2020 Forest Grouse and Mountain Quail Parts Collection Summary

Ruffed grouse tails showing several color morphs, photo by Mikal Cline.

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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. Oregon Department of Fish and Wildlife (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 2020, hunter harvested parts of blue[1] (*Dendragapus spp*), ruffed, and spruce grouse were obtained from 25 of the 36 counties in Oregon (Table 1). Biologists and volunteers examined a total of 1,307 parts from forest grouse. Typically, wings are examined at 2 forest grouse wing bees, which are work parties to identify and classify forest grouse and mountain quail wings and tails. However due to COVID-19 concerns, a wing-bee was not held in eastern Oregon, so parts were examined by individual district offices. Most parts collected in western Oregon were examined at a wing-bee held in Roseburg in early summer of 2021. The total number of forest grouse parts obtained in 2020 was up 8% from the previous year and down 3% from the recent 5-year average of 1,343 (Figure 1). Statewide "blue" grouse submissions were up 6% and ruffed grouse submissions were up 8% compared to 2020. Incidental spruce grouse parts represent a small proportion of all grouse parts collected. Six wings were submitted from Union County, up from the recent 5-year average of 4 wings. There is no open spruce grouse season in Oregon. Since 2005, hunters have submitted 460 mountain quail wings. Fifty-seven of those wings were collected in 2020. The number of mountain quail wings collected has been highly variable, ranging from 5 to 64 wings.

[1]Dusky and Sooty grouse considered collectively as "blue" grouse in this report.

Table 1. Forest grouse and mountain quail parts submitted from the 2020-21 season. One wing-bee was held at the Umpqua Watershed District Office (Roseburg) on June 30, 2021. The remainder of the wings were processed by district staff. Wing-bee counts from 2019 are provided for comparison.

County	"Blue" Grouse		Ruffed Grouse		Spruce Grouse		Mtn Quail		Total Wings		% change from 2019
	2020	2019	2019	2019	2020	2019	2020	2019	2020	2019	
Baker	34	13	21	14					55	27	104%
Deschutes		1							0	1	-100%
Grant	71	42	128	100					199	142	40%
Harney	10	7	3						13	7	86%
Jefferson		2		2					0	4	-100%
Klamath	9	2	1	1					10	3	233%
Lake	15	11							15	11	36%
Malheur			1						1	0	#DIV/0!
Morrow	27	22	68	40					95	62	53%
Umatilla	3	3		3			1		4	6	-33%
Union	85	42	129	71	6				220	113	95%
Wallowa	79	73	69	40		1			148	114	30%
Wasco			1	2					1	2	-50%
Benton				1					0	1	-100%
Clackamas		26	4	34				11	4	71	-94%
Clatsop		1	4	10			3	6	7	17	-59%
Columbia	10	4	15	23			7	3	32	30	7%
Coos	1		32	28			8		41	28	46%
Curry	9	8	16	5			6	1	31	14	121%
Douglas	95	110	173	214			17	11	285	335	-15%
Hood Rvr	5	7	4	3					9	10	-10%
Jackson	16	11	57	41			4	6	77	58	33%
Josephine	4	2	5	4			7	9	16	15	7%
Lane	5	14	16	22				6	21	42	-50%
Lincoln				1					0	1	-100%
Linn	5	4	2	2			4	3	11	9	22%
Marion	2	39		10				7	2	56	-96%
Tillamook	3	3	5	10				1	8	14	-43%
Washington	2	1	1	4					3	5	-40%
Yamhill		7		8					0	15	-100%
Unknown	21	25	35	36					56	61	-8%
Total	**511**	480	**790**	729	**6**	1	**57**	64	**1,364**	1,274	7%

