

Statewide Small Game Hunter Survey, 2014

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February 2015

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This Wildlife Management Report was approved for publication by Richard Merizon, program coordinator for the Alaska Department of Fish and Game's Small Game Program.

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This document was published electronically only. Please cite it as follows:

Merizon, R. A., S. J. Carson, and L. S. Honig. 2015. Statewide Small Game Hunter Survey, 2014. Alaska Department of Fish and Game, Wildlife Management Report, ADF&G/DWC/WMR-2015-1, Palmer, Alaska.

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Cover Photo: Harvested willow ptarmigan *Lagopus lagopus* in Southcentral Alaska. ©2014 ADF&G, photo by Richard Merizon.

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Abstract

Alaska's small game populations (species of grouse, ptarmigan, and hare) have long been popular subsistence and recreational resources for residents and nonresidents alike. Since statehood in 1959, the Alaska Department of Fish and Game (ADF&G) has made attempts to understand harvest, location, and hunter effort relative to small game hunting. The ADF&G completed the first statewide small game hunter survey in April 2012, and in May 2014 followed up with the second such effort. Survey forms were mailed out to 9,552 individual households on 1 May 2014. Respondents were asked to complete either the paper survey form or visit a secure online portal through which the survey could be completed. Survey recipients were asked to report on their household's involvement hunting small game during regulatory year 2013 (RY13; 1 July 2013– 30 June 2014). Respondents were asked questions about species hunted, numbers harvested, hunt locations, hunting effort, number of small game hunters in the household that were under 16 years of age, and whether or not they harvested small game opportunistically. A 30% response rate was received. Alaska hunters used paper survey forms much more than anticipated. An estimated 40,239 individuals hunted small game in Alaska during RY13. An estimated 6,846 hunters were under the age of 16. Approximately 3% of respondents also participated in a federal subsistence hunt for small game; most effort was focused on ptarmigan. Highway vehicles, all-terrain vehicles (ATVs), and walking were the primary means of transportation for small game hunters along the road system. However, snowmachines, ATVs, and boats were the primary means of transportation in the areas distant from the road system. Spruce grouse (*Falcipecten canadensis*) and ptarmigan (*Lagopus* spp.) were the most hunted and harvested species during RY13.

Key words: small game, grouse, ptarmigan, hare, hunter, survey, household, recipient.

Introduction

Alaska is fortunate to have many small game species, including grouse, ptarmigan, and hare. There are 4 species of grouse: ruffed (*Bonasa umbellus*), sharp-tailed (*Tympanuchus phasianellus*), sooty (*Dendragapus fuliginosus*), and spruce grouse (*Falciennis canadensis*). Alaska is home to rock (*Lagopus muta*), white-tailed (*L. leucurus*), and willow ptarmigan (*L. lagopus*). There are 2 species of hare, Alaska (*Lepus othus*) and snowshoe hare (*L. americanus*). Typically, Alaska small game hunters can pursue at least one of these species wherever they hunt in the state. In regulatory year 2013 (RY13; 1 July 2013–30 June 2014), all 9 of these species could be legally harvested under state hunting regulations throughout all of the game management units (GMUs; Fig. 1) where they occur.

Despite its reputation as a big game hunting mecca, Alaska has a long and storied history as an excellent location to pursue small game. The abundance and diversity of small game populations in Alaska compare favorably with other states. Resident and nonresident hunters in Alaska have enjoyed pursuing small game for many decades. Subsistence hunters have long supplemented their diets with seasonally abundant species of small game. In addition, recreational hunting of small game continues to remain very popular for many hunters that reside along the road system and rural residents that hunt in areas not accessible by the primary road system.

Alaska's human population has undergone significant change over the last 35 years. Since 1980, the human population has grown from 400,000 to over 736,000 (U.S. Census Bureau 2014). The road infrastructure and trail systems where hunters can easily access the field has remained largely unchanged, and pursuing big game has become more competitive and expensive; thus placing more pressure on less competitive and more affordable small game hunting opportunities. Alaska's small game populations have become exposed to this demographic and social shift, but only recently has evidence been available to assess its effect (Carroll and Merizon 2014).

Despite the popularity of small game, few attempts have been made to estimate statewide small game hunter participation, harvest, and effort (Merizon and Carson 2013). However, several localized or regional small game hunting surveys have been completed beginning as far back as the 1950s (Buckley 1954) and continuing periodically since the 1960s (Weeden 1965; McGowan and Weeden 1968; Ernest 1976, 1978, McGowan 1980, 1985, 1986, Taylor 1992, 1994, 2000). However a statewide survey that provides a broader perspective on small game hunting was first attempted after RY11 (Merizon and Carson 2013). It was difficult to focus the survey on known small game hunters as there was no resident small game license category available to which a questionnaire could be focused; as a result, a total of 9,539 license holders were questioned. Despite a low response rate (11%) much was learned about hunter effort, participation, species of greatest interest, transportation methods used, and harvest.

In May 2014, the second statewide small game hunter survey was created and mailed to similar numbers of households of residents and nonresidents as in RY11. Goals included trying to further document and understand the statewide trends in harvest patterns and hunter participation.

The objectives of this survey were as follows:

1. Estimate the total number of small game hunters statewide.
2. Estimate the number of small game hunters under the age of 16.
3. Estimate the proportion of hunters who pursue small game opportunistically versus those who target small game.
4. Estimate small game hunting participation among the various license types.
5. Estimate the most frequently used transportation method in each of 10 discrete geographic areas of the state.
6. Estimate the most frequently targeted species in each of 10 discrete geographic areas of the state.

Additional small game hunter surveys will be needed for managers to adequately address regulatory proposals, hunters to be well informed on the status of various small game populations, and the state to thoroughly understand the contributions small game hunters make to regional and local economies.

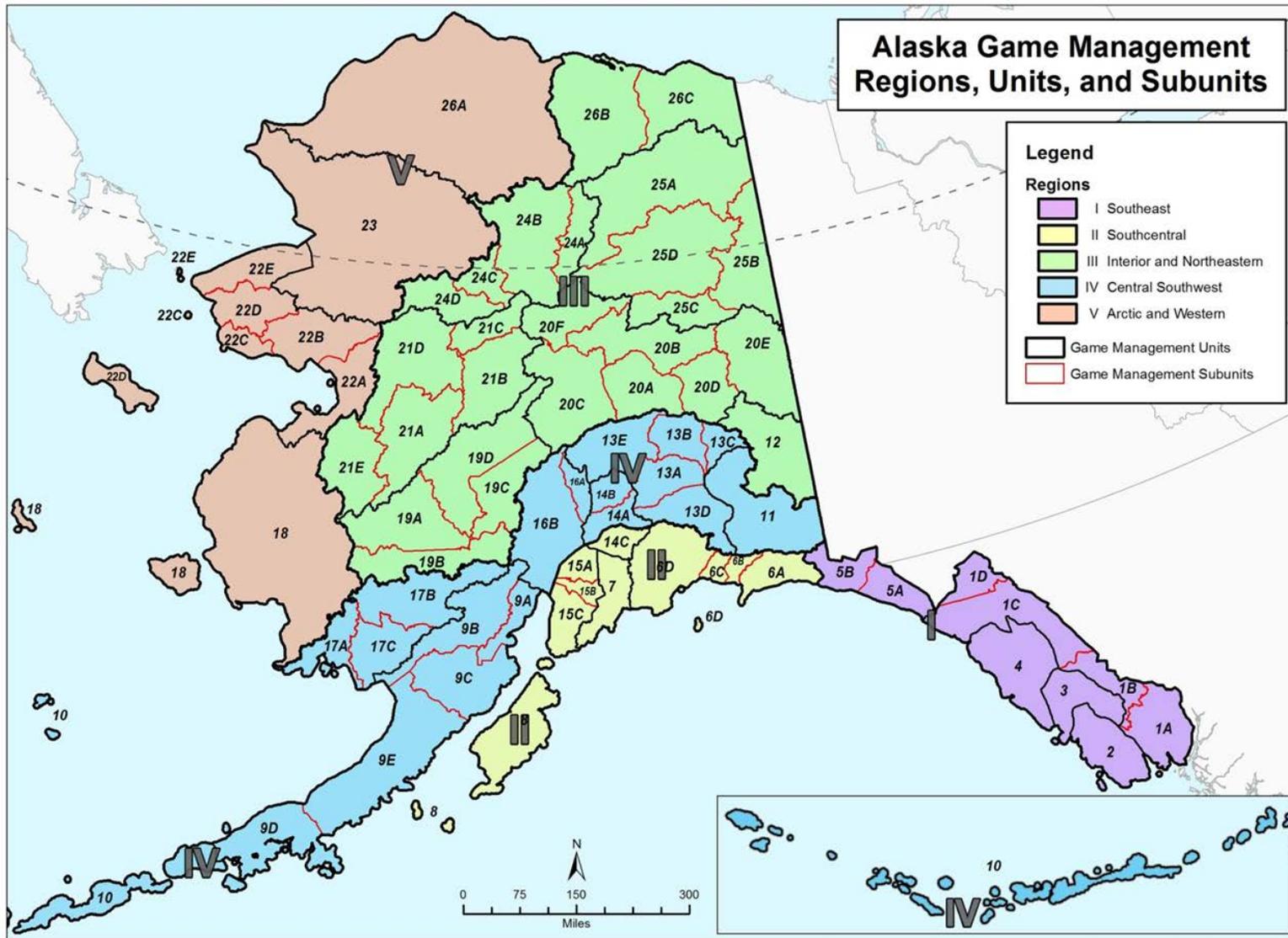


Figure 1. State of Alaska game management units.

Methods

SURVEY DESIGN

A stratified, random sample household survey was conducted to estimate small game hunter participation, harvest, effort, targeted and harvested species, and location of effort for the time period from 1 August 2013 through the end of the RY13 hunting season. A single page survey form (Fig. 2) was mailed to survey recipients who were asked to complete the form and mail it back or respond through a secure online website portal. Survey recipients were provided a unique questionnaire ID number on the paper survey form mailed to each recipient. The questionnaire ID allowed entrance to the online portal, thus keeping multiple household residents from double reporting. Recipients were asked to describe the hunting activities of all members of the household, including hunters under the age of 16. The online application was created using Microsoft (MS) SQL Server and Microsoft.NET.

