2022 Forest Grouse and Mountain Quail Parts Collection Summary

Ruffed Grouse by Kip Richmond

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INTRODUCTION

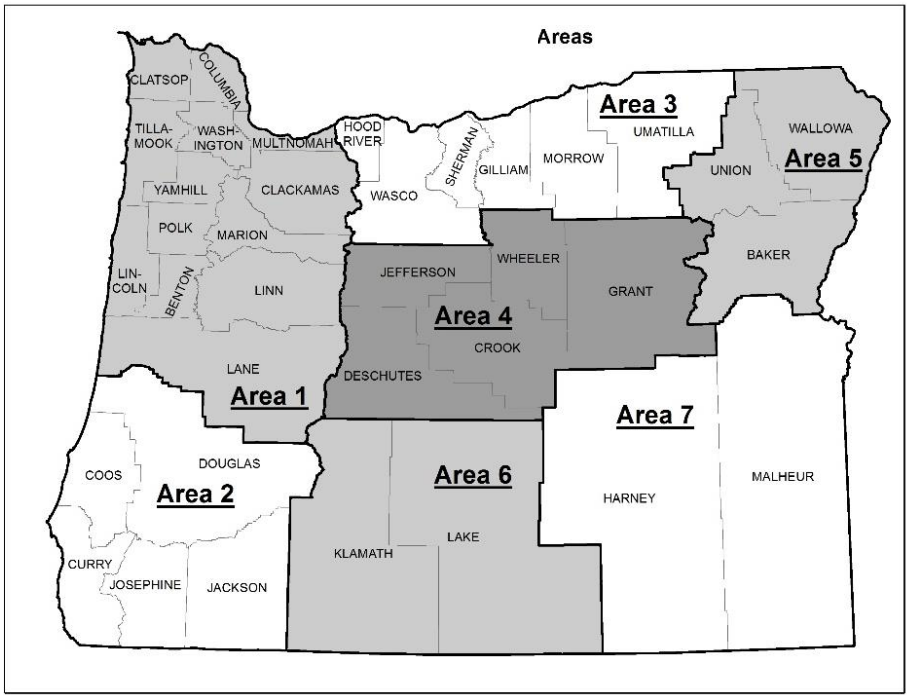
Oregon is home to four species of forest grouse, including sooty grouse *(Dendragapus fuliginosus)*, dusky grouse *(Dendragapus obscurus)*, ruffed grouse *(Bonasa umbellus)*, and spruce grouse *(Falcipennis canadensis)*. Examination of parts (i.e., wings and tails) of hunter-harvested birds can yield 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 2022, 1,264 parts from hunter harvested blue[1] (*Dendragapus spp*), ruffed, and spruce grouse were obtained from across Oregon (Table 1). 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. Wing-bees were held at Ladd Marsh Wildlife Area near La Grande on February 2, 2023, and the Umpqua Watershed District Office in Roseburg on March 14, 2023. The total number of forest grouse parts obtained in 2022 was up 7% from the previous year and was similar to the recent 5-year average of 1,256 (Figure 1). Statewide blue grouse submissions were up 55% and ruffed grouse submissions were down 14% compared to 2021. Incidental spruce grouse parts represent a small proportion of all grouse parts collected since there is no open spruce grouse hunting season in Oregon. No spruce grouse parts were submitted in 2022, down from the recent 5-year average of 3 wings. Since 2005, hunters have submitted 577 mountain quail wings. Sixty-five of those wings were collected in 2022. The number of mountain quail wings collected each year has been highly variable, ranging from 5 to 65 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 2022-23 season by harvest zone (see map below). Wing-bees were held at Ladd Marsh Wildlife Area (La Grande) on February 2, 2023 and the Umpqua Watershed District Office (Roseburg) on March 14, 2023. Wing-bee counts from 2021 are provided for comparison.