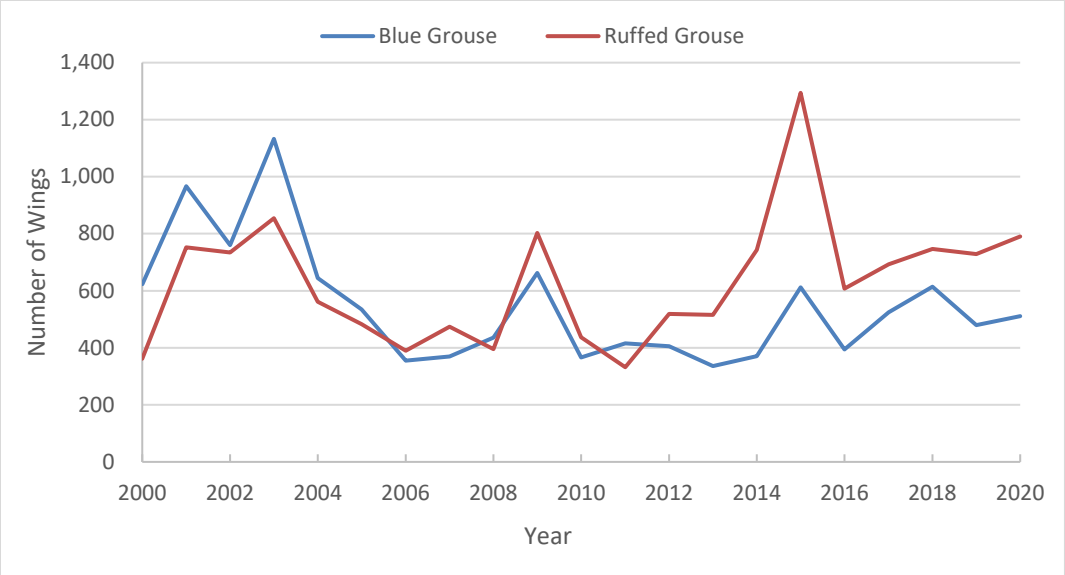

Figure 1. Number of forest grouse parts submitted to ODFW, 2000-2020.

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, Wildlife Management Unit (WMU) or 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 and location of wing barrels.

Each winter, biologists and volunteers gather at wing bees to collect information from the submitted parts. In 2020-21, one wing bee was held at the ODFW Umpqua Watershed District Office (Roseburg) and the remainder of wings were processed at individual district offices as time allowed. Data collected from each set of parts included: species, location and WMU or 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 crossbuck. Wing collection bags and writing utensils are stored inside. Photo courtesy of Tod Lum.

BLUE GROUSE RESULTS

During 2020, hunters submitted 511 parts from "blue" grouse in Oregon, an increase of 6% from the previous year and a 3% decrease from the recent 5-year average ($\bar{x}$ = 525). The 2020 hunting season allowed a daily bag limit of 3 birds with 9 in possession from 1 September through 31 January. For sooty grouse, hunters harvested 33% of the wings and tails during the first week of the season and 45% by the end of September. There is a noticeable reduction in wings/tail submitted just after Labor Day weekend, which is when several large fires started in western Oregon. These fires greatly reduced access for hunters in some areas. There was a second peak of submissions during late September and early October, the beginning of many firearm deer and elk seasons (Figure 3). For dusky grouse, hunters harvested 17% of the wings and tails during the first week of the season and 61% by the end of September.

Eastern Oregon hunters provided 65% (*n* = 333) of the wings and tails submitted, a 53% increase from the number received in 2019 (*n* = 218). The majority of submissions from eastern Oregon were from Union (26%), Wallowa (24%), and Grant (21%) counties. The remainder of the eastern Oregon submissions came from 6 other counties (Baker, Harney, Klamath, Lake,

Morrow, and Umatilla). Western Oregon contributed 157 wings and tails from 12 counties, a 34% decrease from the previous year (*n* = 237). The majority of the submissions were from Douglas (61%), Jackson (10%), and Columbia (6%) counties.

