



2019 Forest Grouse and Mountain Quail Parts Collection Summary



Westside forest grouse wing bee at the Umpqua Watershed District Office in Roseburg (left), photo by Tod Lum.
Male sooty grouse perched on a vehicle (right), photo by Brandon Reishus.

Upland Game Bird Program
Oregon Department of Fish and Wildlife
4034 Fairview Industrial Dr SE.
Salem, OR 97302
Ph: 503-947-6322

E-mail: kelly.m.walton@state.or.us & mikal.l.cline@state.or.us

INTRODUCTION

Oregon is home to four species of forest grouse, including sooty grouse (*Dendragapus fuliginosus*), dusky grouse (*Dendragapus obscurus*), ruffed grouse (*Bonasa umbellus*), and spruce grouse (*Falcipennis Canadensis*). Examination of parts (i.e., wings and tails) of hunter-harvested birds can yield important information on grouse population demographics. ODFW began collecting parts from hunter harvested forest grouse in Wallowa County in 1980. In 1984, the Department expanded collections for forest grouse parts to other counties in northeastern Oregon and portions of southwestern Oregon. Since that time, the effort has increased to nearly statewide participation within forest grouse range. In 2005, wing collection was expanded to include mountain quail (*Oreortyx pictus*). Tails do not contribute to classification of mountain quail.

In 2019, hunter harvested parts of blue¹ (*Dendragapus spp*), ruffed, and spruce grouse were obtained from 29 of the 36 counties in Oregon (Table 1). Biologists and volunteers examined a total of 1,209 parts at 2 forest grouse wing bees, work parties to identify and classify forest grouse and mountain quail wings and tails. The total number of parts obtained in 2019 was down 11% from the previous year and down 8% from the recent 5-year average of 1,318 (Figure 1). Statewide “blue” grouse submissions were down 22% and ruffed grouse submissions were down 2% compared to 2019. Incidental spruce grouse parts represent a small proportion of all grouse parts collected. One wing was submitted from Wallowa County, down from the recent 5-year average of 4 wings. There is no open spruce grouse season in Oregon. Since 2005, hunters have submitted 403 mountain quail wings. Sixty-four of those wings were collected in 2019. The number of mountain quail wings collected has been highly variable, ranging from 5 to 64 wings.

¹Dusky and Sooty grouse considered collectively as “blue” grouse in this report.

Table 1. Forest grouse and mountain quail parts submitted to the 2019 Oregon wing bees held at the Umpqua Watershed District Office (Roseburg) on March 11, 2020 and at Ladd Marsh Wildlife Area on January 28, 2020. Wing bee counts from 2018 are provided for comparison.

County	"Blue" Grouse		Ruffed Grouse		Spruce Grouse		Mtn Quail		Total Wings		% change from 2018
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	
Baker	13	25	14	22					27	47	-43%
Deschutes	1								1	0	#DIV/0!
Grant	42	55	100	104					142	159	-11%
Harney	7	7		1					7	8	-13%
Jefferson	2		2						4	0	#DIV/0!
Klamath	2		1	1					3	1	200%
Lake	11	26		1					11	27	-59%
Morrow	22	25	40	32					62	57	9%
Umatilla	3	1	3	6					6	7	-14%
Union	42	50	71	90		3			113	143	-21%
Wallowa	73	95	40	83	1	2			114	180	-37%
Wasco		3	2						2	3	-33%
Wheeler				1					0	1	-100%
Benton			1						1	0	#DIV/0!
Clackamas	26	49	34	41			11	5	71	95	-25%
Clatsop	1		10				6	6	17	6	183%
Columbia	4	3	23	18			3	3	30	24	25%
Coos		2	28	11				3	28	16	75%
Curry	8	3	5	2			1		14	5	180%
Douglas	110	164	214	209			11	5	335	378	-11%
Hood Rvr	7	11	3	2					10	13	-23%
Jackson	11	15	41	31			6	4	58	50	16%
Josephine	2	7	4	11			9	1	15	19	-21%
Lane	14	27	22	32			6	8	42	67	-37%
Lincoln			1	9					1	9	-89%
Linn	4	7	2	4			3		9	11	-18%
Marion	39	20	10	4			7		56	24	133%
Tillamook	3	1	10	6			1		14	7	100%
Washington	1	3	4	1					5	4	25%
Yamhill	7		8						15	0	#DIV/0!
Unknown	25	15	36	25					61	40	53%
Total	480	614	729	747	1	5	64	35	1,274	1,401	-9%

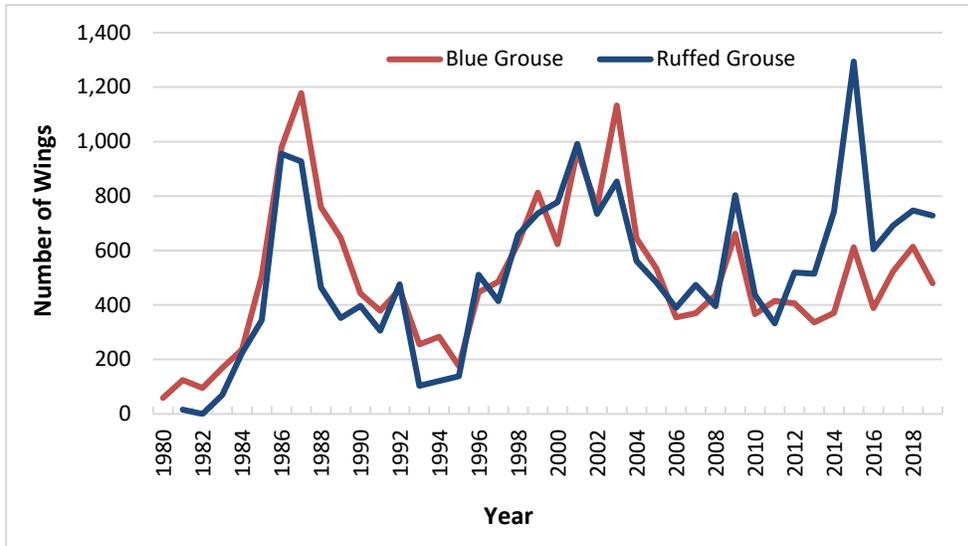


Figure 1. Number of forest grouse parts submitted to wing bees in Oregon, 1980-2019.

USE OF INFORMATION

Data from forest grouse parts are used by biologists to better understand the distribution and timing of grouse harvest in their area, the relative proportions of harvest among species, the sex and age structure of the population, and the chronology of breeding activity. Compared to other methods of tracking trends in population size and productivity, such as brood route and hunter-harvest telephone surveys, data gathered from wings and tails is an effective and low cost method for monitoring trends (Hansen et al. 2015).

Distribution and timing of harvest have relevance to obtaining information about grouse population demographics, season structure, hunter participation, and coordination of law enforcement activities. Sex and age data reveal the reproductive performance in a population (productivity), and in conjunction with abundance information, provide insight into population trends. Hatching data may be used to understand the timing of reproduction in specific areas and provide information to develop appropriate census procedures. For example, if hatching times differed substantially among regions of the state, the timing of summer censuses could be adjusted because the probability of observing a bird is a function of bird age and habitat conditions. Age ratios during the first two weeks of the season provide the best index to reproduction, while there is no significant change in sex ratios during the course of the season

(Hansen et al. 2012). This report provides age ratios for the first two weeks of the season (when there is a large enough sample size) and for the entire season. The age ratios for the entire season will allow comparison to data collected in previous years.