	"Blue" Grouse		Ruffed Grouse		Spruce Grouse		Mtn Quail		Total		% change from
Zone	**2022**	**2021**	**2022**	**2021**	**2022**	**2021**	**2022**	**2021**	**2022**	**2021**	**2021**
Zone 1 (Northwest)	90	49	87	102			9	15	186	166	12%
Zone 2 (Southwest)	137	103	213	205			54	36	404	344	17%
Zone 3 (Columbia Basin)	56	35	94	100			1		151	135	12%
Zone 4 (Central)	91	35	128	121			1		220	156	41%
Zone 5 (Northeast)	150	122	135	257		1			285	380	-25%
Zone 6 (Southcentral)	27	18	4	2					31	20	55%
Zone 7 (Southeast)	13	5	3	1					16	6	167%
Unknown	13	5	23	15					36	20	80%
Total	**577**	**372**	**687**	**803**	**0**	**1**	**65**	**51**	**1,329**	**1,227**	**8%**



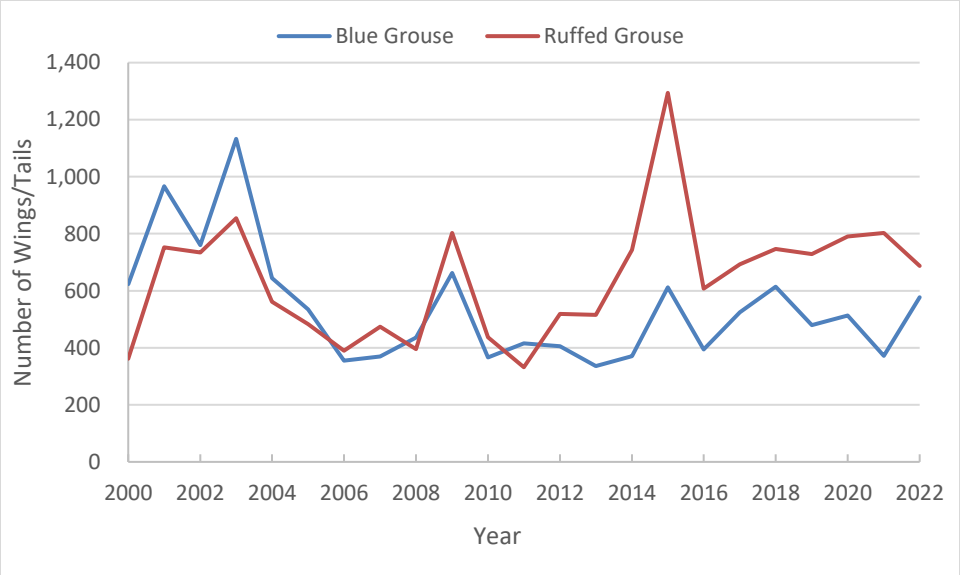


Figure 1. Number of blue and ruffed grouse parts submitted to ODFW, 2000-2022.

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 routes and randomized hunter-harvest 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 when considered 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.

METHODS

Staff collect grouse and mountain quail parts from hunters by placing collection receptacles, or "wing barrels" in locations where 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. 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. Data collected from each set of parts included: species, location and WMU or county of harvest, date of harvest, sex, age, and the stage of primary wing feather molt. 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 the 10th of 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 implements are stored inside. Photo courtesy of Tod Lum.

BLUE GROUSE RESULTS

During 2022, hunters submitted 577 parts from blue grouse in Oregon, an increase of 55% from the previous year and a 15% increase from the recent 5-year average ($\bar{x}$ = 501). The 2022 hunting season allowed a daily bag limit of 3 birds with 9 in possession from 1 September through 31 January, similar to recent years. Oregon's blue grouse can be speciated based on range and plumage characteristics. For sooty grouse, hunters harvested 17% of the wings and tails during the first week of the season and 40% by the end of September. There is a small peak in submissions the first two weeks of the season and 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 41% of the wings and tails during the first week of the season and 67% by the end of September.

Eastern Oregon hunters provided 59% (*n* = 340) of the wings and tails submitted, a 60% increase from the number received in 2021 (*n* = 212). The majority of submissions from eastern Oregon were from Wallowa (29%), Grant (22%), and Union (11%) counties. The remainder of the eastern Oregon submissions came from 11 other counties. Western Oregon contributed 237 wings and tails from 14 counties, a 52% increase from the previous year (*n* = 156). The majority of the submissions were from Douglas (41%), Linn (22%), and Jackson (8%) counties.