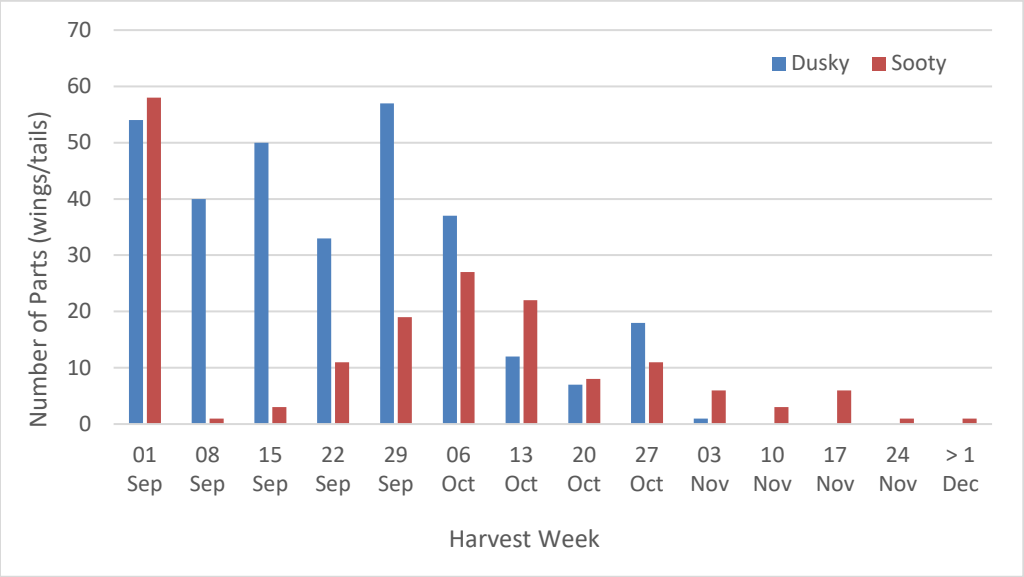

Figure 3. The number of sooty and dusky grouse parts collected by week of reported harvest during the 2020-21 Oregon hunting season.

Age and Sex Ratios

Immature grouse comprised 72% of the "blue" grouse parts collected during the first two weeks of the season and 56% of the sample from the entire season (Table 2). The proportion of immatures was higher for sooty grouse than dusky grouse. The proportion of all immature blue grouse in the harvest was below the long-term average of 64%. A high proportion of immatures indicates good productivity. Males represented 47% of the statewide sample, 53% of adult sample, and 45% of immatures in 2020 (from parts collected during the first two weeks).

Table 2. "Blue" grouse sex ratios, age ratios, and hatch dates by species in 2020 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.

	Gender Ratios				Age Ratios			Hatch Dates	
	n	M:F	AM:AF	IM:IF	n	I:A	I:AF	n	Mean, Range
Dusky									
1st 2 wks	93	46:54	59:41	41:59	94	69:31	84:16	--	--
Total	322	51:49	58:42	44:56	324	52:48	72:28	123	June 1, May 4 - July 11
Sooty									
1st 2 wks	57	49:51	43:57	51:49	59	76:24	85:15	--	--
Total	181	49:51	50:50	49:51	185	63:37	77:23	60	June 6, May 11 - July 20
All									
1st 2 wks	150	47:53	53:47	45:55	153	72:28	85:15	--	--
All Total	504	50:50	56:44	46:54	510	56:44	74:26	183	June 3, May 4 - July 20

Hatching Chronology

Statewide, hatch dates for dusky and sooty grouse harvested during the 2020 hunting season ranged from 4 May - 20 July, which is similar to previous years. Dusky grouse hatch dates ranged from 4 May - 11 July, with a mean hatch date of 1 June. Sooty grouse hatch dates ranged from 11 May - 20 July, with a mean of 6 June (Table 2 & Figure 4). For dusky grouse, 75% hatched between 19 May - 16 June, while 75% of sooty grouse hatched between 14 May - 26 June. Typical of most years, the peak sooty grouse hatch was later than the peak dusky grouse hatch.

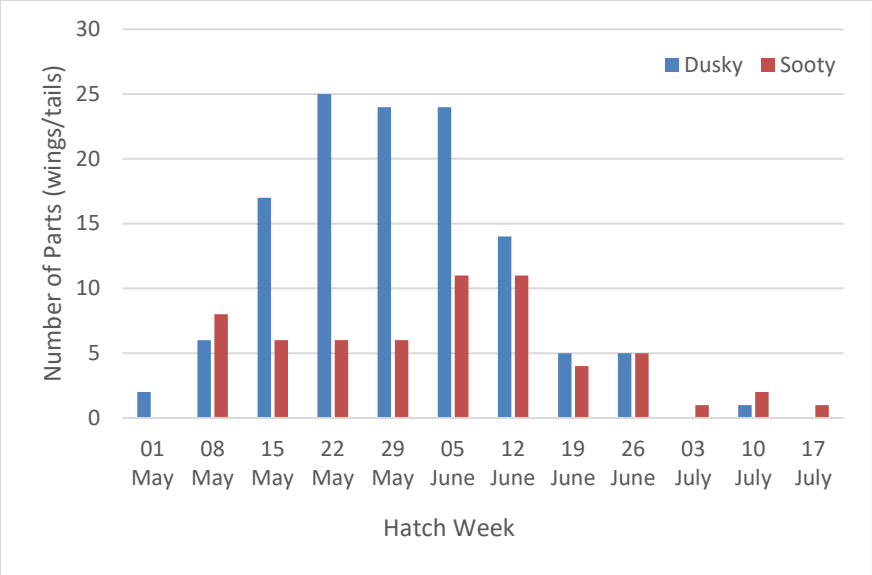

Figure 4. Week of hatch for dusky and sooty grouse in Oregon as estimated from primary feathers from hunter-harvested wings during 2020. Hatch dates were only estimated for birds that were harvested on or before October 10.

