

Alaska Small Game Summary 2021

Richard A. Merizon and Cameron J. Carroll

Species considered small game in Alaska are defined by the Alaska Department of Fish and Game (ADF&G), for regulatory purposes as grouse, ptarmigan, and hare. Alaska has 7 species of grouse and ptarmigan (Tetraonidae) including ruffed (*Bonasa umbellus*), sharp-tailed (*Tympanuchus phasianellus*), sooty (*Dendragapus fuliginosus*), and spruce (*Falcipennis canadensis*) grouse; and rock (*Lagopus muta*), white-tailed (*L. leucurus*), and willow (*L. lagopus*) ptarmigan. In addition, Alaska has 2 species of hare (Leporidae) including Alaska (*Lepus othus*) and snowshoe (*L. americanus*) hare. All 9 species of small game can be legally harvested in Alaska with liberal seasons and bag limits for all game management units (Unit).

The statewide Small Game Program (SGP) has three primary responsibilities including research, management, and outreach. Recent research results are briefly described within the specific species sections. Management efforts largely focus on spring breeding and summer brood surveys, harvest composition, recommendations to the Alaska Board of Game (BOG) regarding regulatory proposals, and addressing concerns from staff and the public. Specific survey methods are fully described in Carroll and Merizon (2021). Survey and research efforts occur across the state from Nome to Ketchikan and along the road system from the Steese Highway south to the Kenai Peninsula. Outreach and education efforts focus on recruiting new hunters, providing hunters with tips, recommendations, and insight into Alaska's small game species.

This report summarizes the activities conducted by the SGP during the 2020 regulatory year (RY20, 1 July, 2020–30 June, 2021) in addition to brood survey results from summer 2021. Specifically, it addresses: 1) 2020-21 weather patterns, 2) species status including spring 2021 breeding and summer 2021 brood survey results, and 2020-21 harvest composition, 3) research updates, 4) recent BOG regulatory changes, and 5) new developments and outreach efforts. A more thorough multi-year (2021 and 2022) management report will be published by December 2022 highlighting these topics in more detail (available at: www.smallgame.adfg.alaska.gov).

2020 / 2021 Weather and Brood Production

Spring through mid-July 2020 experienced near normal temperatures and precipitation throughout much of Alaska. However, in June 2020, Fairbanks and Delta Junction received heavy precipitation compared to the previous 10 years. Throughout the Alaska Range snow was observed during the last half of June 2020 above 3,000' and the Talkeetna and Chugach mountains above 4,000' with heavy rain below those elevations. These conditions likely contributed to very low ptarmigan chick survival in these areas. Heavy rain also fell throughout July in the Interior and Southcentral Alaska with numerous flood warnings issued for the Salcha, Tanana, Delta, Susitna, and Yentna rivers. Much of August was dry and sunny however, beginning in late-August, seasonal rains began throughout Southcentral and the Interior.

Fall 2020 was mild through mid-October when temperatures normalized. Ideal ptarmigan snow-roosting conditions were present by early November above 3,000' in the Talkeetna, Chugach, and Kenai mountains. Much of the 2020/2021 winter was near normal to below normal temperatures but much higher than normal precipitation throughout much of the state. Temperature records from Interior Alaska show some variation with the average January temperature for Delta Junction registering approximately 12°F warmer than the previous 10-year average and the average February temperature for Fairbanks approximately 10°F cooler with greater snowfall than the previous 10-year average. Southwest and Western Alaska also experienced normal to slightly below normal temperatures and much heavier snowfall than in the recent past. The southeast panhandle experienced a very wet winter with several serious and catastrophic mudslides. Overall, February and March

2021 was colder than normal throughout much of the state and as a result delayed snow melt and leaf phenology. Southeast Alaska remained very cold with heavy snow into late April.

Beginning in 2017 and continuing into 2020, a spruce bark beetle (*Dendroctonus rufipennis*) outbreak has severely affected large stands of mature ($\geq 15\text{cm}$ diameter) white spruce (*Picea glauca*) throughout Southcentral and the Kenai Peninsula. Much of the lower Susitna and Matanuska river watersheds have been severely affected in addition to portions of the Anchorage bowl. This will likely have a strong negative effect on spruce grouse populations throughout Southcentral and the Kenai Peninsula over the coming years and has increased the wildfire risk in affected areas.

