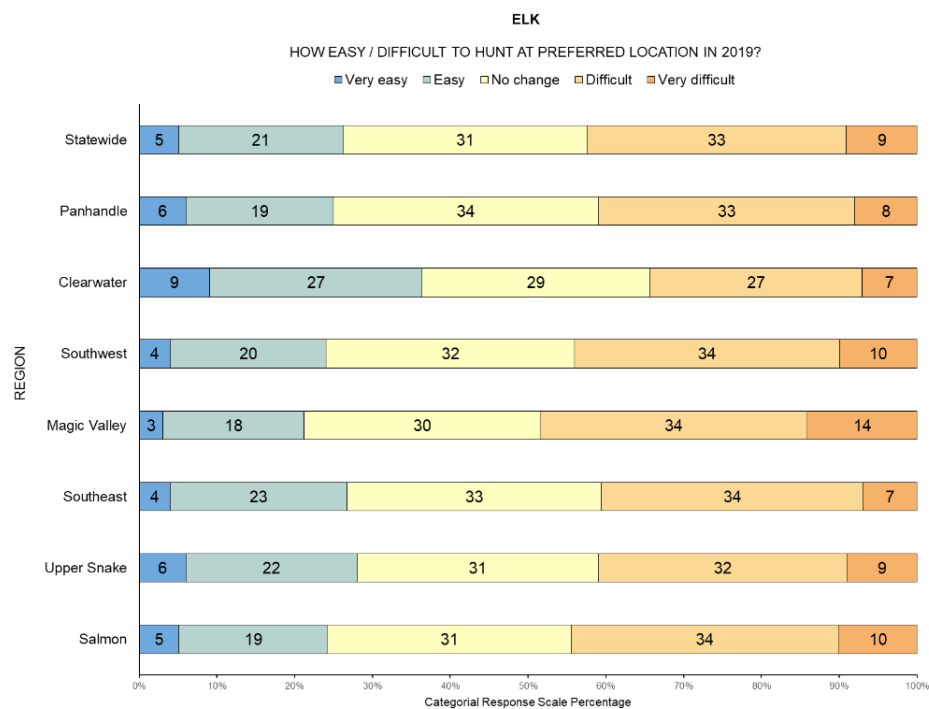
Figure 11
Percentage reporting frequency of encountering other hunters in 2019

ELK
HOW OFTEN DID YOU ENCOUNTER OTHER HUNTERS IN 2019?
■Never ■Seldom □Half the time □Most times ■Always

REGION	Never	Seldom	Half the time	Most times	Always
Statewide	4	18	30	32	16
Panhandle	5	19	30	31	15
Clearwater	7	26	29	28	9
Southwest	2	20	33	30	15
Magic Valley	2	12	24	37	26
Southeast	1	16	33	32	18
Upper Snake	4	17	31	35	13
Salmon	5	18	28	33	16

Categorial Response Scale Percentage
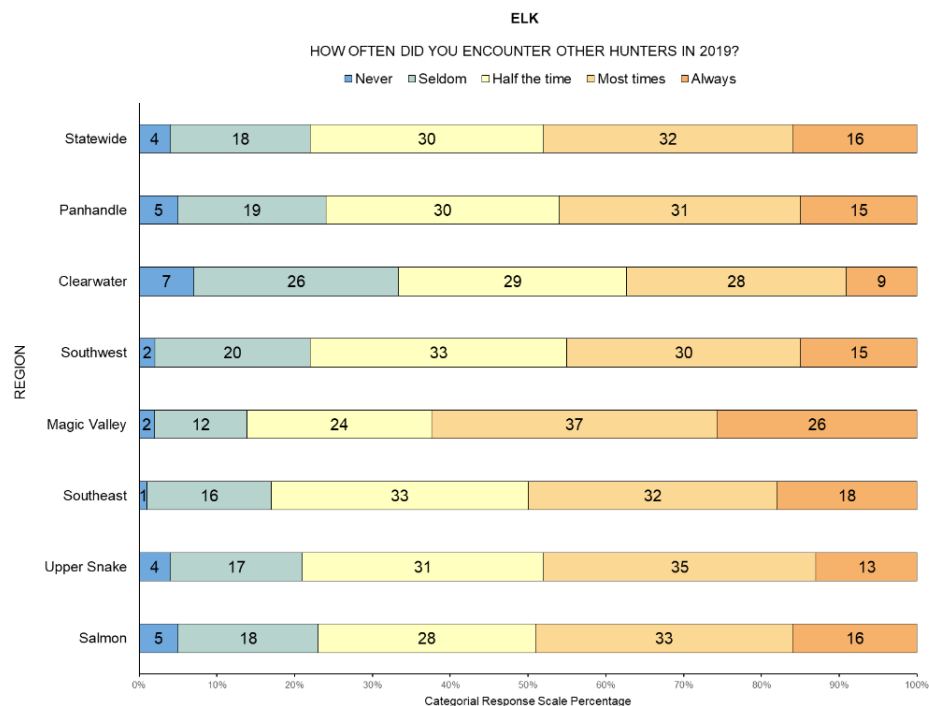
Figure 12
Percentage reporting frequency of displacement by other hunters in 2019

ELK

HOW OFTEN DID YOU MOVE TO A DIFFERENT LOCATION BECAUSE OF OTHER HUNTERS IN 2019?

■ Never ■ Seldom □ Half the time ■ Most times ■ Always
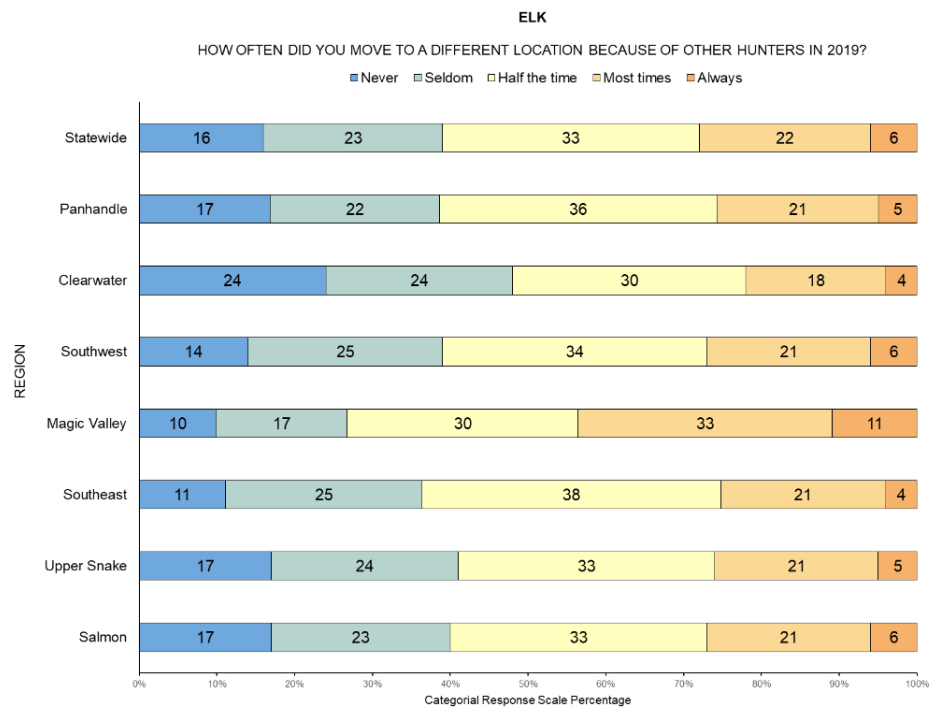
Hunt Outcomes and Hunter Characteristics

Table 12

Percentage of elk tag purchasers who hunted in 2019

	A Tag		B Tag	
	No	Yes	No	Yes
Statewide	5%	95%	10%	90%
Panhandle	8%	92%	11%	89%
Clearwater	4%	96%	11%	89%
Southwest	5%	95%	15%	85%
Magic Valley	5%	95%	11%	89%
Southeast	6%	94%	12%	88%
Upper Snake	9%	91%	9%	91%
Salmon	5%	95%	10%	90%

Table 13

Harvest rate of elk tag purchasers who reported hunting 2019

	A Tag		B Tag	
	No	Yes	No	Yes
Statewide	84%	16%	82%	18%
Panhandle	78%	22%	84%	16%
Clearwater	80%	20%	79%	21%
Southwest	89%	11%	82%	18%
Magic Valley	81%	19%	54%	46%
Southeast	79%	21%	69%	31%
Upper Snake	74%	26%	74%	26%
Salmon	84%	16%	82%	18%

Note. These rates are inclusive of this study and do not reflect other harvest rates reported by IDFG

Table 14
Elk hunter land access usage by tag type in 2019

	A Tag			B Tag		
	Public	Private	Access Yes!	Public	Private	Access Yes!
Statewide	**90%**	**9%**	**1%**	**85%**	**13%**	**2%**
Panhandle	84%	13%	3%	74%	24%	2%
Clearwater	78%	21%	1%	74%	23%	3%
Southwest	97%	3%	—	92%	7%	1%
Magic Valley	96%	4%	—	88%	8%	4%
Southeast	87%	10%	3%	98%	2%	—
Upper Snake	93%	6%	1%	88%	8%	4%
Salmon	90%	10%	—	98%	2%	—

Table 15
Overall satisfaction with elk hunting experience in 2019

	N	Mean	SD
Statewide[a]	**4902**	**2.9**	**1.2**
Panhandle	706	2.8	1.2
Clearwater	698	2.7	1.2
Southwest	772	2.9	1.2
Magic Valley	646	2.6	1.3
Southeast	617	3.1	1.1
Upper Snake	758	3.1	1.2
Salmon	705	3.0	1.2

[a] Response scale: 1 (very dissatisfied), 2 (dissatisfied), 3 (neither), 4 (satisfied), 5 (very satisfied)

Satisfaction
High
Moderate
Low
N/A
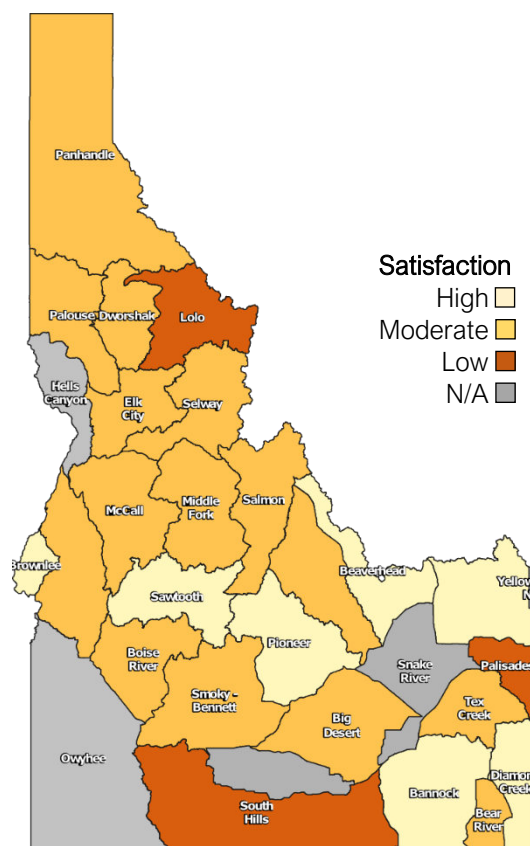
Perception of crowding among elk hunters was moderately but significantly correlated with satisfaction (r = .25, p<.01). More dissatisfaction was associated with a higher perception of crowding, but the relationship is not necessarily strong.