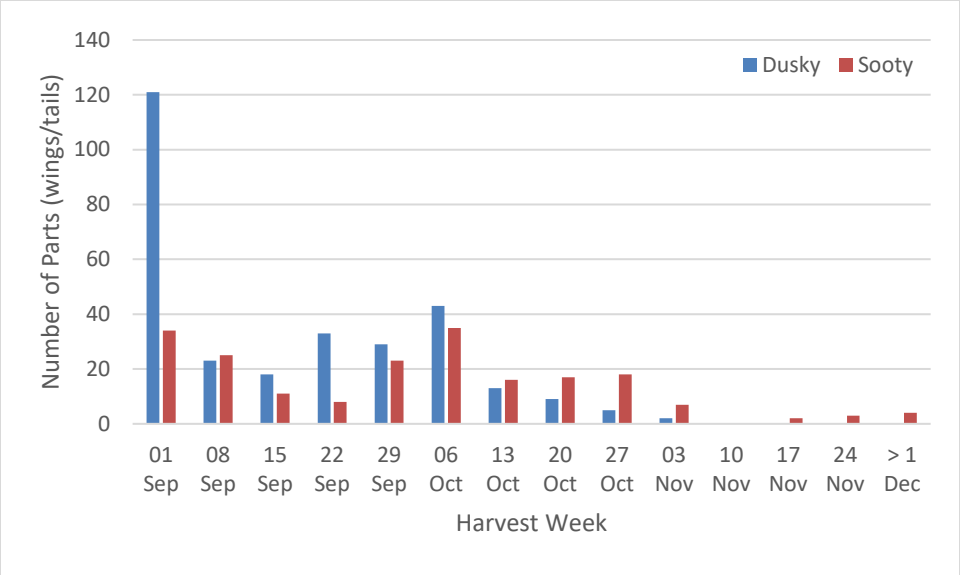


Figure 3. The number of dusky and sooty grouse parts collected by week of reported harvest during the 2022-23 Oregon hunting season.

Age and Sex Ratios

Immature grouse comprised 73% 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 for sooty grouse and dusky grouse were similar. The proportion of all immature blue grouse in the first two weeks of 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, 46% of adult sample, and 46% of immatures in 2022 (from parts collected during the first two weeks).

Table 2. Blue grouse sex ratios, age ratios, and hatch dates by species in 2022-23 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	144	49:51	57:43	45:55	141	74:26	87:13	--	--
Total	339	45:55	57:43	40:60	336	71:29	85:15	152	June 3, May 5 - July 20
Sooty									
1st 2 wks	57	40:60	24:76	48:52	59	71:29	76:24	--	--
Total	227	49:51	46:54	51:49	236	70:30	81:19	78	June 18, May 11 - July 20
All									
1st 2 wks	201	47:53	46:54	46:54	200	73:27	83:17	--	--
All Total	566	47:53	52:48	45:55	572	71:29	83:17	265	June 8, May 5 - July 20

Hatching Chronology

Statewide, hatch dates for dusky and sooty grouse harvested during the 2022 hunting season ranged from 5 May - 20 July, which is similar to previous years. Dusky grouse hatch dates ranged from 5 May - 20 July, with a mean hatch date of 3 June. Sooty grouse hatch dates ranged from 11 May – 20 July. The mean hatch date was 18 June (Table 2 & Figure 4), which is 10 days later than in 2021. Spring conditions in western Oregon were cooler than average, with measurable snow late into the spring. For dusky grouse, 75% hatched between 14 May - 22 June, while 75% of sooty grouse hatched between 2 June - 6 July. In most years, the peak sooty grouse hatch date is later than the peak dusky grouse hatch.