Beginning in mid-May 2021 and continuing through July, much of the state experienced near normal temperatures and average precipitation. Average temperature and precipitation records from Fairbanks and Delta Junction during June and July 2021 indicated temperatures were 1-2°F warmer and 0.3-2.0 inches less precipitation fell than the previous 10 years. The warm and dry conditions likely had a positive effect on grouse chick survival. The Wrangell Mountains and Alaska Range above 3,500-4,000' received significant snow in late-June coupled with periods of heavy rainfall. Like summer 2020, this weather pattern strongly contributed to low chick survival documented in those areas during summer 2021 brood surveys. Southwest and Western Alaska experienced a very wet June and July with heavy rain and cool temperatures. This also may have had a strong negative effect on local ptarmigan chick survival.

Species Status

Ruffed Grouse

Spring breeding surveys were completed at long-term monitoring sites near Palmer, Delta Junction, Anderson, Fairbanks, and Tok. Surveys were conducted from 26 April, 2021 to 19 May, 2021 in Interior Alaska and 21 April, 2021 to 10 May, 2021 in the Matanuska-Susitna valley (Mat-Su). Survey conditions in the Interior were generally good with relatively little snow cover and normal onset of plant phenology. Survey conditions in Mat-Su were good however persistent snow was present on many of the routes through late-April or early-May. The average number of drumming males heard along survey routes in the Interior near Delta Junction and Tok remained low and relatively unchanged from 2020. However, survey data from routes near Fairbanks and Anderson, Alaska suggest ruffed grouse numbers are likely increasing. Overall, counts of drumming males in Mat-Su in spring 2021 increased modestly over the low recorded in spring 2020.

In the Mat-Su, wing donations in RY20 ($n = 16$) was below the long-term average and very poor inferences can be made based on the small sample size; however, samples suggested much lower chick survival than RY19 (56%). The proportion of juveniles in the harvest (based on hunter harvested wing collections) is used as an index of chick survival (Carroll and Merizon 2021). In the Interior, fewer wing donations were received in RY20 ($n = 14$) compared to RY19 ($n = 30$), which was likely a result of lower ruffed grouse abundance but also partly due to reduced hunter participation in wing donations due to effects of Covid-19. Although Covid-19 likely did not keep grouse and ptarmigan hunters from hunting it may have made it more challenging for hunters to donate their wings. The proportion of juveniles in the harvested sample from the Interior in RY20 (79%) did not change from RY19 (79%); however, we urge caution in drawing strong conclusions as the sample of donated wings was small and came from a wide geographic area. Overall, hunter reports of ruffed grouse numbers were poor in the Mat-Su and the Interior during RY20.

Overall, spring breeding surveys coupled with warm and dry weather conditions in the Interior during the early brood rearing period suggest hunters may expect to see greater numbers of ruffed grouse this year near Fairbanks and Anderson with likely fewer numbers available near Delta Junction, Tok, and in the Mat-Su region.

Sharp-tailed Grouse

The SGP conducted annual spring breeding surveys near Delta Junction from 16 April, 2021 to 3 May, 2021 and near Tok from 26 April, 2021 to 30 April, 2021. Survey conditions were excellent with light to moderate winds and relatively cool temperatures.

In Delta Junction, the average number of males observed per lek was similar in 2020 (3.1 males observed per lek) compared to 2021 (3.3 males observed per lek), both of which were below the 5-year-average (3.9 males per lek). The number of active leks observed near Delta Junction was down from 22 in 2020 to 20 in 2021. In Tok, the average number of males observed per lek was up from 2020 (3.4 males observed per lek) to 2021 (4.0 males observed per lek), but still below the 5-year-average (4.4 males per lek). The number of active leks observed near Tok was from up from 2 in 2020 to 4 in 2021. For clarity, a lek is defined here as an area with ≥ 1 male sharp-tailed grouse observed displaying in at least 2 consecutive years. A lek is considered inactive or abandoned when no males are observed displaying for 5 consecutive years.

Brood surveys near Delta Junction were incomplete in 2021 due to rain on 2 of the 3 scheduled survey days. As a result, we cannot make direct comparisons between counts in 2020 and 2021.