In Alaska there is no easy way to query the resident small game hunter population due to the lack of a resident small game license category (only nonresidents can purchase a specific small game license). Therefore, to develop a survey pool, individual survey recipients were selected from the RY12 license database using MS SQL Server. This was the most recent complete list of resident and nonresident hunters from which to create our list of RY13 survey recipients. Recipients were selected according to the following characteristics: 1) at least one member of the household had purchased a resident hunting, trapping, or combination license during RY12, 2) a nonresident purchased a small game, hunting, or combination license during RY12, 3) a nonresident purchased a military license during RY12, or 4) at least one individual of a household held a permanent identification (PID) card during RY12. If multiple license holders were selected with the same address, the first license holder with that address was selected to receive the survey.

Five percent (5%) of Alaska resident license holders (including military and PID) were selected randomly from this pool. Recipients were then stratified by all Alaska communities with a minimum sample size of 10 individual license holders per city. If a stratum had less than 10 members, all of them were selected. Five percent (5%) of all nonresident license holders were randomly selected and not stratified by city. A total of 512 location strata were created due to the city/license combinations.

On 1 May 2014 a single page survey form was mailed to survey recipients. For those that had not completed the survey by 20 June, a reminder survey was mailed on 30 June 2014. All surveys received after 18 August 2014 were not used in the final tabulation and analysis for this report.

In order to more effectively interpret the responses to transportation methods, effort, and hunting location, 10 geographic areas of the state were identified and responses linked to those areas (Fig. 3). These regions were selected based on population size and access to the primary road system in Alaska. Microsoft SQL Server and MS Excel were used to summarize data and produce estimates.

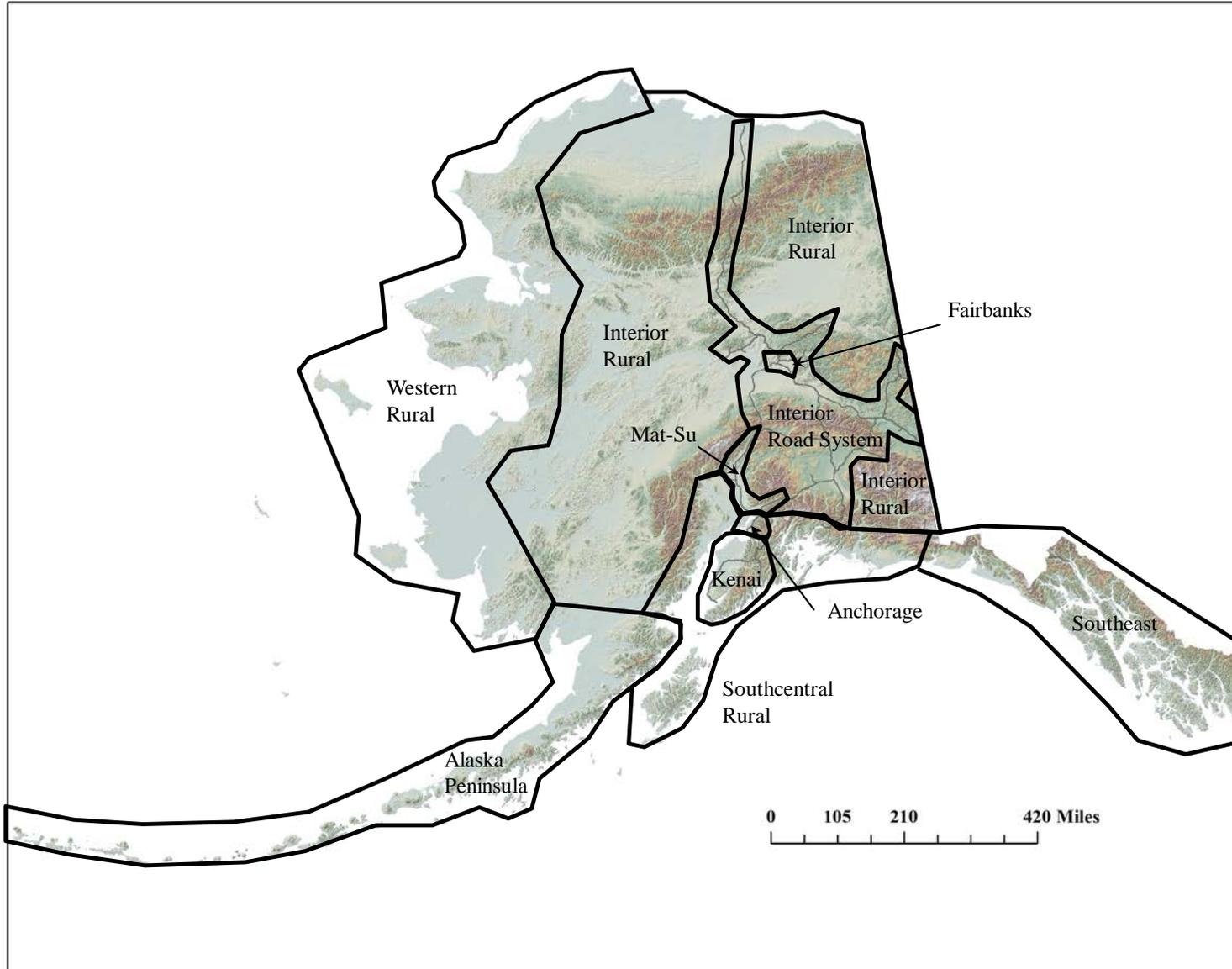


Figure 3. Geographic areas used to better describe small game hunting effort, transportation methods, and location.

Results

SURVEY RESPONSE

During RY12, 182,132 total license holders (resident, PID, and nonresident) lived in 131,928 unique households (Table 1). A random sample of 9,552 was taken of these households and stratified by license type and city. From 9,552 survey requests we received 2,850 completed surveys (online and returned paper responses), for a response rate of 30% (Table 1). A total of 483 respondents (17%) reported hunting small game and 3% reported participating in a federal subsistence hunt for small game. The majority of reported federal subsistence hunting occurred in GMU 13, 17, 18, 22, and 23 and was directed towards ptarmigan.

The highest survey response rate was among nonresidents with licenses other than small game (41%), followed by resident PID (33%), and resident trapping license holders (31%; Table 1). The response rate for rural residents (residents living outside the large urban centers of Anchorage, Mat-Su and Fairbanks) was lower than urban residents (Table 2). Residents in the Interior Rural (17%) and Western Rural (17%) areas had the lowest response rate.

As of 15 December, 2014 a total of 89 surveys (3% of the total) had been received since the 18 August cut-off date and not included in summary results. Of those 21% reported hunting small game during RY13.

SMALL GAME HUNTING

Statewide, an estimated 40,239 (95% CI = 36,057 - 44,420) individuals hunted small game in Alaska (Table 3). Of these, 6,846 (95% CI = 5,585 – 8,164) hunters were under the age of 16 and 33,393 were age 16 and older. Similarly, an estimated total of 23,483 households (22,331 resident and 1,152 nonresident) hunted small game in Alaska during the reporting period.

An estimated 28% of all respondents hunted small game specifically and 22% hunted small game only opportunistically while pursuing other hunting or outdoor activities (Table 4). The majority (50%) of small game hunters in Alaska responded that they enjoyed both pursuing small game specifically as well as opportunistically while enjoying other outdoor recreational activities.

Survey respondents reported spending more days hunting spruce grouse and ptarmigan than any other species (Table 5). The greatest number of reported hunter days spent hunting ptarmigan by geographic area occurred in the Western Rural area although the greatest total reported effort by GMU occurred in GMU 13. The greatest effort spent hunting spruce and ruffed grouse was by residents living in the Interior (Road System and Rural) and the Mat-Su geographic areas.

Species identification may have had an unknown influence on survey results. For example, Southeast respondents reported 54% of their overall effort was spent hunting spruce grouse despite this species having a very limited range (Prince of Wales Island group) and overall low abundance in this geographic area. Sooty grouse are the predominant grouse species throughout Southeast and harvest is much higher than spruce grouse.

Table 1. Statewide small game hunter survey response rate by license type.

License Type	Status	Total Number of		Sample	Surveys Returned		Households that Hunted Small Game	
		License Holders	Households		Number	Percent	Number	Percent
Nonresident Hunting	Nonresident	7,027	6,531	307	124	40%	3	2%
Nonresident Hunting & Sport Fishing	Nonresident	596	528	33	12	36%	0	0%
Nonresident Hunting & Trapping	Nonresident	101	85	2	0	0%	0	0%
Nonresident Hunting/1 Day Sport Fishing	Nonresident	13	12	0	0	0%	0	0%
Nonresident Hunting/3 Day Sport Fishing	Nonresident	29	27	1	1	100%	0	0%
Nonresident Hunting/7 Day Sport Fishing	Nonresident	860	786	44	22	50%	1	5%
Nonresident Hunting/14 Day Sport Fishing	Nonresident	262	244	9	3	33%	0	0%
Total Nonresident		8,888	8,213	396	162	41%	4	2%
Nonresident Small Game Hunting	Nonresident Small Game	1,647	1,423	71	15	21%	10	67%
Total Nonresident Small Game		1,647	1,423	71	15	21%	10	67%
Nonresident Military Hunting	Resident	546	461	29	5	17%	2	40%
Nonresident Military Sport Fishing & Hunting	Resident	1,232	994	58	3	5%	2	67%
Res ANG/Mil Reserves Sport Fishing & Hunting	Resident	1,545	1,275	69	25	36%	6	24%
Resident Hunting	Resident	16,606	11,981	982	197	20%	51	26%
Resident Low Income Sport Fishing, Hunting & Trapping	Resident	15,718	10,550	1,031	146	14%	29	20%
Resident Sport Fishing & Hunting	Resident	40,197	29,612	1,841	645	35%	154	24%
Total Resident		75,844	54,873	4,010	1,021	25%	244	24%
Resident Hunting & Trapping	Resident - Trapping	793	570	77	11	14%	7	64%
Resident Sport Fishing, Hunting & Trapping	Resident - Trapping	7,391	5,336	381	131	34%	54	41%
Total Resident - Trapping		8,184	5,906	458	142	31%	61	43%
Resident Permanent	Resident -Permanent ID	87,569	61,513	4,617	1,510	33%	164	11%
Total Resident - Permanent ID		87,569	61,513	4,617	1,510	33%	164	11%
Survey Total		182,132	131,928	9,552	2,850	30%	483	17%

Table 2. Survey response rate among all geographic areas and nonresidents.