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, 52% of wings were from males, as compared to the Southwest (50%), Central (43%), and the Northwest (52%). 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 67% of the samples were from immatures and in Southwest 65% were from immatures, indicating good production. Production was much lower in Northeast with 54% immatures and Central with 44% immatures. Mean hatch date varied by region, with the earliest date for Central (30 May) and the latest for Southwest Oregon (9 June).

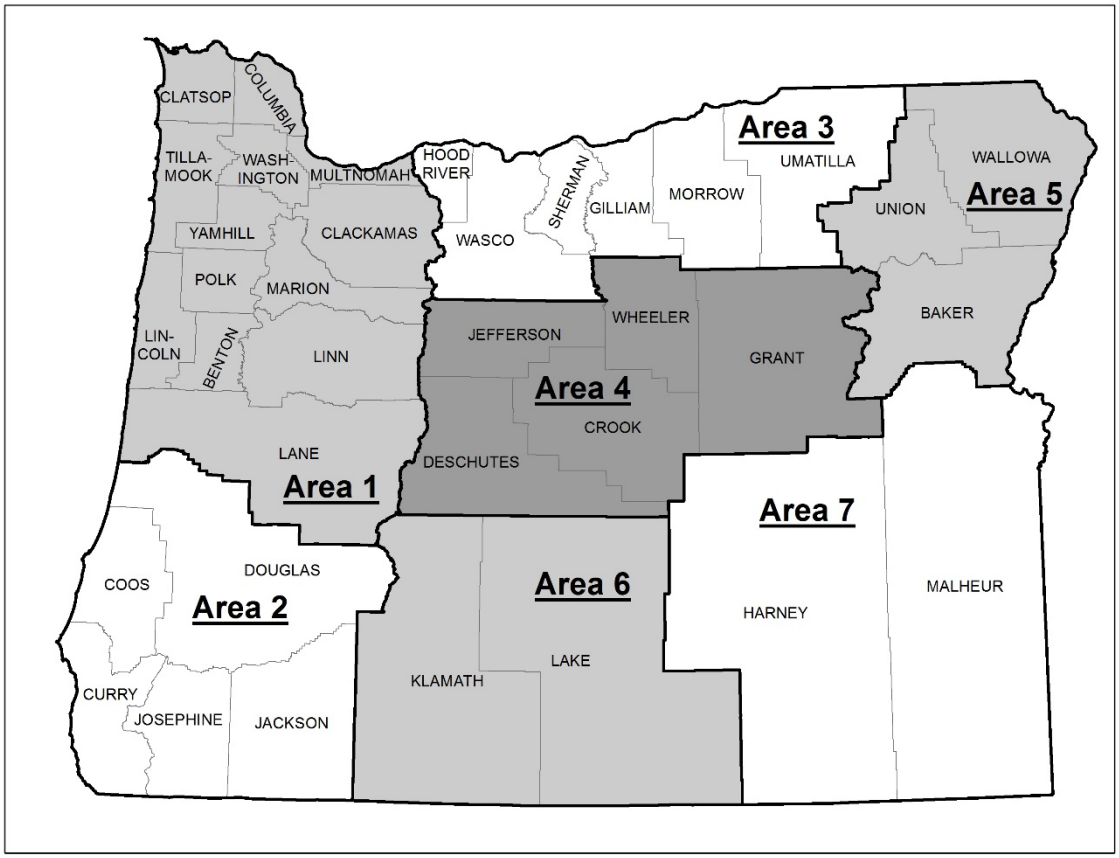

Figure 5. Areas used to calculate region specific age and sex ratios and hatch dates in the table below.

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.