Fewer sharp-tailed grouse wings were donated from hunters throughout the Interior in RY20 ($n = 46$) than in RY19 ($n = 107$), which, like ruffed grouse, was likely partly due to lower abundance but also reduced hunter participation due to effects of Covid-19. The proportion of juveniles in the harvest calculated from donated wings was down in RY20 (57%) from RY19 (75%). Most hunters reported seeing fewer sharp-tailed grouse in RY20; however, at least 1 hunter reported finding several large groups of sharp-tailed grouse on agricultural lands near Delta Junction and had no problem filling the bag limit in the early part of the season.

Overall, spring breeding surveys coupled with warm and dry conditions experienced in June and July during the brood rearing period suggest hunters may expect to see slightly higher abundance of sharp-tailed grouse near Delta Junction this year.

Spruce Grouse

Limited data are available for spruce grouse. Abundance projections are limited to inference made from wing collections and field observations. However, beginning in fall 2019, a new roadside survey technique has been evaluated as an index of abundance in the Mat-Su. This technique has shown promise in its ability to provide an efficient and cost-effective means to index Southcentral spruce grouse population abundance. Early results from this evaluation suggest Mat-Su spruce grouse populations declined in fall 2020 from fall 2019.

Wing donations for spruce grouse throughout Southcentral and the Kenai Peninsula were down slightly for RY20 ($n = 192$) versus RY19 ($n = 245$); however, RY20 samples documented poor chick survival in summer 2020 (40%). The number of donated samples in the Interior was down in RY20 ($n = 21$) from RY19 ($n = 93$); yet the proportion of juveniles was up in RY20 (90%) compared to RY19 (58%). However, the small sample of donated wings were harvested across a wide geographic range in RY20 and caution should be used when making strong conclusions regarding juvenile production.

In 2021, Southcentral spruce grouse populations will likely be negatively affected by the ongoing and widespread spruce bark beetle infestation throughout the region and as a result hunters should expect to see fewer birds during fall 2021. Summer 2021 field observation on the Kenai Peninsula suggest strong chick survival throughout the eastern peninsula. ADF&G staff in June 2021 reported slightly lower numbers of

spruce grouse throughout the upper Copper Basin and Bristol Bay than have been observed in the recent past. There have been few reported observations of spruce grouse broods in the Interior during the summer of 2021; however, with the excellent weather conditions observed in June and July, hunters should expect to see good numbers of spruce grouse while afield.

Sooty Grouse

Spring breeding surveys were completed in Haines, Juneau, Petersburg, and Ketchikan between 6 April and 20 May, 2021. The spring breeding index was down in Juneau compared to 2020 but up significantly in Haines and Petersburg. Ketchikan spring breeding data suggest overall low breeding abundance; however, due to challenging access these data may be biased low. According to survey data, peak breeding activity was nearly 1 week later than was observed in 2020. Persistent cold temperatures, delayed snow melt, and frequent snowstorms through late April likely contributed to this delay.

Rock Ptarmigan

Rock ptarmigan spring breeding surveys occurred from 27 April to 24 May throughout the Kenai Peninsula, Anchorage Bowl, Alaska Range, and White Mountains. Spring breeding abundance of rock ptarmigan in 2021 on the Kenai Peninsula was up from 2020 but down in Anchorage and across the Alaska Range in 2021. Rock ptarmigan spring breeding surveys in the Interior occurred from 29 April, 2021 to 24 May, 2021. Survey data indicate rock ptarmigan at Donnelly Dome are likely stable, increasing near Mount Fairplay, and stable to increasing near Eagle Summit. Reports from ADF&G staff in Bethel, Dillingham, and King Salmon have all observed higher abundance in local ptarmigan populations in 2021 and reported seeing more ptarmigan throughout Southwestern Alaska and the Alaska Peninsula beginning in 2020. However, spring and summer 2021 in Southwestern Alaska and the Alaska Peninsula was cool and rainy and may have contributed to lower chick survival. Rock ptarmigan populations throughout Southwestern Alaska and the Alaska Peninsula had been depressed for nearly 6 consecutive years likely due to low chick survival, cool wet summers, and little snow throughout many of the winters. In the southern portion of the Seward Peninsula rock ptarmigan populations appear to remain strong in spring 2021.