Geographic Area	Surveys		Response
	Sent	Returned	Rate
Southeast	1,046	396	38%
Nonresident	572	199	35%
Anchorage	2,069	716	35%
Mat-Su	903	311	34%
Kenai	864	294	34%
Interior Road System	501	151	30%
Fairbanks	791	234	30%
Southcentral Rural	438	119	27%
Alaska Peninsula	452	109	24%
Interior Rural	731	126	17%
Western Rural	1,185	195	16%
Total	9,552	2,850	30%

Table 3. Mean and estimated number of small game hunters by age and household.

Status	Estimated Number of Households that Hunted Small Game	Mean Number of Small Game Hunters per Household		Estimated Number of Statewide Small Game Hunters	
		Total	Age 10-16	Total	Age 10-16
		Total Nonresident	203	1.75	0.00
Total Nonresident-small game	949	1.30	0.10	1,233	95
Total Resident	13,114	1.74	0.36	22,841	4,783
Total Resident and Trapping	2,537	1.62	0.25	4,118	624
Total Permanent ID	6,681	1.75	0.20	11,692	1,344
Survey Total	23,484			40,239	6,846

Table 4. Number of respondents who targeted and/or opportunistically hunted small game.

Method	Number of	
	Responses	Percent
Specifically targeted small game	137	28%
Hunted small game opportunistically	107	22%
Both of the above	239	50%
Total	483	100.0%

Table 5. Average number of days hunted per species by those that reported hunting small game within a geographic area.

Geographic Area	Number of Respondents	Grouse					Hare		Average Total
		Ruffed	Spruce	Sharp-tailed	Sooty	Ptarmigan	Snowshoe	Alaska	
Alaska Peninsula	33	1.5	6.4	0.0	0.0	7.5	2.3	2.5	20
Anchorage	93	1.5	3.5	0.1	0.1	2.7	1.4	0.7	10
Fairbanks	45	3.3	2.9	2.0	0.1	2.6	1.4	0.8	13
Interior Road System	42	4.5	9.8	3.8	0.1	4.5	6.5	2.6	32
Interior Rural	30	7.0	12.2	0.4	0.0	8.3	5.4	1.3	34
Kenai	30	0.1	5.7	0.0	0.0	3.1	6.2	0.1	15
Mat-Su	61	3.2	8.5	0.2	0.0	5.9	3.9	1.0	23
Southcentral Rural	24	0.0	3.2	0.0	0.0	4.0	5.7	1.5	14
Southeast	30	0.0	3.5	0.0	2.3	0.2	0.2	0.2	6
Western Rural	60	0.5	0.8	0.0	0.1	7.2	2.9	2.5	14
Non-resident	11	0.6	1.5	0.0	0.0	4.1	0.6	0.0	7

Of the Alaska resident respondents that reported hunting small game, most hunters spent the majority of their time pursuing small game within the geographic area in which they lived (Appendix A). For example, 95% of Kenai resident effort was from within GMUs 7 and 15, 66% of Mat-Su resident effort within GMUs 14 and 16, 86% of Fairbanks resident effort within GMU 20, and 100% of effort from Southeast residents in GMUs 1–5. Overall, 50% of hunters statewide reported hunting in GMUs 13, 14, and 20 during RY13 (Fig. 4).

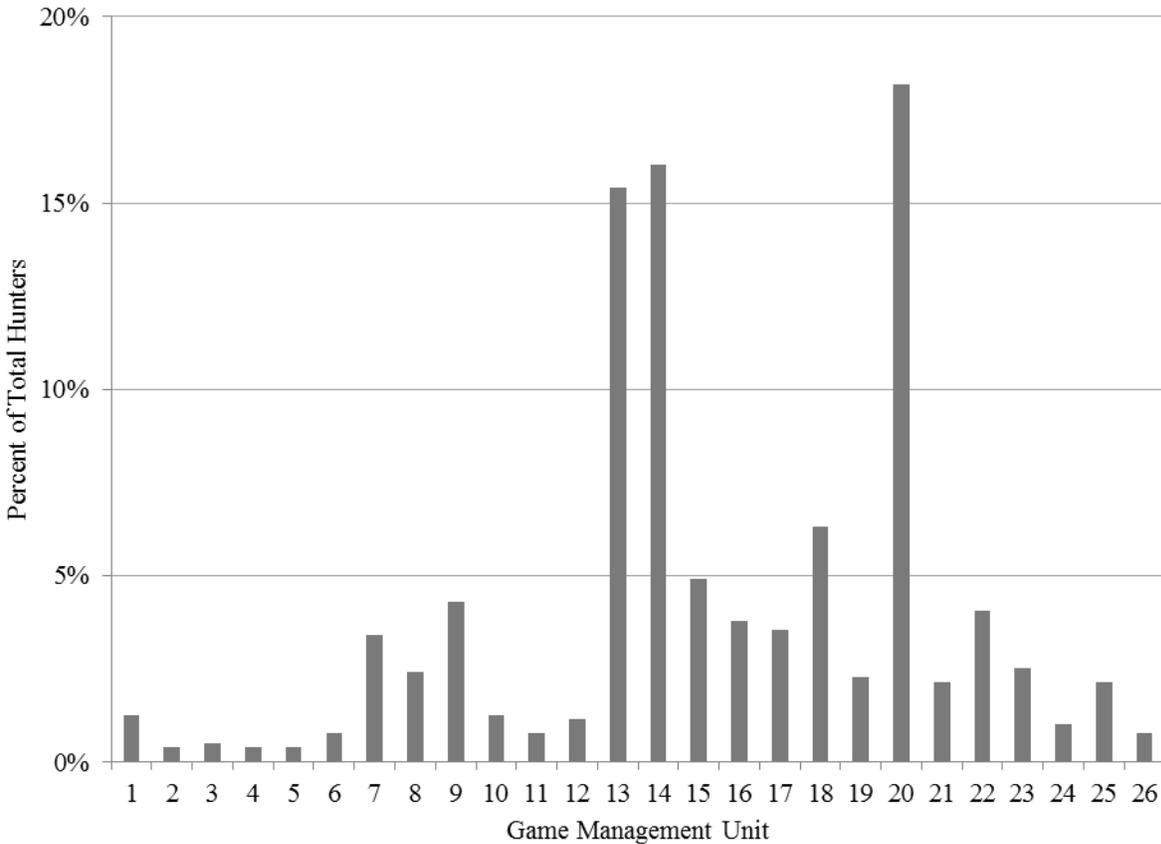


Figure 4. Percent of total hunters that reported hunting all small game in RY13 by game management unit.

The primary transportation methods used to hunt small game statewide reported by respondents included walking (28%), all-terrain vehicle (ATV; 24%), and highway vehicle (21%; Table 6). However, this varied by geographic area; hunters in the Western Rural area reported using primarily snowmachine (67%) versus other means of transportation. Statewide, ptarmigan were hunted primarily using snowmachine (39%; Appendix B); however, in GMUs 17 and 18 that percentage was higher (91% and 73%, respectively). Snowshoe hare, spruce, ruffed, and sharp-tailed grouse were hunted primarily using highway vehicles, walking, and ATVs. Too few data were collected to estimate transportation methods used for Alaska hare and sooty grouse.

Overall, respondents reported lower abundance of virtually all small game species statewide during RY13 than during the previous year. Of particular notice were snowshoe and Alaska hare (Table 7).

Table 6. Percentage of respondents that utilize specific transportation methods for hunting small game in Alaska by geographic area.

Geographic Area	Highway						
	Vehicle	Snowmachine	ATV	Airplane	Boat	Foot	Other
Alaska Peninsula	19%	4%	33%	0%	2%	41%	0%
Anchorage	28%	3%	27%	2%	8%	31%	1%
Fairbanks	47%	7%	12%	2%	0%	32%	0%
Interior Road System	14%	5%	36%	0%	0%	43%	0%
Interior Rural	10%	38%	14%	2%	12%	22%	2%
Kenai	27%	9%	13%	0%	1%	29%	21%
Mat-Su	28%	22%	31%	1%	4%	14%	0%
Southcentral Rural	8%	1%	24%	2%	0%	66%	0%
Southeast	35%	11%	5%	0%	31%	18%	0%
Western Rural	2%	67%	16%	0%	4%	10%	0%
Non-resident	71%	0%	11%	8%	0%	11%	0%
Total	21%	19%	24%	1%	5%	28%	2%

Table 7. Population abundance trend observed by hunters during RY13 based on percent of total responses.

Overall Abundance Compared to Last Year	Grouse					Hare	
	Ruffed	Spruce	Sharp-tailed	Sooty	Ptarmigan	Snowshoe	Alaska
Less	53%	46%	43%	33%	43%	61%	59%
More	11%	14%	30%	42%	14%	10%	12%
Same	36%	40%	26%	25%	43%	29%	29%
Total Responses	83	188	23	12	188	112	41

An attempt was made to estimate total harvest. Estimates were calculated by multiplying the total number of households that reported hunting small game in Alaska during RY13 (23,483) by the percent of households that targeted each species and then by the mean household harvest of each species. During the RY13, statewide small game hunting season, an estimated 114,000 ptarmigan, 73,000 spruce grouse, 23,000 snowshoe hare, 16,000 ruffed grouse, 5,000 sharp-tailed grouse, 5,000 sooty grouse, and 7,500 Alaska hare were harvested under state regulations (Table 8). However, these statewide harvest estimates should be interpreted cautiously.