	Gender Ratios				Age Ratios			Hatch Dates	
Region	**n**	**M:F**	**AM:AF**	**IM:IF**	**n**	**I:A**	**I:AF**	**n**	**Mean, Range**
Northwest	46	52:48	60:40	48:52	46	67:33	84:16	19	June 2, May 4 - Jun 28
Southwest	121	50:50	48:52	51:49	125	65:35	78:22	38	June 9, May 11 - July 20
Central	70	43:57	49:51	35:65	71	44:66	61:39	22	May 30, May 9 - June 21
Northeast	196	52:48	64:36	43:57	197	54:46	77:23	87	June 2, May 4 - July 11
Statewide	**504**	**50:50**	**56:44**	**46:54**	**510**	**56:44**	**74:26**	**183**	**June 3, May 4 - July 20**

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 - 2020, hunters in Wallowa County submitted parts representing 9,925 dusky grouse. In 2020, hunters submitted 79 wings, down 68% from the average since

the wing bee began in 1980 ($\bar{x}$ =246) and down 42% from the recent 5-year average ($\bar{x}$ =136). The immature proportion of the harvest (49%) was below the long-term average of 61%, suggesting poor production (Table 4 and Figure 6).

The mean hatch date was 1 Jun and ranged from 4 May to 30 June. 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 (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 2020.

		Sex Ratios			Age Ratios		Hatch Information			
Season	***n***	**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
2020	**79**	**60:40**	**67:33**	**53:47**	**49:51**	**75:25**	**1-Jun**	**4-May**	**to**	**30-Jun**

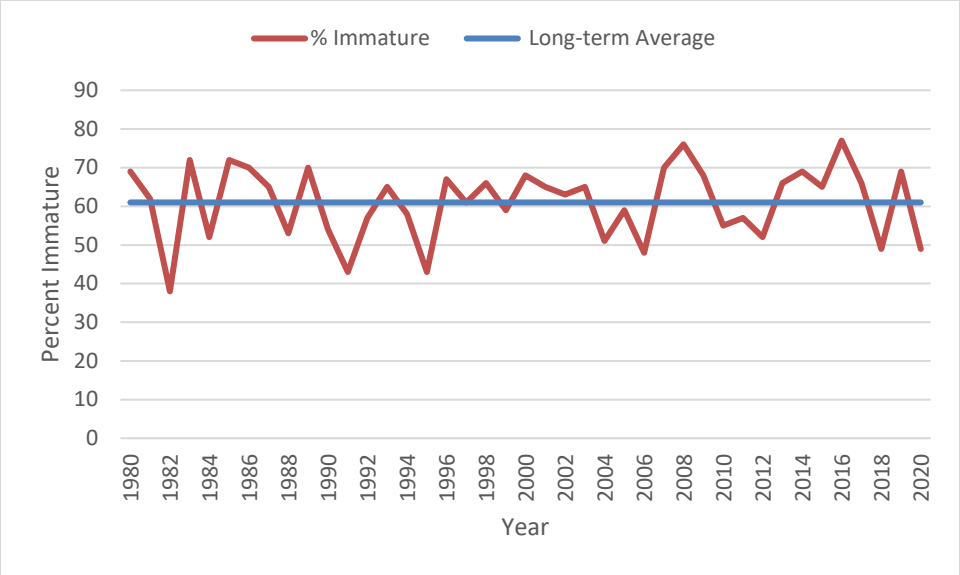

Figure 6. Proportion of immature (to adult) dusky grouse in harvest from parts submitted by hunters in Wallowa County Oregon, 1980 to 2020 (long-term average = 61%).

RUFFED GROUSE RESULTS

In 2020, hunters submitted 790 ruffed grouse parts, an 8% increase from 2019 (*n* = 729) and a 3% decrease from the recent 5-year average (*n* = 814). The 2020 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 2020; 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). Fires in western Oregon likely caused a decrease in harvest in mid-September as seen by the sudden drop off in wings submitted. In western Oregon, hunters submitted 10% (*n* = 36) of the ruffed grouse parts during the first week of the season. Similar to previous years, the number of grouse parts returned dropped after big game rifle seasons; however, there was another peak of ruffed grouse harvested on/after December 1st. This may be related to the relative lack of snowpack in December 2020, leaving hunting areas accessible. In 2020, only 23% (*n* = 81) of parts were from birds harvested in September. Typically, a higher percentage of wings are

harvested in September. Forty-one percent were from birds harvested in October (*n* = 143). In eastern Oregon, hunters submitted 18% (*n* = 69) of the ruffed grouse parts during the first week of the season. Similar to previous years, the number of grouse parts returned dropped after big game rifle seasons. In 2020, 51% (*n* = 198) of parts were from birds harvested in September and 45% from birds harvested in October (*n* = 173).