Table 16
Characteristics of elk tag purchasers based on the 2019 Idaho resident hunter crowding survey

	Mean	SD
Age (years)	49.4	14.6
ID residency (years)	33.9	18.8

	n	%
Hunting experience		
1-4 years	1057	21
5-9 years	765	15
10-14 years	571	11
15-19 years	511	10
20+ years	2076	42
Gender		
Female	399	8
Male	4478	92
Ethnicity		
Asian	13	<1
Black, African American	7	<1
Hispanic, Latino	65	1
Indigenous	25	1
Native Hawaiian	8	<1
White	4633	96
Other	87	2
Education (highest level)		
Less than high school	153	3
High school graduate	1371	28
Two-year college degree	778	16
Four-year college degree	1302	27
Vocational/trade school	603	12
Graduate degree	658	14
Income (pre-tax)		
Less than $20,000	206	4
$20,000 - $49,999	671	14
$50,000 - $99,999	1027	22
$75,000 - $99,999	982	21
$100,000 - $149,999	1113	24
$150,000 - $199,999	361	8
Greater than $200,000	297	6
Employment status		
Full-time	3429	71
Part-time	231	5
Temporary	40	1
Unemployed	119	2
Retired	927	19
Disabled	84	2

Regular Deer Tag

MULE DEER
Odocoileus hemionus

WHITE-TAILED DEER
Odocoileus virginianus

Regular Deer: Statewide

Crowding Perceptions

Idaho hunters possessing a regular deer tag are permitted to hunt mule deer and/or white-tailed deer. The 2019 survey's regular deer tag sample (n = 3,474) included 2,653 self-identified mule deer hunters and 821 whitetail hunters; 76% of regular adult deer tag purchasers stated they pursued mule deer in 2019. Given IDFG manages by species rather than tag, and the difficulty of combining regular deer tag purchasers who state they hunt white-tailed deer with purchasers of a white-tailed deer tag, results are presented by self-identified mule deer and whitetail hunter.

Regular deer hunters' perceptions of crowding in 2019 varied most clearly by species, with mule deer hunters perceiving more crowding (5.9) compared to whitetail hunters (4.9). The Magic Valley (6.1) and Salmon (6.1) regions had the highest ratings of crowding among mule deer hunters. In general, crowding scores in southern Idaho were higher, on average, than scores in northern Idaho for both species. This pattern tends to coincide with human population growth trends and the popularity of mule deer hunting in those regions, but also the natural history of each species and hunting practices.

As previously noted, scores are reported as slight (blue) <4.8, moderate-low at 4.8 - 5.4 (light blue), moderate at 5.4 - 5.7 (orange), moderate-high >5.7 (red). For maps reporting crowding scores by game management unit, those with fewer than 10 responses or less than 1% of total responses are not reported (gray).

Table 17

Regular deer perception of crowding (2019) and hunter number change ratings (9-pt scales)

	Mule deer		White-tailed deer	
	Mean	SD	Mean	SD
Perception of crowding (statewide)[a]	**5.9**	**2.5**	**4.9**	**2.8**
Panhandle	5.6	2.7	5.0	2.7
Clearwater	4.2	2.7	4.7	2.8
Southwest	6.0	2.5	5.2	3.2
Magic Valley*	6.1	2.5	—	—
Southeast*	6.0	2.5	—	—
Upper Snake	5.7	2.5	3.8	2.3
Salmon	6.1	2.5	3.7	3.0
Perception of hunter numbers change (statewide)[b]	**7.1**	**2.1**	**6.4**	**2.4**
Panhandle	6.4	2.6	6.4	2.4
Clearwater	5.9	2.7	6.6	2.4
Southwest	7.2	2.0	6.2	2.9
Magic Valley*	7.2	2.1	—	—
Southeast*	7.1	2.0	—	—
Upper Snake	7.0	2.1	5.5	2.5
Salmon	7.2	2.0	5.8	2.7

[a] Response scale: 1-2 (not at all), 3-4 (slightly), 5-7 (moderately), 8-9 (extremely)
[b] Response scale: 1 (fewer hunters) – 9 (more hunters)
*Too few responses were collected to conduct valid analyses

MULE Crowding
- Mod-High ■ (red)
- Moderate ■ (orange)
- Mod-Low ■ (light blue)
- Slight ■ (blue)

Panhandle 5.6
Clearwater 4.2
Salmon 6.1
Southwest 6.0
Upper Snake 5.7
Magic Valley 6.1
Southeast 6.0
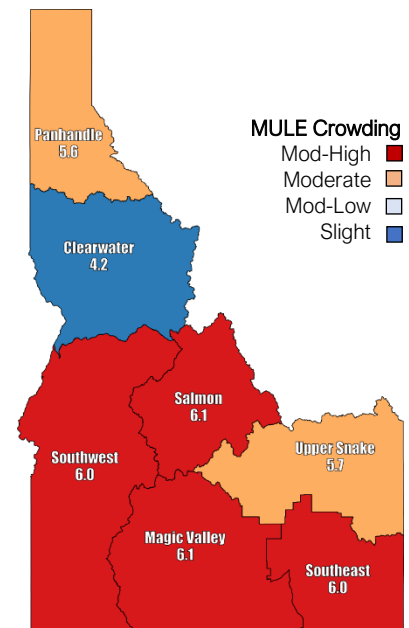
In contrast to inter-regional variability, regular deer hunters, regardless of species, perceive hunter numbers to have increased over the past 10-years. These findings are consistent with those reported in the elk and white-tailed deer hunter surveys. The perception of more hunters on the landscape will be an important factor to manage, whether it remains simply a mental perception and expectation or is combined with tangible, on-the-ground hunting experiences.

An important element of crowding is land type and associated accessibility. A clear pattern, statewide, of more perceived crowding on public land versus private was observed. In general, perceptions of crowding on public land were above the total regional average and those on private land were considerably lower.

Table 18
Regular deer crowding (2019) by land type

| | Mule deer | | | | White-tailed deer | | | |
| | Public | | Private | | Public | | Private | |
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Statewide	**6.1**	**2.5**	**3.8**	**2.7**	**5.6**	**2.6**	**3.5**	**2.6**
Panhandle	5.6	2.7	4.7	2.1	5.8	2.5	3.6	2.6
Clearwater	4.7	2.7	2.2	1.6	5.4	2.6	3.3	2.6
Southwest	6.1	2.4	3.3	2.7	5.2	3.2	—	—
Magic Valley	6.2	2.4	4.1	3.0	—	—	—	—
Southeast	6.4	2.3	3.9	2.6	—	—	—	—
Upper Snake	5.7	2.5	4.9	3.1	4.1	2.0	3.5	2.7
Salmon	6.2	2.4	2.6	2.6	6.2	3.0	2.3	1.9

[a] Response scale: 1-2 (not at all), 3-4 (slightly), 5-7 (moderately, 8-9 (extremely)

Table 19
Regular deer perception of hunter number change (~10-years) by land type

| | Mule deer | | | | White-tailed deer | | | |
| | Public | | Private | | Public | | Private | |
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Statewide	**7.1**	**2.0**	**6.4**	**2.4**	**6.8**	**2.2**	**5.7**	**2.6**
Panhandle	6.6	2.6	4.0	2.0	6.9	2.2	5.7	2.6
Clearwater	6.0	2.7	5.3	2.8	6.9	2.4	5.9	2.5
Southwest	7.2	1.9	6.4	2.3	6.2	2.9	—	—
Magic Valley	7.2	2.0	6.9	2.4	5.6	3.1	—	—
Southeast	7.2	1.9	6.3	2.4	6.1	2.2	4.0	1.7
Upper Snake	7.0	2.1	7.0	2.2	5.6	2.1	5.5	3.2
Salmon	7.2	2.0	6.5	2.1	7.7	1.6	4.6	2.7

