

NEBRASKA



HUNTER & ANGLER RESEARCH

Species Specific Reports

Nathaniel Price and Christopher Chizinski

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Chapter 1

Introduction

In this document, we provide species-specific reports for deer, turkey, waterfowl, and the hunt (small/upland game) permits with the following items:

1. Retention rate of those purchasing a youth permit the 1st, 2nd, and 3rd time
2. Retention rate of those with a youth permit and then purchasing a license between the ages of 16-24 years old
3. % of people who harvest a deer and purchase a permit the following year vs those who do not harvest a deer previous year¹
4. Permit sales timeline for the new hunter
5. How many people purchase a deer permit if they also buy a turkey permit, etc.
6. Overall permit purchases * By gender * % of population that purchases a permit by county
7. Timeline of permit purchases by species
8. % of people that purchase a fish and hunt permit

This report is organized with an introduction followed by separate chapters for each species specific report. Each chapter is divided into four sections:

1. Overall Permit Purchases (item 6)
2. Youth Retention (items 1 and 2)
3. Timelines (items 4 and 7)
4. Permit Associations (items 5 and 8)

Electronic permit records for deer and turkey permits started in **2008**. Electronic records for other permit types did not start until **2010**. Therefore, some plots and metrics are not directly comparable among these permit types. Data presented in this report refer to both residents and non-residents, except for information on participation rate. For the calculations participation rate, data was limited to residents only.

¹It was not possible to address this item because harvest data was not available.

Chapter 2

Deer

2.1 Overall Permit Purchases

2.1.1 Participants

The number of female deer hunter participants ranged from 7495 to 11042 and male deer hunter participants ranged from 84408 to 95231. The number of male and female deer hunters between 2008 and 2017 is shown in Figure 2.1.

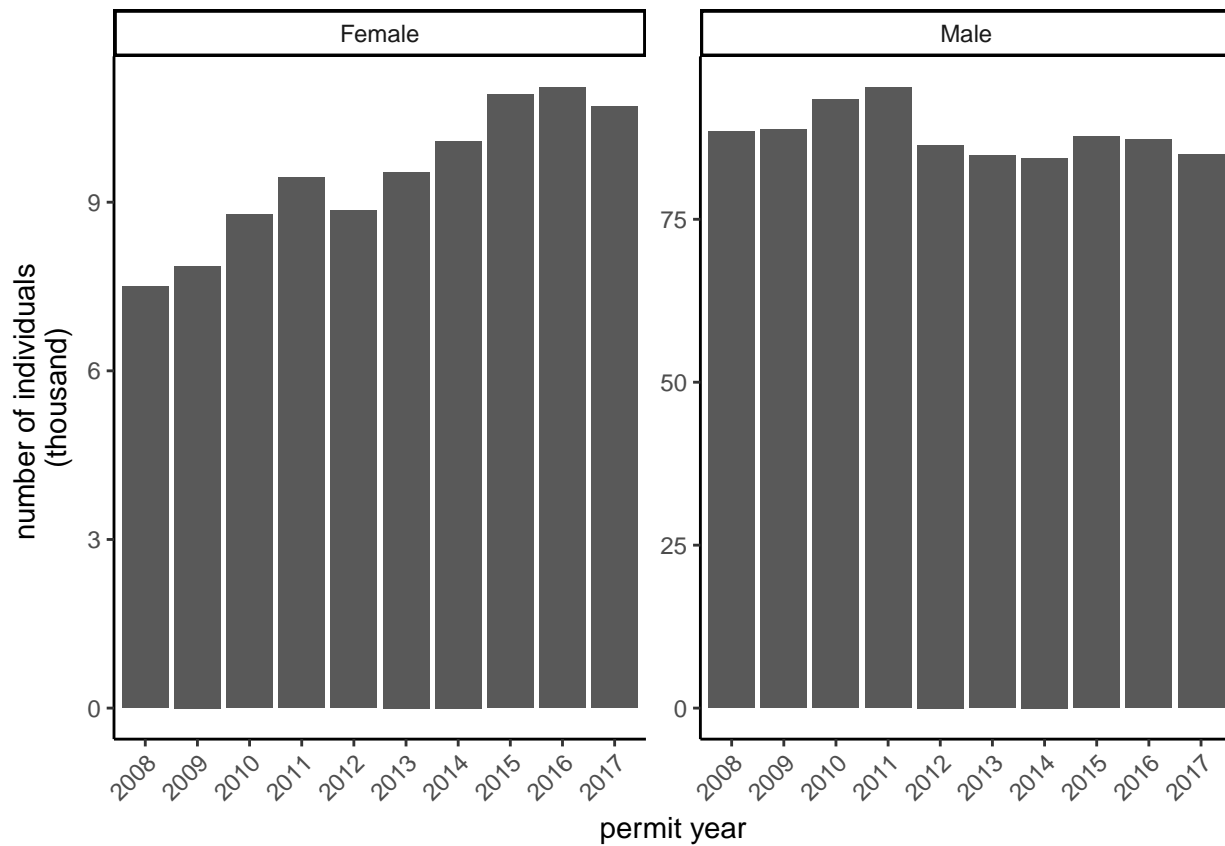


Figure 2.1: Number of individual deer hunters by permit year and gender.

2.1.2 Participation rate

Participation rate is defined as the number of individuals with Nebraska addresses who purchased resident permits divided by the total county population. The county population estimates are 5-year estimates from the 2010-2015 American Community Survey (ACS).

In 2017, participation rate ranged from a low in Douglas county (1.2%) to a high in Keya Paha county (20.7%). The average across counties was 9.4%. Due to the unequal distribution of the population across counties, the overall state participation rate was 4.3%. The 2017 deer hunter participation rate by county is shown in **Figure 2.2** and listed in **Table 2.1**.

Participation Rate

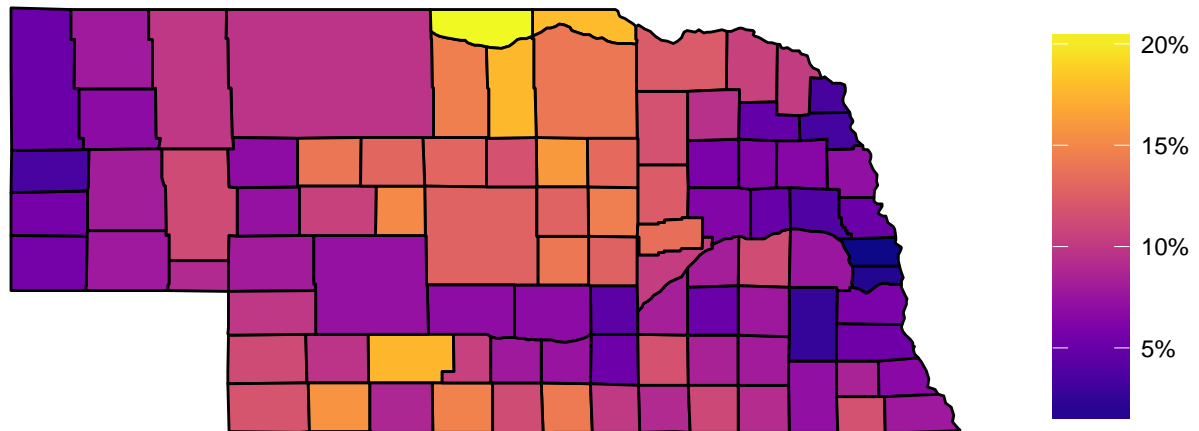


Figure 2.2: Participation rates of deer hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population.

Table 2.1: Participation rates of deer hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population.

county	population	participants	participation rate (%)
Adams	31536	1652	5.2
Antelope	6421	743	11.6
Arthur	437	32	7.3
Banner	793	45	5.7
Blaine	580	75	12.9
Boone	5353	660	12.3
Box Butte	11279	776	6.9
Boyd	2006	357	17.8
Brown	3022	439	14.5
Buffalo	48402	3329	6.9
Burt	6594	471	7.1
Butler	8205	927	11.3
Cass	25463	1514	5.9
Cedar	8657	915	10.6

2.1. OVERALL PERMIT PURCHASES

Table 2.1: Participation rates of deer hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population. (*continued*)

county	population	participants	participation rate (%)
Chase	4061	454	11.2
Cherry	5781	558	9.7
Cheyenne	10090	791	7.8
Clay	6313	737	11.7
Colfax	10499	517	4.9
Cuming	9055	597	6.6
Custer	10784	1380	12.8
Dakota	20697	711	3.4
Dawes	9082	718	7.9
Dawson	23924	1668	7.0
Deuel	1932	174	9.0
Dixon	5809	595	10.2
Dodge	36679	1422	3.9
Douglas	543253	6634	1.2
Dundy	1823	216	11.8
Fillmore	5676	481	8.5
Franklin	3076	438	14.2
Frontier	2599	457	17.6
Furnas	4850	713	14.7
Gage	21778	1563	7.2
Garden	1930	216	11.2
Garfield	1968	316	16.1
Gosper	1977	208	10.5
Grant	647	45	7.0
Greeley	2447	354	14.5
Hall	61105	2689	4.4
Hamilton	9118	751	8.2
Harlan	3465	390	11.3
Hayes	1013	98	9.7
Hitchcock	2866	452	15.8
Holt	10360	1457	14.1
Hooker	669	94	14.1
Howard	6365	812	12.8
Jefferson	7354	671	9.1
Johnson	5167	440	8.5
Kearney	6548	491	7.5
Keith	8103	648	8.0
Keya Paha	736	152	20.7
Kimball	3713	209	5.6
Knox	8551	1047	12.2
Lancaster	301707	7823	2.6
Lincoln	35777	2618	7.3
Logan	830	126	15.2

Table 2.1: Participation rates of deer hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population. (*continued*)

county	population	participants	participation rate (%)
Loup	542	63	11.6
Madison	35125	2092	6.0
McPherson	425	45	10.6
Merrick	7793	802	10.3
Morrill	4843	392	8.1
Nance	3607	489	13.6
Nemaha	7101	473	6.7
Nuckolls	4352	392	9.0
Otoe	15890	847	5.3
Pawnee	2695	312	11.6
Perkins	2911	289	9.9
Phelps	9236	728	7.9
Pierce	7179	681	9.5
Platte	32703	2060	6.3
Polk	5242	429	8.2
Red Willow	10884	954	8.8
Richardson	8149	639	7.8
Rock	1407	249	17.7
Saline	14356	1151	8.0
Sarpy	172460	3219	1.9
Saunders	20946	1598	7.6
Scotts Bluff	36599	1279	3.5
Seward	17113	1324	7.7
Sheridan	5259	523	9.9
Sherman	3090	435	14.1
Sioux	1274	66	5.2
Stanton	6022	377	6.3
Thayer	5163	570	11.0
Thomas	675	88	13.0
Thurston	6989	232	3.3
Valley	4240	542	12.8
Washington	20338	1045	5.1
Wayne	9414	450	4.8
Webster	3665	370	10.1
Wheeler	805	107	13.3
York	13842	695	5.0

2.2 Youth Retention

Youth who were age 15 in 2008 would be age 24 in 2017. In 2008, there were 1937 deer hunters who were age 15. The percent of 15-year-olds from 2008 and the number of times they purchased between ages 16 and 24 is shown in **Figure 2.3**. By 2017, 1668 of these individuals had purchased once or more. The percent

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of 15-year-old youth deer hunters who purchased once or more between ages 16 and 24 was 86%. Of the original 1937 deer hunters, 391 individuals or 20% purchased every year between ages 16 and 24.

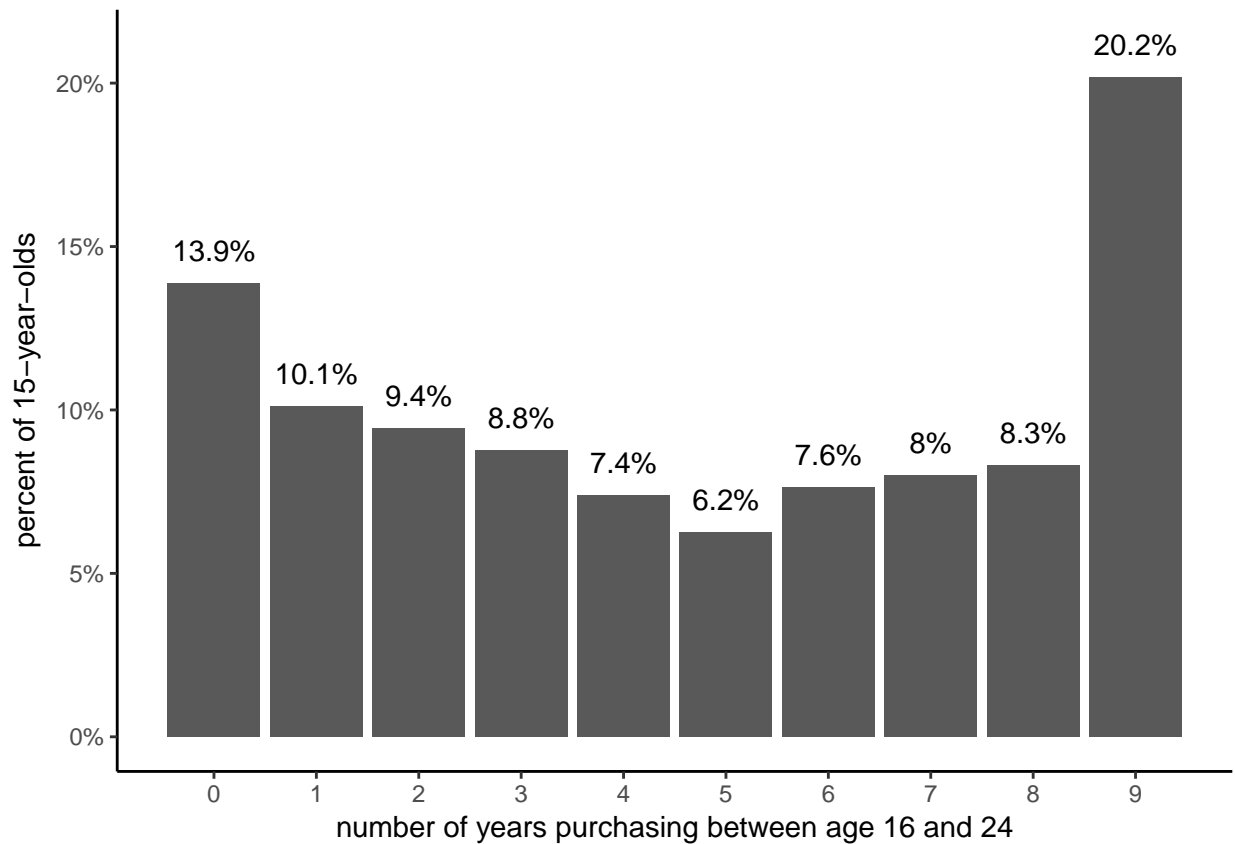


Figure 2.3: The 15-year-old deer hunters who purchased in 2008 were tracked until age 24 in 2017. The number of years a purchase was made between ages 16 and 24 was counted for each individual. The height of the bars indicates the percent of individuals who made a purchase for the number of years indicated on the horizontal axis. The total of all bars is 100%.