METHODS

Staff collect grouse parts from hunters by placing collection receptacles, or “wing barrels” in locations where grouse hunters are likely to encounter them (Figure 2). Paper bags are placed at the barrels with instructions for hunters to remove one wing and the tail from each grouse they harvest and place it in a single bag (see Appendix A). They are also asked to record the date, county, and general location of the harvest. Barrels are checked periodically throughout the season and any bags not dated or labeled by hunters are labeled with the barrel location and date of collection. Many districts have established traditional wing barrel locations that are used annually.

In addition to wing barrels, field staff distribute wing bags to known grouse hunters, and Upland Game Bird program staff mail wing bags to a list of cooperating hunters prior to the hunting season. An advertisement requesting participation in the grouse parts collection program is placed in the annual game bird regulations and on the Department’s website, and the weekly recreation report and social media are used to make hunters aware of the program. In 2019, KTVZ in Central Oregon featured the grouse parts collection program on the evening news.

Each winter, biologists and volunteers gather at wing bees to collect information from the submitted parts. In 2019-20, wing bees were held at Ladd Marsh Wildlife Area (La Grande) and the ODFW Umpqua Watershed District Office (Roseburg). Data collected from each set of parts include: species, location and county of kill, date of kill, sex, age, and the stage of primary wing feather molt (for immature birds only). Age class is recorded as adult or immature and if discernible, the adult class is further subdivided to adult or yearling. After the wing bees, data is analyzed using formulas for estimating the age (in days) of immature grouse based on the sequential replacement (molt) of primary wing feathers. Hatch dates are then back-calculated

for birds of known harvest date; provided they were harvested no later than 10 October (immature molt of primaries 1 through 8 is usually complete by 10 October).



Figure 2. Typical grouse wing barrel constructed from a plastic barrel and mounted on a crossbar. Wing collection bags and writing utensils are stored inside. Photo courtesy of Tod Lum.

BLUE GROUSE RESULTS

During 2019, hunters submitted 480 parts from “blue” grouse in Oregon, a decrease of 22% from the previous year and a 4% decrease from the recent 5-year average ($\bar{x} = 502$). The 2019 hunting season allowed a daily bag limit of 3 birds with 9 in possession from 1 September through 31 January. Hunters harvested 31% of the wings and tails during the first week of the season and 67% by the end of September. There was a second smaller peak of submissions during late September and early October, the beginning of many firearm deer and elk seasons (Figure 3).

Eastern Oregon hunters provided 45% ($n = 218$) of the wings and tails submitted, a 24% decrease from the number received in 2018 ($n = 287$). The majority of submissions from eastern Oregon were from Wallowa (33%), Grant (19%), Union (19%), and Morrow (10%) counties. The remainder of the eastern Oregon submissions came from 7 other counties (Baker, Deschutes, Harney, Jefferson, Klamath, Lake, and Umatilla). Western Oregon contributed 237 wings and tails from 14 counties, a 28% decrease from the previous year ($n = 327$). The majority of the submissions were from Douglas (46%), Marion (16%), Clackamas (11%), and Lane (6%) counties.

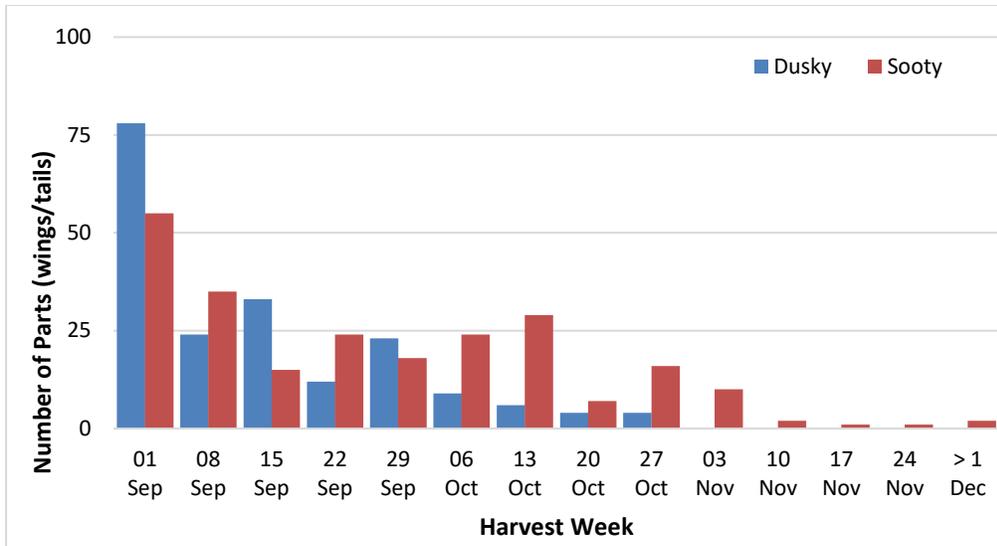


Figure 3. The number of sooty and dusky grouse parts collected by week of reported harvest during the 2019-20 Oregon hunting season.

Age and Sex Ratios

Immature grouse comprised 69% of the “blue” grouse parts collected during the first two weeks of the season and 71% of the sample from the entire season (Table 2). The proportion of immatures in the harvest was above the long-term average of 64%. A high proportion of immatures in the harvest was above the long-term average of 64%. A high proportion of immatures indicates good productivity. Males represented 47% of the statewide sample, 52% of adult sample, and 46% of immatures in 2019.

Table 2. “Blue” grouse sex ratios, age ratios, and hatch dates by species in 2019 from hunter submitted parts. Ratios are presented for the first two weeks of season and for the entire season. Hatch date is only estimated for grouse harvested on or before October 10.

	<u>Gender Ratios</u>			<u>Age Ratios</u>			<u>Hatch Dates</u>		
	n	M:F	AM:AF	IM:IF	n	I:A	I:AF	n	Mean, Range
Dusky									
1st 2 wks	102	50:50	66:34	44:56	102	71:29	88:22	--	--
Total	202	53:47	59:41	50:50	201	69:31	84:16	106	May 31, May 5 - July 5
Sooty									
1st 2 wks	90	41:59	45:55	39:61	90	68:32	79:21	--	--
Total	253	43:57	48:52	42:58	251	73:27	83:27	103	June 7, May 5 - July 11
All									
1st 2 wks	193	46:54	55:45	42:58	193	69:31	84:16	--	--
All Total	480	47:53	52:48	46:54	477	71:29	84:26	220	June 4, May 5 - July 11

Hatching Chronology

Statewide, hatch dates for dusky and sooty grouse harvested during the 2019 hunting season ranged from 5 May - 11 July, which is similar to previous years. Dusky grouse hatch dates ranged from 5 May - 5 July, with a mean hatch date of 31 May. Sooty grouse hatch dates ranged from 5 May - 11 July, with a mean of 7 June (Table 2 & Figure 4). For dusky grouse, 75% hatched between 21 May - 13 June, while 75% of sooty grouse hatched between 23 May - 22 June. Typical of most years, the peak sooty grouse hatch was later than the peak dusky grouse hatch.