Table 8. Estimated statewide harvest by species during regulatory year 2013.

Species	Harvest	Percent of Total	95% Confidence Interval	
			Lower	Upper
Ptarmigan	114,206	47%	84,213	144,200
Spruce Grouse	72,734	30%	59,921	85,547
Snowshoe Hare	23,434	10%	16,489	30,380
Ruffed Grouse	15,947	7%	10,161	21,733
Alaska Hare	7,536	3%	4,059	11,013
Sharp-tailed Grouse	5,397	2%	3,029	7,765
Sooty Grouse	4,813	2%	1,573	8,054
Total	244,067	100%	179,445	308,692

Discussion

SURVEY MEDIUM

During the first statewide small game hunter survey in May 2012 all recipients had to provide their responses online; no paper survey forms were provided. It was believed that a vast majority of resident and nonresident hunters had convenient and frequent access to the Internet, therefore making an online response easy and efficient. A very low response rate (11%) was received. The reason for the low response rate is unknown and may have been caused by one of several issues:

1. The online portal was constructed using Adobe Flash which was not supported by Apple™ products. Due to Apple's market share in the United States (60% of digital devices in 2012; Business Insider 2014) this may have affected a significant portion of the survey recipients.
2. Internet access in certain portions of Alaska may be limited therefore affecting responses.
3. For hunters that did not hunt small game it may have been more inconvenient than filling out and mailing a paper form to go online, log in through the portal, and complete the survey. Therefore, responses may have been biased towards those that actually hunted small game.

All of these reasons contributed to the creation of the dual medium used for this most recent survey.

In May 2014, recipients received a paper survey form that could be completed and returned or they had the option of providing their responses online as in 2012. Over 50% of participants completed the paper survey form. We plan to continue sending paper survey forms to hunters in the future as it was clear that Alaskan hunters strongly support this survey medium. The PID license category showed the highest increase in survey response between the 2012 and 2014 surveys.

The proportion of recipient households that reported hunting small game in RY13 was much lower (17%) than the RY11 small game survey (33%). There are several possible explanations:

1. Fewer resident and nonresident households hunted small game during RY13.
2. It was easier for survey respondents to check one box on a paper form than it was to go online to complete the same response.
3. There could have been a difference in geographic area response rates.

INTERPRETING HUNTER RESPONSES

We felt a single household questionnaire was the best way to capture the hunting activities of the license holder within the household, other hunters in the household, and young hunters (age 10–15) in the household. Young hunters, 10–15 years of age, are not required to purchase a hunting license; therefore documenting their effort and harvest presents unique challenges this survey hoped to overcome. By asking for household small game hunting information, data could be summarized by individual respondent or household.

Small game hunters residing in the urban geographic areas (Anchorage, Mat-Su, and Fairbanks) used transportation methods differently than residents living in more remote locations both on and away from the primary road system (Interior Rural, Southcentral Rural, and Western Rural). Urban area hunters predominantly used highway vehicles, walking, and ATVs in order of importance. Non-urban residents used ATVs, boats, and snowmachines more than urban residents. Ptarmigan hunters statewide tended to use snowmachines more than any other mode of transportation (39% of the time) whereas grouse hunters (ruffed, sharp-tailed, and spruce) tended to use highway vehicles, ATVs, and walking most commonly.

With 9 species of small game in Alaska, species identification can be a potential source of error for hunters recalling the species they hunted or harvested. There are several examples of this that should be considered when interpreting these data. For example, hunters reported hunting and harvesting species outside the known range of each species in Alaska, for instance harvesting sooty grouse outside the Southeast area or sharp-tailed grouse in the Kenai area. An attempt was made to correct for some of these errors. Hunter effort and harvest of species that are known to be absent from specific GMUs were disregarded.

Small game harvest estimates were made for animals harvested under state regulations despite potential biases based on response rates and data quality. Despite potential bias the estimates do reveal the overall pattern that was reflected throughout the survey. Spruce grouse, ptarmigan, and snowshoe hare are the most popular small game species statewide based on hunting effort and harvest. Ruffed and sharp-tailed grouse are hunted proportionately less perhaps because they are not as widespread and thus less accessible to hunters statewide. Since sooty grouse are restricted to Southeast Alaska relatively few hunters pursue this species as is reflected in the harvest data.

Overall hunters reported seeing a lower abundance of virtually every species of small game during RY13 than the previous year. This was particularly evident from responses regarding snowshoe and Alaska hare. The likely explanation for snowshoe hare is its documented low in the 8-10 year population cycle statewide (Carroll and Merizon 2014). Overall, Alaska hare appears to be at low yet stable densities throughout its range in Alaska. It remains uncertain whether this has been a long-term decline or a midcentury crash with a continued low but stable population in recent years (Carroll and Merizon 2014).

The popularity of spruce grouse, ptarmigan, and snowshoe hare indicated in this survey is similar to what was found in the hunter survey in 2012 (Merizon and Carson 2013) and earlier by McGowan (1980, 1985, and 1986). McGowan suggested that spruce grouse were the most popular small game species in the early to mid-1980s in the Interior. The increased interest in ptarmigan could be explained by various factors, including technological improvements in off-road vehicles (ATVs and snowmachines) over the past 25 years. These improvements have allowed hunters to more easily pursue ptarmigan at greater distances from the road corridor.

The importance of ptarmigan to statewide small game hunters was strongly underscored through this survey effort. Although neither state regulations nor this survey allowed us to distinguish between willow, white-tailed, and rock ptarmigan in terms of numbers harvested or hunter effort, willow ptarmigan were likely the predominant species harvested. This is the most abundant ptarmigan species in Alaska and occurs throughout the entire state with the exception of the Aleutian Islands (Carroll and Merizon 2014). This species is facing unique challenges as the

state's human population continues to grow. Increased wintertime recreation and increasing interest in pursuing easy and affordable small game hunting opportunities will continue to put pressures on all of Alaska's small game species, particularly ptarmigan.

This survey clearly demonstrated both the recreational and subsistence value of Alaska's small game resources. However, ADF&G has only just begun to understand small game harvest, hunter participation, and effort throughout the state. Regular surveys are needed in the future for managers to make recommendations and evaluate proposed regulations. Information from these surveys can also be used to inform hunters on the status of small game populations. In addition, data gathered from these surveys can be used to highlight and understand the contributions small game hunters make to regional and local economies. Future surveys will take into account experience from these first surveys in order to refine our approach to better assess hunter effort, harvests and population trend of small game species at finer geographic scales.

Acknowledgments

We'd like to thank all the respondents to the survey; your time and effort is greatly appreciated. Thank you to all who assisted in entering survey data including C. Anderson, C. Bue, B. Fitzgerald, and W. Newberry. Thank you to B. Dale, T. Paragi, S. Brainerd, C. Carroll, and P. Harper for reviewing this report and providing a thorough review.

This project was funded in part by Federal Aid in Wildlife Restoration W-33-12, Project 35.0: Status, public use, and management of small game populations in Alaska FY2014.

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Appendix A: Number of days hunted reported by small game survey respondents, by species and geographic area.

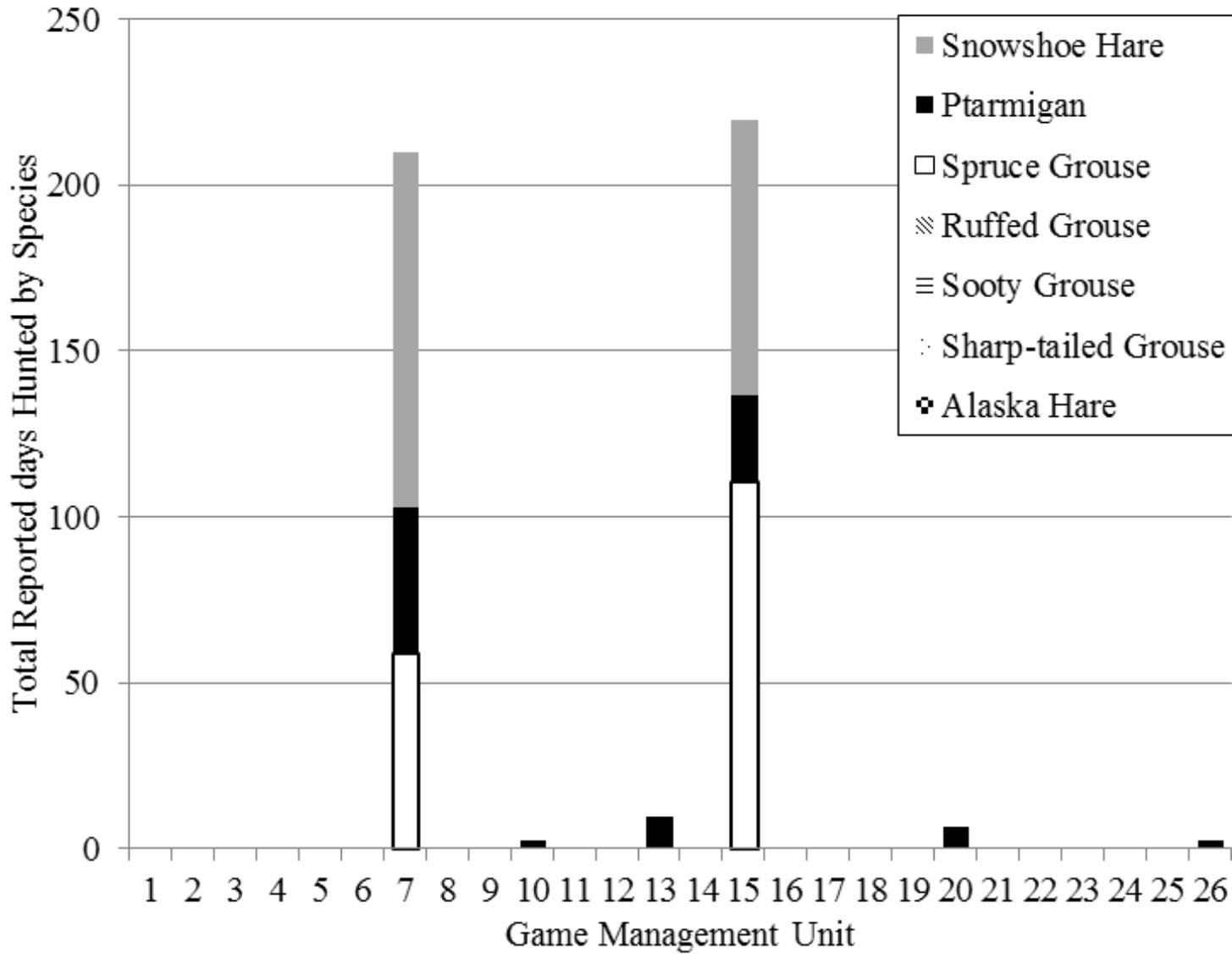


Figure A1. Total effort (hunting days) reported from residents within the Kenai geographic area by species, RY13.