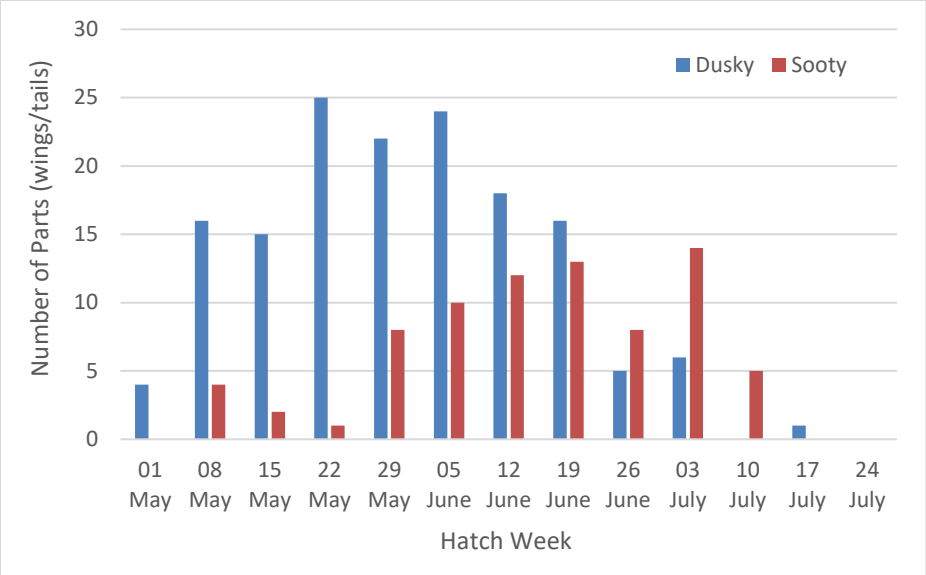


Figure 4. Week of hatch for dusky and sooty grouse in Oregon as estimated from primary feathers from hunter-harvested wings during 2022. Hatch dates were only estimated for birds that were harvested on or before October 10.

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 (Area 5) regions (see map of regions on page 3) to make region specific calculations (Table 3). In the Northeast region, 47% of wings were from males, in the Southwest 52%, in the Northwest 45%, and in the Central 42% were from males. 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 Northeast 76%, Northwest 72%, Central 68%, and Southwest 68% of the samples were from immatures, indicating good production. Mean hatch date varied by region, with the earliest average date for Northeast (2 June) and Central (5 June) and the latest for Northwest (19 June) and Southwest (17 June) Oregon.

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	87	45:55	36:64	48:52	90	72:28	80:20	31	June 17, May 11 - July 16
Southwest	131	52:48	52:48	52:48	136	68:32	82:18	56	June 19, May 13 - July 20
Central	91	42:58	52:48	37:63	91	68:32	82:18	46	June 5, May 5 - July 6
Northeast	149	47:53	58:42	42:58	147	76:24	88:12	77	June 2, May 6 - July 20
Statewide	566	47:53	52:48	45:55	572	71:29	83:17	265	June 8, May 5 - 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. From 1980 - 2022, hunters in Wallowa County submitted parts representing 10,075 dusky grouse. In 2022, hunters submitted 100 wings, down 58% from the average since the wing-bee began in 1980 ($\bar{x}$ =238) and similar to the recent 5-year average ($\bar{x}$ =101). The immature proportion of the harvest (76%) was above the long-term average of 61%, suggesting good production in 2022 (Figure 5 and Appendix B).

The mean hatch date was 30 May and ranged from 6 May to 25 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 (Appendix B).