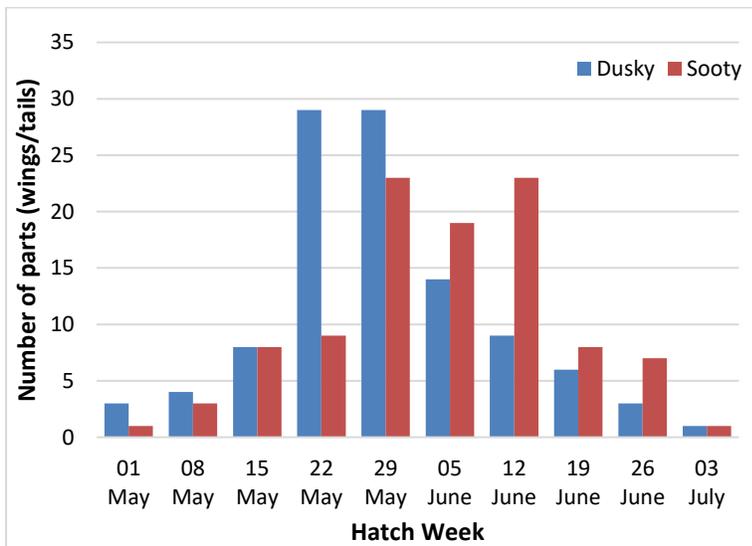


Figure 4. Week of hatch for dusky and sooty grouse in Oregon as estimated from primary feathers from hunter-harvested wings during 2019. Hatch dates were only estimated for birds that were harvested on or before October 10.

Region Specific Ratios and Hatching Chronology

For many regions of the state, age and sex ratios as well as hatching dates can be calculated if enough wings are collected. Wing collection efforts were sufficient in the Northwest (Area 1), Southwest (Area 2), Central (Area 4), and Northeast regions (Area 5; see Figure 5 for map of regions) to make region specific calculations (Table 3). In the Northeast region, 59% of wings were from males, as compared to the Southwest (48%), Central (49%), and the Northwest (35%). An uneven sex ratio can be an indication that one sex is more vulnerable to harvest than the other. For example, adult females with broods may be more vulnerable to

harvest early in the season than adult males. In the Northwest 80% of the samples were from immatures and in Northeast 72% were from immatures, indicating good production. Production was slightly lower in Southwest with 68% immatures and Central with 64% immatures. Mean hatch date varied by region, with the earliest date for Central (30 May) and the latest for Northwest Oregon (8 June).

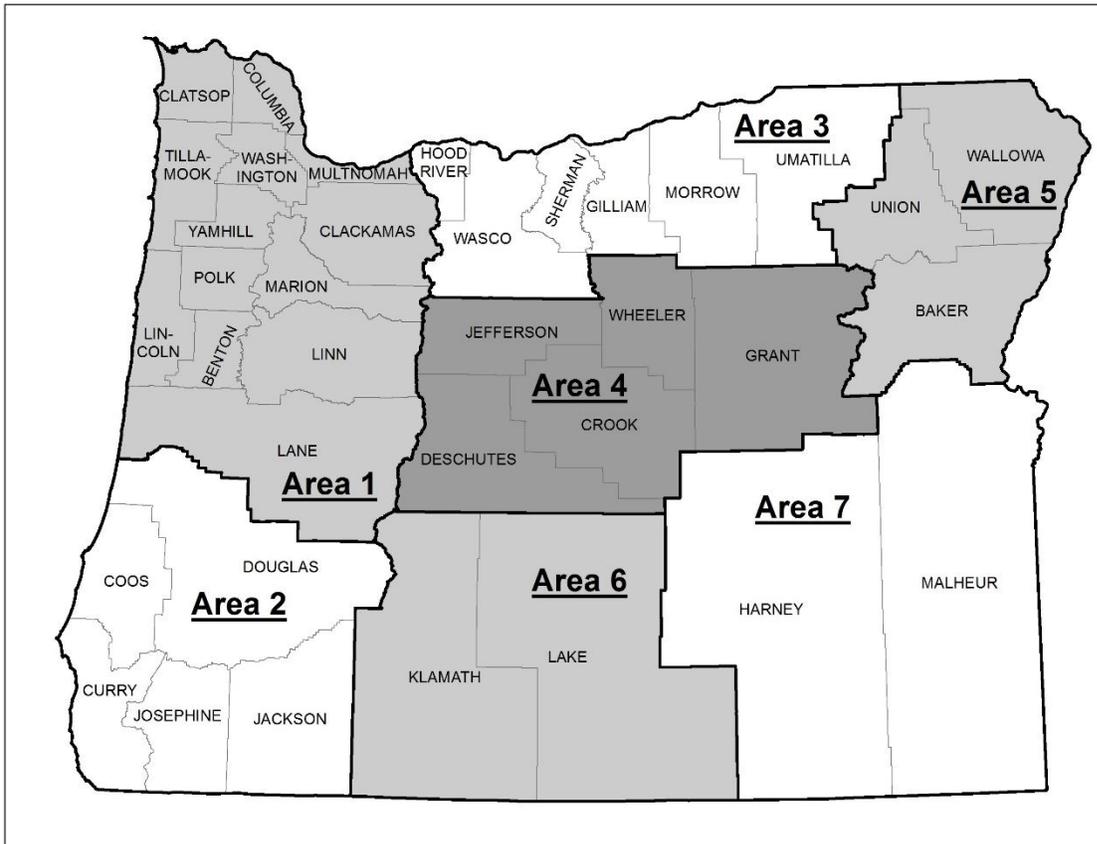


Figure 5. Areas used to calculate region specific age and sex ratios and hatch dates in the table below.

Table 3. “Blue” grouse sex ratios, age ratios, and hatch dates by region from hunter submitted parts. Hatch date is only estimated for grouse harvested on or before October 10.

Region	Gender Ratios				Age Ratios			Hatch Dates	
	n	M:F	AM:AF	IM:IF	n	I:A	I:AF	n	Mean, Range
Northwest	99	35:65	40:60	33:67	98	80:20	87:13	45	Jun 8, May 5 - Jul 11
Southwest	131	48:52	50:50	48:52	130	68:32	81:19	47	Jun 7, May 12 - Jul 7
Central	45	49:51	50:50	48:52	45	64:36	78:22	18	May 30, May 7 - Jun 24
Northeast	128	59:41	67:33	55:45	127	72:28	88:22	70	Jun 3, May 11 - Jul 5
Statewide	480	47:53	52:48	46:54	477	71:29	84:26	220	Jun 4, May 5 - Jul 11

In addition to reporting ratios and hatching dates by region, traditionally calculations have also been made for Wallowa County as part of their long term dataset dating back to 1980 (see Table 4). From 1980 - 2019, hunters in Wallowa County submitted parts representing 9,846 dusky grouse. Wing collection efforts were down in Wallowa County. In 2019, hunters submitted 73 wings, down 71% from the average since the wing bee began in 1980 (\bar{x} =251) and down 45% from the recent 5-year average (\bar{x} =133). The immature proportion of the harvest (69%) was above the long-term average of 61%, suggesting good production (Table 4 and Figure 6).

The mean hatch date was 1 Jun and ranged from 11 May to 1 July. Mean hatch dates range from 25 May (1992, 1998, and 2004) to 9 June (2018) with the preponderance of young hatched during a 3-week interval between late May and early June (\bar{x} = 31 May, Table 4).

Table 4. Total number of parts (n), sex ratios, age ratios and hatching dates of dusky grouse from parts submitted by hunters from harvest in Wallowa County, Oregon, 1980 to 2019.