[a] Response scale: 1 (fewer hunters) – 9 (more hunters)
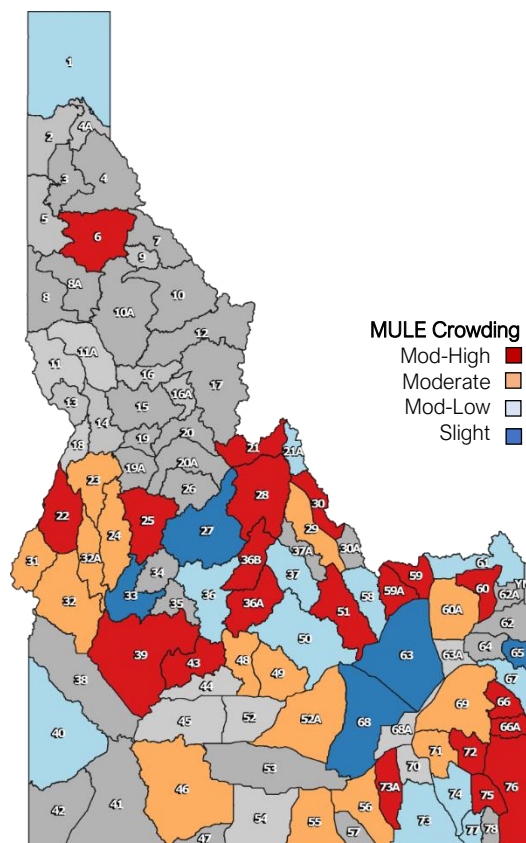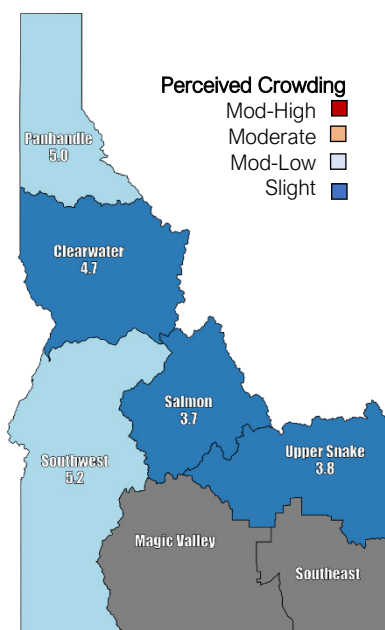
Perceived Crowding
Mod-High
Moderate
Mod-Low
Slight

Panhandle 5.0 · Clearwater 4.7 · Salmon 3.7 · Southwest 5.2 · Upper Snake 3.8 · Magic Valley · Southeast

MULE Crowding
Mod-High
Moderate
Mod-Low
Slight

*GMUs with sample sizes less than 15 are omitted

WHITETAIL Crowding
Mod-High
Moderate
Mod-Low
Slight
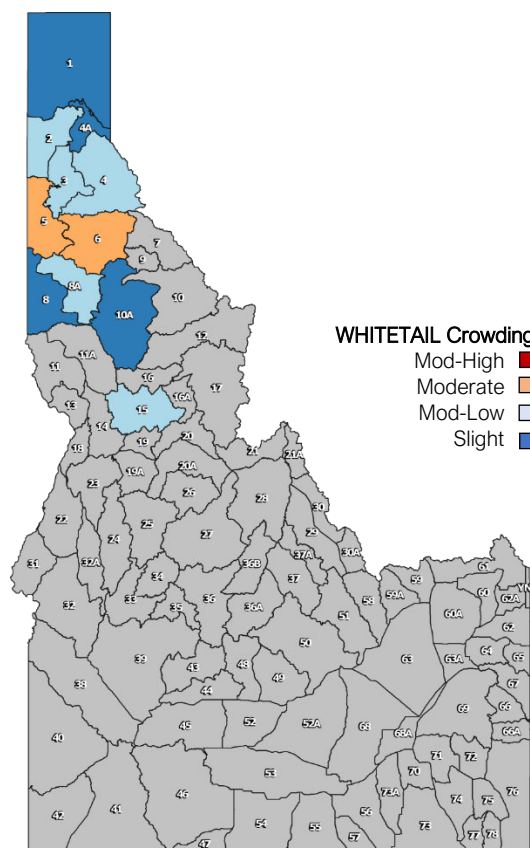
*GMUs with sample sizes less than 15 are omitted

Figure 13

Percentage of regular deer hunters statewide and by region hunted in each response category of crowding on a standard 9-point rating scale: 1-2 (not at all), 3-4 (slightly), 5-7 (moderately), 8-9 (extremely).

REGULAR: MULE DEER

PERCEPTION OF CROWDING IN 2019 | *not at all crowded - extremely crowded*

■1 ■2 ■3 ■4 ■5 ■6 ■7 ■8 ■9

REGION	1	2	3	4	5	6	7	8	9
Statewide	9	5	7	6	12	13	18	10	21
Panhandle	14	5	6	8	11	14	15	12	17
Clearwater	25	12	10	8	12	8	13	3	8
Southwest	9	4	7	7	10	14	19	10	21
Magic Valley	8	5	5	6	12	14	17	11	23
Southeast	8	4	7	4	14	13	18	10	22
Upper Snake	9	7	8	9	11	12	18	10	17
Salmon	7	5	6	6	12	12	19	11	22

Categorial Response Scale Percentage

REGULAR: WHITE-TAILED DEER

PERCEPTION OF CROWDING IN 2019 | *not at all crowded - extremely crowded*

■1 ■2 ■3 ■4 ■5 ■6 ■7 ■8 ■9

REGION	1	2	3	4	5	6	7	8	9
Statewide	19	9	9	7	10	13	14	5	14
Panhandle	18	8	8	8	12	13	14	6	14
Clearwater	20	11	12	4	7	15	14	2	15
Southwest	20	10	5	5	10	10	10		30
Magic Valley	*Too few responses were collected to conduct valid analyses								
Southeast	*Too few responses were collected to conduct valid analyses								
Upper Snake	17	17	20	13	7	10	10	3	3
Salmon	38	13	13	6	6	13			13

Categorial Response Scale Percentage

Figure 14

Percentage of regular deer hunters statewide and by region hunted in each response category of the change in the number of other hunters in the past 10-years, on a 9-point rating scale: 1 (fewer hunters) – 9 (more hunters).

REGULAR: MULE DEER

PERCEPTION OF CHANGING HUNTER NUMBERS (PAST 10 YEARS) | *fewer hunters- more hunters*

■1 ■2 ■3 ■4 ■5 ■6 ■7 ■8 ■9

Region	1	2	3	4	5	6	7	8	9
Statewide	2	2	3	3	13	10	18	10	39
Panhandle	6		9	2	5	9	15	11	9	35
Clearwater	10	5	7	5	17	8	12	12	24
Southwest	2	2	1	3	14	9	18	12	39
Magic Valley	2	1	4	2	12	10	17	10	42
Southeast	2	1	4	4	13	9	20	9	39
Upper Snake	3	1	4	4	15	12	17	8	37
Salmon	2	2	2	4	13	8	20	10	41

Categorial Response Scale Percentage (0% – 100%)

REGION

REGULAR: WHITE-TAILED DEER

PERCEPTION OF CHANGING HUNTER NUMBERS (PAST 10 YEARS) | *fewer hunters- more hunters*

■1 ■2 ■3 ■4 ■5 ■6 ■7 ■8 ■9

Region	1	2	3	4	5	6	7	8	9
Statewide	5	3	6	7	16	11	12	8	32
Panhandle	5	2	7	7	15	12	13	7	33
Clearwater	3	5	5	6	18	12	5	10	37
Southwest	15			5	5	15	20	5	35
Magic Valley	*Too few responses were collected to conduct valid analyses
Southeast	*Too few responses were collected to conduct valid analyses
Upper Snake	13	3	10	23	19	10	3	19
Salmon	13	6	13	19	25	25

Categorial Response Scale Percentage (0% – 100%)

REGION

Crowding-Related Experiences

Hunters who perceive or experience crowding (congestion) can often attribute that to one or several factors. To simplify those contributing factors, the study asked if hunters attribute crowding to *other hunters* or *access to hunting lands* (or if they were not crowded in 2019). For those two categories, a follow-up question asked hunters to specify their response. If "other hunters" was selected, respondents specified resident hunters, non-resident hunters, or non-hunters; if "access" was selected, respondents specified trail designation, environmental conditions, or personal issues.

Figure 15
Percentage reporting factors that contribute to regular deer hunters' crowding experience in 2019: not crowded, other hunters, and access
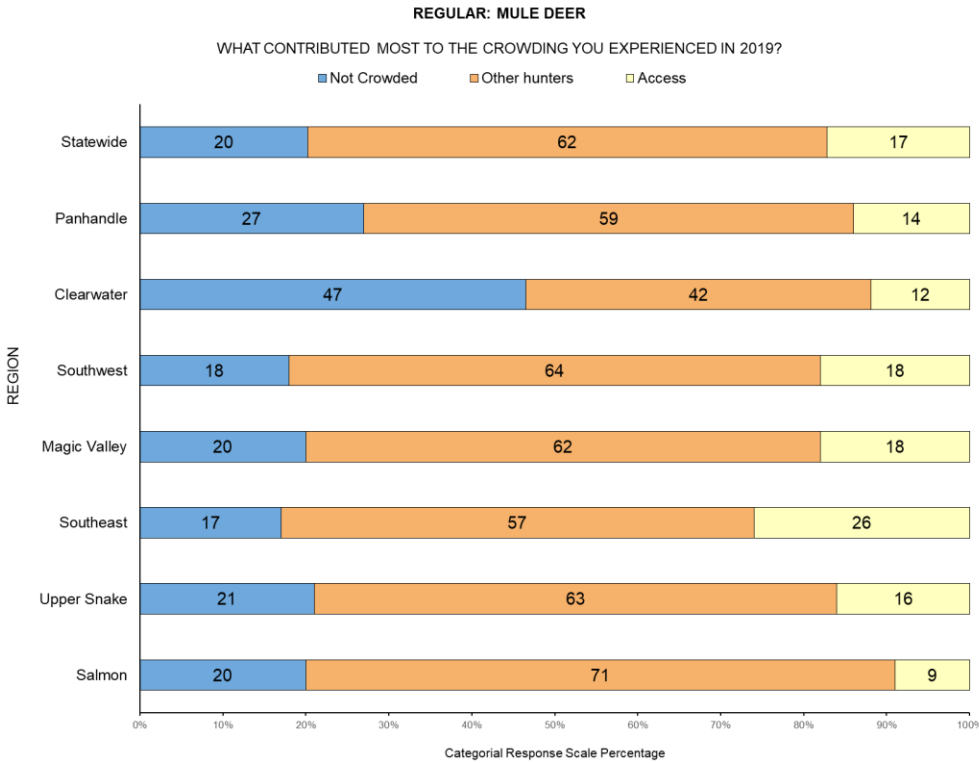
Figure 16
Percentage reporting "other hunters": resident hunters, non-resident hunters, and non-hunters
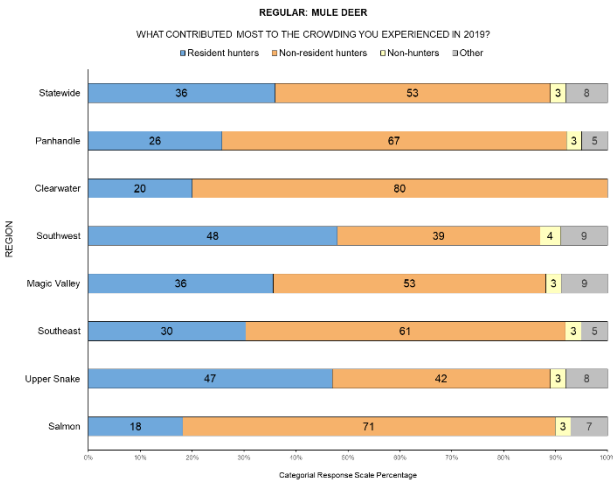
Figure 17
Percentage reporting "access": trail issues , environmental conditions, and personal issues