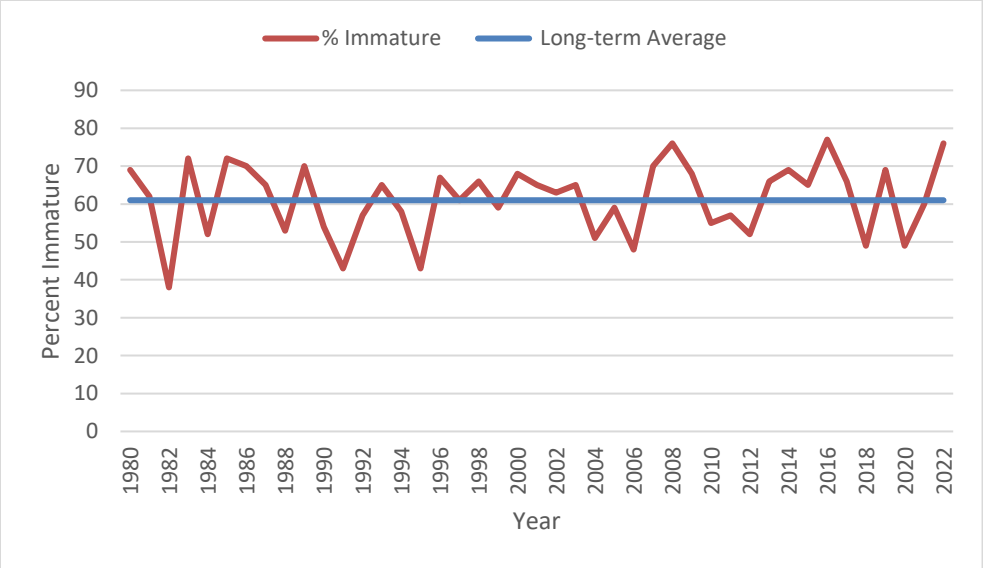


Figure 5. Proportion of immature (to adult) dusky grouse in harvest from parts submitted by hunters in Wallowa County Oregon, 1980 to 2022 (long-term average = 61%).

RUFFED GROUSE RESULTS

In 2022, hunters submitted 687 ruffed grouse parts, a 14% decrease from 2021 (*n* = 803) and a 9% decrease from the recent 5-year average (*n* = 752). The 2022 ruffed grouse hunting season allowed a daily bag limit of 3 birds with 9 in possession, similar to recent years. 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 2022; 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 6). In western Oregon, hunters submitted 8% (*n* = 22) of the ruffed grouse parts during the first week of the season, 23% (*n* = 67) from birds harvested in September, and 47% from birds harvested in October (*n* = 135). In eastern Oregon, hunters submitted 14% (*n* = 44) 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 2022, 47% (*n* = 145) of parts were from birds harvested in September and 51% from birds harvested in October (*n* = 158).

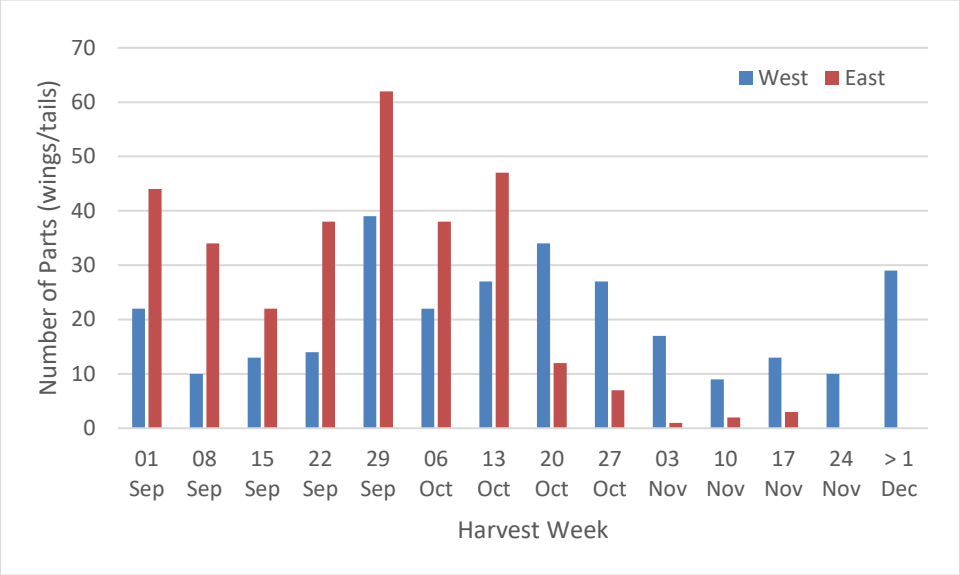


Figure 6. Timing of 2022 ruffed grouse harvest in western and eastern Oregon as estimated from ruffed grouse parts with harvest dates.

In eastern Oregon, hunters submitted 363 parts, a 26% decrease from 2021 (*n* = 488) and 6% below the recent 5-year average ($\bar{x}$= 388). Most of the samples collected in eastern Oregon were from Grant (32%), Wallowa (17%), Union (15%), Umatilla (15%), Morrow (8%), and Baker (5%) counties. In western Oregon, hunters submitted 324 ruffed grouse samples, a 4% increase from 2021 (*n* = 311) and 9% below the recent 5-year average ($\bar{x}$= 356). Collection efforts in Douglas County accounted for the majority of the parts (41%), followed by Jackson (15%), Linn (14%), Coos (6%), and Clackamas (4%) counties. Parts were collected from a total of 15 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 45% of the ruffed grouse submissions. Age was determined for 99% of the samples obtained statewide. Immature grouse comprised 48% of the eastern Oregon and 61% 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 43% of the statewide harvest of ruffed grouse, including 46% in eastern Oregon and 41% in western Oregon (Table 4). 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 55% of the samples harvested during the first two weeks of the season with sufficient material to determine sex. The proportion of adult males was 59% for eastern and 42% for 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 4. Sex ratios, age ratios and hatching dates of ruffed grouse as determined from parts submitted by hunters from Oregon harvest during the 2022-23 hunting season.