Season	n	Sex Ratios			Age Ratios		Hatch Information			
		M:F	AM:AF	IM:IF	I:A	I:AF	Mean	Range		
1980	59	54:46	83:17	41:59	69:31	93:7				
1981	125	57:43	60:40	55:45	62:38	80:20	29-May	7-May	to	29-Jun
1982	95	53:47	53:47	53:47	38:62	56:44	31-May	16-May	to	16-Jun
1983	165	53:47	57:43	51:49	72:28	86:14	30-May	8-May	to	25-Jun
1984	155	57:43	63:37	53:47	52:48	74:26	4-Jun	13-May	to	8-Jul
1985	258	53:47	63:37	49:51	72:28	88:12	1-Jun	4-May	to	4-Jul
1986	598	58:42	74:26	52:48	70:30	90:10	26-May	3-May	to	15-Jul
1987	736	58:42	72:28	51:49	65:35	87:13	26-May	2-May	to	14-Jul
1988	471	54:46	60:40	47:53	53:47	75:25	2-Jun	28-Apr	to	19-Jul
1989	371	53:47	59:41	51:49	70:30	85:15	30-May	29-Apr	to	10-Jul
1990	286	58:42	65:35	55:45	54:46	77:23	27-May	5-May	to	1-Jul
1991	260	60:40	68:32	50:50	43:57	70:30	1-Jun	9-May	to	13-Jul
1992	284	54:46	61:39	47:53	57:43	78:22	25-May	2-May	to	26-Jun
1993	200	58:42	61:39	57:43	65:35	83:17	2-Jun	10-May	to	28-Jun
1994	249	59:41	66:34	52:48	58:42	80:20	28-May	10-May	to	21-Jun
1995	140	47:53	61:39	30:70	43:57	66:34	6-Jun	14-May	to	10-Jul
1996	261	61:39	75:25	54:46	67:33	89:11	30-May	10-May	to	8-Jul
1997	205	54:46	78:22	41:59	61:39	88:12	30-May	10-May	to	24-Jun
1998	361	59:41	73:27	53:47	66:34	88:12	25-May	8-May	to	30-Jun
1999	453	59:41	69:31	51:49	59:41	82:18	6-Jun	11-May	to	5-Jul
2000	379	60:40	82:18	51:49	68:32	92:8	27-May	3-May	to	3-Jul
2001	570	52:48	62:38	47:53	65:35	83:17	31-May	3-May	to	7-Jul
2002	376	59:41	64:36	56:44	63:37	83:17	5-Jun	5-May	to	29-Jul
2003	460	64:36	74:26	58:42	65:35	88:12	3-Jun	6-May	to	17-Jul
2004	251	50:50	56:44	47:53	51:49	70:30	25-May	5-May	to	30-Jun
2005	209	64:36	80:20	56:44	59:41	88:12	1-Jun	9-May	to	14-Jul
2006	163	61:39	70:30	54:46	48:52	76:24	1-Jun	10-May	to	8-Jul
2007	172	55:45	55:45	56:44	70:30	84:16	27-May	6-May	to	4-Jul
2008	104	53:47	56:44	53:47	76:24	88:12	5-Jun	10-May	to	22-Jul
2009	173	58:42	64:36	55:45	68:32	87:13	30-May	9-May	to	12-Jul
2010	128	47:53	58:42	38:62	55:45	76:24	5-Jun	9-May	to	6-Jul
2011	150	57:43	61:39	46:54	57:43	83:17	5-Jun	8-May	to	15-Jul
2012	126	46:54	66:34	29:71	52:48	76:24	1-Jun	15-May	to	26-Jun
2013	93	61:39	65:35	59:41	66:34	85:15	2-Jun	5-May	to	30-Jun
2014	59	44:56	78:22	46:54	69:31	91:9	3-Jun	13-May	to	24-Jun
2015	228	66:34	80:20	59:41	65:35	90:10	26-May	5-May	to	4-Jul
2016	99	51:49	65:35	47:53	77:23	90:10	27-May	2-May	to	29-Jun
2017	185	57:43	72:28	49:51	66:34	88:12	31-May	7-May	to	1-Jul
2018	95	60:40	70:30	51:49	49:51	77:23	9-Jun	20-May	to	2-Jul
2019	73	62:38	73:27	56:44	69:31	89:11	1-Jun	11-May	to	1-Jul

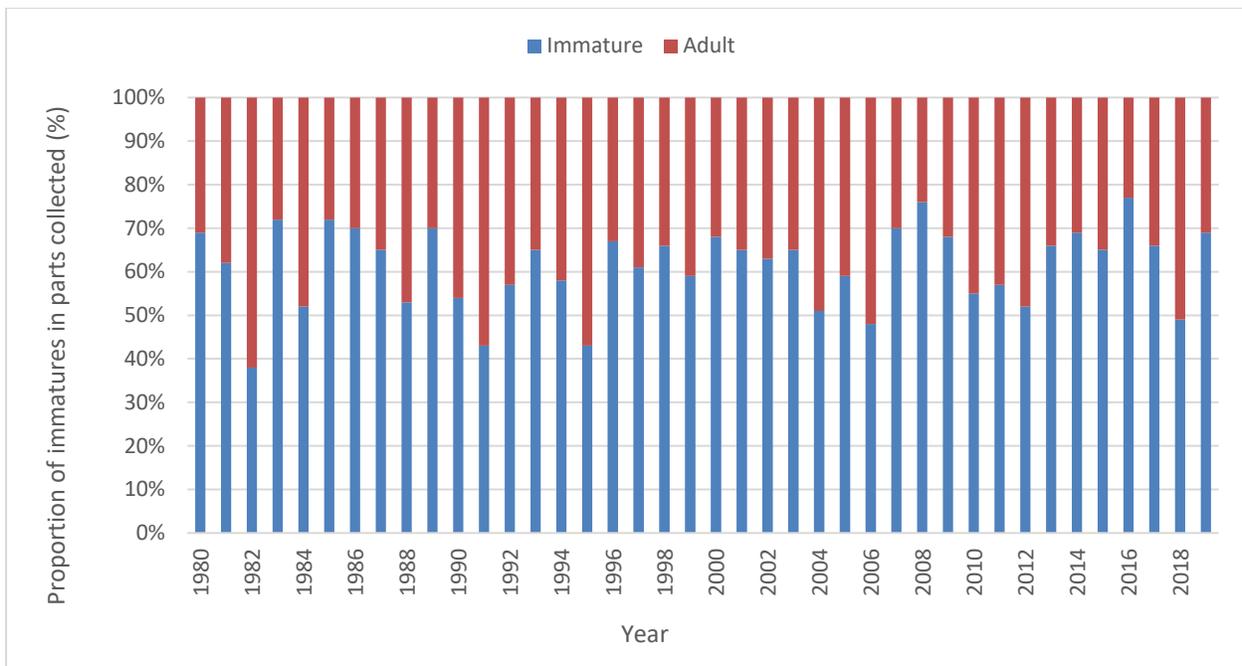


Figure 6. Proportion of immature to adult dusky grouse in harvest from parts submitted by hunters in Wallowa County Oregon, 1980 to 2019 (long-term average = 61%).

RUFFED GROUSE RESULTS

In 2019, hunters submitted 729 ruffed grouse parts, a 2% decrease from 2018 ($n = 747$) and an 11% decrease from the recent 5-year average ($n = 817$). The 2019 ruffed grouse hunting season allowed a daily bag limit of 3 birds with 9 in possession. The statewide season began 1 September and extended through 31 January. Typically hunters submit a large portion of the ruffed grouse wings during the first couple weeks of the season, with a second peak in harvest occurring during the start of modern firearms big game seasons the beginning of October. This trend was repeated in 2019; the peak of ruffed grouse wing returns occurred during the first week of the grouse season and again during the start of the big game rifle seasons (Figure 7). Hunters submitted 14% ($n = 92$) of the ruffed grouse parts during the first week of the season. Similar to previous years, the number of grouse parts returned dropped considerably after big game rifle seasons; however, more late-season (Dec – Jan) parts were submitted than typical. In 2019, 43% ($n = 294$) of parts were from birds harvested in September and 37% from birds harvested in October ($n = 247$).