- 20 -
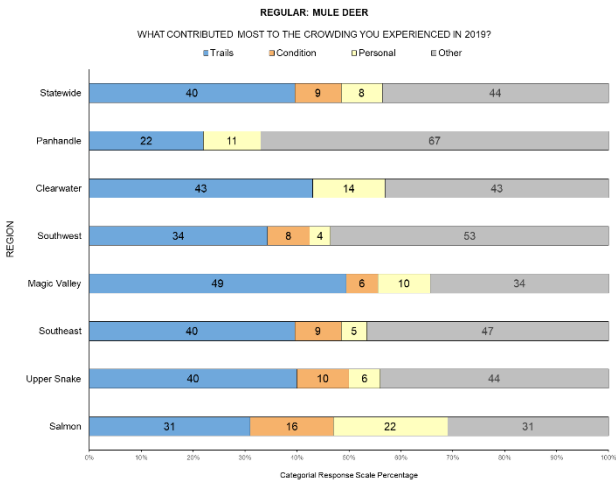
Figure 18
Percentage reporting factors that contribute to regular deer hunters' crowding experience in 2019: not crowded, other hunters, and access

REGULAR: WHITE-TAILED DEER

WHAT CONTRIBUTED MOST TO THE CROWDING YOU EXPERIENCED IN 2019?

■ Not Crowded   ■ Other hunters   □ Access

Region	Not Crowded	Other hunters	Access
Statewide	33	48	19
Panhandle	31	50	19
Clearwater	35	44	20
Southwest	40	25	35
Magic Valley	*Too few responses were collected to conduct valid analyses		
Southeast	*Too few responses were collected to conduct valid analyses		
Upper Snake	42	42	16
Salmon	50	38	13

Categorial Response Scale Percentage
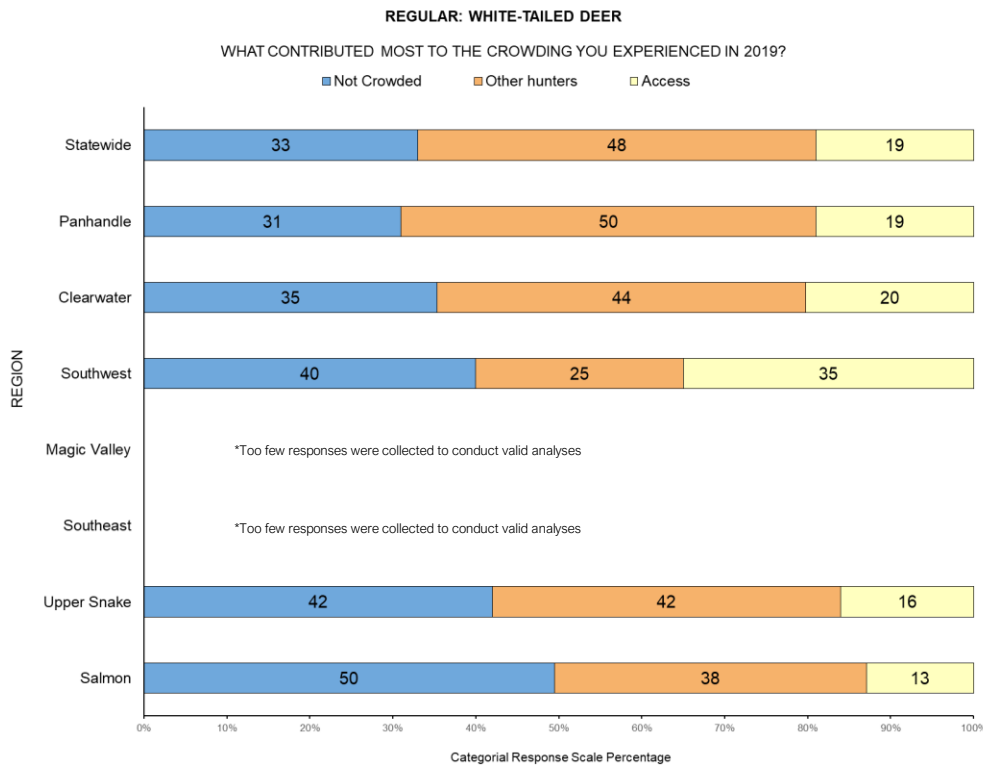
Figure 19
Percentage reporting "other hunters": resident hunters, non-resident hunters, and non-hunters

REGULAR: WHITE-TAILED DEER

WHAT CONTRIBUTED MOST TO THE CROWDING YOU EXPERIENCED IN 2019?

■ Resident hunters   ■ Non-resident hunters   □ Non-hunters   ■ Other

Region	Resident hunters	Non-resident hunters	Non-hunters	Other
Statewide	33	55	6	7
Panhandle	32	55	6	6
Clearwater	26	62	4	8
Southwest	40	40		20
Magic Valley	*Too few responses were collected to conduct valid analyses			
Southeast	*Too few responses were collected to conduct valid analyses			
Upper Snake	69	15	8	8
Salmon	17	83		

Categorial Response Scale Percentage

Figure 20
Percentage reporting "access": trail issues, environmental conditions, and personal issues

REGULAR: WHITE-TAILED DEER

WHAT CONTRIBUTED MOST TO THE CROWDING YOU EXPERIENCED IN 2019?

■ Trails   ■ Condition   □ Personal   ■ Other

Region	Trails	Condition	Personal	Other
Statewide	46	7	15	32
Panhandle	48	6	19	27
Clearwater	26	13	9	52
Southwest	57			43
Magic Valley	*Too few responses were collected to conduct valid analyses			
Southeast	*Too few responses were collected to conduct valid analyses			
Upper Snake	*Too few responses were collected to conduct valid analyses			
Salmon	*Too few responses were collected to conduct valid analyses			

Categorial Response Scale Percentage

Hunters may also have difficulty hunting in a preferred location, encounter other hunters, or be displaced from a location or their "spot", all of which may contribute to a sense, belief, or experience of crowding.

Figure 21
Percentage reporting ease or difficulty hunting at a preferred location in 2019

REGULAR: MULE DEER

HOW EASY / DIFFICULT TO HUNT AT PREFERRED LOCATION IN 2019?

■ Very easy ▨ Easy ☐ No change ☐ Difficult ■ Very difficult

Region	Very easy	Easy	No change	Difficult	Very difficult
Statewide	5	23	33	30	9
Panhandle	5	21	33	26	15
Clearwater	15	17	23	37	8
Southwest	4	21	35	30	10
Magic Valley	5	26	30	31	8
Southeast	4	24	34	29	10
Upper Snake	5	24	33	30	8
Salmon	7	20	36	30	7

Categorial Response Scale Percentage

REGULAR: WHITE-TAILED DEER

HOW EASY / DIFFICULT TO HUNT AT PREFERRED LOCATION IN 2019?

■ Very easy ▨ Easy ☐ No change ☐ Difficult ■ Very difficult

Region	Very easy	Easy	No change	Difficult	Very difficult
Statewide	6	23	34	28	10
Panhandle	6	23	34	28	10
Clearwater	7	22	33	30	8
Southwest	20	35	25	20	
Magic Valley	*Too few responses were collected to conduct valid analyses				
Southeast	*Too few responses were collected to conduct valid analyses				
Upper Snake	3	13	43	23	17
Salmon	6	13	31	25	25

Categorial Response Scale Percentage

Figure 22
Percentage reporting frequency of encountering other hunters in 2019

REGULAR: MULE DEER

HOW OFTEN DID YOU ENCOUNTER OTHER HUNTERS IN 2019?

■Never ■Seldom □Half the time ■Most times ■Always

Region	Never	Seldom	Half the time	Most times	Always
Statewide	2	13	24	40	20
Panhandle	6	20	26	35	14
Clearwater	12	38	23	15	12
Southwest	3	13	24	41	19
Magic Valley	1	12	24	38	24
Southeast	2	12	22	43	21
Upper Snake	1	16	24	41	18
Salmon	3	9	28	39	21

Categorial Response Scale Percentage

REGULAR: WHITE-TAILED DEER

HOW OFTEN DID YOU ENCOUNTER OTHER HUNTERS IN 2019?

■Never ■Seldom □Half the time ■Most times ■Always

Region	Never	Seldom	Half the time	Most times	Always
Statewide	9	24	26	30	11
Panhandle	10	21	27	30	11
Clearwater	6	30	21	34	9
Southwest		30	10	45	15
Magic Valley	*Too few responses were collected to conduct valid analyses				
Southeast	*Too few responses were collected to conduct valid analyses				
Upper Snake	10	39	39	10	3
Salmon	31	19	6	38	6

Categorial Response Scale Percentage

- 23 -

Figure 23

Percentage reporting frequency of displacement by other hunters in 2019

REGULAR: MULE DEER

HOW OFTEN DID YOU MOVE TO A DIFFERENT LOCATION BECAUSE OF OTHER HUNTERS IN 2019?

Never ■ Seldom □ Half the time □ Most times ■ Always

REGION	Never	Seldom	Half the time	Most times	Always
Statewide	13	19	35	25	7
Panhandle	15	24	36	21	3
Clearwater	33	30	17	15	5
Southwest	13	19	35	26	8
Magic Valley	11	17	35	27	10
Southeast	11	19	37	27	5
Upper Snake	14	22	35	22	6
Salmon	13	16	38	24	8

Categorial Response Scale Percentage

REGULAR: WHITE-TAILED DEER

HOW OFTEN DID YOU MOVE TO A DIFFERENT LOCATION BECAUSE OF OTHER HUNTERS IN 2019?