	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	46	59:41	71:29	48:52	77	48:52	84:16	--	--
Total	183	52:48	55:45	49:51	359	46:54	78:22	99	June 4, May 4 - July 19
West									
1st 2 wks	12	42:58	40:60	33:67	31	61:39	86:14	--	--
Total	196	48:52	53:47	40:60	318	41:59	70:30	46	June 8, May 4 - July 31
All									
1st 2 wks	58	55:45	66:34	44:56	108	52:48	85:15	--	--
All Total	379	50:50	54:46	45:55	677	43:57	75:25	145	June 5, May 4 - July 31

Hatching Chronology

The mean hatch date for ruffed grouse collected no later than October 10th was June 5. Hatch dates were estimated from 145 parts, of which 46 were from western Oregon and 99 in eastern Oregon (Table 4). Peak hatch dates for ruffed grouse were slightly later than the previous year and the long-term average. Hatch dates ranged from May 4 to July 31, with 75% of ruffed grouse in the harvest hatching between May 20 and June 19 (Figure 7).

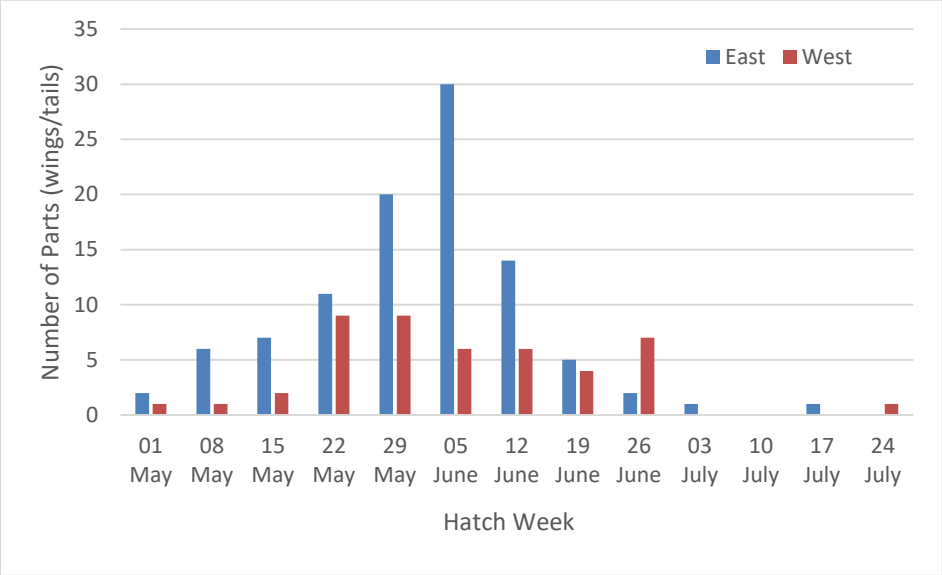


Figure 7. Timing of Oregon's 2022 ruffed grouse hatch as estimated from grouse harvested on or before 10 October.

Region Specific Ratios and Hatching Chronology

Wing collection efforts were sufficient in the Northwest, Southwest, Central, and Northeast regions (see page 3 for map of regions) to make region-specific calculations (Table 5). Males comprised the lowest percentage of the sample in the Southwest (44%) and Northeast (49%), as compared to the Central (58%) and Northwest (59%). The proportion of immatures to adults was higher in Northeast (52%), whereas the ratio was lower in Southwest (42%), Northwest (40%) and Central (39%). A higher proportion of immatures indicates higher production of young. Mean hatch dates were similar in Northeast, Central, and Southwest (June 4 – 7), but later in Northwest (June 12).