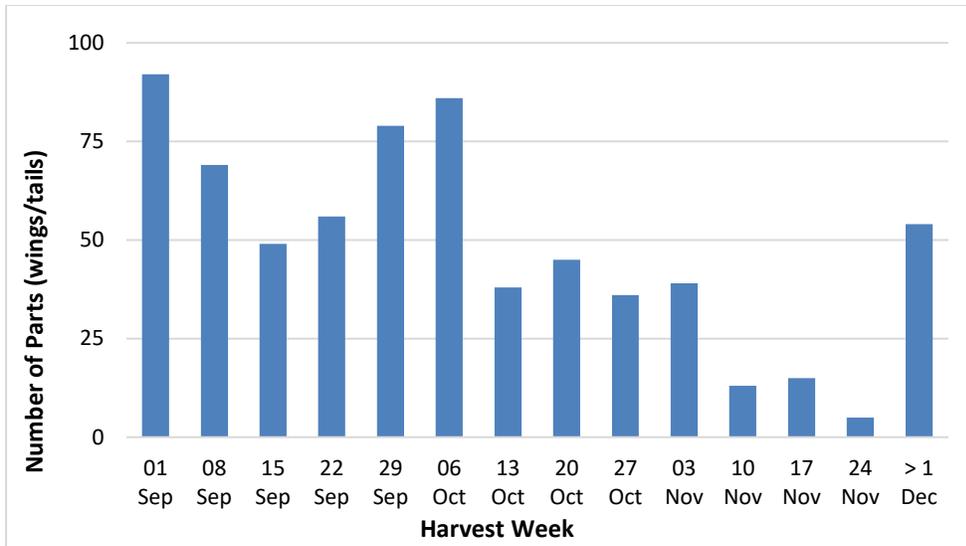


Figure 7. Timing of Oregon’s 2019 ruffed grouse harvest as estimated from ruffed grouse parts with harvest dates.

In eastern Oregon, hunters submitted 273 parts, a 21% decrease from 2018 ($n = 343$) and 43% below the recent 5-year average ($\bar{x} = 477$). Most of the samples collected in eastern Oregon were from Wallowa, Grant, Union, and Morrow counties. In western Oregon, hunters submitted 425 ruffed grouse samples, a 6% increase from 2018 ($n = 400$). Collection efforts in Douglas County accounted for the majority of the parts, followed by Clackamas, Jackson, Coos, Columbia, and Lane counties. Parts were collected from a total of 17 counties in western Oregon.

Age and Sex Ratios

Due to lack of tails or rump feathers attached to the tail, gender could not be determined for 44% of the ruffed grouse submissions. Age was determined for greater than 99% of the samples obtained statewide. Immature grouse comprised 63% of the eastern Oregon and 65% of the western Oregon sample during the first two weeks of the season indicating moderate production. Age ratios during the first two weeks of the season provide the best index to reproduction because age ratios in the harvest can change over the course of the season (Hansen et al. 2012). For the entire season, immatures comprised 57% of the statewide harvest of ruffed grouse, including 57% in eastern Oregon, and 55% in western

Oregon (Table 5). An analysis of ruffed grouse wings from about 30 years in Oregon found that immatures ranged from 33–74% of the sample. Ruffed grouse populations in other states have also displayed highly variable productivity that ranged from 39–80% of immatures in fall populations (Dorney 1963, Davis and Stoll 1973). The differences in production may be related to local variations and naturally occurring population cycles. A study of ruffed grouse survival in Maine showed that adult ruffed grouse were less vulnerable to harvest than juveniles (Davis et al. 2018). This cautions that ruffed grouse production estimates based on harvest age ratios may be overestimated.

Ruffed grouse males of all ages accounted for 58% of the samples with sufficient material to determine sex. The proportion of adult males was 45% and 51% for eastern and western Oregon, respectively. Males accounted for 55–61% of the adult population in several states in the Midwest (Dorney 1963, Davis and Stoll 1973, Major and Olson 1980). Confidence in the sex ratios would be improved if sex could be determined for a higher proportion of the samples.

Table 5. Sex ratios, age ratios and hatching dates of ruffed grouse as determined from parts submitted by hunters from Oregon harvest during the 2019-20 hunting season.

	<u>Gender Ratios</u>				<u>Age Ratios</u>			<u>Hatch Dates</u>	
	n	M:F	AM:AF	IM:IF	n	I:A	I:AF	n	Mean, Range
<u>East</u>									
1st 2 wks	42	60:40	60:40	59:41	91	63:37	82:12	---	---
Total	141	57:43	61:39	54:46	272	55:45	84:16	107	June 2, May 1 - July 6
<u>West</u>									
1st 2 wks	37	49:51	38:62	54:46	68	65:35	85:15	---	---
Total	233	56:44	54:46	58:42	422	57:43	83:17	72	May 27, May 3 - June 24
<u>Statewide</u>									
1st 2 wks	80	55:45	53:47	57:43	160	63:37	86:14	---	---
Total	400	58:42	59:41	57:43	725	57:43	84:16	179	May 30, May 1 - July 6

Hatching Chronology

The mean hatch date for ruffed grouse collected no later than 10 October 2019 was 30 May. Hatch dates were estimated from 179 parts, of which 72 were from western Oregon (Table 5). Peak hatch dates for ruffed grouse were similar to average and similar to last year.

Hatch dates ranged from 1 May to 6 July, with 75% of ruffed grouse in the harvest hatching between 15 May and 14 June (Figure 8).

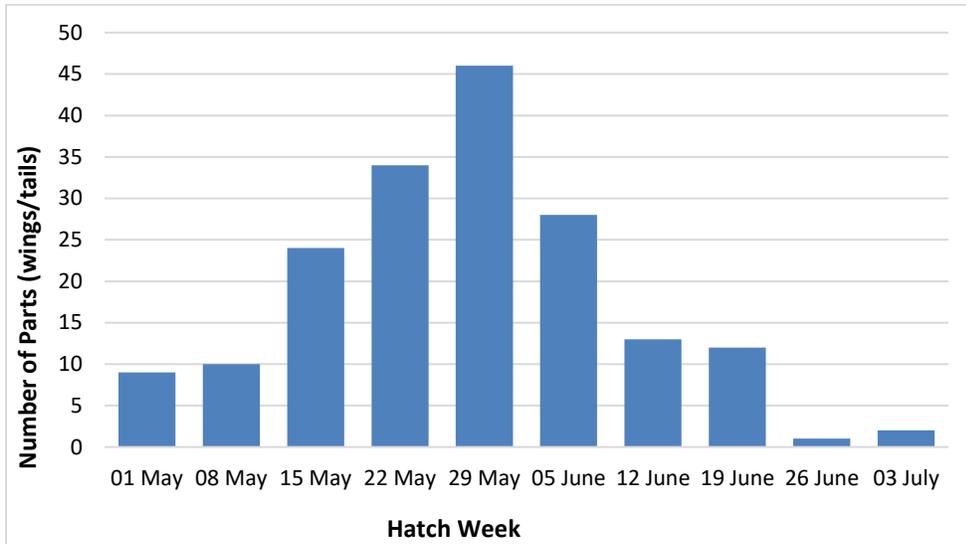


Figure 8. Timing of Oregon's 2019 ruffed grouse hatch as estimated from grouse harvested on or before 10 October.