2.3 Timelines

For this analysis, permit purchase timelines were defined as the month a permit was purchased in a given permit year. A permit year was defined as starting in November of the previous year and extending to January of the following year. The number of individual deer hunters purchasing each month was counted and the results are plotted in **Figure 2.4**. Most purchases were made in November.

Permit purchase timelines were also created for new participants. New participants were defined as those individuals who had not purchased in the previous 5 years. The number of new deer hunters purchasing each month was counted and the results are plotted in **Figure 2.5**. Most purchases by new participants were made in November.

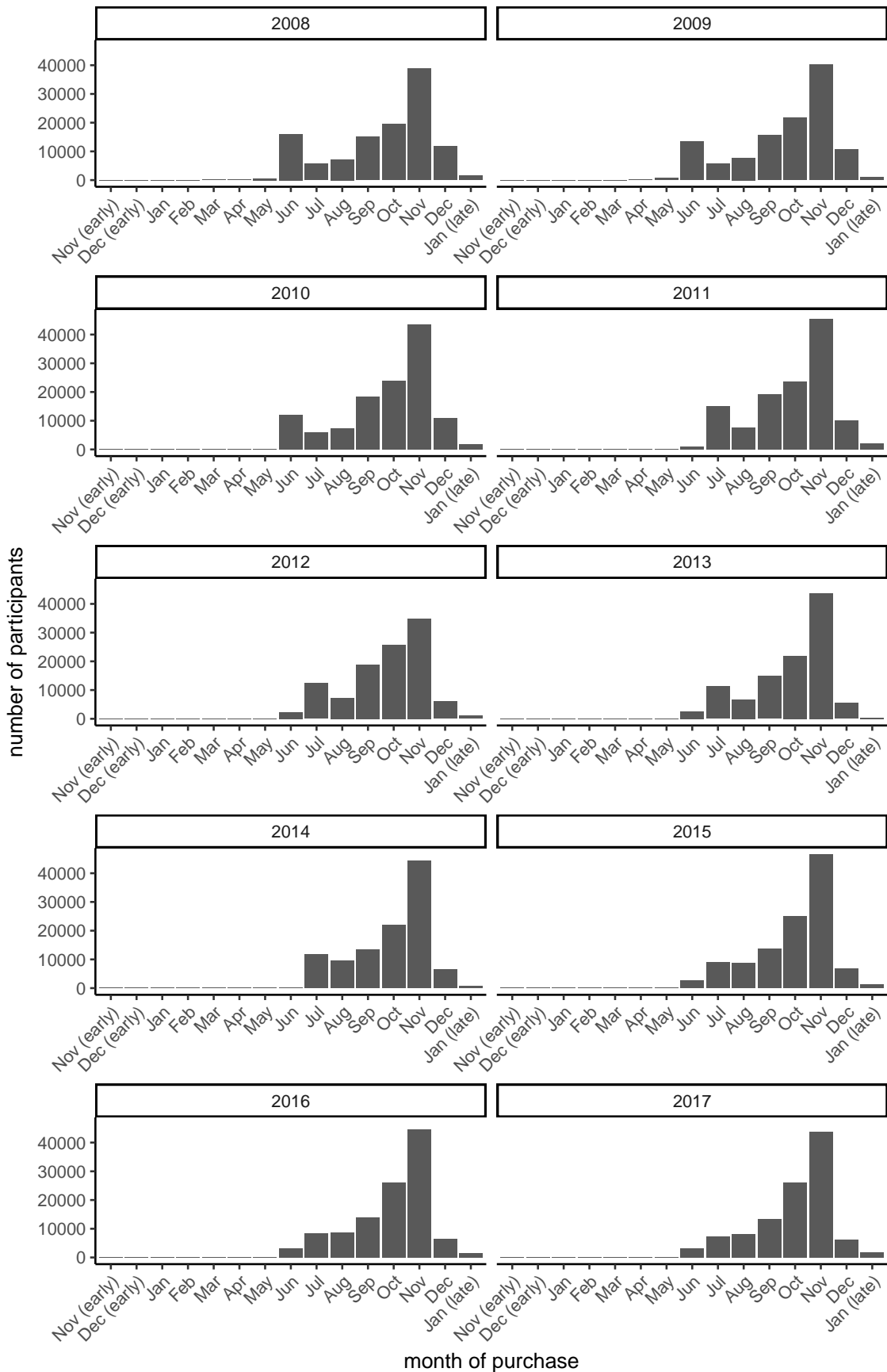


Figure 2.4: The number of participants purchasing a deer hunter permit in a month from 2008 to 2017 .

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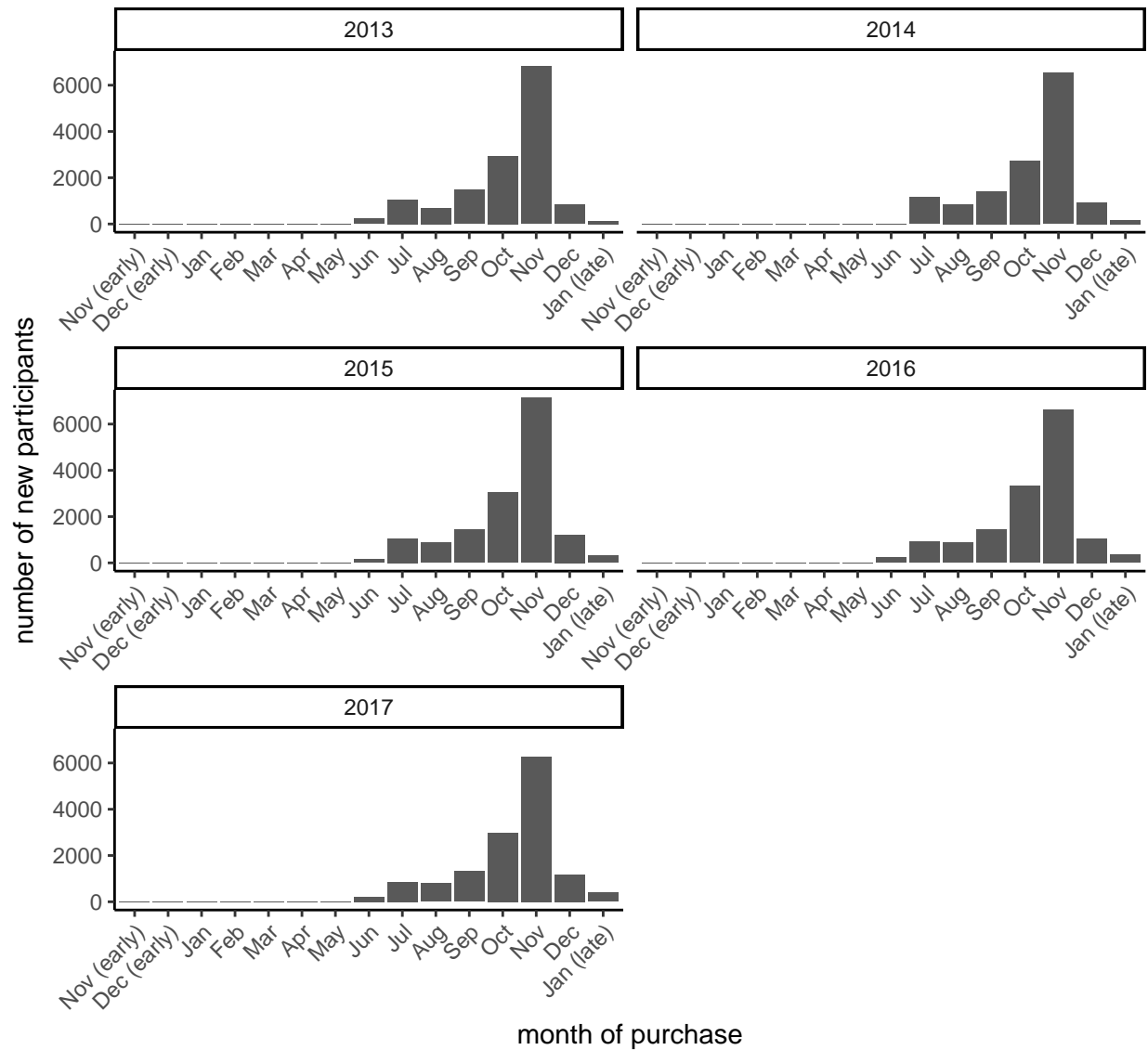


Figure 2.5: The number of new participants purchasing a deer hunter permit in a month from 2008 to 2017. New participants were defined as individuals who have not purchased in at least 5 years.

2.4 Permit Associations

Individual deer hunters may purchase a variety of other permits in a given year. Identifying patterns in purchasing multiple items is referred to as associations or cross-buying. We analyzed the purchases made in 2017 to identify permit purchase associations. **Figure 2.6** shows the number deer hunters purchasing a given combination permit types. On the horizontal axis, dots with connecting lines indicate a combination of permits and the bars above indicate the number of individuals with that combination of permits. Each individual has a particular combination of permits and is therefore only counted in the bar corresponding to their purchase combination.

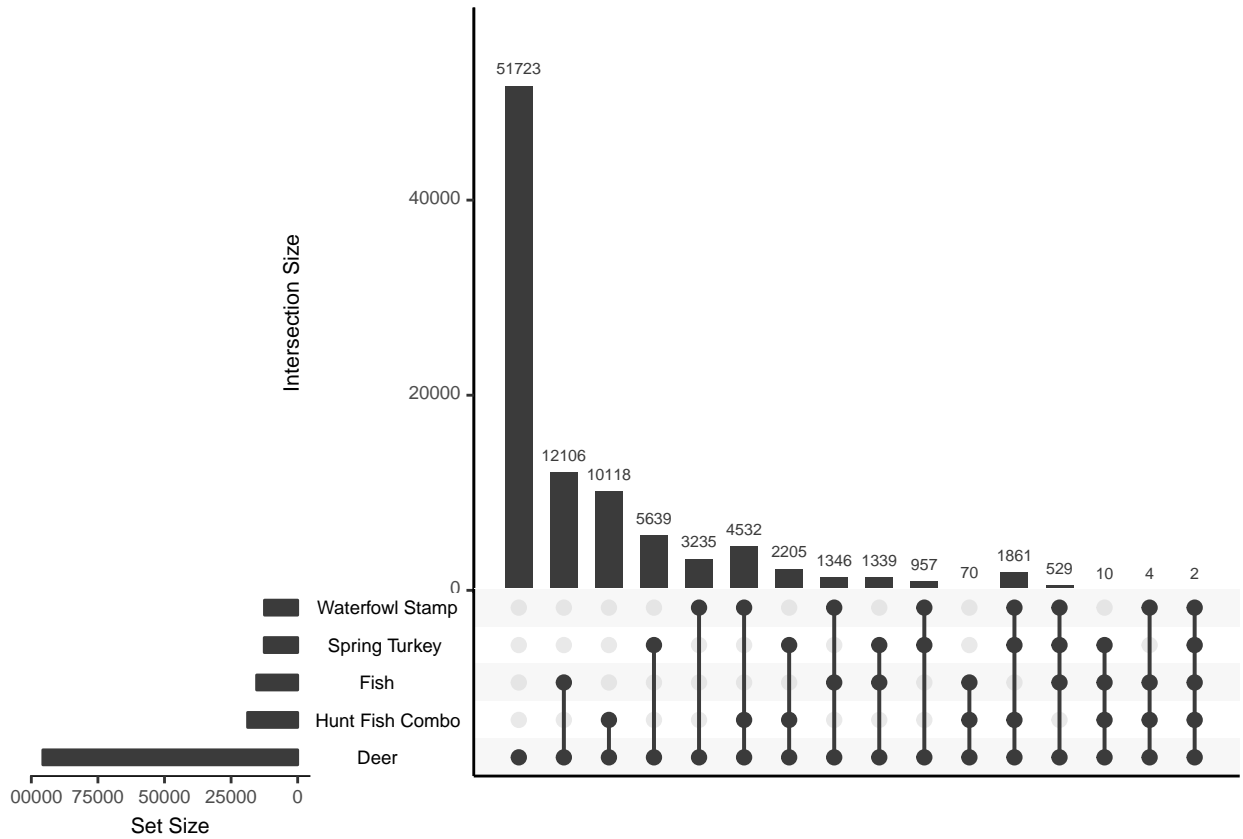


Figure 2.6: Permit associations of deer hunters in 2017.

We also examined the percent of deer hunters purchasing various other permit types. **Figure 2.7** shows the percent of deer hunters who also purchased the permit type shown on the horizontal axis. Note that the bars do not add up to 100% because an individual may purchase several other permits or no other permits.

2.4. PERMIT ASSOCIATIONS

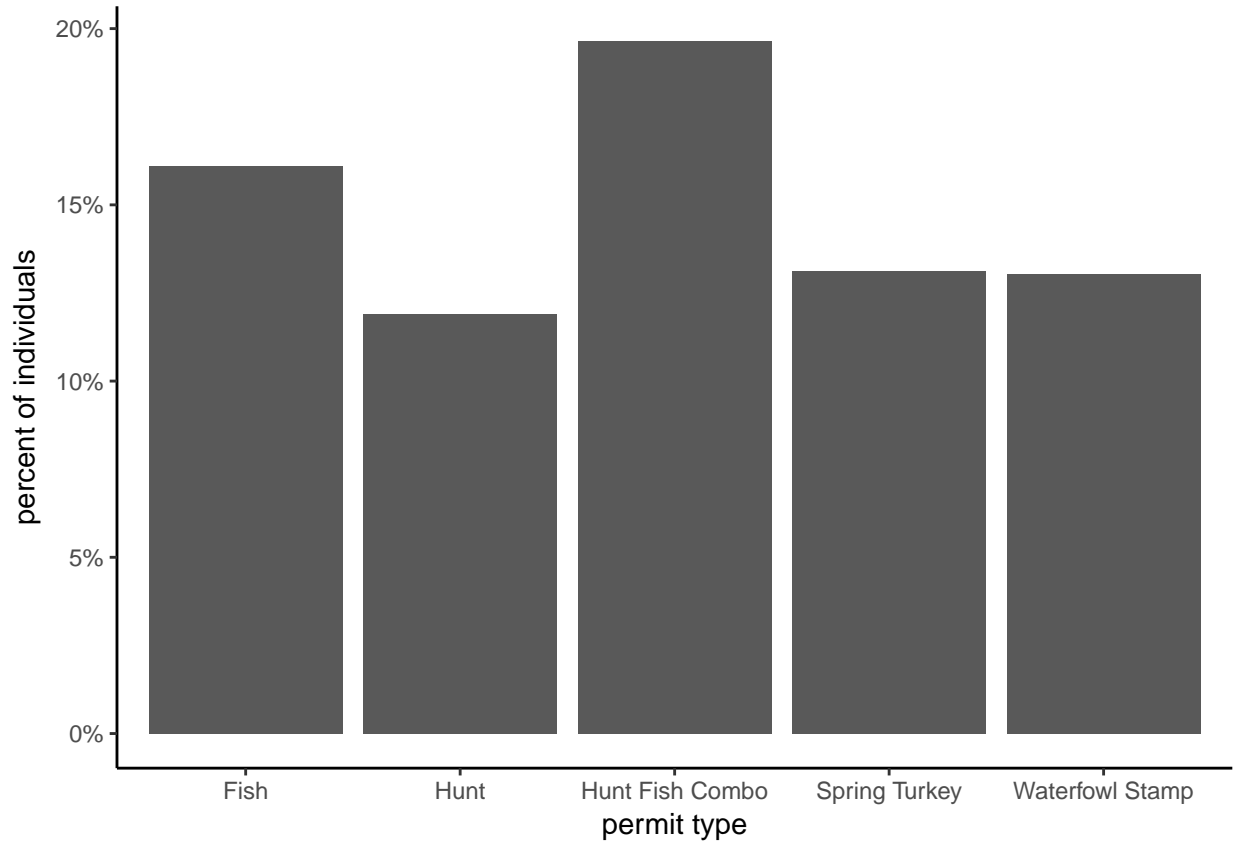


Figure 2.7: Percent of deer hunters in 2017 who also purchased another permit type.