Forty-five harvested rock ptarmigan wings collected in RY20, most of which were harvested in Southcentral ($n = 33$, 39% juvenile). There were no rock ptarmigan wings donated from the Interior in RY20.

Brood surveys were completed between 19 and 21 July, 2021 along the Denali Highway, and between 30 July, 2021 and 1 August, 2021 near Eagle Summit. Very few rock ptarmigan are typically observed along brood survey routes along the Denali Highway and surveys along these routes are more focused on willow ptarmigan. Surveys near Eagle Summit suggest good population productivity in 2021. Counts of broods was relatively high and the number of chicks per brood was higher in 2021 ($n = 7$; 5.4 chicks/brood; range: 1-10) than 2020 ($n = 7$; 3.9 chicks/brood; range: 1-5); however, caution is warranted in drawing strong conclusions as sample sizes are small in all years (range: 4-7; 2016-2021). Beginning in July 2021, additional brood surveys were completed in Sheep Mountain, Chugach State Park, and the Kenai Mountains. Although inferences about one year of data are difficult very few rock ptarmigan broods were observed in 2021.

Two research reports from recent rock ptarmigan studies (Eagle Summit movement / mortality and comparative nesting ecology) will be available online by early 2022 (www.smallgame.adfg.alaska.gov).

Overall, hunters afield are likely to encounter relatively good abundance of rock ptarmigan on the Kenai Peninsula, near Mount Fairplay, and in rock ptarmigan habitat adjacent to the Steese Highway but are likely to encounter fewer numbers within the Anchorage Bowl and far fewer rock ptarmigan throughout the Alaska Range.

White-tailed Ptarmigan

Beginning in summer 2021, increased brood survey effort was employed throughout Southcentral Alaska for white-tailed ptarmigan. In addition to hunter harvested wing collections the brood survey data affords a much better understanding of white-tailed ptarmigan chick survival and subsequent population production throughout the Chugach, Kenai, and Talkeetna mountains. Few white-tailed ptarmigan broods were observed in the Chugach State Park or Talkeetna Mountains in 2021 however average brood size was good (5.6 chicks/brood).

Much like other grouse and ptarmigan in 2021, we anticipate poor chick survival and subsequently low abundance throughout the Alaska Range and only slightly higher abundance in the Chugach and Talkeetna mountains.

Willow Ptarmigan

Willow ptarmigan spring breeding surveys occurred from 22 April to 24 May throughout the Kenai Peninsula, Anchorage Bowl, the Alaska Range, and White Mountains. Spring breeding surveys in 2021 along the eastern Denali Highway (Unit 13B) were down from 2020 and remain below the 5-year average. Estimates from the western Denali Highway (Unit 13E) and Denali National Park (DNP) were up slightly from 2020. These low spring breeding estimates were anticipated after brood surveys in summer 2020 documented very poor chick survival. Interior, Seward Peninsula, Anchorage, and Kenai Peninsula surveys generally estimated higher spring breeding abundance than in 2020; however, surveys of willow ptarmigan near Delta Junction within the Donnelly Training Area (DTA) suggest a decline in numbers from 2020 to 2021. Reports from ADF&G staff in Bethel, Dillingham, and King Salmon have all observed higher abundance in local ptarmigan populations in 2021 and reported seeing more ptarmigan throughout Southwestern Alaska and the Alaska Peninsula beginning in 2020. However, spring and summer 2021 in Southwestern Alaska and the Alaska Peninsula was cool and rainy and may have contributed to lower chick survival. Rock and willow ptarmigan populations throughout Southwestern Alaska and the Alaska Peninsula had been depressed for nearly 6 consecutive years likely due to low chick survival, cool wet summers, and low to zero snow throughout much of the winters. In the southern portion of the Seward Peninsula rock ptarmigan populations appear to remain strong in spring 2021.