Region Specific Ratios and Hatching Chronology

Wing collection efforts were sufficient in the Northwest, Southwest, Central, and Northeast regions (see Figure 5 in Blue Grouse section for map of regions) to make region specific calculations (Table 6). Males comprised the lowest percentage of the sample in the Northwest (53%), as compared to the Northeast (55%), Southwest (56%), and Central (61%). The proportion of immatures to adults was higher in Central (64:36) and Northwest (63:37), whereas the ratio was lower in Southwest (54:46) Northeast (45:55). A higher proportion of immatures indicates higher production of young. Mean hatch date varied by region but were all within a week of each other, with the earliest date for Northwest (25 May) and the latest in Central Oregon (1 June).

Table 6. Ruffed grouse sex ratios, age ratios, and hatch dates by region from hunter submitted parts. Hatch date is only estimated for grouse harvested on or before October 10.

Region	Gender Ratios			Age Ratios			Hatch Dates		
	n	M:F	AM:AF	IM:IF	n	I:A	I:AF	n	Mean, Range
Northwest	88	53:47	55:45	54:46	124	63:37	84:16	34	May 25, May 3 - Jun 19
Southwest	141	56:44	52:48	61:39	290	54:46	82:19	36	May 30, May 7 - Jun 24
Central	49	61:39	67:33	56:44	102	64:36	89:11	37	Jun 1, May 1 - Jul 6
Northeast	58	55:45	52:48	60:40	124	45:55	78:22	46	May 31, May 7 - Jun 22
Statewide	400	58:42	59:41	57:43	725	57:43	84:16	179	May 30, May 1 - Jul 6

In addition to reporting ratios and hatching dates by region, traditionally calculations have also been made for Wallowa County as part of their long term dataset dating back to 1983 (Table 7). From 1983-2019, hunters submitted 6,793 ruffed grouse parts from Wallowa County. Only 40 ruffed grouse parts were submitted in 2019, so age and sex ratios and average hatch date are based on very little data and should be used cautiously. Data collected since 1983 in Wallowa County indicated exceptional production from 1983–1990, then age ratios declined and stabilized until they again increased in 1999 through 2001. Age ratios have since been stable and slightly higher than during the early 90s except for 2004 and 2010, the age ratio in 2014 indicated exceptional production (Table 7 & Figure 9).

Table 7. Total number of parts (n), sex ratios, age ratios and hatching dates of ruffed grouse as determined from parts submitted by hunters from grouse harvested in Wallowa County, Oregon, 1983 to 2019.

Season	n	Sex Ratios			Age Ratios		Hatch Dates		
		M:F	AM:AF	IM:IF	I:A	I:AF	Mean	Range	
1983	70				83:17				
1984	47	50:50	0:100		66:34	97:3	5-Jun	22-May	to 20-Jun
1985	193	56:44	64:36	52:48	75:25	92:8	28-May	3-May	to 7-Jul
1986	395	61:39	69:31	56:44	72:28	93:7	29-May	5-May	to 14-Jul
1987	372	59:41	51:49	64:36	70:30	88:12	27-May	4-May	to 28-Jun
1988	212	69:31	78:22	64:36	68:32	95:5	1-Jun	13-May	to 1-Jul
1989	139	55:45	50:50	57:43	74:26	90:10	2-Jun	2-May	to 29-Jun
1990	189	61:39	71:29	56:44	67:33	93:7	28-May	11-May	to 20-Jun
1991	155	64:36	62:38	65:35	63:37	88:12	3-Jun	7-May	to 6-Jul
1992	220	65:35	64:36	66:34	61:39	87:13	27-May	30-Apr	to 5-Jul
1993	55	65:35	71:29	60:40	62:38	86:14	1-Jun	15-May	to 2-Jul
1994	112	53:47	52:48	54:46	55:45	76:24	25-May	12-May	to 26-Jun
1995	84	61:39	68:32	52:48	57:43	89:11	30-May	12-May	to 26-Jun
1996	180	62:38	70:30	54:46	57:43	85:15	29-May	3-May	to 20-Jun
1997	169	61:39	84:16	34:66	58:42	92:8	31-May	3-May	to 18-Jun
1998	279	53:47	59:41	48:52	55:45	81:19	25-May	7-May	to 26-Jun
1999	370	44:56	48:52	41:59	64:36	89:11	2-Jun	8-May	to 6-Jul
2000	339	61:39	67:33	55:45	58:42	89:11	26-May	3-May	to 21-Jul
2001	434	61:39	75:25	50:50	62:38	92:8	31-May	7-May	to 14-Jul
2002	165	51:49	60:40	42:58	56:44	83:17	5-Jun	11-May	to 7-Jul
2003	284	65:35	66:34	64:36	54:46	87:13	1-Jun	8-May	to 3-Jul
2004	98	48:52	57:43	35:65	49:51	76:24	28-May	7-May	to 18-Jun
2005	180	53:47	68:32	41:59	58:42	89:11	1-Jun	6-May	to 1-Jul
2006	152	56:44	62:38	48:52	59:41	87:13	26-May	5-May	to 10-Jul
2007	198	49:51	55:45	41:59	58:42	83:17	25-May	2-May	to 15-Jun
2008	94	56:44	61:39	52:48	63:37	87:13	4-Jun	7-May	to 27-Jun
2009	222	66:44	75:25	58:42	69:31	94:6	30-May	6-May	to 6-Jul
2010	167	54:46	56:44	50:50	43:57	73:27	6-Jun	14-May	to 28-Jun
2011	150	57:43	61:39	46:54	57:43	83:17	5-Jun	8-May	to 15-Jul
2012	143	47:53	51:49	41:59	55:45	68:32	30-May	6-May	to 1-Jul
2013	174	48:52	54:46	43:57	61:39	70:30	29-May	4-May	to 7-Jul
2014	157	62:38	64:36	61:39	76:24	93:7	30-May	3-May	to 29-Jun
2015	236	44:56	43:57	45:55	59:41	81:19	1-Jun	12-May	to 26-Jul
2016	118	57:43	68:32	42:58	52:48	85:15	26-May	9-May	to 16-Jun
2017	118	47:53	51:49	41:59	36:64	72:28	5-Jun	9-May	to 20-Jun
2018	83	49:51	48:52	50:50	61:39	82:18	2-Jun	3-May	to 1-Jul
2019	40	73:27	67:33	100:0	40:60	84:16	24-May	7-May	to 22-Jul