Chapter 3

Spring Turkey

3.1 Overall Permit Purchases

3.1.1 Participants

The number of female spring turkey hunter participants ranged from 1280 to 2071 and male spring turkey hunter participants ranged from 24049 to 28037. The number of male and female spring turkey hunters between 2008 and 2017 is shown in **Figure 3.1**.

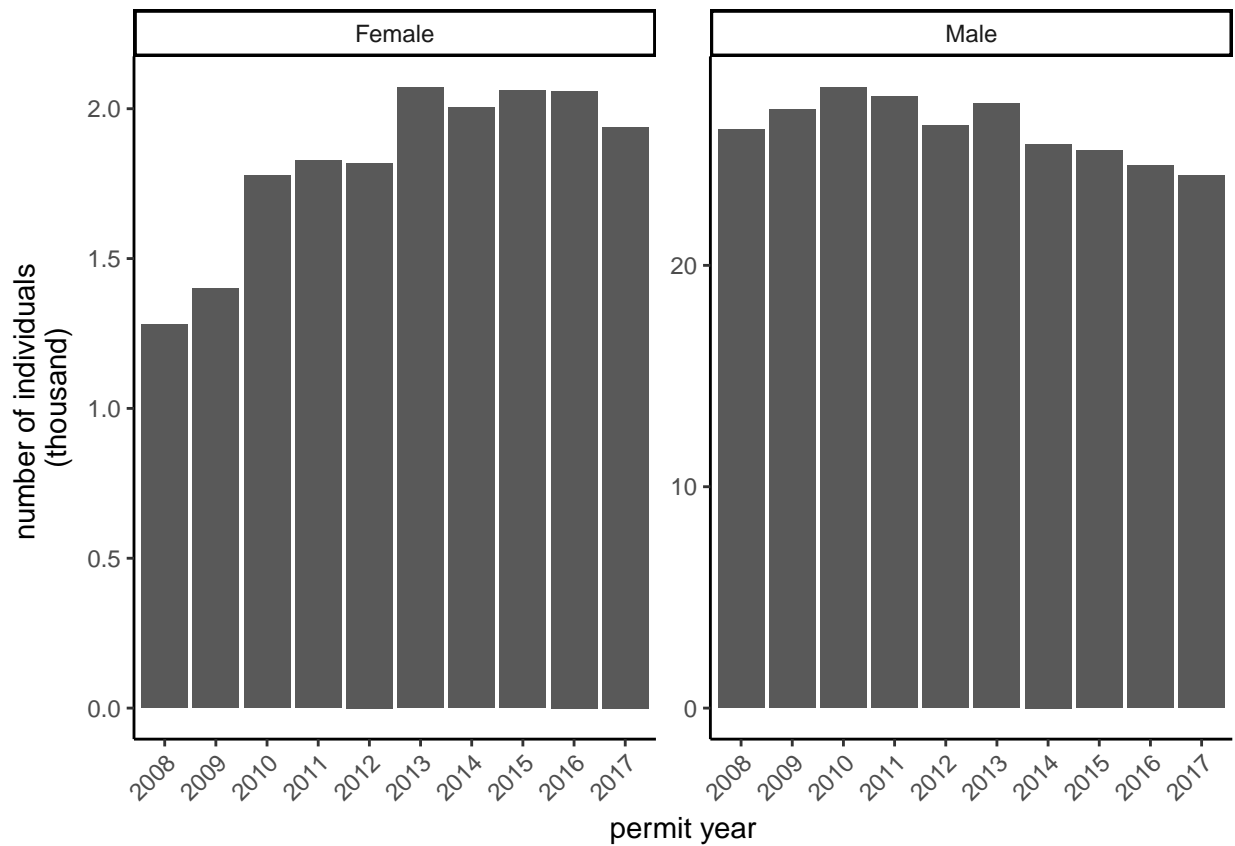


Figure 3.1: Number of individual spring turkey hunters by permit year and gender.

3.1.2 Participation rate

Participation rate is defined as the number of individuals with Nebraska addresses who purchased resident permits divided by the total county population. The county population estimates are 5-year estimates from the 2010-2015 American Community Survey (ACS).

In 2017, participation rate ranged from a low in ArthurMcPherson county (0%) to a high in Furnas county (3.5%). The average across counties was 1.4%. Due to the unqual distribution of the population across counties, the overall state participation rate was 0.9%. The 2017 spring turkey hunter participation rate by county is shown in **Figure 3.2** and listed in **Table 3.1**.

Participation Rate

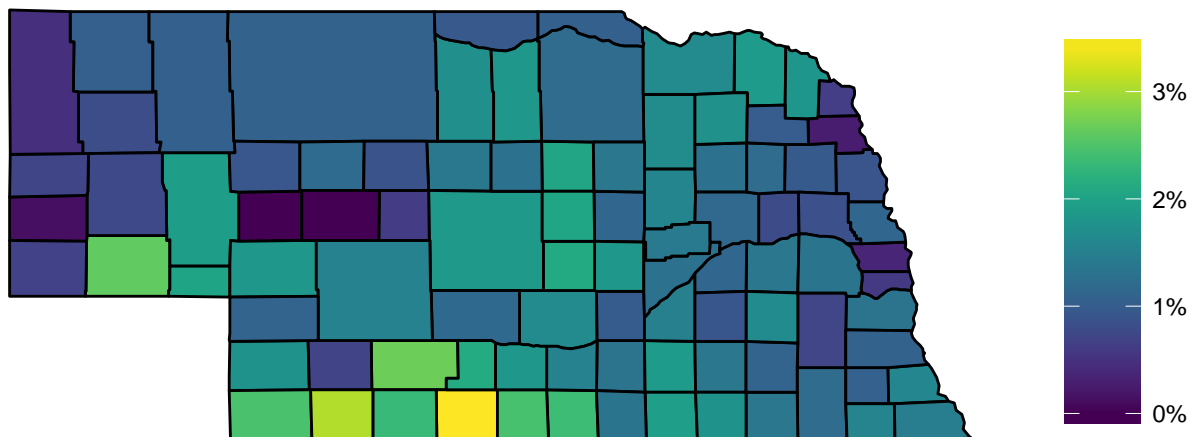


Figure 3.2: Participation rates of spring turkey hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population.

Table 3.1: Participation rates of spring turkey hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population.

county	population	participants	participation rate (%)
Adams	31536	417	1.3
Antelope	6421	107	1.7
Arthur	437	0	0.0
Banner	793	1	0.1
Blaine	580	8	1.4
Boone	5353	84	1.6
Box Butte	11279	90	0.8
Boyd	2006	21	1.0
Brown	3022	52	1.7
Buffalo	48402	796	1.6
Burt	6594	59	0.9
Butler	8205	113	1.4
Cass	25463	335	1.3
Cedar	8657	164	1.9

3.1. OVERALL PERMIT PURCHASES

Table 3.1: Participation rates of spring turkey hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population. (*continued*)

county	population	participants	participation rate (%)
Chase	4061	71	1.7
Cherry	5781	62	1.1
Cheyenne	10090	265	2.6
Clay	6313	119	1.9
Colfax	10499	82	0.8
Cuming	9055	87	1.0
Custer	10784	200	1.9
Dakota	20697	129	0.6
Dawes	9082	94	1.0
Dawson	23924	281	1.2
Deuel	1932	39	2.0
Dixon	5809	106	1.8
Dodge	36679	307	0.8
Douglas	543253	1893	0.3
Dundy	1823	45	2.5
Fillmore	5676	78	1.4
Franklin	3076	73	2.4
Frontier	2599	70	2.7
Furnas	4850	168	3.5
Gage	21778	263	1.2
Garden	1930	37	1.9
Garfield	1968	40	2.0
Gosper	1977	42	2.1
Grant	647	6	0.9
Greeley	2447	28	1.1
Hall	61105	607	1.0
Hamilton	9118	136	1.5
Harlan	3465	85	2.5
Hayes	1013	7	0.7
Hitchcock	2866	88	3.1
Holt	10360	125	1.2
Hooker	669	8	1.2
Howard	6365	118	1.9
Jefferson	7354	101	1.4
Johnson	5167	55	1.1
Kearney	6548	100	1.5
Keith	8103	149	1.8
Keya Paha	736	7	1.0
Kimball	3713	25	0.7
Knox	8551	141	1.6
Lancaster	301707	2163	0.7
Lincoln	35777	548	1.5
Logan	830	5	0.6

Table 3.1: Participation rates of spring turkey hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population. (*continued*)

county	population	participants	participation rate (%)
Loup	542	7	1.3
Madison	35125	451	1.3
McPherson	425	0	0.0
Merrick	7793	102	1.3
Morrill	4843	37	0.8
Nance	3607	51	1.4
Nemaha	7101	113	1.6
Nuckolls	4352	84	1.9
Otoe	15890	170	1.1
Pawnee	2695	42	1.6
Perkins	2911	32	1.1
Phelps	9236	169	1.8
Pierce	7179	125	1.7
Platte	32703	379	1.2
Polk	5242	59	1.1
Red Willow	10884	255	2.3
Richardson	8149	119	1.5
Rock	1407	26	1.8
Saline	14356	158	1.1
Sarpy	172460	978	0.6
Saunders	20946	280	1.3
Scotts Bluff	36599	259	0.7
Seward	17113	283	1.7
Sheridan	5259	55	1.0
Sherman	3090	65	2.1
Sioux	1274	6	0.5
Stanton	6022	73	1.2
Thayer	5163	91	1.8
Thomas	675	6	0.9
Thurston	6989	18	0.3
Valley	4240	87	2.1
Washington	20338	229	1.1
Wayne	9414	95	1.0
Webster	3665	49	1.3
Wheeler	805	11	1.4
York	13842	127	0.9

3.2 Youth Retention

Youth who were age 15 in 2008 would be age 24 in 2017. In 2008, there were 531 spring turkey hunters who were age 15. The percent of 15-year-olds from 2008 and the number of times they purchased between ages 16 and 24 is shown in **Figure 3.3**. By 2017, 337 of these individuals had purchased once or more. The percent

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of 15-year-old youth spring turkey hunters who purchased once or more between ages 16 and 24 was 63%. Of the original 531 spring turkey hunters, 29 individuals or 5% purchased every year between ages 16 and 24.

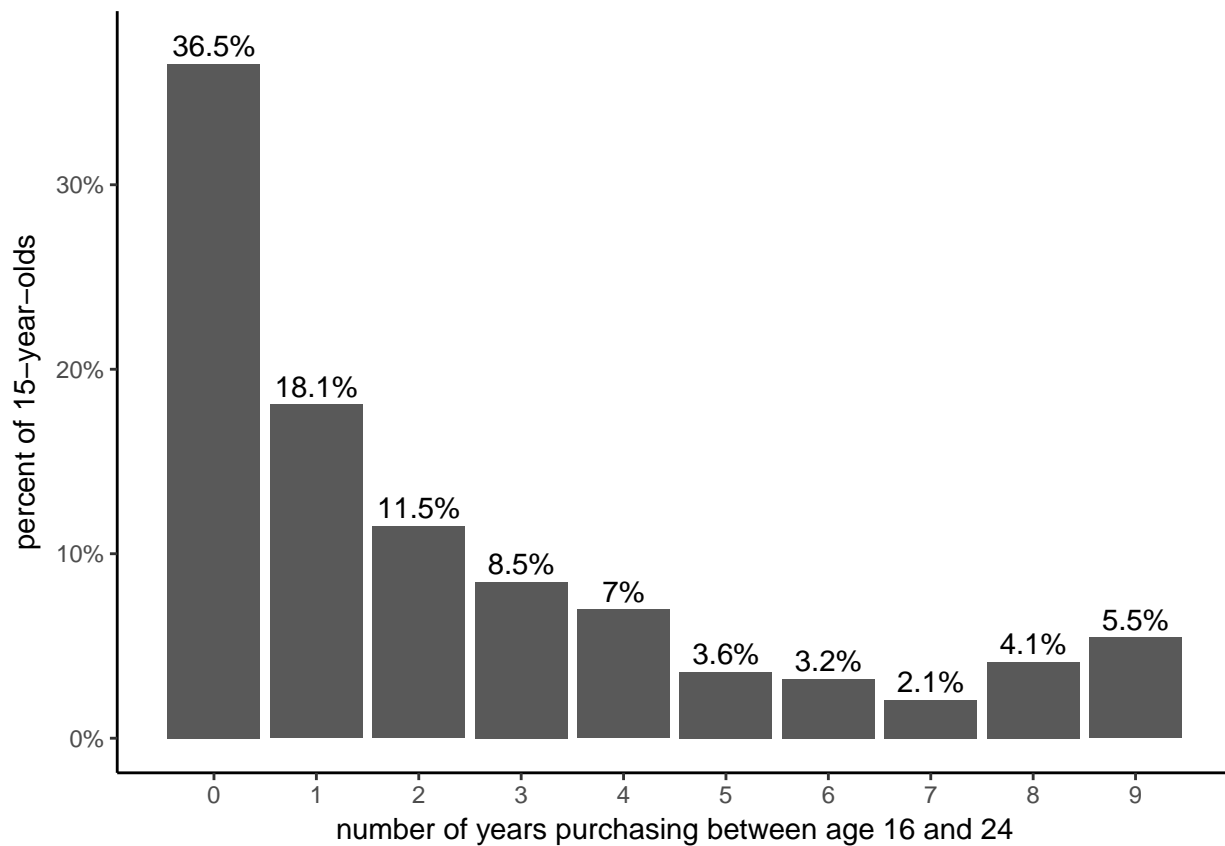


Figure 3.3: The 15-year-old spring turkey hunters who purchased in 2008 were tracked until age 24 in 2017. The number of years a purchase was made between ages 16 and 24 was counted for each individual. The height of the bars indicates the percent of individuals who made a purchase for the number of years indicated on the horizontal axis. The total of all bars is 100%.

3.3 Timelines

For this analysis, permit purchase timelines were defined as the month a permit was purchased in a given permit year. A permit year was defined as starting in November of the previous year and extending to January of the following year. The number of individual spring turkey hunters purchasing each month was counted and the results are plotted in **Figure 3.4**. Most purchases were made in April.