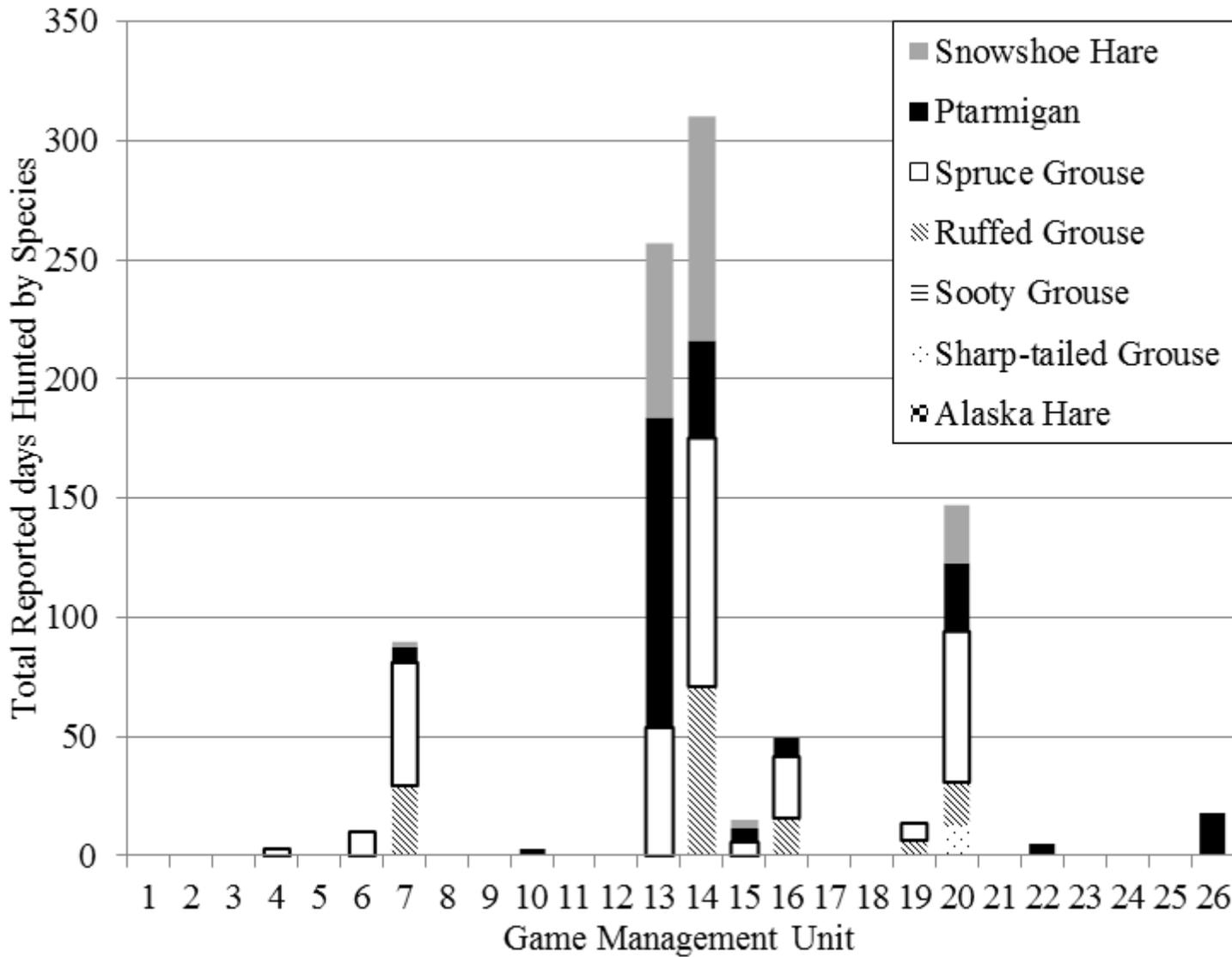


Figure A2. Total effort (hunting days) reported from residents within the Anchorage geographic area by species, RY13.

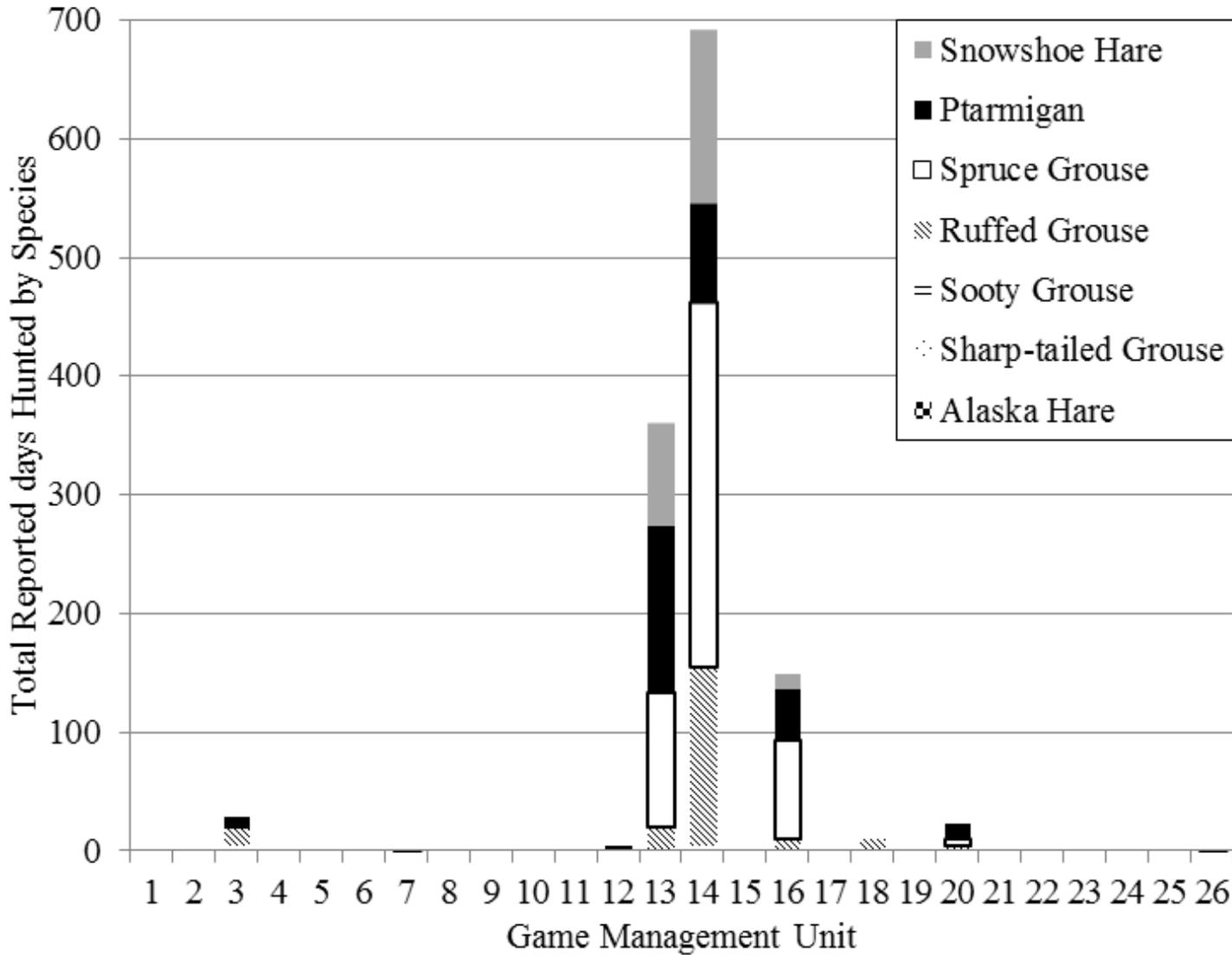


Figure A3. Total effort (hunting days) reported from residents within the Mat-Su geographic area by species, RY13.