Never ■ Seldom □ Half the time □ Most times ■ Always

| REGION	Never	Seldom	Half the time	Most times	Always
Statewide	24	22	28	20	6
Panhandle	23	22	29	20	6
Clearwater	25	21	26	23	4
Southwest	20	20	25	25	10
Magic Valley	*Too few responses were collected to conduct valid analyses				
Southeast	*Too few responses were collected to conduct valid analyses				
Upper Snake	23	29	35	10	3
Salmon	50	25	13	6	6

Categorial Response Scale Percentage

Hunt Outcomes and Hunter Characteristics

Table 20
Regular deer hunter land access usage by tag type in 2019

	Mule deer			White-tailed deer		
	Public	Private	Access Yes!	Public	Private	Access Yes!
Statewide	92%	6%	2%	63%	34%	3%
Panhandle	94%	5%	2%	62%	35%	3%
Clearwater	75%	22%	3%	66%	34%	—
Southwest	95%	4%	1%	100%	—	—
Magic Valley	90%	5%	5%	—	—	—
Southeast	84%	13%	3%	—	—	—
Upper Snake	96%	3%	1%	65%	35%	—
Salmon	97%	3%	—	38%	56%	6%
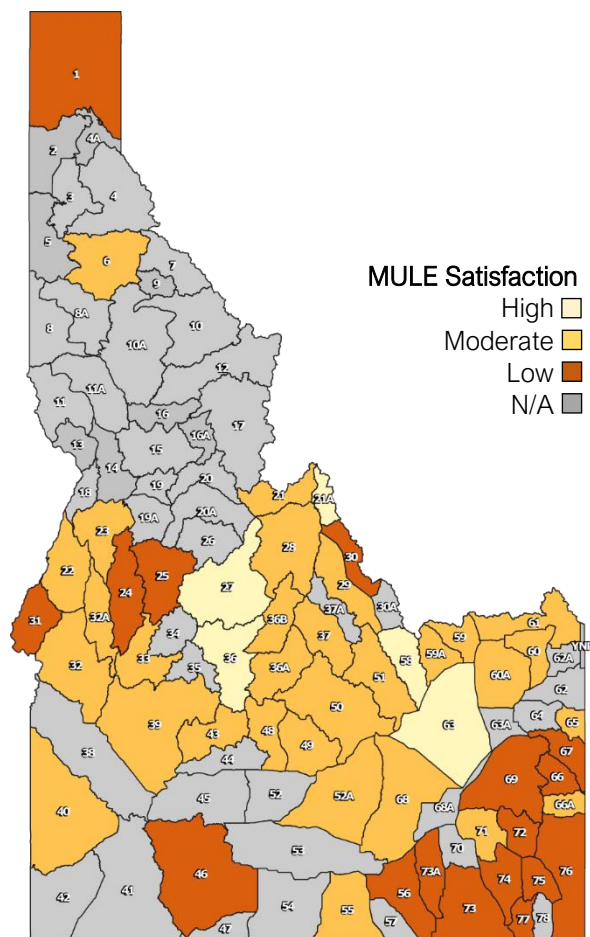
MULE Satisfaction
High
Moderate
Low
N/A

Table 21
Percentage of regular deer tag purchasers who hunted in 2019

	Mule deer		White-tailed deer	
	No	Yes	No	Yes
Statewide	5%	95%	6%	94%
Panhandle	5%	95%	5%	95%
Clearwater	7%	93%	8%	92%
Southwest	6%	94%	10%	90%
Magic Valley	6%	94%	—	—
Southeast	3%	97%	—	—
Upper Snake	6%	94%	—	100%
Salmon	5%	95%	13%	88%

Table 22
Harvest rate of regular deer tag purchasers who hunted in 2019

	Mule deer		White-tailed deer	
	No	Yes	No	Yes
Statewide	78%	22%	67%	33%
Panhandle	79%	21%	66%	34%
Clearwater	69%	31%	69%	31%
Southwest	79%	21%	83%	17%
Magic Valley	77%	23%	—	—
Southeast	83%	17%	—	—
Upper Snake	80%	20%	74%	26%
Salmon	68%	32%	36%	64%

Note. These rates are inclusive of this study and do not reflect other harvest rates reported by IDFG

Perception of crowding among regular tag hunters was moderately but significantly correlated with satisfaction: mule deer (r = .27, p<.01) and whitetail (r = .37, p<.01). More dissatisfaction was associated with a higher perception of crowding, but not necessarily strongly. Results show GMUs with sample size greater than 15 responses.

Table 23
Overall satisfaction with regular deer hunting experience in 2019

	Mule deer		White-tailed deer	
	Mean	SD	Mean	SD
Statewide[a]	**2.7**	**1.2**	**3.0**	**1.2**
Panhandle	2.6	1.2	3.0	1.2
Clearwater	3.0	1.3	3.0	1.3
Southwest	2.8	1.2	2.9	1.3
Magic Valley	2.8	1.2	2.5	1.4
Southeast	2.4	1.1	3.0	1.4
Upper Snake	2.7	1.2	3.3	1.2
Salmon	2.9	1.2	3.4	1.3

[a]Response scale: 1 (very dissatisfied), 2 (dissatisfied), 3 (neither), 4 (satisfied), 5 (very satisfied)

WHITETAIL Satisfaction

High
Moderate
Low
N/A
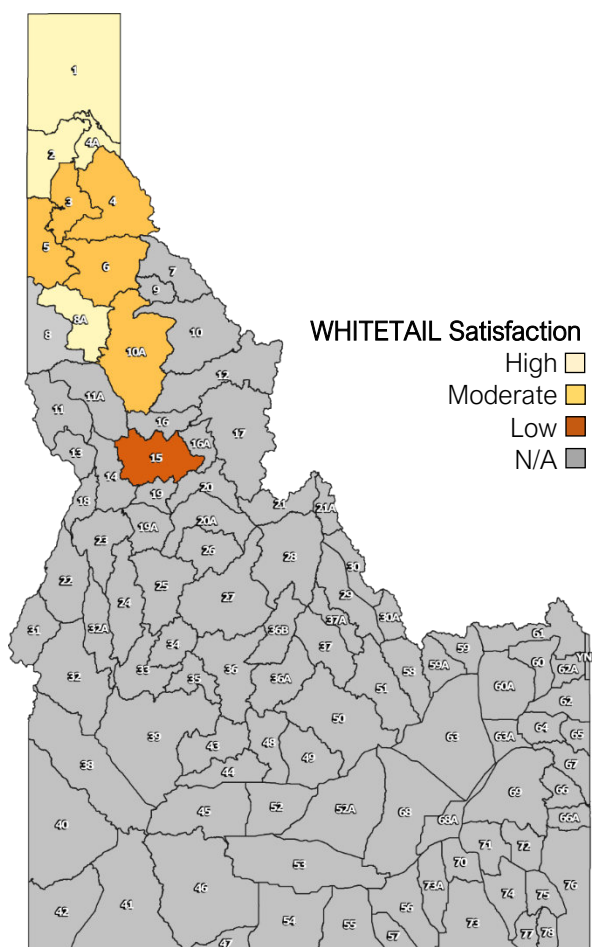
Perception of crowding among regular tag hunters was moderately but significantly correlated with satisfaction: mule deer (r = .27, p<.01) and whitetail (r = .37, p<.01). More dissatisfaction was associated with a higher perception of crowding, but not necessarily strongly. Results show GMUs with sample size greater than 15 responses.

Table 24
Characteristics of regular deer tag purchasers (mule or whitetail) based on the 2019 Idaho resident hunter crowding survey

	Mule deer		White-tailed deer	
	Mean	SD	Mean	SD
Age (years)	49.2	14.5	51.6	14.9
ID residency (years)	35.3	18.5	32.4	19.3
	n	%	n	%
Hunting experience				
1-4 years	367	14	144	18
5-9 years	305	12	136	17
10-14 years	278	11	81	10
15-19 years	291	11	76	9
20+ years	1411	53	384	47
Gender				
Female	176	7	81	10
Male	2408	93	718	90
Ethnicity				
Asian	7	<1	0	—
Black, African American	2	<1	2	<1
Hispanic, Latino	30	1	7	1
Indigenous	12	<1	6	<1
Native Hawaiian	1	<1	0	—
White	2460	96	755	96
Other	57	2	18	3
Education (highest level)				
Less than high school	64	3	16	2
High school graduate	771	30	238	30
Two-year college degree	421	16	139	18
Four-year college degree	675	26	191	24
Vocational/trade school	319	12	106	13
Graduate degree	333	13	101	13
Income (pre-tax)				
Less than $20,000	116	5	44	6
$20,000 - $49,999	399	16	141	19
$50,000 - $99,999	574	23	181	24
$75,000 - $99,999	516	21	167	22
$100,000 - $149,999	547	22	151	20
$150,000 - $199,999	171	7	41	5
Greater than $200,000	158	6	38	5
Employment status				
Full-time	1881	73	506	64
Part-time	100	4	43	5
Temporary	14	<1	5	<1
Unemployed	59	2	15	2
Retired	474	18	205	26
Disabled	43	2	23	3

# WHITE-TAILED DEER
Odocoileus virginianus

White-tailed Deer: Statewide

Crowding Perceptions

White-tailed deer distribution is distinctly delimited by the landscape and habitat available to the species in Idaho. Hunting is likewise concentrated in central and northern Idaho. Results by region and unit hunted should be interpreted accordingly.

Perceptions of crowding among white-tailed deer tag holders in 2019 were lower and less variable than those observed among regular deer and elk tag holders. No region averaged above 5.0 out of 9 but 12 units reported an average rating above 5.4 (orange) and 6 above 6.0 (red). Units throughout high and medium density white-tailed deer areas averaged below 5.4 (light blue) and 4.7 (blue) ratings. While still within the slightly and moderately crowded categories, perceptions of crowding among white-tailed deer hunters remains low, relative to other big game ungulates.