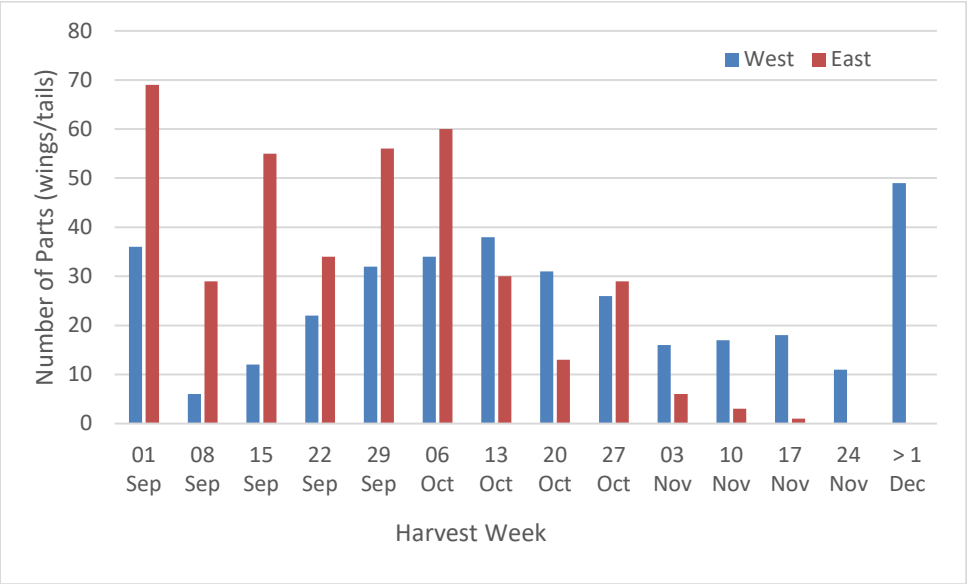

Figure 7. Timing of 2020 ruffed grouse harvest in western and eastern Oregon as estimated from ruffed grouse parts with harvest dates.

In eastern Oregon, hunters submitted 421 parts, a 54% increase from 2020 (*n* = 273) and 5% below the recent 5-year average ($\bar{x}$= 445). Most of the samples collected in eastern Oregon were from Union, Grant, Wallowa, and Morrow counties. In western Oregon, hunters submitted 334 ruffed grouse samples, a 20% decrease from 2019 (*n* = 420). Collection efforts in Douglas County accounted for the majority of the parts, followed by Jackson, Coos, Lane, and Columbia counties. Parts were collected from a total of 13 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 76% of the eastern

Oregon and 79% 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 51% of the statewide harvest of ruffed grouse, including 59% in eastern Oregon, and 42% 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 51% of the samples with sufficient material to determine sex. The proportion of adult males was 59% for both eastern and western Oregon. 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 2020-21 hunting season. Few parts were collected in western Oregon the first two weeks of the season, so ratios should be interpreted with caution.

	Gender Ratios				Age Ratios			Hatch Dates	
	n	M:F	AM:AF	IM:IF	n	I:A	I:AF	n	Mean, Range
East									
1st 2 wks	51	47:53	62:38	43:57	96	76:24	94:6	--	--
Total	236	50:50	59:41	43:57	417	59:41	86:14	154	June 3, May 3 - July 11
West									
1st 2 wks	16	13:87	--	18:82	42	79:21	87:13	--	--
Total	206	52:48	59:41	43:57	360	42:58	75:25	42	June 1, May 11 - June 27
All									
1st 2 wks	67	39:61	44:56	38:62	138	77:23	91:9	--	--
All Total	442	51:49	51:49	43:57	781	51:49	81:19	196	June 1, May 3 - July 11

Hatching Chronology

The mean hatch date for ruffed grouse collected no later than 10 October 2020 was June 1st. Hatch dates were estimated from 196 parts, of which 42 were from western Oregon and 154 in eastern Oregon (Table 5). Peak hatch dates for ruffed grouse were similar to average and similar to last year. Hatch dates ranged from May 3 to July 11, with 75% of ruffed grouse in the harvest hatching between May 19 and June 17 (Figure 8).