Permit purchase timelines were also created for new participants. New participants were defined as those individuals who had not purchased in the previous 5 years. The number of new spring turkey hunters purchasing each month was counted and the results are plotted in **Figure 3.5**. Most purchases by new participants were made in April.

CHAPTER 3. SPRING TURKEY

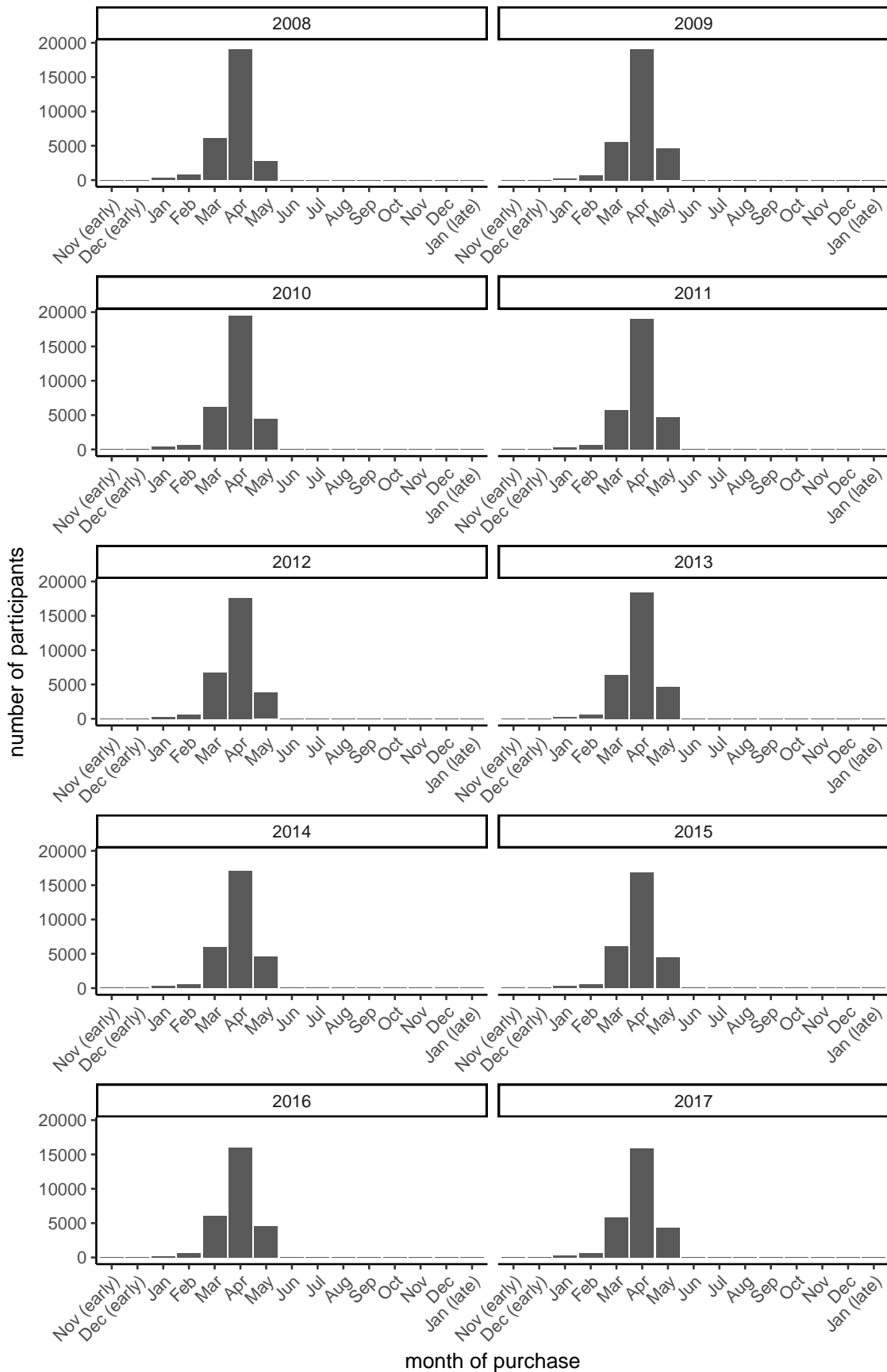


Figure 3.4: The number of participants purchasing a spring turkey hunter permit in a month from 2008 to 2017 .

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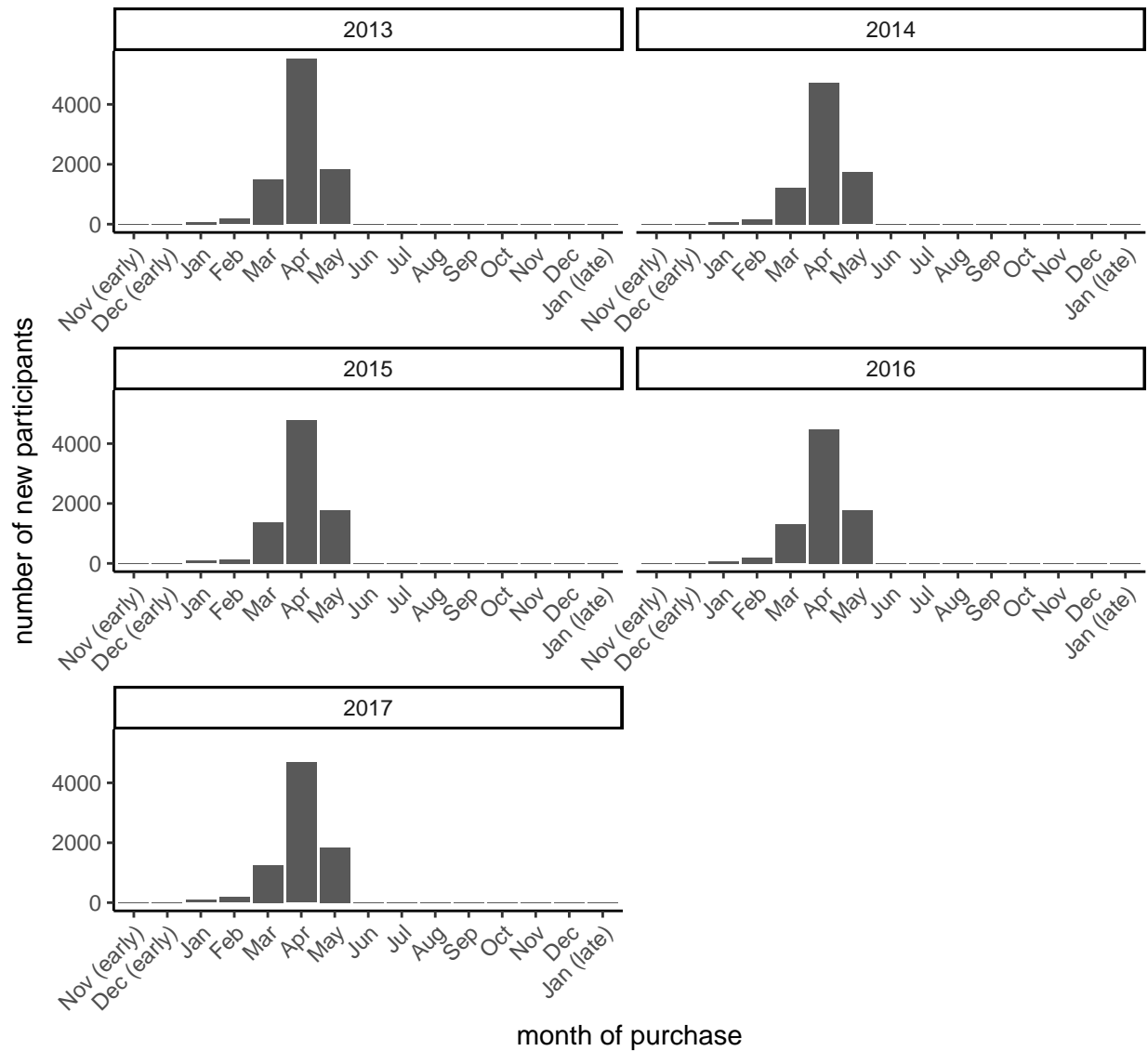


Figure 3.5: The number of new participants purchasing a spring turkey hunter permit in a month from 2008 to 2017. New participants were defined as individuals who have not purchased in at least 5 years.

3.4 Permit Associations

Individual spring turkey hunters may purchase a variety of other permits in a given year. Identifying patterns in purchasing multiple items is referred to as associations or cross-buying. We analyzed the purchases made in 2017 to identify permit purchase associations. **Figure 3.6** shows the number spring turkey hunters purchasing a given combination permit types. On the horizontal axis, dots with connecting lines indicate a combination of permits and the bars above indicate the number of individuals with that combination of permits. Each individual has a particular combination of permits and is therefore only counted in the bar corresponding to their purchase combination.

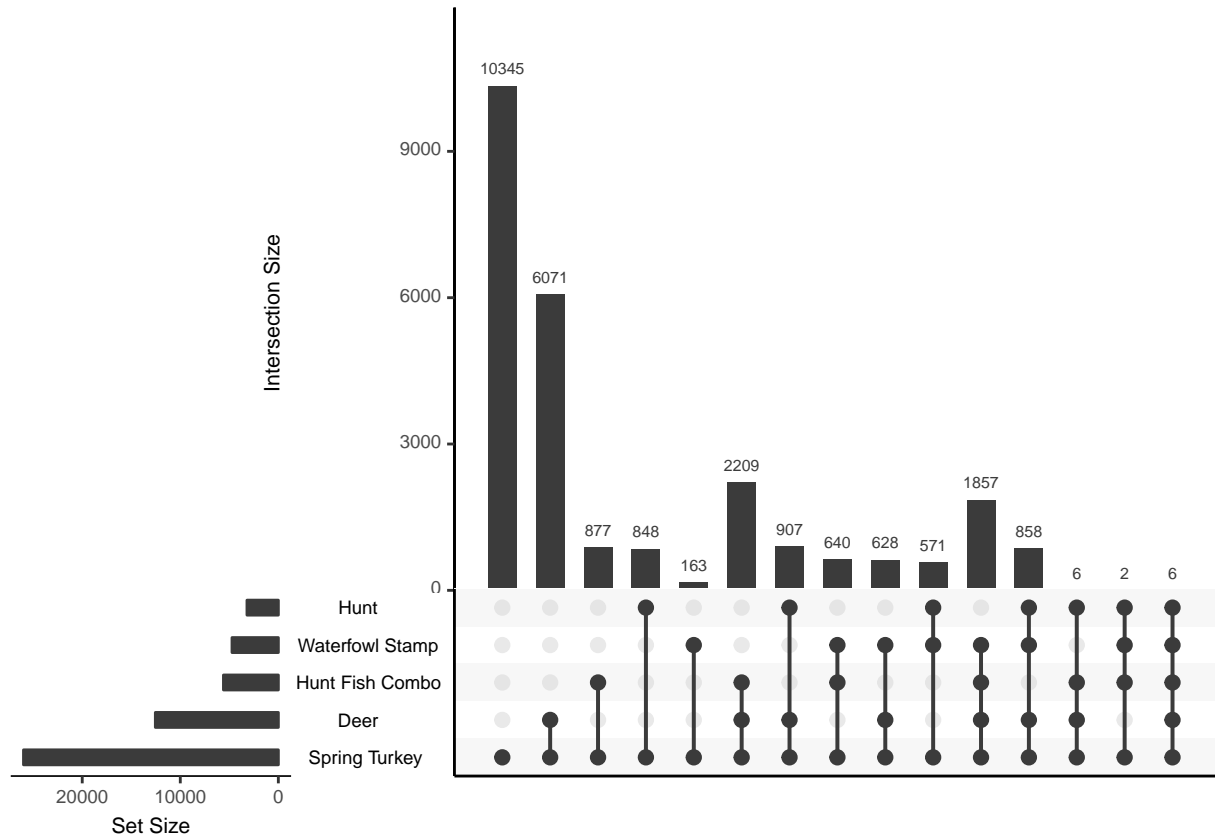


Figure 3.6: Permit associations of spring turkey hunters in 2017.

We also examined the percent of spring turkey hunters purchasing various other permit types. **Figure 3.7** shows the percent of spring turkey hunters who also purchased the permit type shown on the horizontal axis. Note that the bars do not add up to 100% because an individual may purchase several other permits or no other permits.

3.4. PERMIT ASSOCIATIONS

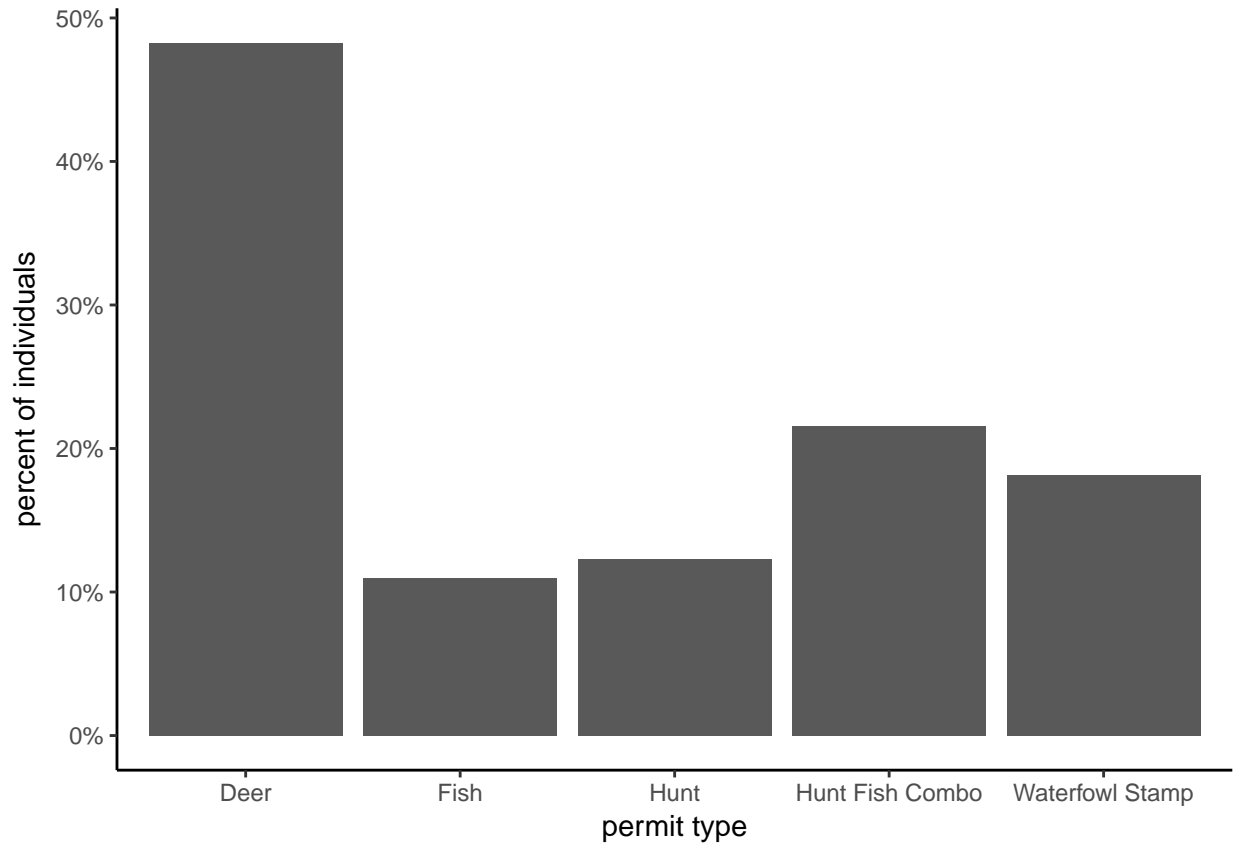


Figure 3.7: Percent of spring turkey hunters in 2017 who also purchased another permit type.