Summer brood surveys were completed between 19 and 21 July 2021 along the Denali Highway and between 30 July, 2021 and 1 August, 2021 in the White Mountains. Denali Highway brood surveys documented only 1 small brood group (2 chicks) which is the lowest estimate since brood surveys began in 2016. This population likely experienced very poor chick survival as a result of a snowstorm in late June 2021 over much of the Alaska Range, Wrangell Mountains, and portions of the Talkeetna Mountains. One willow ptarmigan brood of 7 chicks was documented in 2021 along transects adjacent to the Steese Highway (White Mountains). In previous years a few willow ptarmigan broods have been observed along the same transects but very small sample sizes preclude making inferences from the data. Beginning in July 2021, additional brood surveys were completed in Sheep Mountain, Chugach State Park, and Kenai Mountains for willow ptarmigan. Although inferences about one year of data are difficult it appears chick survival was good in the Chugach State Park ($n=5$; 5 chicks/brood average), but poor in the Kenai Mountains.

Hunter harvested willow ptarmigan wings were collected statewide ($n = 241$) during RY20. Samples were collected from primarily Southcentral ($n = 101$), the Kenai Peninsula ($n = 87$), and the Alaska Range ($n = 37$). Only 1 willow ptarmigan wing was donated from the Interior in RY20. Statewide, the proportion of juveniles in the harvest was lower in RY20 (47%) than in RY19 (59%), which further confirms relatively poor chick survival in RY20.

As a result of the summer 2021 weather pattern throughout the state and brood survey results, willow ptarmigan hunters are likely to see well below average abundance of willow ptarmigan along the Denali Highway but near to slightly below average abundance in the Chugach, Talkeetna, and Kenai mountains.

Alaska Hare

Currently there is no active monitoring effort underway for Alaska hare. Based on field reports from hunters and ADF&G staff, it appears that the hare populations are fairly stable at low density in Southwest and Western Alaska.

Beginning in March 2017, ongoing efforts have been evaluating various capture methods and population assessment methods. Since May 2018 several Alaska hares have been captured throughout western Alaska and fitted with a GPS tracking collar. Movement data from these individuals will prove to be very insightful in learning more about the life history of this valuable species.

Snowshoe Hare

In the Interior, snowshoe hare populations peaked in 2018/19 and have declined considerably throughout monitored locations (Tok, Delta Junction, Anderson, and DNP). In Southcentral, snowshoe hares have also begun to decline after the population peak in 2019/20. Populations on the Kenai Peninsula are abundant and are expected to peak in 2021. Based on ADF&G staff observations in winter and spring 2021, snowshoe hare appear to be abundant throughout the Y-K delta and lower Kuskokwim River. However, hare abundance has dropped throughout most of Bristol Bay and the Seward Peninsula.

Regulatory Changes

As a result of the ongoing Covid-19 pandemic the BOG postponed all normally scheduled meetings during the 2020-21 meeting cycle. Proposals scheduled to be addressed in 2020-21 will be addressed this coming winter (2021-22).

For the upcoming BOG meeting schedule and the list of proposals to be considered during the 2021-2022 BOG cycle please visit the BOG webpage (www.boardofgame.adfg.alaska.gov).

Public Involvement and Support

In July 2021 the SGP with significant assistance from several volunteer organizers nearly tripled the annual volunteer-based brood survey project that documents annual chick survival for sharp-tailed grouse and rock, white-tailed, and willow ptarmigan throughout the road system of Alaska. Engaged volunteers and their highly trained pointing dogs are used to locate and enumerate broods along survey routes. Survey locations include Eagle Summit (Steese Highway), Delta Junction, Denali Highway, Hatcher Pass, and new this year survey routes were created near Sheep Mountain, Chugach State Park, and Kenai Mountains. Also new in 2021, volunteer hours are being used to match federal Pittman-Robertson funds that will allow the SGP to further increase overall population monitoring efforts and research. New participants are always welcome and encouraged to join the fieldwork. If you are interested in participating in this program as a future volunteer please contact either Rick Merizon in Palmer (907.746.6333) or Cameron Carroll in Fairbanks (907.459.7237).

Our statewide wing collection program continues to have widespread support among hunters. This program allows biologists to gain valuable insight into the harvest composition (age, sex, species, and Unit of harvest) of numerous hunted populations. Please consider donating your harvested grouse and ptarmigan wings, it is often the only way the SGP can gather important biological information across Alaska. If you're interested in participating, at no cost, please contact your local ADF&G office or SGP staff for free wing envelopes.