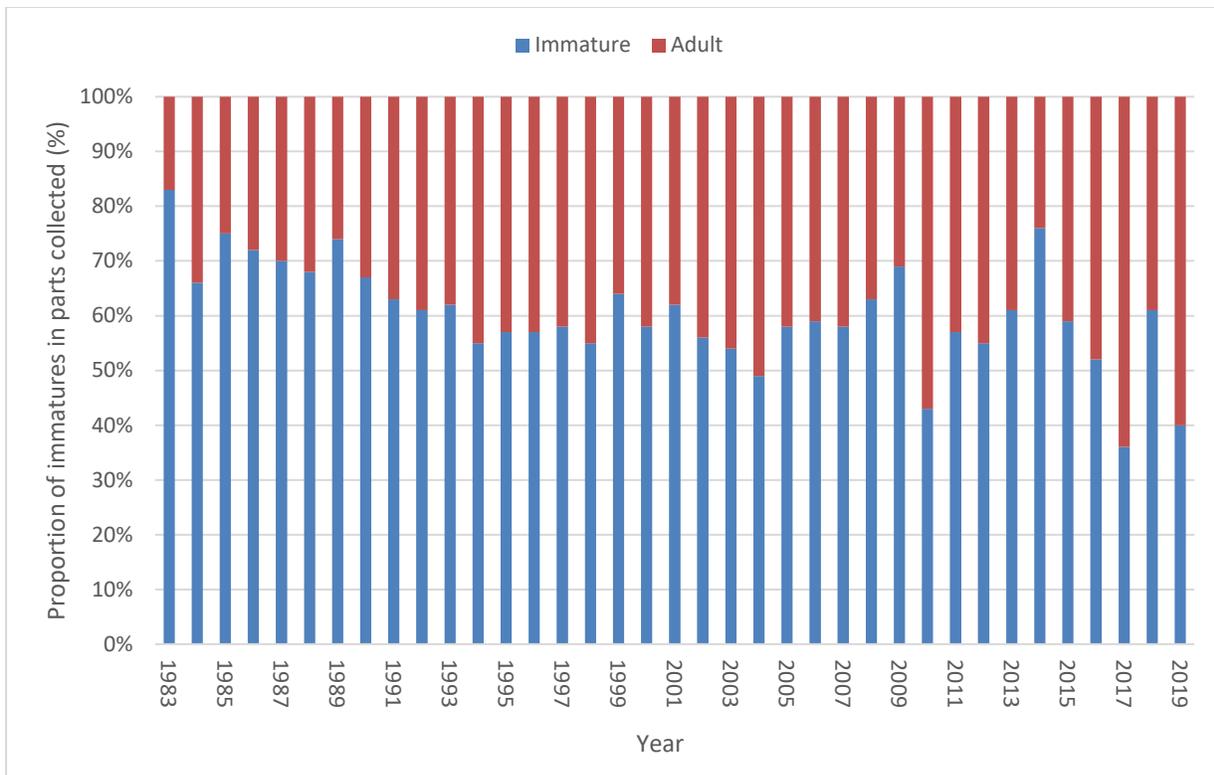


Figure 9. Proportion of immature to adult ruffed grouse in harvest from parts submitted by hunters in Wallowa County Oregon, 1983 to 2019 (long-term average = 61%).

SPRUCE GROUSE

Wing Collections – 1985 to 2019

Incidental to the harvest of dusky and ruffed grouse in Baker, Wallowa and Union counties, hunters deposited 213 spruce grouse parts in wing barrels from 1985 - 2019. To educate and remind hunters that there is no open season for spruce grouse, signs are posted in Northeast Oregon and the 2017-18 game bird regulations featured a one-page article on spruce grouse identification. In 2019, 1 spruce grouse wing was collected from Wallowa County, compared to a total of 5 wings collected in 2018. Wallowa County typically has the highest incidental harvest of spruce grouse, but Union County has collected some spruce grouse wings in recent years. During 1997, spruce grouse wings were obtained from Baker County for the first time, likely related to an increased effort in wing collection efforts rather than range expansion. The 1988 wing bee recorded the highest number of spruce grouse wings ($n=27$). During the past 30 years, immatures and adults comprised nearly equal proportions of the

sample. The wing submitted in 2019 was from an adult male. Oregon is on the southwest periphery of the natural range of spruce grouse.

MOUNTAIN QUAIL

Wing Collections – 2005 to 2019

The 2019 mountain quail season in western Oregon, Hood River, and Wasco counties began 1 September and extended through 31 January with a daily bag limit of 10 quail and a possession limit of 30. In Crook, Grant, Wheeler, Gilliam, Klamath, Umatilla, Morrow, and Wallowa counties of eastern Oregon, the season began 5 October and extended through 31 January with a daily bag limit of 2 and a possession limit of 2. The remaining eastern Oregon counties were closed to mountain quail hunting (Figure 10). Although overall wing collection efforts focus on forest grouse, wing collection bags also instruct hunters to submit mountain quail wings. Since 2005, ODFW collected 403 mountain quail wings, averaging 24 wings per year. Wing collection efforts were above average with 64 wings collected from 11 western counties. Of the wings collected in 2019, 47 were from immatures (73%) and 17 from adults (27%).

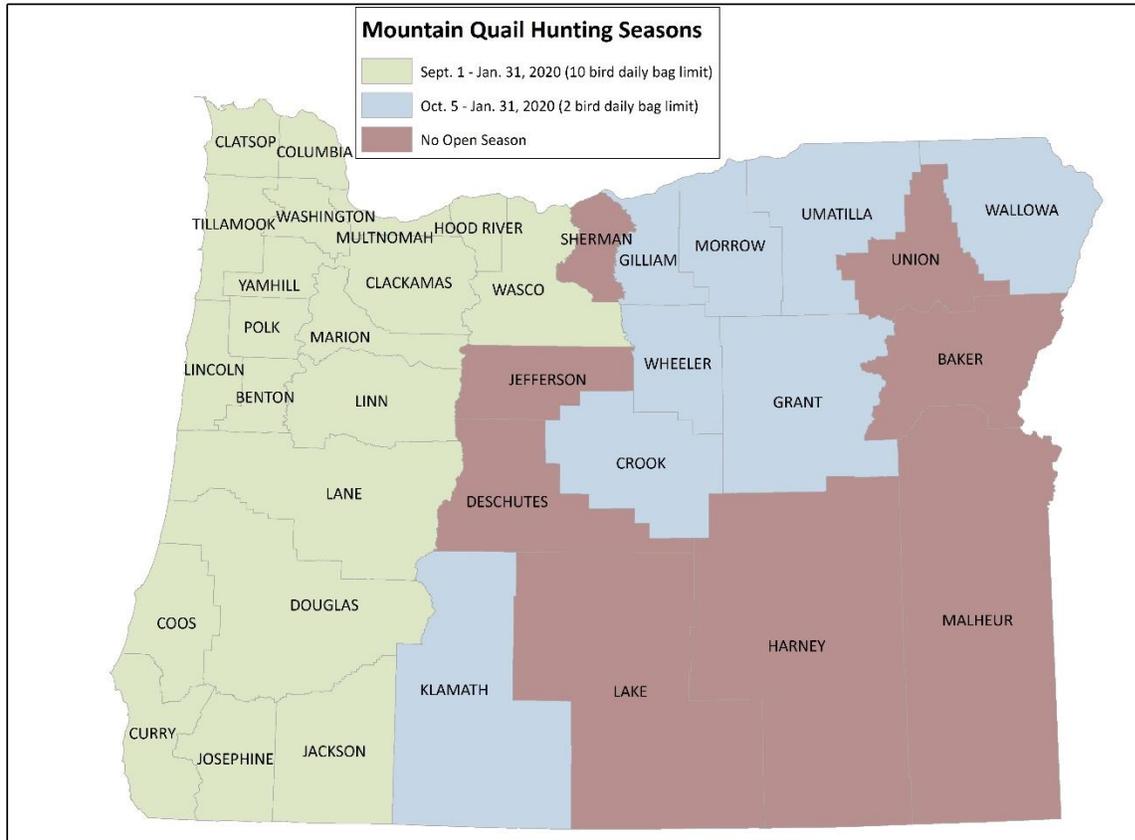


Figure 10. Map of counties open to mountain quail hunting, including season dates and daily bag limits.

HARVEST AND PRODUCTION INFORMATION FROM OTHER SURVEYS

Each year the Department conducts telephone surveys of upland game bird validation holders to estimate hunter effort and harvest. Managers may use data from these surveys in combination with wing bee data to gain a better understanding of trends in production and harvest. Estimates of the harvest from random phone surveys of 2019-20 upland game bird validation holders showed a decrease (statewide) in “blue” grouse harvest by 2% from the 5-year average and ruffed grouse harvest decreased by 9% from the 5-year average (Table 8). Compared to last year, harvest from phone survey data was down for “blue” grouse in western Oregon (-8.7%), central (-34%), northeast Oregon (-35%) and up for the Columbia Basin (+157%). Phone surveys showed that ruffed grouse harvest decreased compared to last year in western (-6%), central (-46%), Columbia Basin (-22%), and northeast Oregon (-63%).