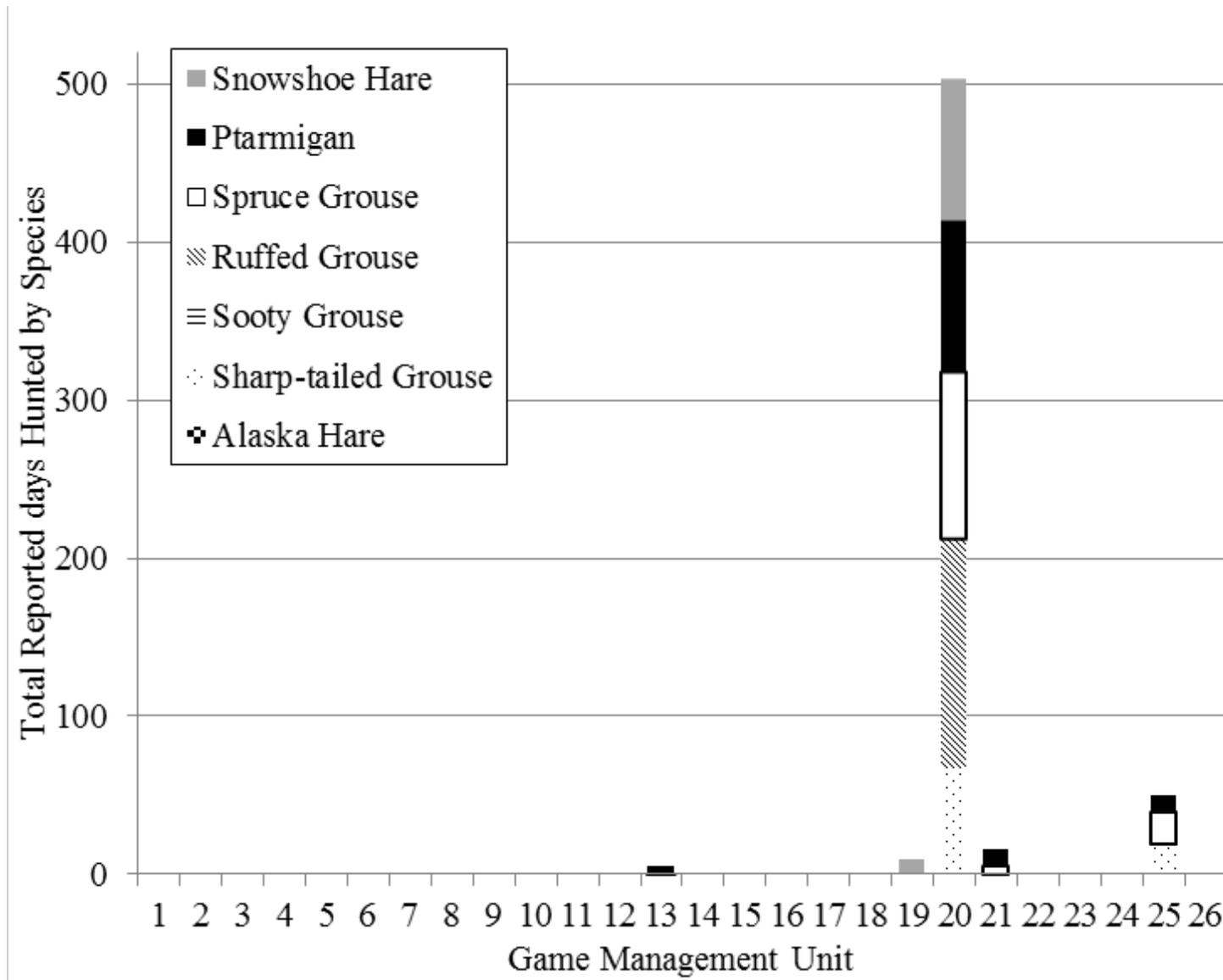


Figure A4. Total effort (hunting days) reported from residents within the Fairbanks geographic area by species, RY13.

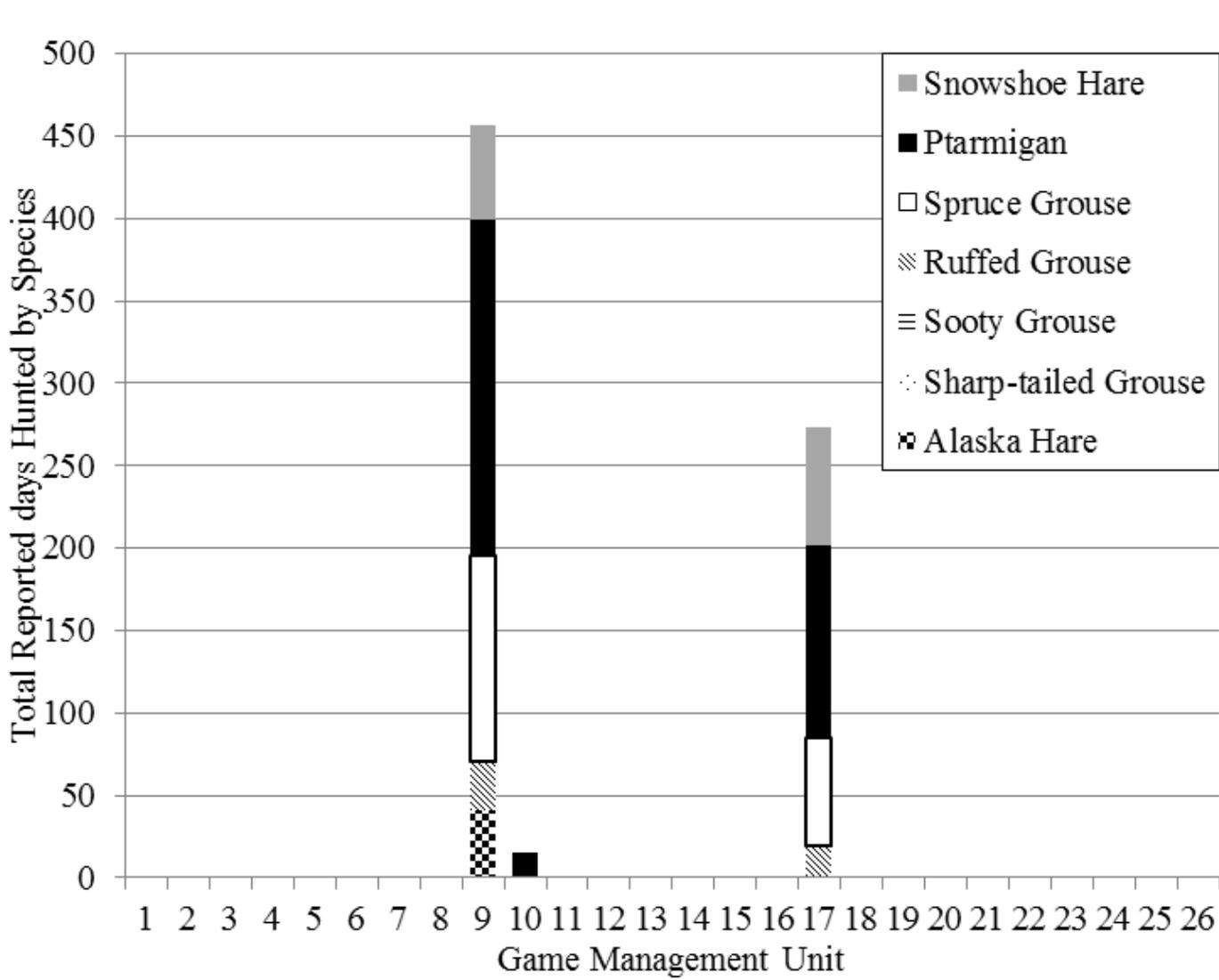


Figure A5. Total effort (hunting days) reported from residents within the Alaska Peninsula geographic area by species, RY13.

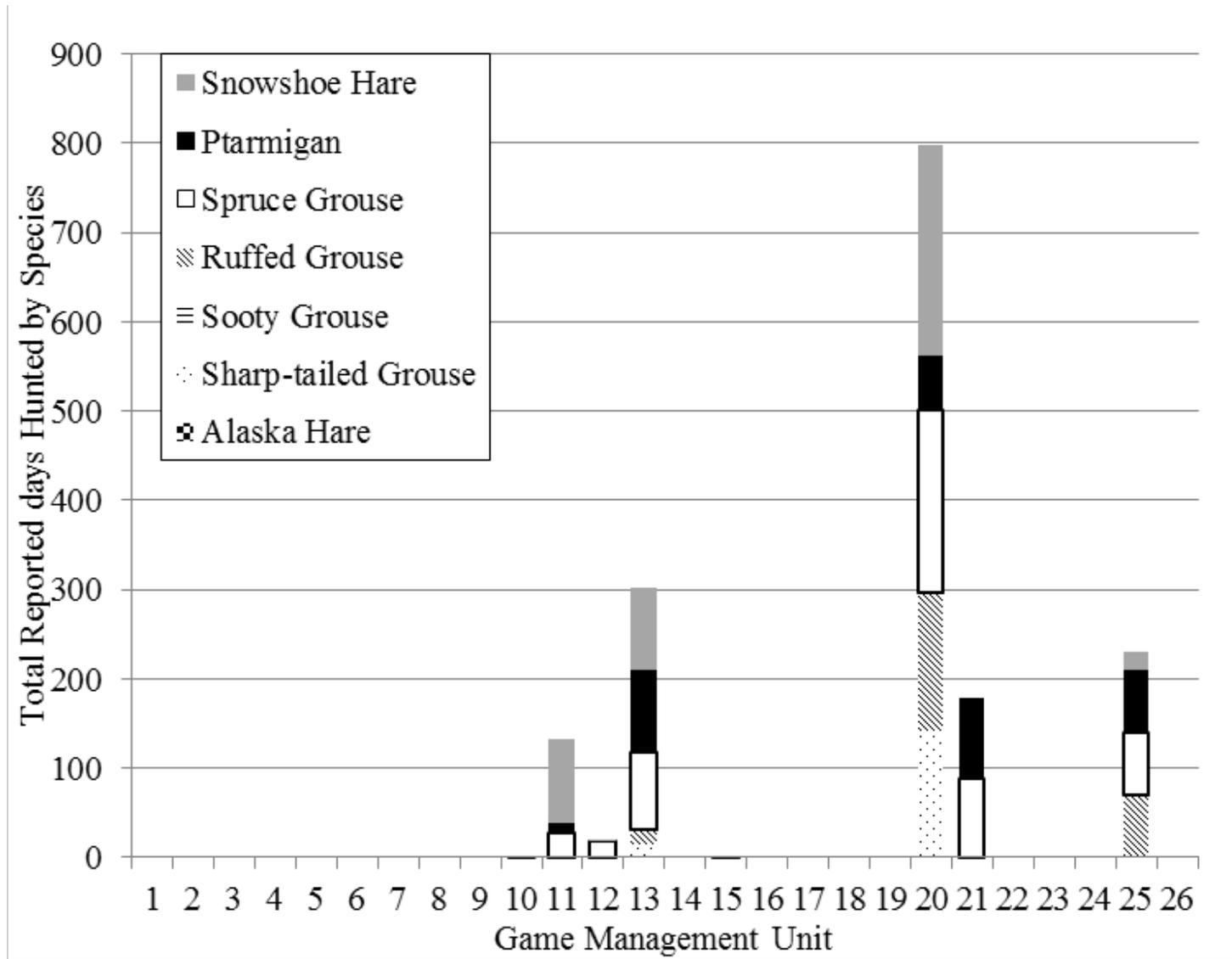


Figure A6. Total effort (hunting days) reported from residents within the Interior Road System geographic area by species, RY13.