Chapter 4

Small Game

4.1 Overall Permit Purchases

4.1.1 Participants

The number of female small game hunter participants ranged from 1665 to 2129 and male small game hunter participants ranged from 36484 to 45325. The number of male and female small game hunters between 2010 and 2017 is shown in **Figure 4.1**.

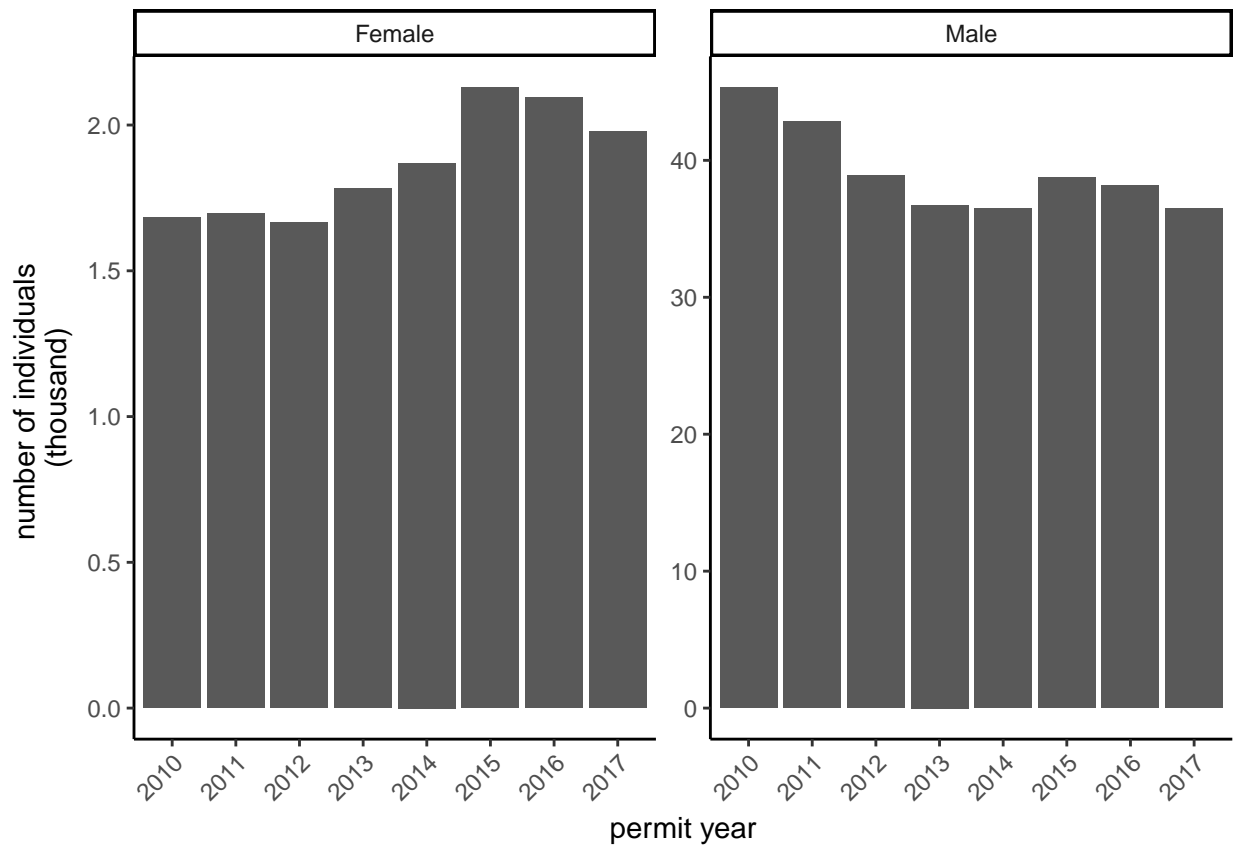


Figure 4.1: Number of individual small game hunters by permit year and gender.

4.1.2 Participation rate

Participation rate is defined as the number of individuals with Nebraska addresses who purchased resident permits divided by the total county population. The county population estimates are 5-year estimates from the 2010-2015 American Community Survey (ACS).

In 2017, participation rate ranged from a low in Arthur county (0.2%) to a high in Chase county (4%). The average across counties was 1.8%. Due to the unqual distribution of the population across counties, the overall state participation rate was 1.1%. The 2017 small game hunter participation rate by county is shown in **Figure 4.2** and listed in **Table 4.1**.

Participation Rate

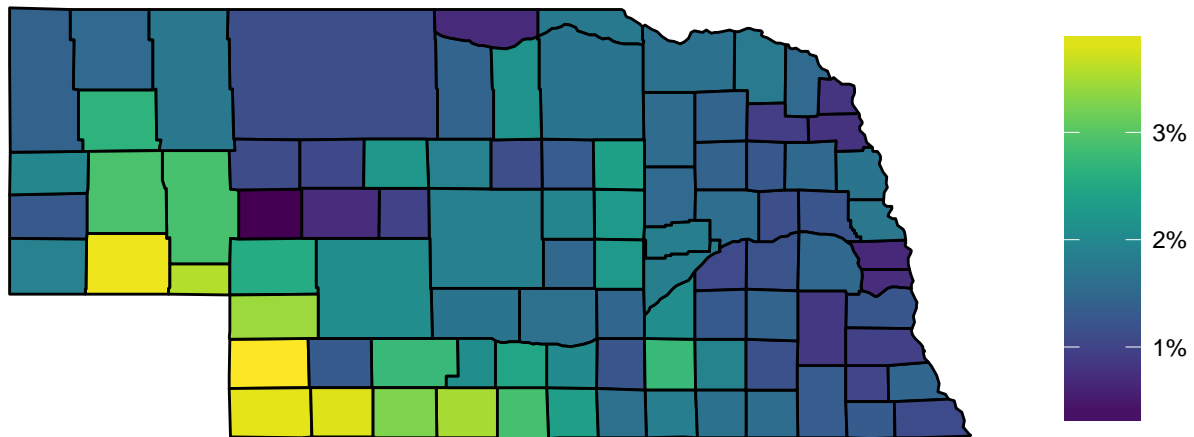


Figure 4.2: Participation rates of small game hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population.

Table 4.1: Participation rates of small game hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population.

county	population	participants	participation rate (%)
Adams	31536	382	1.2
Antelope	6421	99	1.5
Arthur	437	1	0.2
Banner	793	10	1.3
Blaine	580	11	1.9
Boone	5353	81	1.5
Box Butte	11279	300	2.7
Boyd	2006	35	1.7
Brown	3022	43	1.4
Buffalo	48402	783	1.6
Burt	6594	110	1.7
Butler	8205	98	1.2
Cass	25463	313	1.2
Cedar	8657	152	1.8

4.1. OVERALL PERMIT PURCHASES

Table 4.1: Participation rates of small game hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population. (*continued*)

county	population	participants	participation rate (%)
Chase	4061	162	4.0
Cherry	5781	65	1.1
Cheyenne	10090	393	3.9
Clay	6313	175	2.8
Colfax	10499	118	1.1
Cuming	9055	136	1.5
Custer	10784	200	1.9
Dakota	20697	166	0.8
Dawes	9082	137	1.5
Dawson	23924	400	1.7
Deuel	1932	69	3.6
Dixon	5809	88	1.5
Dodge	36679	441	1.2
Douglas	543253	3489	0.6
Dundy	1823	70	3.8
Fillmore	5676	108	1.9
Franklin	3076	72	2.3
Frontier	2599	72	2.8
Furnas	4850	170	3.5
Gage	21778	287	1.3
Garden	1930	56	2.9
Garfield	1968	26	1.3
Gosper	1977	41	2.1
Grant	647	7	1.1
Greeley	2447	55	2.2
Hall	61105	889	1.5
Hamilton	9118	187	2.1
Harlan	3465	100	2.9
Hayes	1013	13	1.3
Hitchcock	2866	109	3.8
Holt	10360	174	1.7
Hooker	669	7	1.0
Howard	6365	144	2.3
Jefferson	7354	114	1.6
Johnson	5167	52	1.0
Kearney	6548	132	2.0
Keith	8103	206	2.5
Keya Paha	736	5	0.7
Kimball	3713	69	1.9
Knox	8551	140	1.6
Lancaster	301707	2503	0.8
Lincoln	35777	738	2.1
Logan	830	8	1.0

Table 4.1: Participation rates of small game hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population. (*continued*)

county	population	participants	participation rate (%)
Loup	542	6	1.1
Madison	35125	490	1.4
McPherson	425	3	0.7
Merrick	7793	143	1.8
Morrill	4843	141	2.9
Nance	3607	66	1.8
Nemaha	7101	104	1.5
Nuckolls	4352	79	1.8
Otoe	15890	150	0.9
Pawnee	2695	35	1.3
Perkins	2911	100	3.4
Phelps	9236	226	2.4
Pierce	7179	102	1.4
Platte	32703	515	1.6
Polk	5242	56	1.1
Red Willow	10884	355	3.3
Richardson	8149	88	1.1
Rock	1407	30	2.1
Saline	14356	167	1.2
Sarpy	172460	1217	0.7
Saunders	20946	311	1.5
Scotts Bluff	36599	720	2.0
Seward	17113	243	1.4
Sheridan	5259	91	1.7
Sherman	3090	46	1.5
Sioux	1274	18	1.4
Stanton	6022	75	1.2
Thayer	5163	85	1.6
Thomas	675	15	2.2
Thurston	6989	54	0.8
Valley	4240	82	1.9
Washington	20338	349	1.7
Wayne	9414	85	0.9
Webster	3665	59	1.6
Wheeler	805	19	2.4
York	13842	176	1.3

4.2 Youth Retention

Youth who were age 15 in 2010 would be age 22 in 2017. In 2010, there were 422 small game hunters who were age 15. The percent of 15-year-olds from 2010 and the number of times they purchased between ages 16 and 22 is shown in **Figure 4.3**. By 2017, 209 of these individuals had purchased once or more. The percent

4.3. TIMELINES

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of 15-year-old youth small game hunters who purchased once or more between ages 16 and 22 was 50%. Of the original 422 small game hunters, individuals or % purchased every year between ages 16 and 22.

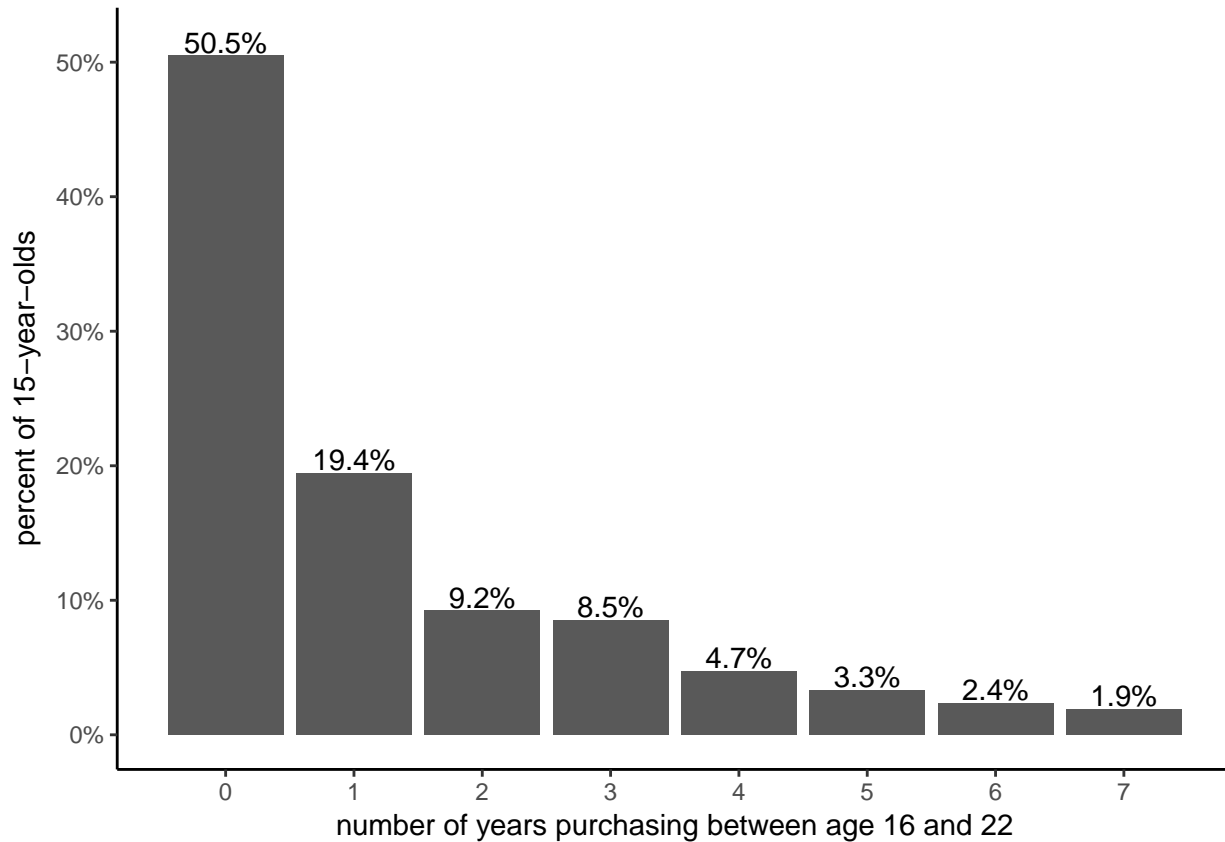


Figure 4.3: The 15-year-old small game hunters who purchased in 2010 were tracked until age 22 in 2017. The number of years a purchase was made between ages 16 and 22 was counted for each individual. The height of the bars indicates the percent of individuals who made a purchase for the number of years indicated on the horizontal axis. The total of all bars is 100%.

4.3 Timelines

For this analysis, permit purchase timelines were defined as the month a permit was purchased in a given permit year. A permit year was defined as starting in November of the previous year and extending to January of the following year. The number of individual small game hunters purchasing each month was counted and the results are plotted in **Figure 4.4**. Most purchases were made in November.

Permit purchase timelines were also created for new participants. New participants were defined as those individuals who had not purchased in the previous 5 years. The number of new small game hunters purchasing each month was counted and the results are plotted in **Figure 4.5**. Most purchases by new participants were made in November.