As reported in the elk and deer survey results, current whitetail hunters perceive hunter numbers to be increasing but at a lower rate than elk and mule deer.
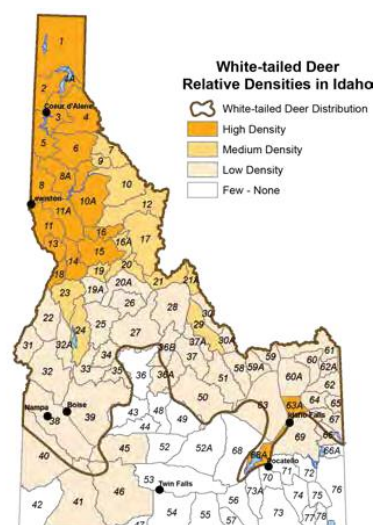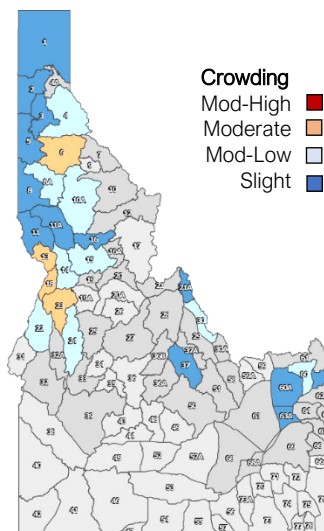
Table 25
Whitetail perception of crowding (2019) and hunter number change ratings (9-pt scales)

	Mean	SD
Perception of crowding (statewide)[a]	4.5	2.7
Panhandle	4.5	2.8
Clearwater	4.6	2.7
Southwest	5.0	2.6
Magic Valley*	—	—
Southeast*	—	—
Upper Snake	4.3	2.7
Salmon	3.8	2.5
Perception of hunter numbers change (statewide)[b]	6.2	2.4
Panhandle	6.2	2.4
Clearwater	6.2	2.3
Southwest	6.8	2.2
Magic Valley*	—	—
Southeast*	—	—
Upper Snake	6.2	2.4
Salmon	5.8	2.5

[a]Response scale: 1-2 (not at all), 3-4 (slightly), 5-7 (moderately), 8-9 (extremely)
[b]Response scale: 1 (fewer hunters) – 9 (more hunters)
*Too few responses were collected to conduct valid analyses

Table 26
Whitetail perception of crowding (2019) by land type

	Public		Private	
	Mean	SD	Mean	SD
Statewide	5.5	2.5	3.2	2.4
Panhandle	5.7	2.6	3.3	2.5
Clearwater	5.6	2.5	3.3	2.4
Southwest	5.5	2.5	3.2	2.5
Magic Valley	—	—	—	—
Southeast	—	—	—	—
Upper Snake	4.9	2.6	3.1	2.4
Salmon	4.9	2.6	2.8	2.0

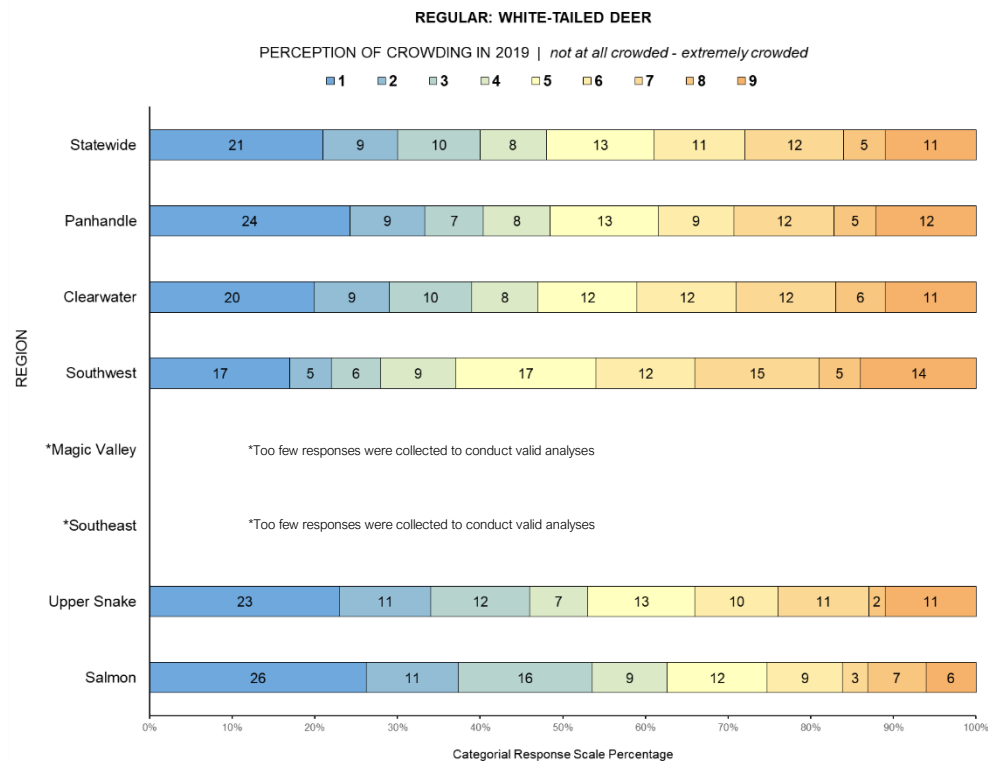[a]Response scale: 1-2 (not at all), 3-4 (slightly), 5-7 (moderately, 8-9 (extremely)

Table 27
Whitetail perception of hunter number change by land type

	Public		Private	
	Mean	SD	Mean	SD
Statewide	6.7	2.2	5.5	2.4
Panhandle	6.9	2.3	5.6	2.5
Clearwater	6.7	2.2	5.4	2.4
Southwest	7.2	2.0	5.3	2.4
Magic Valley	—	—	—	—
Southeast	—	—	—	—
Upper Snake	6.5	2.2	5.6	2.6
Salmon	6.3	2.4	5.3	2.5

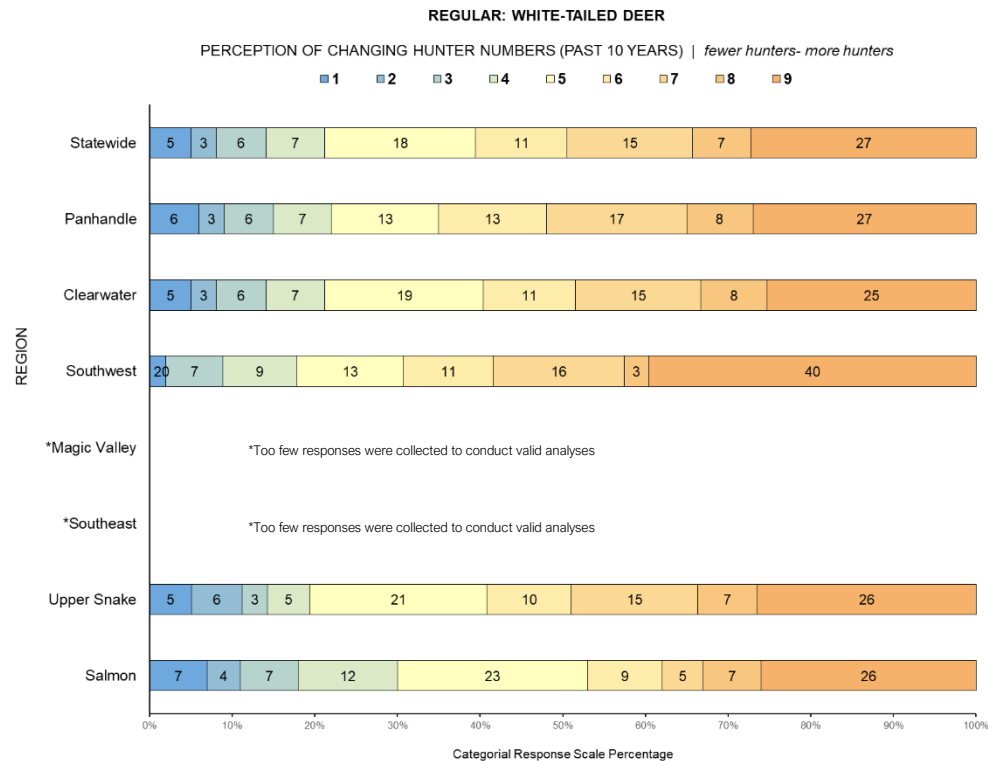[a]Response scale: 1 (fewer hunters) – 9 (more hunters)

Figure 24

Percentage of whitetail hunters statewide and by region hunted in each response category of crowding on a standard 9-point rating scale: 1-2 (not at all), 3-4 (slightly), 5-7 (moderately), 8-9 (extremely).

REGULAR: WHITE-TAILED DEER

PERCEPTION OF CROWDING IN 2019 | *not at all crowded - extremely crowded*

Figure 25

Percentage of whitetail hunters statewide and by region hunted in each response category of the change in the number of other hunters in the past 10-years, on a 9-point rating scale: 1 (fewer hunters) – 9 (more hunters).

REGULAR: WHITE-TAILED DEER

PERCEPTION OF CHANGING HUNTER NUMBERS (PAST 10 YEARS) | *fewer hunters- more hunters*