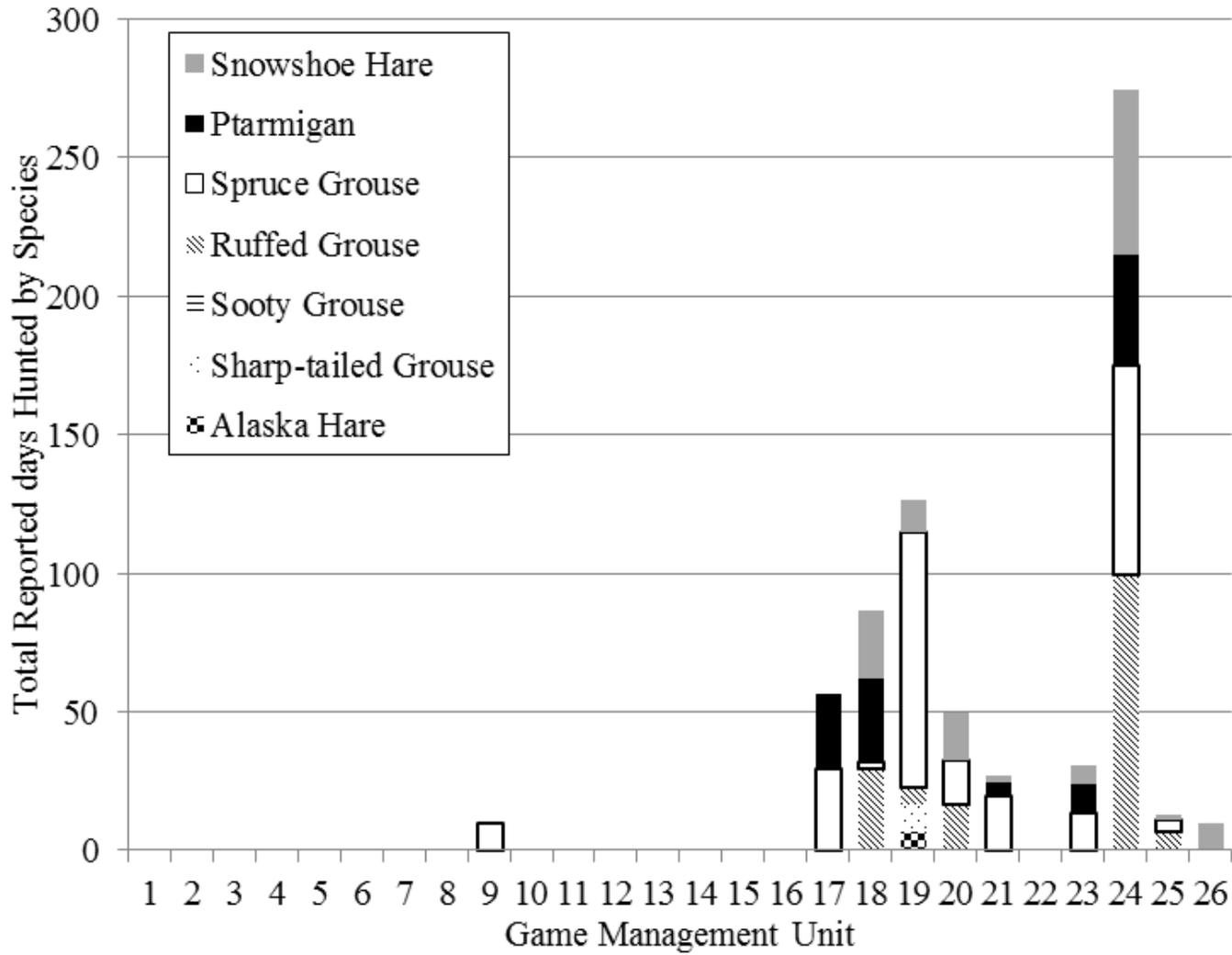


Figure A7. Total effort (hunting days) reported from residents within the Interior Rural geographic area by species, RY13.

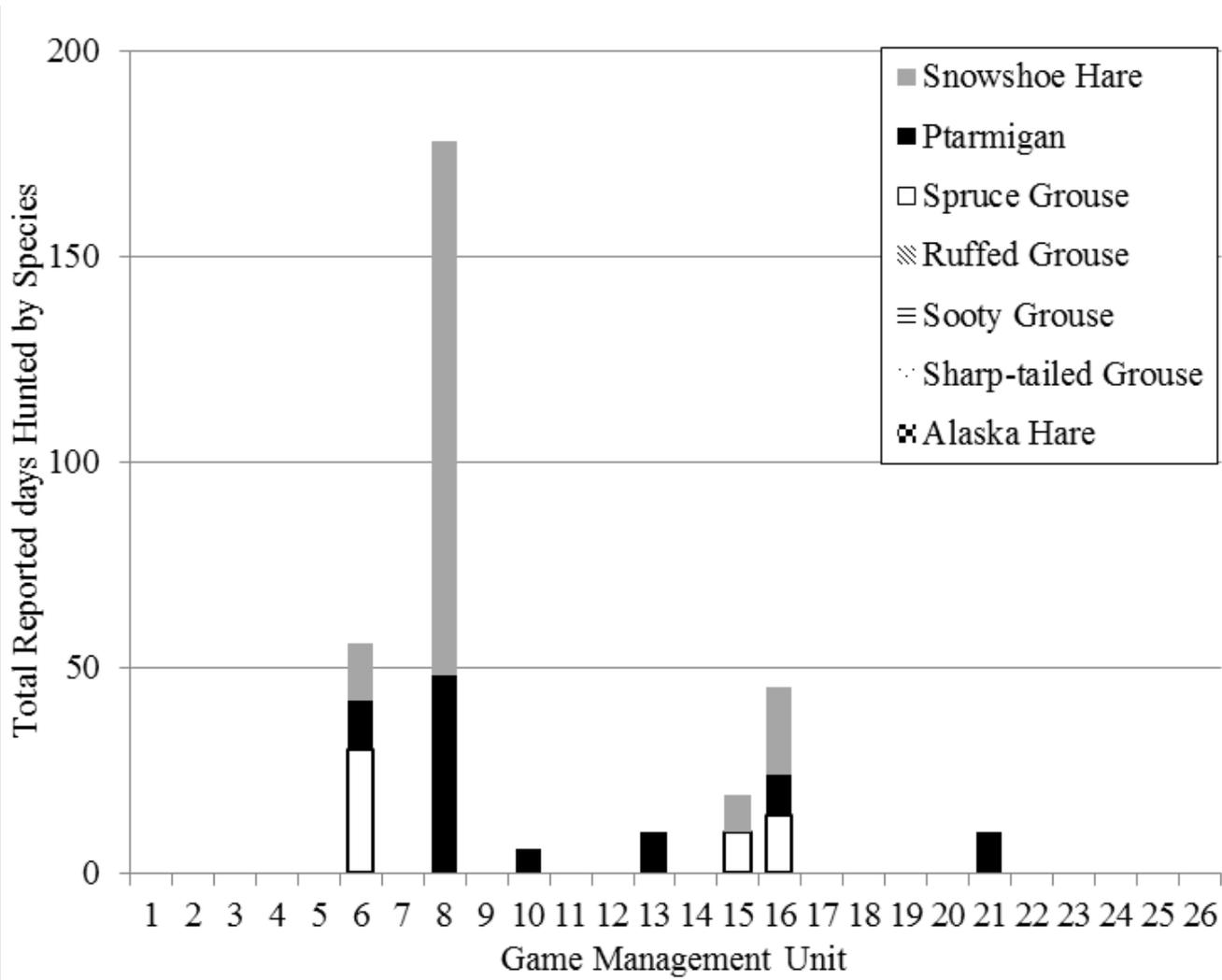


Figure A8. Total effort (hunting days) reported from residents within the Southcentral Rural geographic area by species, RY13.