Table 8. Estimated harvest of “blue” and ruffed grouse in 2019-20 calculated from random phone surveys of Oregon upland game bird validation holders (n = ~3,600). The state is divided into 7 harvest regions, a general description is included in parentheses and see Figure 5 for a map.

Harvest Region	Estimated Harvest	
	“Blue” Grouse	Ruffed Grouse
Area 1 (Northwest)	6,020	14,654
Area 2 (Southwest)	1,524	5,916
Area 3 (Columbia Basin)	1,089	1,882
Area 4 (Central)	827	2,529
Area 5 (Northeast)	2,021	3,650
Area 6 (Southcentral)	268	769
Area 7 (Southeast)	210	419
Total	11,985	29,819
<i>Change from '18-19</i>	<i>-25%</i>	<i>-19%</i>
<i>Change from 5-year avg. ('14-18)</i>	<i>-2%</i>	<i>-9%</i>

In addition to phone surveys, the Department also conducts spring hooting surveys for sooty grouse in western Oregon. Results from 2019 spring surveys and several prior years, show that the sooty grouse population may be on the upward trajectory of their population cycle (Walton and Cline 2019). In comparison results from hunter harvested parts in 2019 also showed relatively high productivity as measured by the proportion of immatures. While there may be a lag between years of high productivity and when an increase in hooting males is heard due to the age males start hooting, both are indicators of sooty grouse population cycles.

Lastly, some ODFW wildlife districts conduct summer production surveys for upland game birds, including forest grouse, primarily in eastern Oregon. 2019 production data indicated a large decline (-91%) in ruffed grouse density from the previous year, and a more modest decline in dusky grouse (-14%). Conversely, ruffed grouse production (chicks/hen) was above average in 2019 (4.0 chicks/hen vs. 2.6 long-term average). Blue grouse production in 2019 (1.7 chicks/hen) was very similar to the long term average (1.7 chicks/hen). This does support the findings of strong immature representation in the harvested sample. Summer counts should be interpreted with caution as sample sizes and sampling effort has declined over time.

SUMMARY

In general, ruffed, sooty, and dusky grouse mean hatch dates in 2019 were average and slightly earlier than last year. This was the first year that data was analyzed for specific regions of the state other than Wallowa County. Production and hatch dates varied by region, but overall production was good in 2019. Statewide, the proportion of immature “blue” grouse (71%) was slightly higher than 2018 (66%), suggesting increased production. The proportion of immatures was lower for ruffed grouse than “blue” grouse (57%); however, it was higher than last year (40%). The proportion of immature ruffed grouse is more variable from year-to-year and is often lower than for “blue” grouse. Harvest estimates from phone surveys were down slightly in most areas for both sooty, dusky, and ruffed grouse compared to last year suggesting that harvest was not high as expected. However, sooty grouse surveys in western Oregon are showing an increase in the number of hooting birds heard per stop, which makes sense with the good productivity seen in the wing bee data. Upland game bird production surveys (i.e., brood counts) showed an average to above average chicks per adult female in the summer of 2019 surveys (in eastern Oregon).

The number of forest grouse wings collected in 2019 ($n=1,210$) was down 11% from 2018 ($n=1,366$). Increased effort to install new barrels in under-surveyed areas should increase the number of wings, and correspondingly, achieve greater confidence in age and sex ratios and hatch dates in areas where grouse populations are poorly understood. Five years ago there was a large disparity between the numbers of wings collected on the east vs west side of the state; that difference has decreased over the last several years with the increase in collection efforts.

Statewide education efforts directed at the need and value of returning wings and tails should continue to increase hunter awareness and participation. The game bird regulations, field offices, and Department social media provide information on wing collection efforts. These efforts should emphasize the need for hunters to include both a wing and a tail fan from “blue” grouse and a wing and a tail fan with attached rump feathers for ruffed grouse for gender identification. In addition, without a harvest date written on the wing collection bag, the hatch date cannot be back-calculated for immature grouse. Although increased

participation from Oregon forest grouse hunters would improve the data set, these wing collections still provide a valuable and reasonably low cost method of obtaining demographic profiles of grouse populations.

ACKNOWLEDGEMENTS

These data would simply not be available without the continued support and cooperation of Oregon hunters – for this we thank all the hunters who provided wings and tails! Forest grouse parts collection can also be a large workload for the wildlife districts, and their effort is greatly appreciated. Some wildlife districts have embraced this challenge and the results are self-evident as most of the wings are collected from a small number of districts.

LITERATURE CITED

- Davis, J. A., and R. J. Stoll, Jr. 1973. Ruffed grouse sex and age ratios in Ohio. *Journal of Wildlife Management* 37:133-141.
- Davis, S. R. B., Mangelinckx, J., Allen, R. B., Sullivan, K., and Blomberg, E. J. 2018. Survival and harvest of ruffed grouse in central Maine, USA. *Journal of Wildlife Management* 82:1263-1272.
- Dorney, R. S. 1963. Sex and age structure of Wisconsin ruffed grouse populations. *Journal of Wildlife Management* 27:599-603.
- Hansen, M. C., C. A. Hagen, D. A. Budeau, V. L. Coggins, and B. S. Reishus. 2015. Comparison of 3 surveys for estimating forest grouse population trends. *Wildlife Society Bulletin* 39:197–202
- Hansen, M. C., C. A. Hagen, T. M. Loughin, D. A. Budeau, V. C. Coggins, and B. S. Reishus. 2012. Temporal Changes in Age and Sex Ratios of Forest Grouse Harvested in Northeast Oregon. *Journal of Wildlife Management* 76:356-362.
- Major, P. D., and J. C. Olson. 1980. Harvest statistics from Indiana ruffed grouse season. *Wildlife Society Bulletin* 8:18-23.
- Walton, K. and M. Cline. 2019. Summary of 2019 Western Oregon Sooty Grouse Surveys. Oregon Department of Fish and Wildlife. 12 p.
- Zwickel, F. C., J. H. Brigham, and I. O. Buss. 1975. Autumn structure of blue grouse populations in north-central Washington. *Journal of Wildlife Management* 39:461-467.

Appendix A: ODFW wing collection bag design. This is an updated version of the bag that will be used starting in 2020-21. Bags in 2019 asked for the county of harvest instead of the WMU.

ATTENTION:
FOREST GROUSE AND MOUNTAIN QUAIL HUNTERS:

ODFW is collecting wings and tails from hunter-harvested forest grouse and mountain quail. These parts provide important information on the status of these populations.

PLEASE COMPLETE:

Area Harvested:

• Location _____

• WMU _____

Date Harvested: _____

IF YOU HARVEST A GROUSE OR MOUNTAIN QUAIL, PLEASE:

1. Remove one entire WING and remove the TAIL with the rump feathers by skinning out the lower 2 or 3 inches of the back (see illustrations).
2. Place in paper collection bag. Use one bag per bird.
3. Mark the bag with the LOCATION, Wildlife Management Unit (WMU), and DATE harvested.
4. Drop bag off at designated collection sites located around the state or at nearest ODFW office.
5. If there will be a delay in dropping off your bag, please freeze it.

For more information, contact the ODFW office in your area.
Thank you for contributing to game bird management in Oregon.