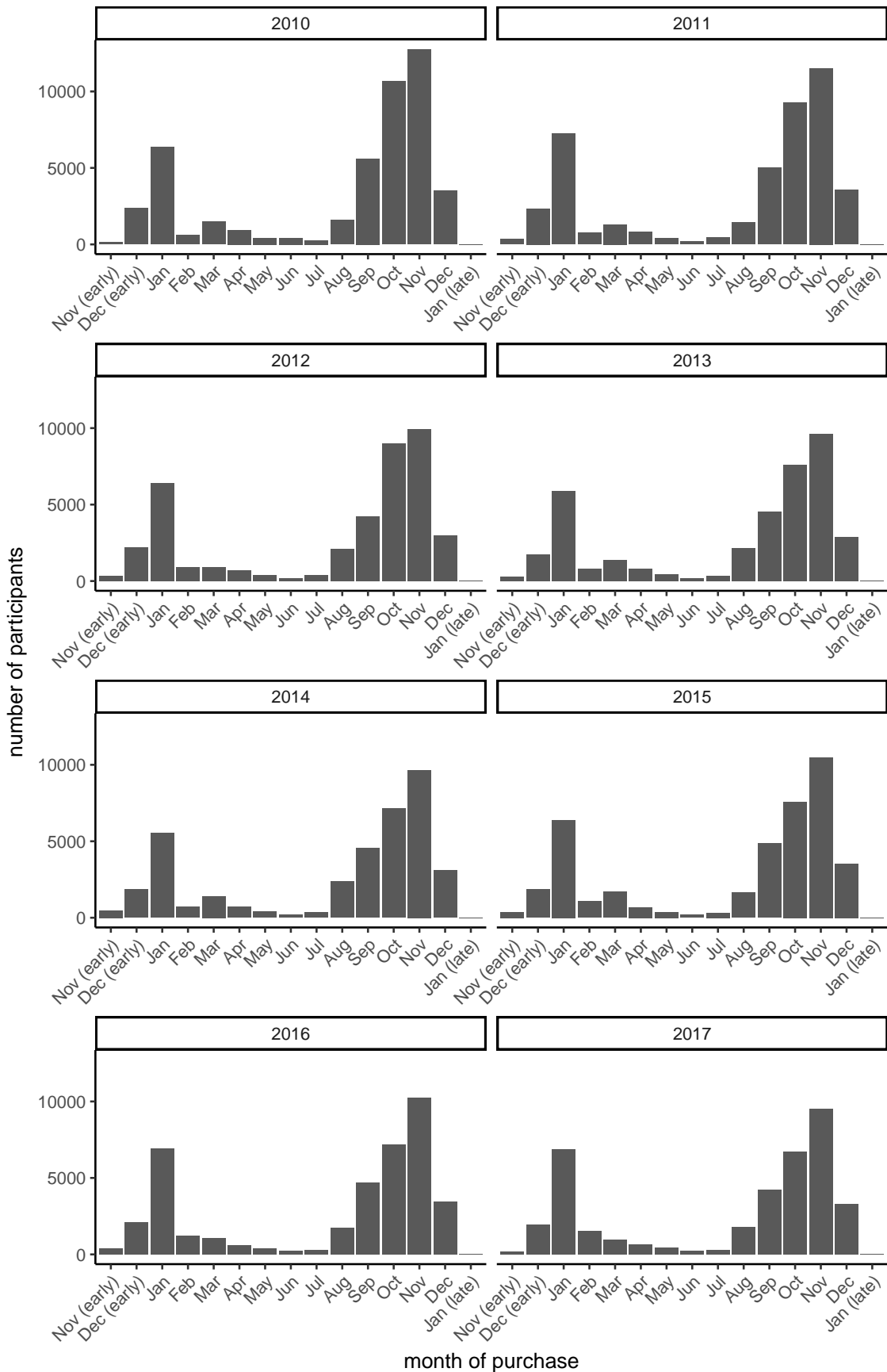


Figure 4.4: The number of participants purchasing a small game hunter permit in a month from 2010 to 2017 .

4.4. PERMIT ASSOCIATIONS

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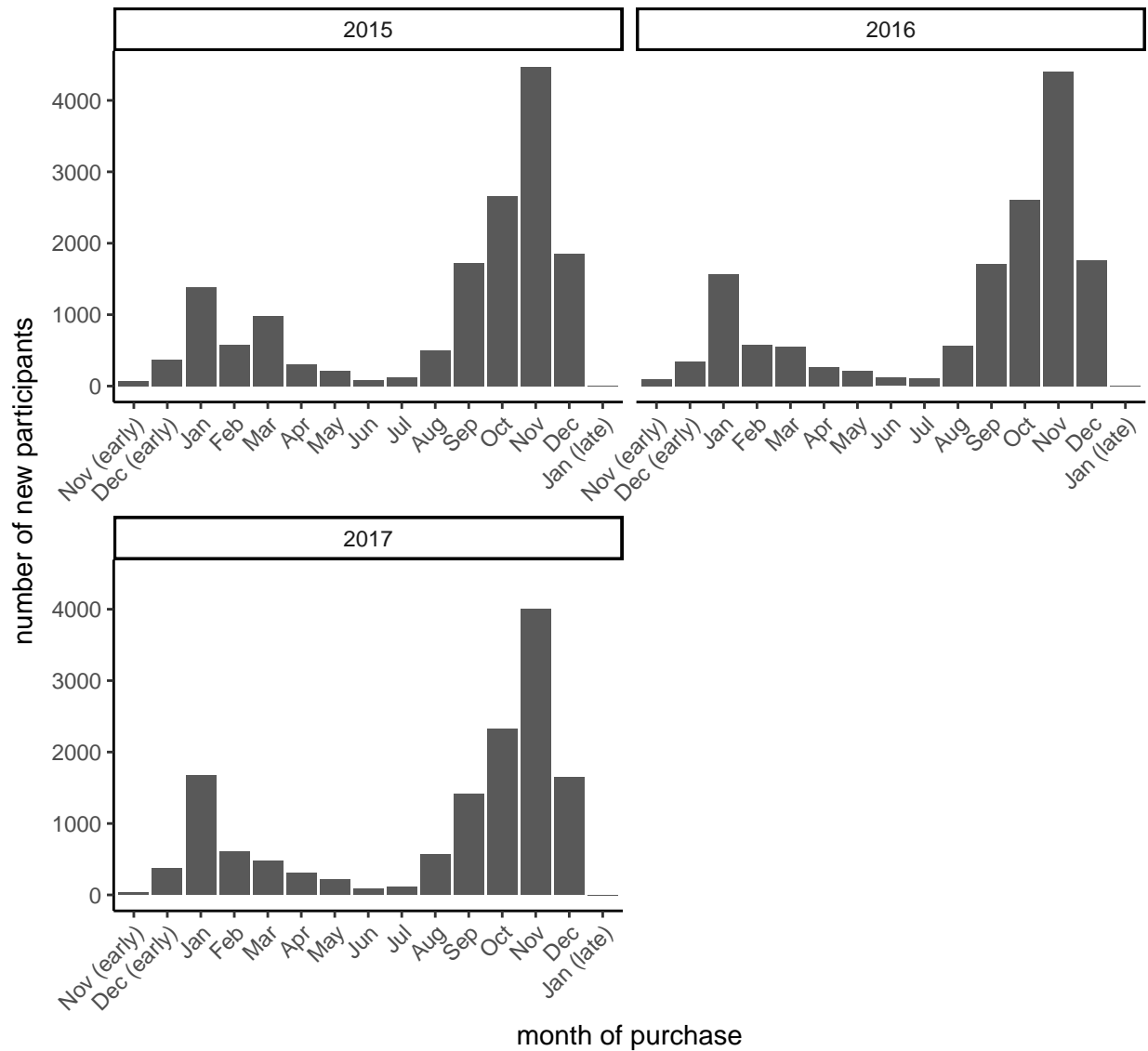


Figure 4.5: The number of new participants purchasing a small game hunter permit in a month from 2010 to 2017. New participants were defined as individuals who have not purchased in at least 5 years.

4.4 Permit Associations

Individual small game hunters may purchase a variety of other permits in a given year. Identifying patterns in purchasing multiple items is referred to as associations or cross-buying. We analyzed the purchases made in 2017 to identify permit purchase associations. **Figure 4.6** shows the number small game hunters purchasing a given combination permit types. On the horizontal axis, dots with connecting lines indicate a combination of permits and the bars above indicate the number of individuals with that combination of permits. Each individual has a particular combination of permits and is therefore only counted in the bar corresponding to their purchase combination.

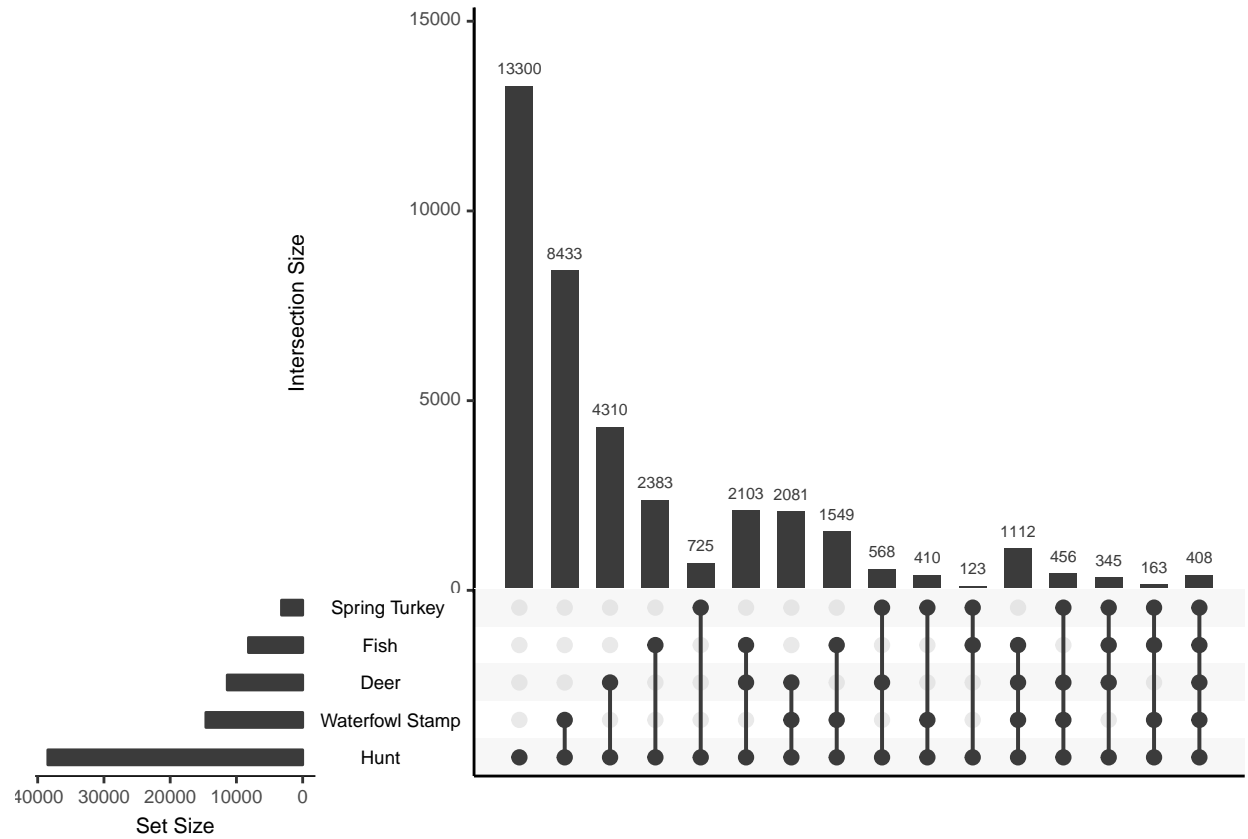


Figure 4.6: Permit associations of small game hunters in 2017.

We also examined the percent of small game hunters purchasing various other permit types. **Figure 4.7** shows the percent of small game hunters who also purchased the permit type shown on the horizontal axis. Note that the bars do not add up to 100% because an individual may purchase several other permits or no other permits.

4.4. PERMIT ASSOCIATIONS

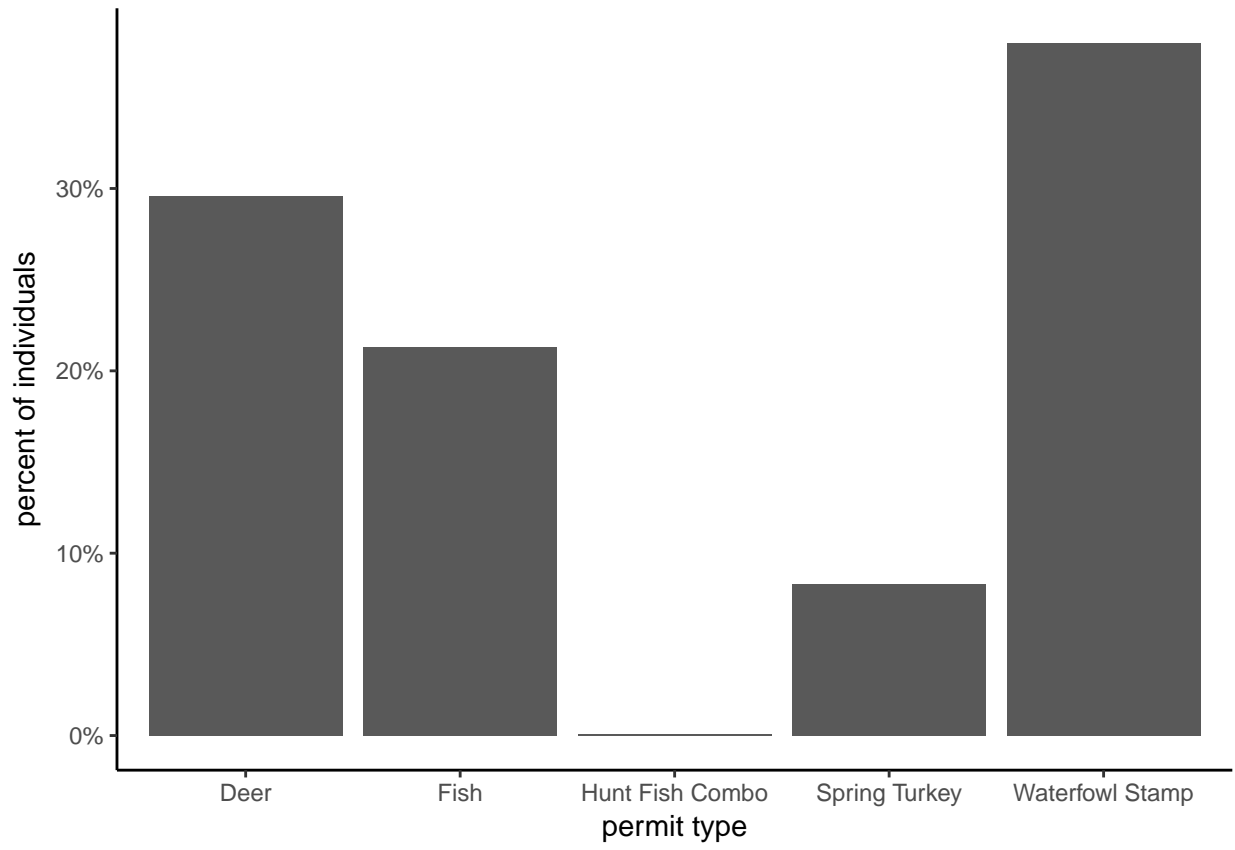


Figure 4.7: Percent of small game hunters in 2017 who also purchased another permit type.