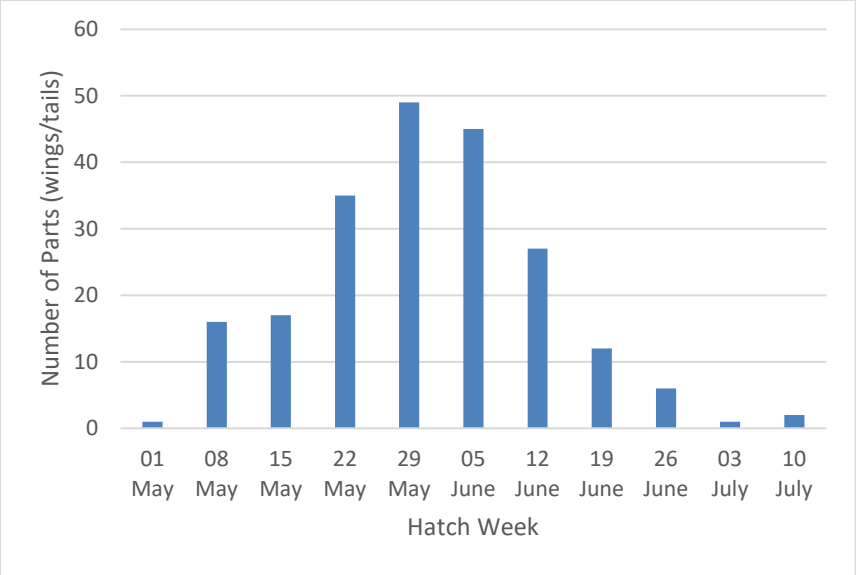

Figure 8. Timing of Oregon's 2020 ruffed grouse hatch as estimated from grouse harvested on or before 10 October.

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 Central (41%), as compared to the Northwest (48%), Northeast (51%), and Southwest (54%). The proportion of immatures to adults was higher in Central (63:37) and Northeast (60:40), whereas the ratio was lower in Southwest (42:58) and Northwest (42:58). A higher proportion of immatures indicates higher production of young. Mean hatch dates were similar across regions.

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.

	Gender Ratios				Age Ratios			Hatch Dates	
Region	**n**	**M:F**	**AM:AF**	**IM:IF**	**n**	**I:A**	**I:AF**	**n**	**Mean, Range**
Northwest	56	48:52	53:47	39:61	76	42:58	68:32	12	June 2, May 20 - June 16
Southwest	150	54:46	61:39	44:66	280	42:58	76:24	30	June 1, May 11 - June 27
Central	51	41:59	63:37	44:66	127	63:37	93:7	56	June 2, May 8 - July 2
Northeast	135	51:49	65:35	40:60	216	60:40	86:16	79	June 2, May 3 - July 11
Statewide	**442**	**51:49**	**51:49**	**43:57**	**781**	**51:49**	**81:19**	**196**	**June 1, May 3 - July 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 1983 (Table 7). From 1983-2020, hunters submitted 6,862 ruffed grouse parts from Wallowa County. Sixty-nine ruffed grouse parts were submitted in 2020. 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). In 2020, the proportion of immatures to adults was 76:24, indicating good production.

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 2020.

		Sex Ratios			Age Ratios		Hatch Dates			
Season	***n***	**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-Jun
2020	**69**	**38:62**	**44:56**	**36:64**	**76:24**	**91:9**	**31-May**	**3-May**	**to**	**30-Jun**

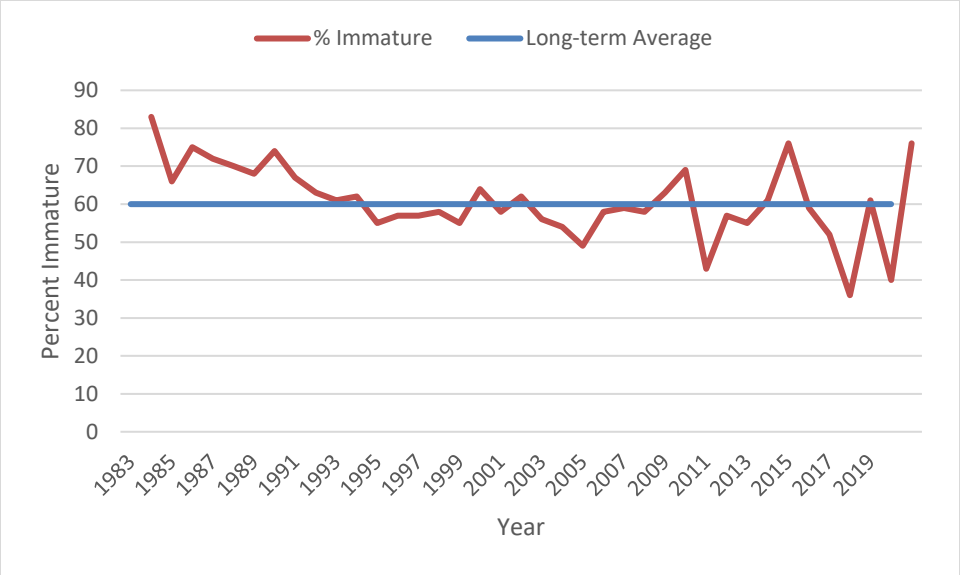

Figure 9. Proportion of immature (to adult) ruffed grouse in harvest from parts submitted by hunters in Wallowa County Oregon, 1983 to 2020 (long-term average = 60%).