Crowding-Related Experiences

Hunters who perceive or experience crowding (congestion) can often attribute that to one or several factors. To simplify those contributing factors, the study asked if hunters attribute crowding to *other hunters* or *access to hunting lands* (or if they were not crowded in 2019). For those two categories, a follow-up question asked hunters to specify their response. If "other hunters" was selected, respondents specified resident hunters, non-resident hunters, or non-hunters; if "access" was selected, respondents specified trail designation, environmental conditions, or personal issues.
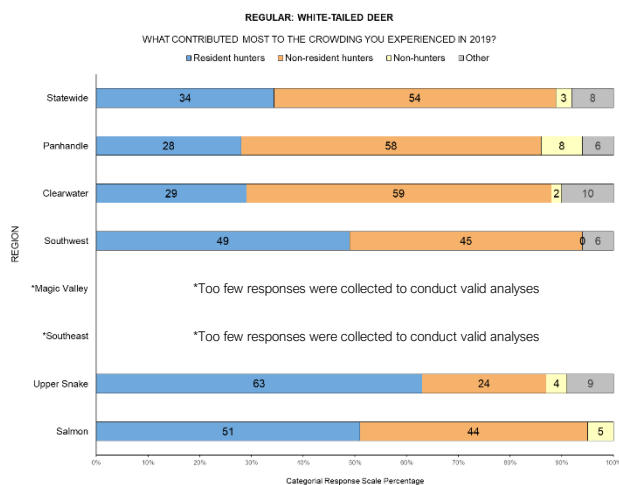
Figure 26
Percentage reporting factors that contribute to whitetail hunters' crowding experience in 2019:
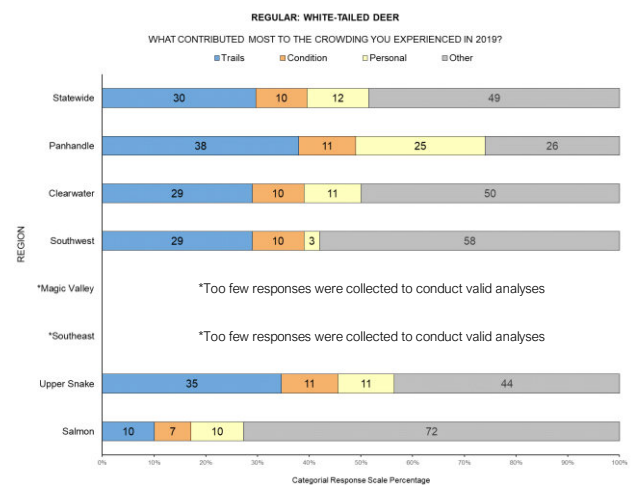*not crowded, other hunters, and access*
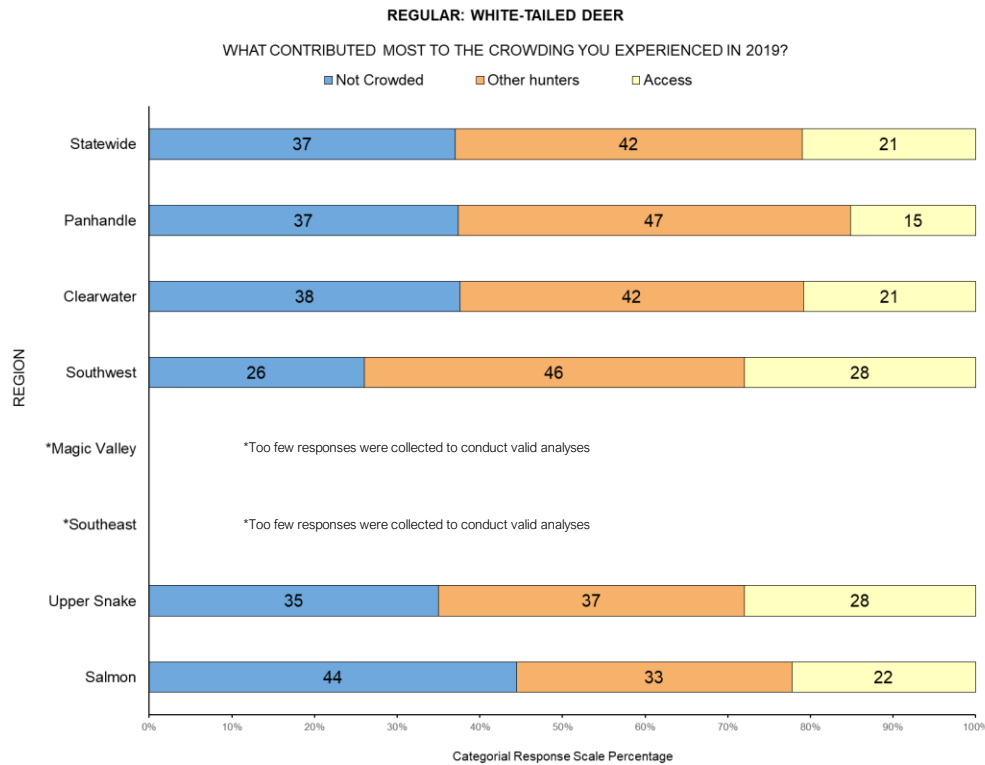
Figure 27
Percentage reporting "other hunters": resident hunters, non-resident hunters, and non-hunters
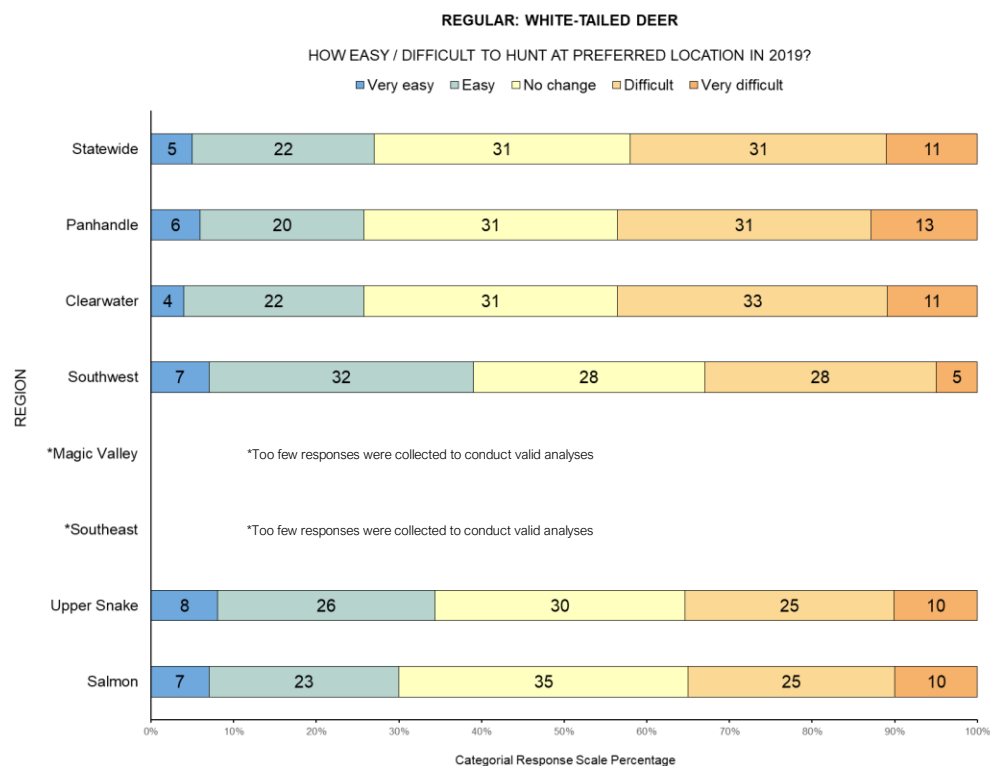

Figure 28
Percentage reporting "access": trail issues, environmental conditions, and personal issues

Hunters may also have difficulty hunting in a preferred location, encounter other hunters, or be displaced from a location or their "spot", all of which may contribute to a sense, belief, or experience of crowding.
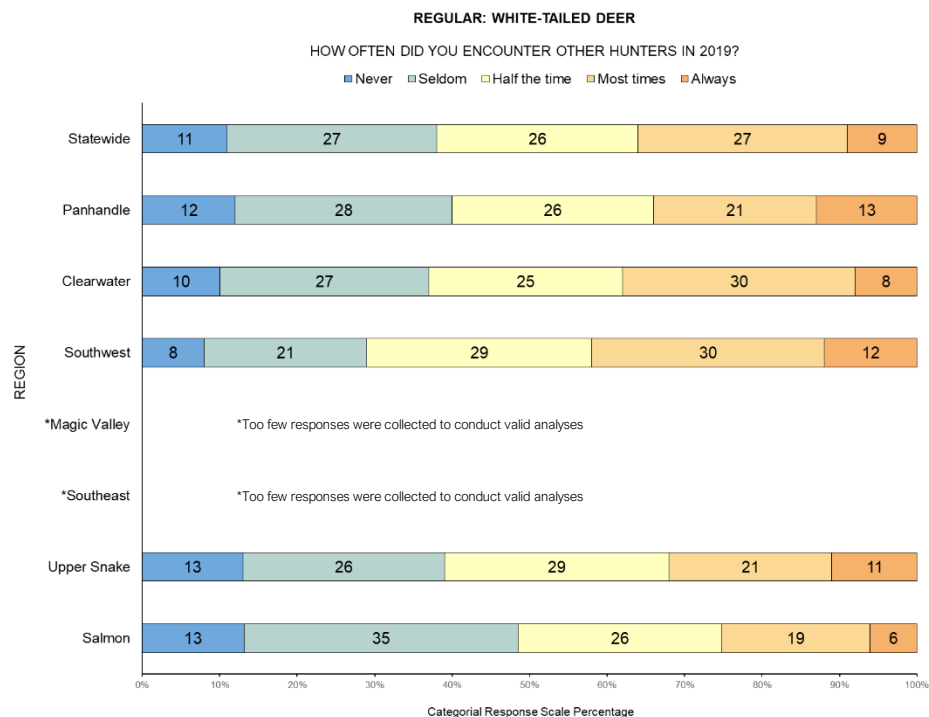
Figure 29
Percentage reporting ease or difficulty hunting at a preferred location in 2019

REGULAR: WHITE-TAILED DEER

HOW EASY / DIFFICULT TO HUNT AT PREFERRED LOCATION IN 2019?

■ Very easy ■ Easy □ No change □ Difficult ■ Very difficult

Region	Very easy	Easy	No change	Difficult	Very difficult
Statewide	5	22	31	31	11
Panhandle	6	20	31	31	13
Clearwater	4	22	31	33	11
Southwest	7	32	28	28	5
*Magic Valley	*Too few responses were collected to conduct valid analyses				
*Southeast	*Too few responses were collected to conduct valid analyses				
Upper Snake	8	26	30	25	10
Salmon	7	23	35	25	10

Categorial Response Scale Percentage

Figure 30
Percentage reporting frequency of encountering other hunters in 2019

REGULAR: WHITE-TAILED DEER

HOW OFTEN DID YOU ENCOUNTER OTHER HUNTERS IN 2019?