Table 5. 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	59:41	68:32	48:52	85	40:60	76:24	20	June 12, May 20 - June 29
Southwest	131	44:56	48:52	36:64	209	42:58	70:30	39	June 7, May 4 - July 31
Central	59	58:42	68:32	43:57	126	39:61	80:20	33	June 6, May 7 - July 19
Northeast	75	49:51	49:51	50:50	135	52:48	79:21	53	June 4, May 8 - July 5
Statewide	**379**	**50:50**	**54:46**	**45:55**	**677**	**43:57**	**75:25**	**145**	**June 5, May 4 - July 31**

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 (Appendix C). From 1983-2022, hunters submitted 7,028 ruffed grouse parts from Wallowa County. Sixty-one ruffed grouse parts were submitted in 2022. 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. Since 2001, age ratios have been variable, averaging at 60% immatures (Figure 8 & Appendix C).

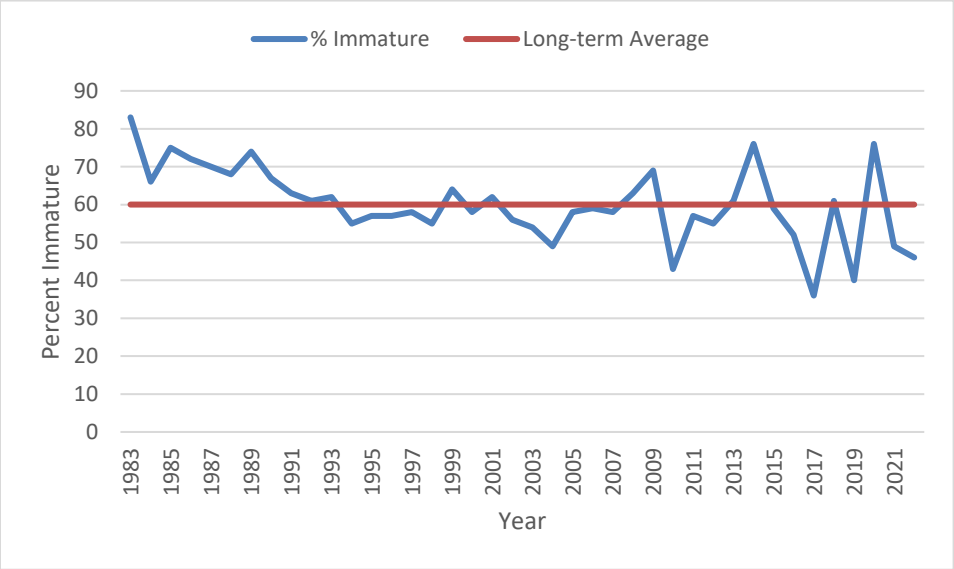


Figure 8. Proportion of immature (to adult) ruffed grouse in harvest from parts submitted by hunters in Wallowa County Oregon, 1983 to 2022 (long-term average = 60%).

SPRUCE GROUSE

Wing Collections – 1985 to 2022

Incidental to the harvest of dusky and ruffed grouse in Baker, Wallowa and Union counties, hunters deposited 220 spruce grouse parts in wing barrels from 1985 - 2022. To educate and remind hunters that there is no open season for spruce grouse, signs are posted in Northeast Oregon and the current game bird hunting regulations have a call-out box reminding hunters not to shoot spruce grouse. Oregon is on the southwest periphery of the natural range of spruce grouse. In 2022, no spruce grouse parts were submitted. The 1988 wing bee recorded the highest number of spruce grouse wings (*n*=27). During the past 35+ years, immatures and adults comprised nearly equal proportions of the sample.

MOUNTAIN QUAIL

Wing Collections – 2005 to 2022

The 2022 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 8 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 577 mountain quail wings, averaging 32 wings per year. Wing collection efforts were above average in 2022, with 65 wings collected from 8 western and 2 eastern counties. Of the wings collected in 2022, 53 were from immatures (82%) and 12 from adults (18%).