Chapter 5

Waterfowl

5.1 Overall Permit Purchases

5.1.1 Participants

The number of female waterfowl hunter participants ranged from 908 to 1432 and male waterfowl hunter participants ranged from 29216 to 33168. The number of male and female waterfowl hunters between 2010 and 2017 is shown in **Figure 5.1**.

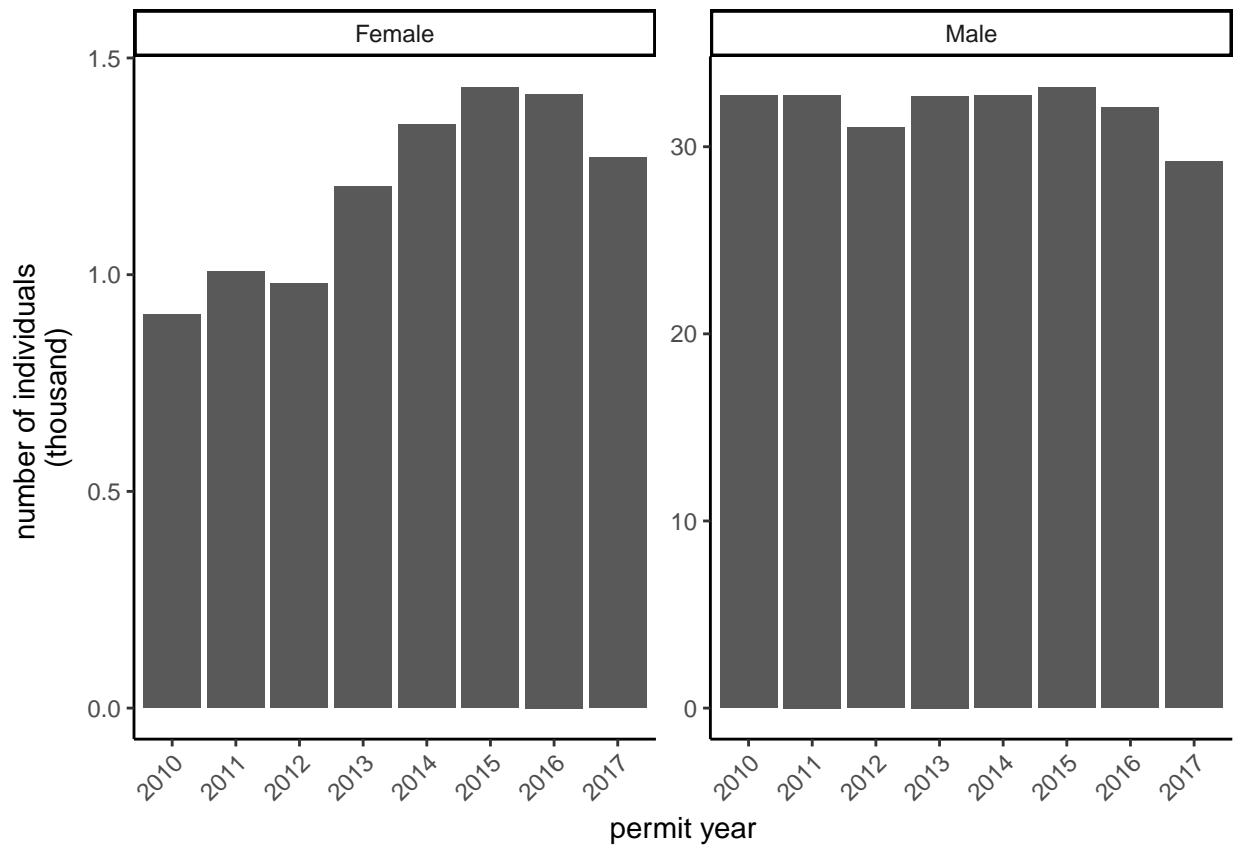


Figure 5.1: Number of individual waterfowl hunters by permit year and gender.

5.1.2 Participation rate

Participation rate is defined as the number of individuals with Nebraska addresses who purchased resident permits divided by the total county population. The county population estimates are 5-year estimates from the 2010-2015 American Community Survey (ACS).

In 2017, participation rate ranged from a low in JohnsonMcPhersonWebster county (0.5%) to a high in Garden county (8.5%). The average across counties was 2.0%. Due to the unqual distribution of the population across counties, the overall state participation rate was 1.2%. The 2017 waterfowl hunter participation rate by county is shown in **Figure 5.2** and listed in **Table 5.1**.

Participation Rate

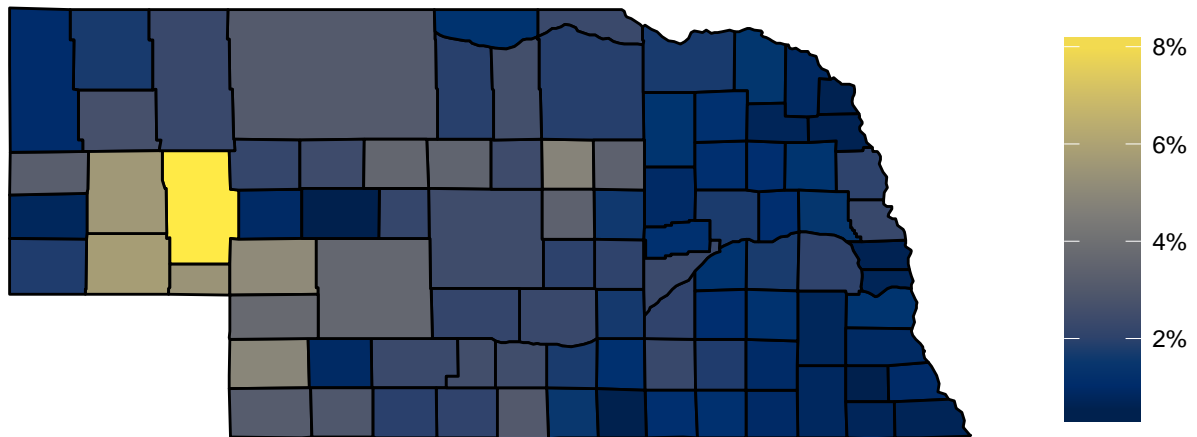


Figure 5.2: Participation rates of waterfowl hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population.

Table 5.1: Participation rates of waterfowl hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population.

county	population	participants	participation rate (%)
Adams	31536	385	1.2
Antelope	6421	89	1.4
Arthur	437	4	0.9
Banner	793	6	0.8
Blaine	580	20	3.4
Boone	5353	49	0.9
Box Butte	11279	296	2.6
Boyd	2006	46	2.3
Brown	3022	57	1.9
Buffalo	48402	1089	2.2
Burt	6594	133	2.0
Butler	8205	136	1.7
Cass	25463	350	1.4
Cedar	8657	126	1.5

5.1. OVERALL PERMIT PURCHASES

Table 5.1: Participation rates of waterfowl hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population. (*continued*)

county	population	participants	participation rate (%)
Chase	4061	199	4.9
Cherry	5781	176	3.0
Cheyenne	10090	588	5.8
Clay	6313	141	2.2
Colfax	10499	116	1.1
Cuming	9055	124	1.4
Custer	10784	262	2.4
Dakota	20697	114	0.6
Dawes	9082	149	1.6
Dawson	23924	511	2.1
Deuel	1932	105	5.4
Dixon	5809	49	0.8
Dodge	36679	539	1.5
Douglas	543253	3105	0.6
Dundy	1823	57	3.1
Fillmore	5676	99	1.7
Franklin	3076	46	1.5
Frontier	2599	60	2.3
Furnas	4850	99	2.0
Gage	21778	175	0.8
Garden	1930	164	8.5
Garfield	1968	95	4.8
Gosper	1977	50	2.5
Grant	647	14	2.2
Greeley	2447	38	1.6
Hall	61105	977	1.6
Hamilton	9118	186	2.0
Harlan	3465	105	3.0
Hayes	1013	9	0.9
Hitchcock	2866	83	2.9
Holt	10360	192	1.9
Hooker	669	16	2.4
Howard	6365	129	2.0
Jefferson	7354	68	0.9
Johnson	5167	25	0.5
Kearney	6548	109	1.7
Keith	8103	412	5.1
Keya Paha	736	10	1.4
Kimball	3713	64	1.7
Knox	8551	140	1.6
Lancaster	301707	2245	0.7
Lincoln	35777	1296	3.6
Logan	830	18	2.2

Table 5.1: Participation rates of waterfowl hunters by county in Nebraska for 2017 permit year. Participation rate is calculated as the number of individuals with Nebraska addresses who purchased resident permits divided by the county population. (*continued*)

county	population	participants	participation rate (%)
Loup	542	13	2.4
Madison	35125	405	1.2
McPherson	425	2	0.5
Merrick	7793	178	2.3
Morrill	4843	273	5.6
Nance	3607	44	1.2
Nemaha	7101	68	1.0
Nuckolls	4352	50	1.1
Otoe	15890	139	0.9
Pawnee	2695	19	0.7
Perkins	2911	108	3.7
Phelps	9236	227	2.5
Pierce	7179	87	1.2
Platte	32703	547	1.7
Polk	5242	69	1.3
Red Willow	10884	208	1.9
Richardson	8149	52	0.6
Rock	1407	36	2.6
Saline	14356	136	0.9
Sarpy	172460	1156	0.7
Saunders	20946	426	2.0
Scotts Bluff	36599	1176	3.2
Seward	17113	219	1.3
Sheridan	5259	119	2.3
Sherman	3090	61	2.0
Sioux	1274	13	1.0
Stanton	6022	66	1.1
Thayer	5163	62	1.2
Thomas	675	24	3.6
Thurston	6989	39	0.6
Valley	4240	143	3.4
Washington	20338	455	2.2
Wayne	9414	64	0.7
Webster	3665	18	0.5
Wheeler	805	27	3.4
York	13842	153	1.1

5.2 Youth Retention

Youth who were age 15 in 2010 would be age 22 in 2017. In 2010, there were 171 waterfowl hunters who were age 15. The percent of 15-year-olds from 2010 and the number of times they purchased between ages 16 and 22 is shown in **Figure 5.3**. By 2017, 105 of these individuals had purchased once or more. The percent of

5.3. TIMELINES

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15-year-old youth waterfowl hunters who purchased once or more between ages 16 and 22 was 61%. Of the original 171 waterfowl hunters, individuals or % purchased every year between ages 16 and 22.

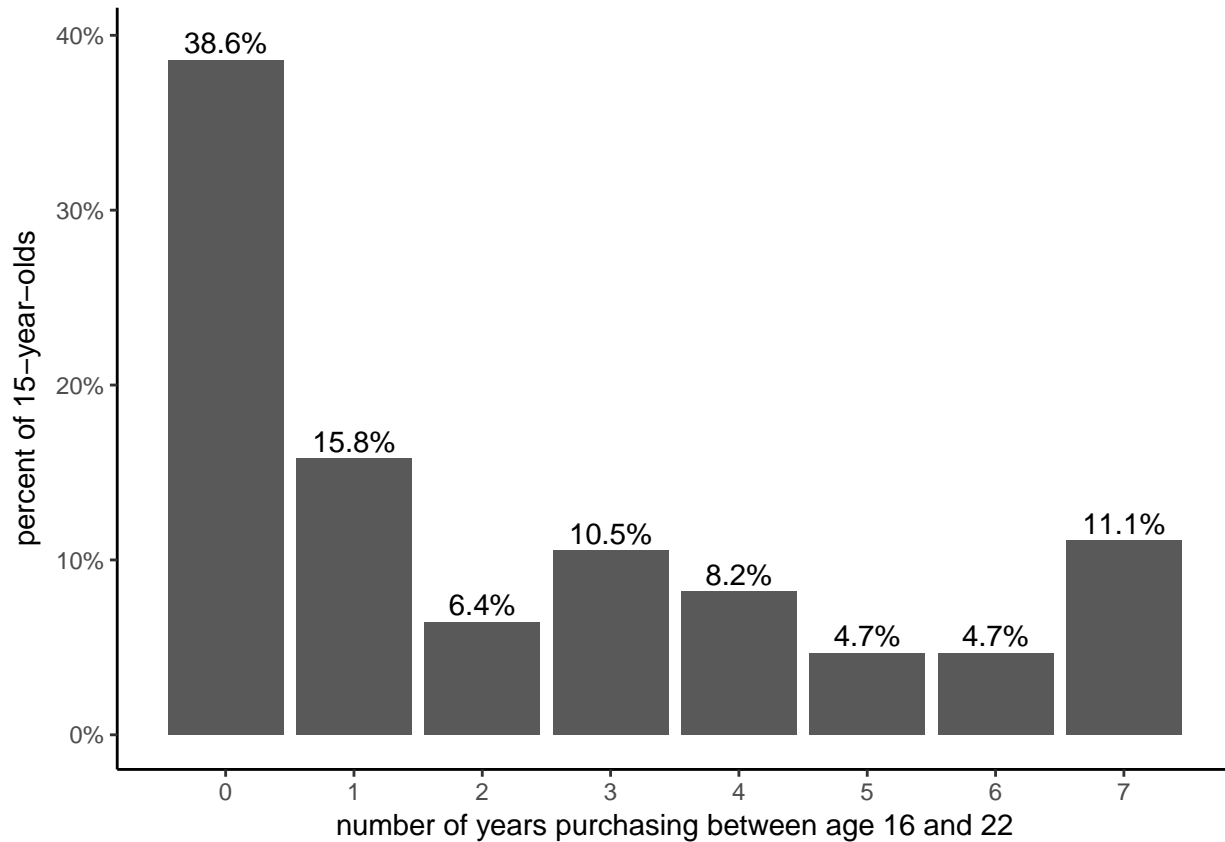


Figure 5.3: The 15-year-old waterfowl hunters who purchased in 2010 were tracked until age 22 in 2017. The number of years a purchase was made between ages 16 and 22 was counted for each individual. The height of the bars indicates the percent of individuals who made a purchase for the number of years indicated on the horizontal axis. The total of all bars is 100%.

5.3 Timelines

For this analysis, permit purchase timelines were defined as the month a permit was purchased in a given permit year. A permit year was defined as starting in November of the previous year and extending to January of the following year. The number of individual waterfowl hunters purchasing each month was counted and the results are plotted in **Figure 5.4**. Most purchases were made in January.

Permit purchase timelines were also created for new participants. New participants were defined as those individuals who had not purchased in the previous 5 years. The number of new waterfowl hunters purchasing each month was counted and the results are plotted in **Figure 5.5**. Most purchases by new participants were made in January.