SPRUCE GROUSE

Wing Collections – 1985 to 2020

Incidental to the harvest of dusky and ruffed grouse in Baker, Wallowa and Union counties, hunters deposited 219 spruce grouse parts in wing barrels from 1985 - 2020. 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, 6 spruce grouse wings were collected from Union County, compared to a total of 1 wing collected in 2019. The 1988 wing bee recorded the highest number of spruce grouse wings (*n*=27). During the past 30 plus years, immatures and adults comprised nearly equal proportions of the sample. The wings submitted in 2020 were from 3 adult males, 1 immature male, and 2 immature females. Oregon is on the southwest periphery of the natural range of spruce grouse.

MOUNTAIN QUAIL

Wing Collections – 2005 to 2020

The 2020 mountain quail season in western Oregon began 1 September and extended through 31 January with a daily bag limit of 10 quail and a possession limit of 30. In eastern

Oregon, the season began 10 October and extended through 31 January with a daily bag limit of 2 and a possession limit of 6 mountain quail. Although overall wing collection efforts focus on forest grouse, wing collection bags also instruct hunters to submit mountain quail wings. Since 2005, ODFW collected 460 mountain quail wings, averaging 27 wings per year. Wing collection efforts were above average with 57 wings collected from 8 western counties and 1 eastern Oregon county. Of the wings collected in 2020, 42 were from immatures (74%) and 14 from adults (25%).

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 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 2020-21 upland game bird validation holders showed a decrease (statewide) in "blue" grouse harvest by 30% from the 5-year average and ruffed grouse harvest decreased by 32% from the 5-year average (Table 8). Compared to last year, harvest from phone survey data was down substantially for "blue" grouse in northwest (-61%) and southwest (-30%) Oregon, which may be due to wildfires. Increases were seen in the Columbia Basin (53%) and central (27%) regions compared to last year. Phone surveys showed that ruffed grouse harvest decreased compared to last year in northwest (-54%) and northeast (-19%) and increased in the Columbia Basin (66%) and central (42%) Oregon.

Table 8. Estimated harvest of "blue" and ruffed grouse in 2020-21 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.

	Estimated Harvest	
Harvest Region	**"Blue" Grouse**	**Ruffed Grouse**
Area 1 (Northwest)	2,335	6,811
Area 2 (Southwest)	1,070	5,898
Area 3 (Columbia Basin)	1,671	3,127
Area 4 (Central)	1,054	3,600
Area 5 (Northeast)	1,841	2,954
Area 6 (Southcentral)	112	348
Area 7 (Southeast)	230	127
Total	**8,314**	**22,864**
Change from '19-20	*-30%*	*-23%*
Change from 5-year avg.('15-19)	*-30%*	*-32%*

In addition to phone surveys, the Department also conducts spring hooting surveys for sooty grouse in western Oregon. Results from 2020 spring surveys show that the sooty grouse population was relatively stable after several years of increase in the Coast Range and Cascades (Walton and Cline 2020). Hooting surveys showed a decline in southwest Oregon compared to the previous year. In comparison results from hunter harvested parts in 2020 also showed relatively high productivity as measured by the proportion of immatures for blue grouse in western Oregon. 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; however, very few routes record forest grouse so the sample size is too low to assess trends.

SUMMARY

In general, ruffed, sooty, and dusky grouse mean hatch dates in 2020 were average. Production and hatch dates varied by region; overall production for blue grouse was higher in western Oregon and production for ruffed grouse was higher in eastern Oregon. Statewide, the

proportion of immature “blue” grouse (56%) was lower than last year (71%), suggesting a decrease in production. The proportion of immatures was lower for ruffed grouse than “blue” grouse (51%); and was slightly lower than last year (57%). 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 overall down for forest grouse. Some decline in harvest was expected due to access limitations and poor air quality from wildfire in western Oregon.

The number of forest grouse wings collected in 2020 (*n*= 1,307) was up 8% from 2019 (*n*=1,201). 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.

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Appendix A: ODFW wing collection bag.

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.

Oregon Department of Fish and Wildlife