HARVEST AND PRODUCTION INFORMATION FROM OTHER SURVEYS

Each year the department conducts surveys of upland game bird validation holders to estimate hunter effort and harvest. In the past, surveys have been conducted by phone, but in 2021 surveys were transitioned to email-based questionnaires to more efficiently increase survey sample size. The email survey contains an online link to a survey form for hunters to fill out. Biologists 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 email surveys of 2022-23 upland game bird validation holders showed a 40% increase (statewide) in blue grouse harvest from last year and harvest was 21% above the 5-year average. Estimates for ruffed grouse were down 17% from last year and down 7% from the 5-year average. By region, harvest was down for blue grouse in the Northeast (-2%). Increases were seen in the Southwest (5%), Columbia Basin (14%), Northwest (53%), Central (66%), and Southcentral (252%) regions compared to last year. Harvest surveys showed that ruffed grouse harvest decreased compared to last year in the Northwest (-20%), Columbia Basin (-36%), Northeast (-41%), and Central (-45%) and increased in the Southwest (29%) and Southcentral (328%) regions compared to last year (Table 6).

Table 6. Estimated harvest of blue and ruffed grouse in 2022-23 calculated from email surveys of Oregon upland game bird validation holders (n = 10,539 survey responses). The state is divided into 7 harvest regions, a general description is included in parentheses and see page 3 for a map.

	Estimated Harvest	
Harvest Region	**"Blue" Grouse**	**Ruffed Grouse**
Area 1 (Northwest)	3,334	9,527
Area 2 (Southwest)	2,011	6,542
Area 3 (Columbia Basin)	1,130	2,916
Area 4 (Central)	2,831	3,074
Area 5 (Northeast)	2,282	4,152
Area 6 (Southcentral)	841	976
Area 7 (Southeast)	643	2,051
Total	**13,071**	**29,237**
Change from '21-22	*+40%*	*-17%*
Change from 5-year avg.('17-21)	*+21%*	*-7%*

In addition to harvest surveys, the department also conducts spring hooting surveys for sooty grouse in western Oregon. The department, in collaboration with Oregon State University, is in the process of using mixed models to determine population trends from the hooting surveys. Lastly, some ODFW wildlife districts conduct summer production surveys (brood counts) for upland game birds; however, very few routes record forest grouse so the sample size is too low to assess trends.

SUMMARY

Statewide blue grouse submissions were up 15% compared to the 5-year average and up 55% from 2021. Ruffed grouse submissions were down 9% from the 5-year average and down 14% from 2021. The mean hatch date for sooty grouse was later than average and 10 days later than in 2021, likely due to heavy snowpack in the Coast and Cascade ranges that extended into late spring. The mean hatch date for dusky grouse was average. Production and hatch dates varied by region; overall production for blue grouse was moderate to high. Email harvest survey results showed increased harvest of blue grouse compared to 2021 and compared to the 5-year average. The mean hatch date for ruffed grouse was slightly later than average, especially in the Northwest region. Production, measured by the number of parts collected and the proportion of immatures, was down for ruffed grouse. Email harvest surveys also indicated an overall decrease in ruffed grouse harvest compared to the previous year and the 5-year average.

The number of wing barrels placed out in the field has been fairly consistent over the last 5 years. Placing wing barrels spread throughout forested areas of the state achieves greater confidence in age and sex ratios and hatch dates in each region and spreads the workload out between districts. Ten years ago, there was a large disparity between the numbers of wings collected on the east vs west side of the state despite the amount of hunter effort on the west side; however, that difference has decreased with the increase in collection efforts on the west side.

Statewide education efforts directed at the need and value of returning wings and tails increase hunter awareness and participation. The game bird hunting regulations, field offices, and department social media provide information on wing collection efforts. These efforts 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.

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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

Appendix B: 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 2022.

		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

		Sex Ratios			Age Ratios		Hatch Information			
Season	***n***	**M:F**	**AM:AF**	**IM:IF**	**I:A**	**I:AF**	**Mean**	**Range**		
2020	79	60:40	67:33	53:47	49:51	75:25	1-Jun	4-May	to	30-Jun
2021	71	54:46	72:28	45:55	60:40	86:14	29-May	5-May	to	2-Jul
2022	**100**	**44:56**	**58:42**	**39:61**	**76:24**	**88:12**	**30-May**	**6-May**	**to**	**25-Jun**

Appendix C: 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 2022.

		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
2021	105	47:53	39:61	55:45	49:51	69:31	26-May	7-May	to	18-Jun
2022	**61**	**48:52**	**52:48**	**43:57**	**46:54**	**74:26**	**2-Jun**	**13 May**	**to**	**17-Jun**