CHAPTER 5. WATERFOWL

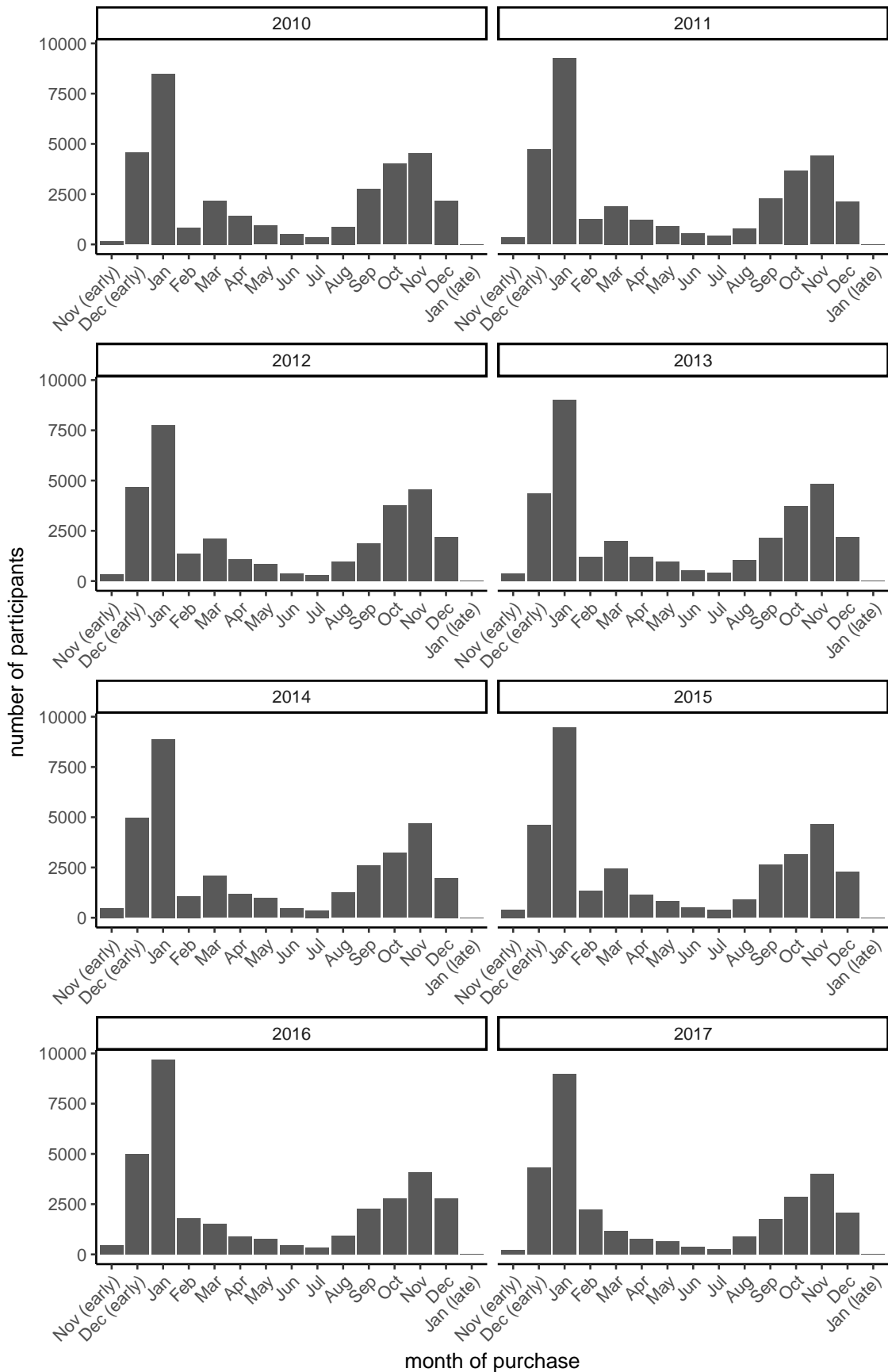


Figure 5.4: The number of participants purchasing a waterfowl hunter permit in a month from 2010 to 2017

5.4. PERMIT ASSOCIATIONS

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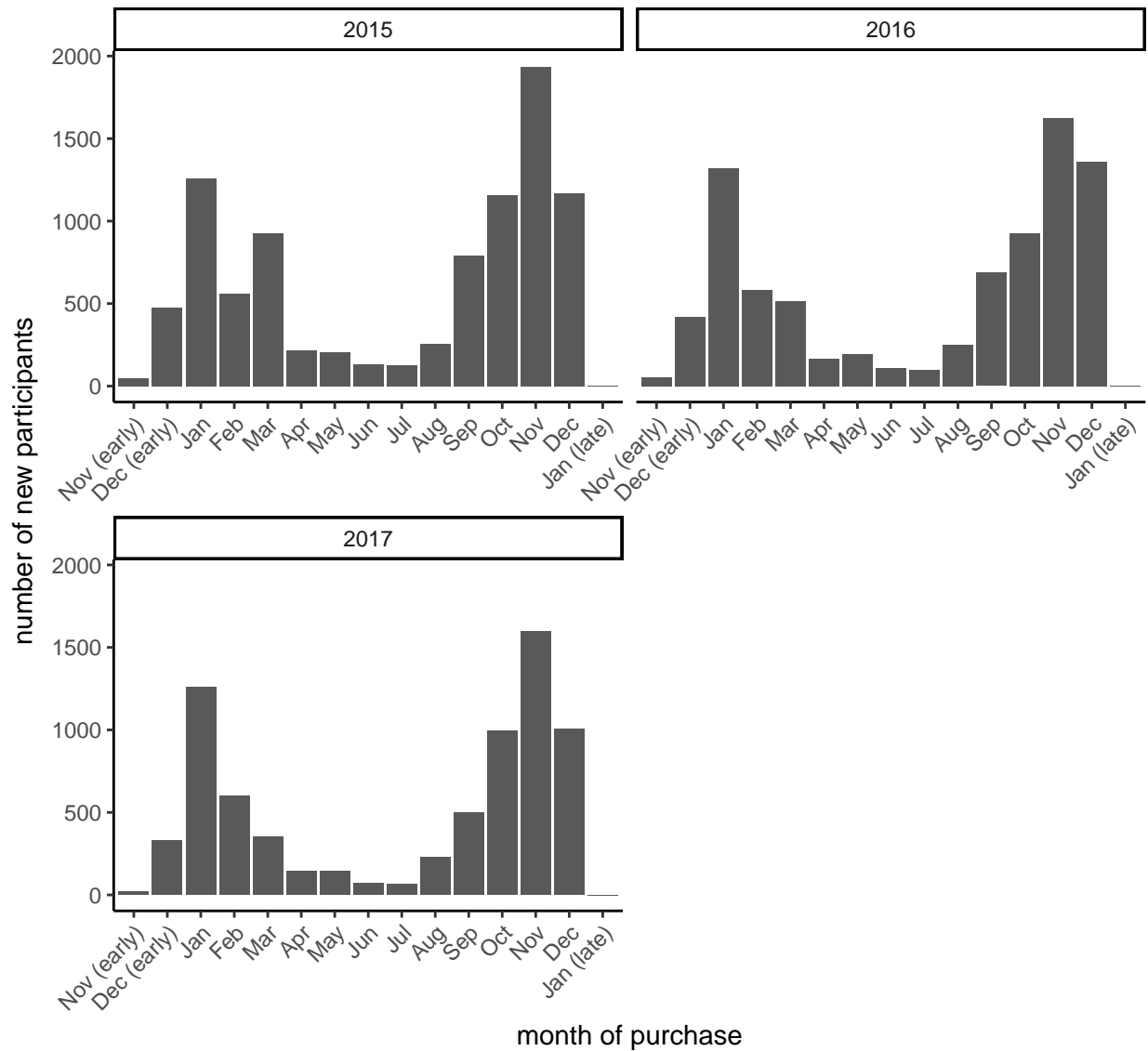


Figure 5.5: The number of new participants purchasing a waterfowl hunter permit in a month from 2010 to 2017. New participants were defined as individuals who have not purchased in at least 5 years.

5.4 Permit Associations

Individual waterfowl hunters may purchase a variety of other permits in a given year. Identifying patterns in purchasing multiple items is referred to as associations or cross-buying. We analyzed the purchases made in 2017 to identify permit purchase associations. **Figure 5.6** shows the number waterfowl hunters purchasing a given combination permit types. On the horizontal axis, dots with connecting lines indicate a combination of permits and the bars above indicate the number of individuals with that combination of permits. Each individual has a particular combination of permits and is therefore only counted in the bar corresponding to their purchase combination.

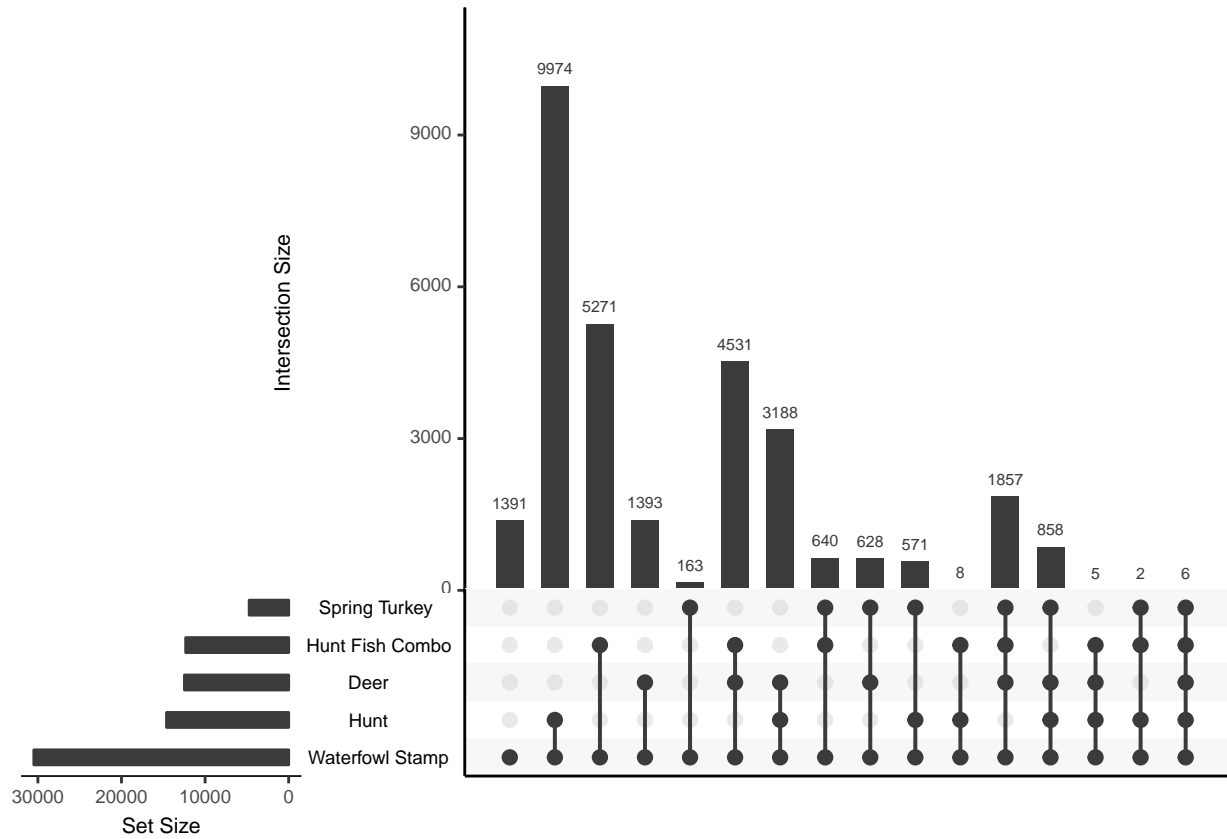


Figure 5.6: Permit associations of waterfowl hunters in 2017.

We also examined the percent of waterfowl hunters purchasing various other permit types. **Figure 5.7** shows the percent of waterfowl hunters who also purchased the permit type shown on the horizontal axis. Note that the bars do not add up to 100% because an individual may purchase several other permits or no other permits.

5.4. PERMIT ASSOCIATIONS

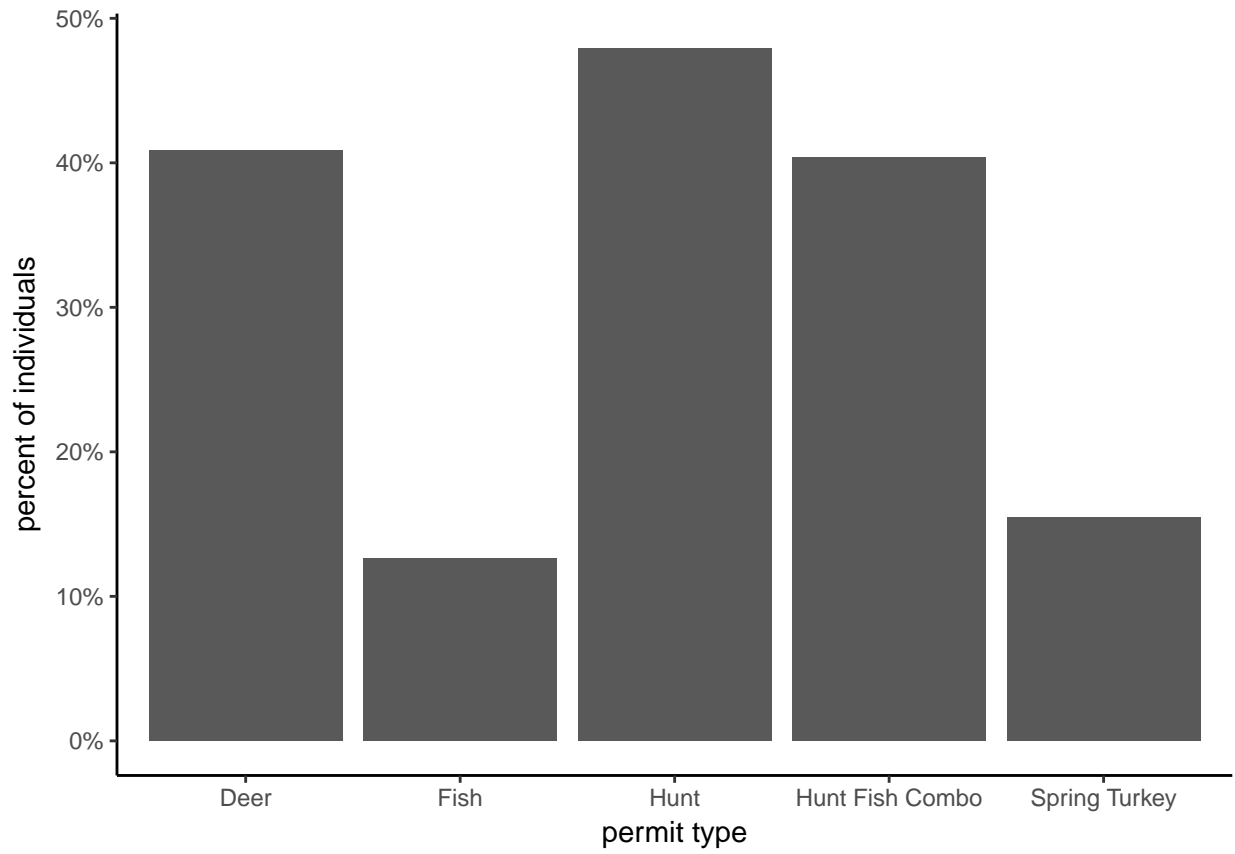


Figure 5.7: Percent of waterfowl hunters in 2017 who also purchased another permit type.