■ Never ■ Seldom □ Half the time □ Most times ■ Always

Region	Never	Seldom	Half the time	Most times	Always
Statewide	11	27	26	27	9
Panhandle	12	28	26	21	13
Clearwater	10	27	25	30	8
Southwest	8	21	29	30	12
*Magic Valley	*Too few responses were collected to conduct valid analyses				
*Southeast	*Too few responses were collected to conduct valid analyses				
Upper Snake	13	26	29	21	11
Salmon	13	35	26	19	6

Categorial Response Scale Percentage

Figure 31
Percentage reporting frequency of displacement by other hunters in 2019
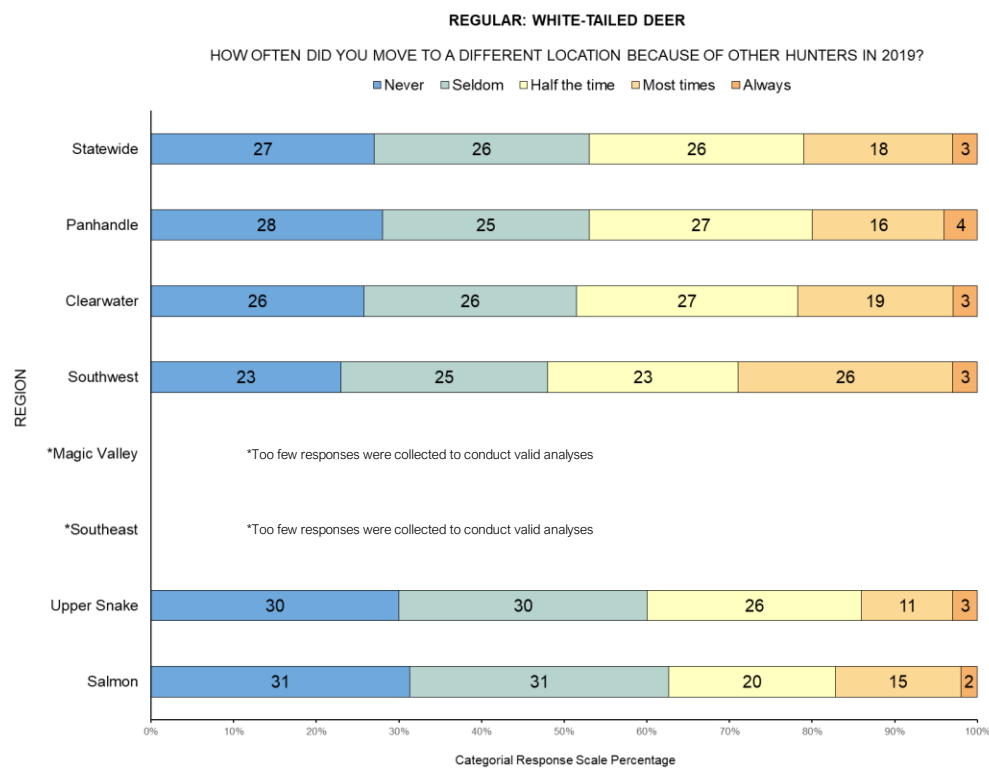
Hunt Outcomes and Hunter Characteristics

Table 28
Percentage of adult deer: white-tailed tag purchasers who hunted in 2019

	No	Yes
Statewide	9%	91%
Panhandle	8%	92%
Clearwater	7%	93%
Southwest	17%	83%
Magic Valley	—	—
Southeast	—	—
Upper Snake	8%	92%
Salmon	19%	81%

Table 29
Harvest rate of adult deer: white-tailed tag purchasers who reported hunting 2019

	No	Yes
Statewide	59%	41%
Panhandle	60%	40%
Clearwater	55%	45%
Southwest	81%	19%
Magic Valley	—	—
Southeast	—	—
Upper Snake	66%	34%
Salmon	60%	40%

Note. These rates are specific to this study and do not reflect other harvest rates reported by IDFG

Table 30
White-tailed deer hunter land access usage by tag type in 2019

	Public	Private	Access Yes!
Statewide	57%	41%	2%
Panhandle	49%	49%	2%
Clearwater	58%	40%	2%
Southwest	79%	21%	—
Magic Valley	—	—	—
Southeast	—	—	—
Upper Snake	64%	33%	3%
Salmon	46%	52%	2%

Table 31
Overall satisfaction with whitetail hunting experience in 2019

	N	Mean	SD
Statewide[a]	**1970**	**3.3**	**1.1**
Panhandle	356	3.3	1.1
Clearwater	1159	3.3	1.2
Southwest	113	3.1	1.2
Magic Valley	2	—	—
Southeast	4	—	—
Upper Snake	206	3.6	1.0
Salmon	130	3.5	1.1

[a]Response scale: 1 (very dissatisfied), 2 (dissatisfied), 3 (neither), 4 (satisfied), 5 (very satisfied)

Satisfaction
High
Moderate
Low
N/A
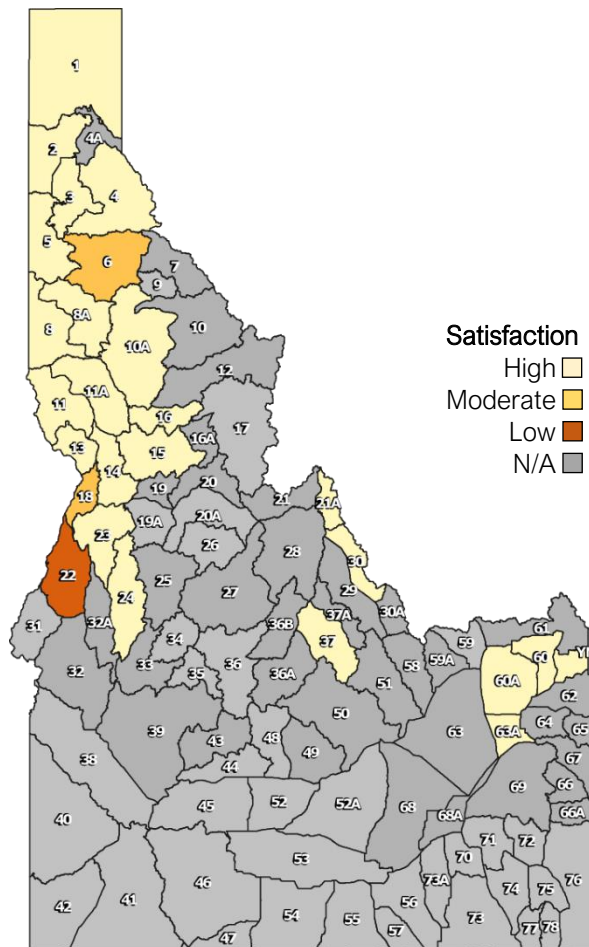
Perception of crowding among whitetail hunters was significantly correlated with satisfaction at a moderate level of .32 (p<.01). More dissatisfaction was associated with a higher perception of crowding, but the relationship is not necessarily 1-to-1 or strong.

Table 32
Characteristics of adult deer: white-tailed tag purchasers based on the 2019 Idaho resident hunter crowding survey

	Mean	SD
Age (years)	53.9	14.4
ID residency (years)	35.6	19.4

	n	%
Hunting experience		
1-4 years	433	22
5-9 years	296	15
10-14 years	218	11
15-19 years	187	9
20+ years	868	43
Gender		
Female	179	9
Male	1755	91
Ethnicity		
Asian	5	<1
Black, African American	1	<1
Hispanic, Latino	16	1
Indigenous	4	<1
Native Hawaiian	2	<1
White	1857	97
Other	37	2
Education (highest level)		
Less than high school	38	2
High school graduate	488	25
Two-year college degree	330	17
Four-year college degree	584	30
Vocational/trade school	209	11
Graduate degree	280	15
Income (pre-tax)		
Less than $25,000	84	5
$25,000 - $49,999	281	15
$50,000 - $99,999	415	23
$75,000 - $99,999	382	21
$100,000 - $149,999	430	22
$150,000 - $199,999	128	7
Greater than $200,000	119	7
Employment status		
Full-time	1166	61
Part-time	111	6
Temporary	13	<1
Unemployed	37	2
Retired	562	29
Disabled	37	2

APPENDIX

Appendix A: Survey Instruments

Resident elk tag
https://doi.org/10.6084/m9.figshare.13469898.v1

Adult deer: regular
https://doi.org/10.6084/m9.figshare.13469859.v1

Adult deer: white-tailed
https://doi.org/10.6084/m9.figshare.13469910.v1

Appendix B: Supplemental Information

Table S1
Most visited (top-6) elk management zones and game management units by tag based on 2019 survey respondents

Elk			Reg. Mule			Reg. White-tailed			White-tailed		
Zone	N	%	Unit	N	%	Unit	N	%	Unit	N	%
Panhandle	722	14.5%	39	235	9.1%	1	206	25.7%	10a	237	12.2%
Smoky-Bennett	511	10.2%	76	142	5.5%	3	91	11.4%	8a	226	11.6%
Salmon	347	7.0%	43	111	4.3%	2	90	11.2%	15	121	6.2%
Diamond Creek	270	5.4%	48	103	4.0%	5	85	10.6%	8	113	5.8%
Bannock	270	5.4%	49	99	3.8%	6	63	7.9%	11a	109	5.6%
Pioneer	268	5.4%	50	96	3.7%	4	48	6.0%	14	106	5.4%

Table S2
Perceptions of crowding by elk management zone

Zone	N	Mean
Panhandle	722	5.4
Dworshak	243	5.1
Elk City	109	4.7
Hells Canyon	—	—
Lolo	42	4.0
Palouse	253	4.7
Selway	62	4.5
Boise River	130	6.4
Brownleee	20	6.5
McCall	209	5.6
Middle Fork	142	4.1
Owyhee	—	—
Sawtooth	176	5.1
Weiser River	251	5.7
Smoky-Bennett	511	6.8
Snake River	11	4.7
South Hills	145	5.8
Bannock	270	5.2
Bear River	86	5.2
Big Desert	82	5.5
Diamond Creek	270	6.3
Beaverhead	115	6.3
Island Park	143	5.5
Lemhi	231	5.2
Palisades	53	4.4
Pioneer	268	5.5
Tex Creek	98	5.9
Salmon	347	6.0

Table S3
Mule deer and white-tailed deer units excluded

Mule deer	White-tailed deer
11	36
11a	42
13	44
14	45
18	47
44	48
45	49
52	52
54	52a
63a	53
68a	54
70	55
	56
	57
	66a
	68
	68a
	70
	71
	72
	73
	73a
	74
	75
	76
	77
	78

Note: Information from these game management units were not reported for mule deer and white-tailed deer due to data deficiencies.