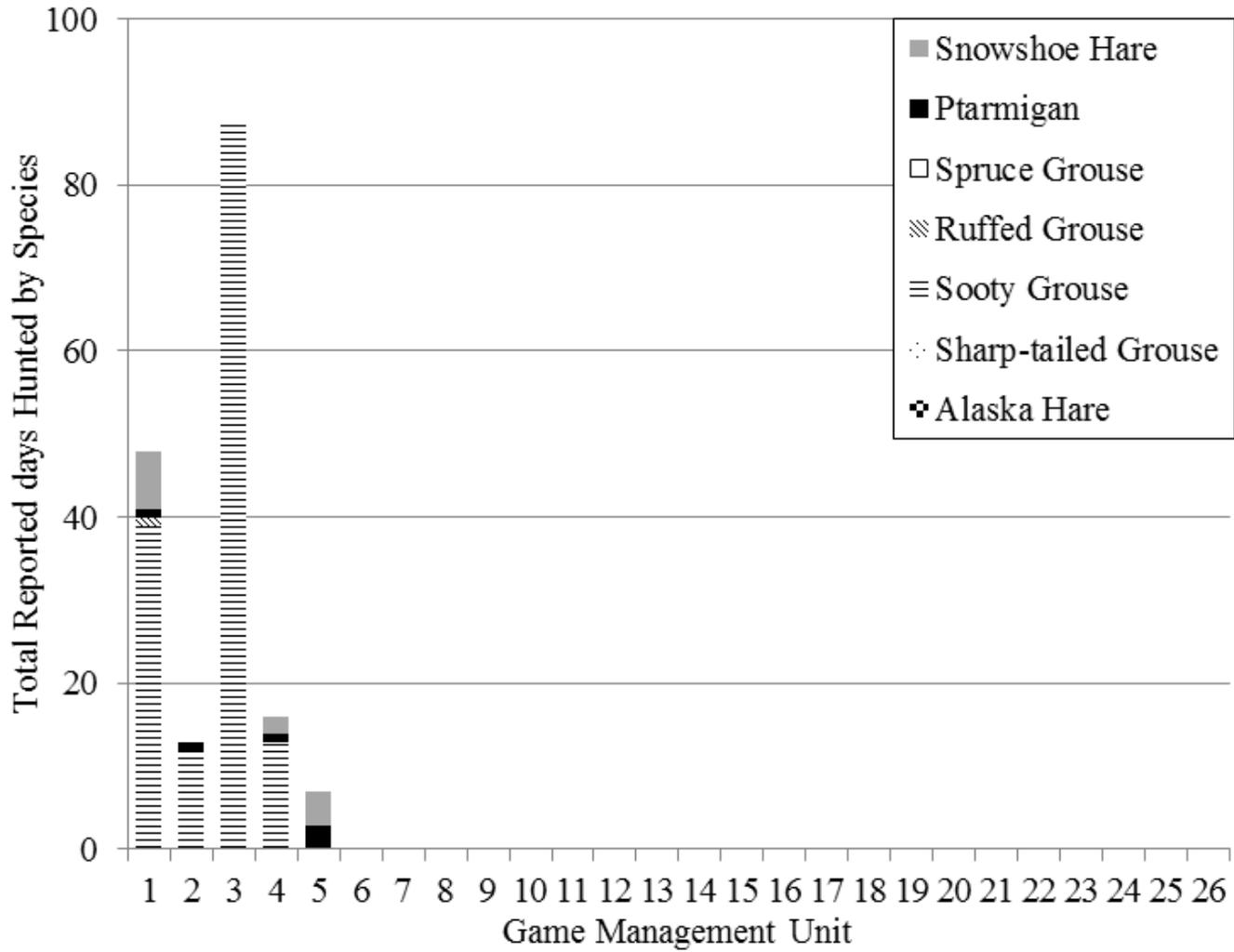


Figure A9. Total effort (hunting days) reported from residents within the Southeast geographic area by species, RY13.

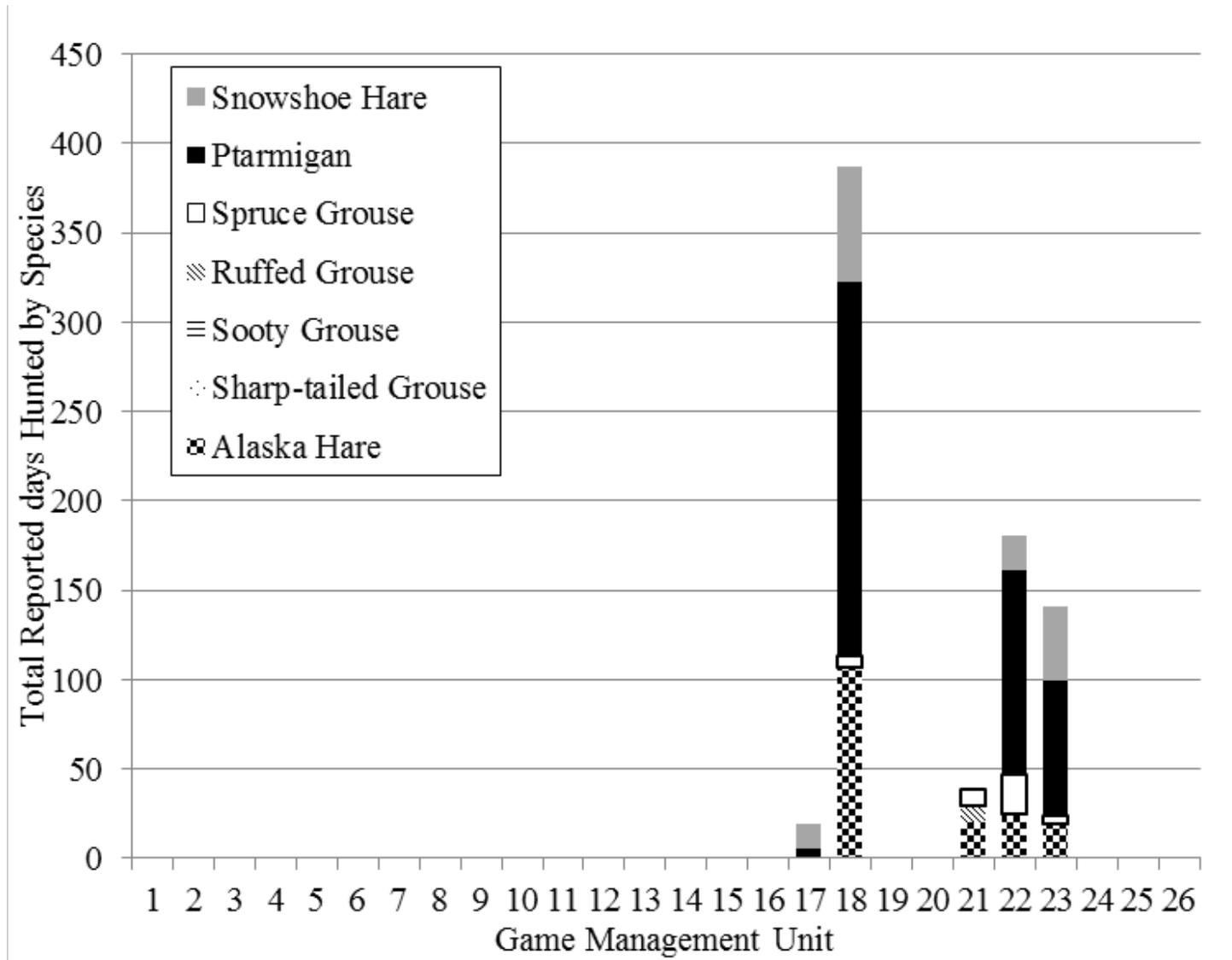


Figure A10. Total effort (hunting days) reported from residents within the Western Rural geographic area by species, RY13.

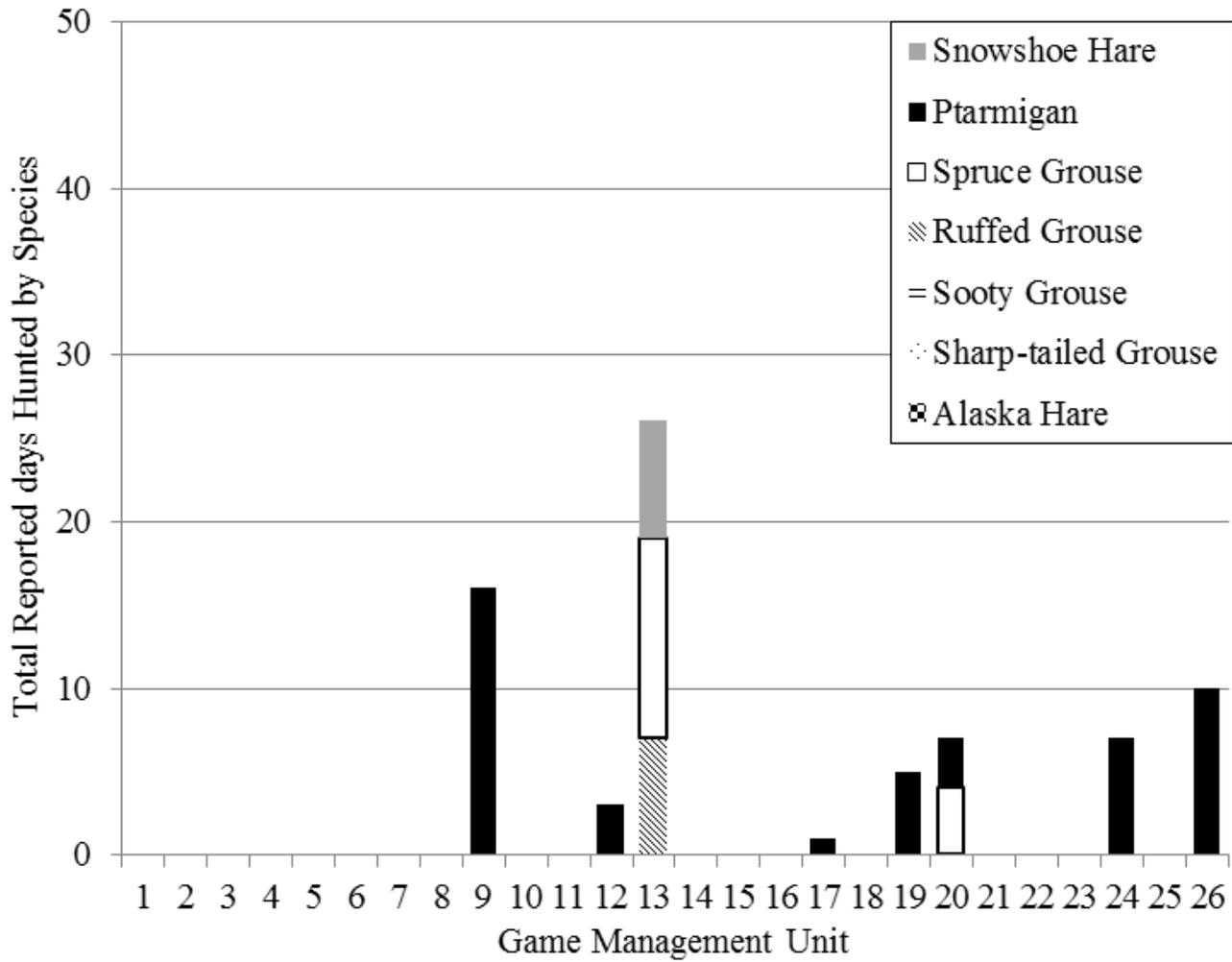


Figure A11. Total effort (hunting days) reported from Nonresident hunters by species, RY13.

Appendix B: Reported number of days using various transportation methods used to hunt small game, by species.

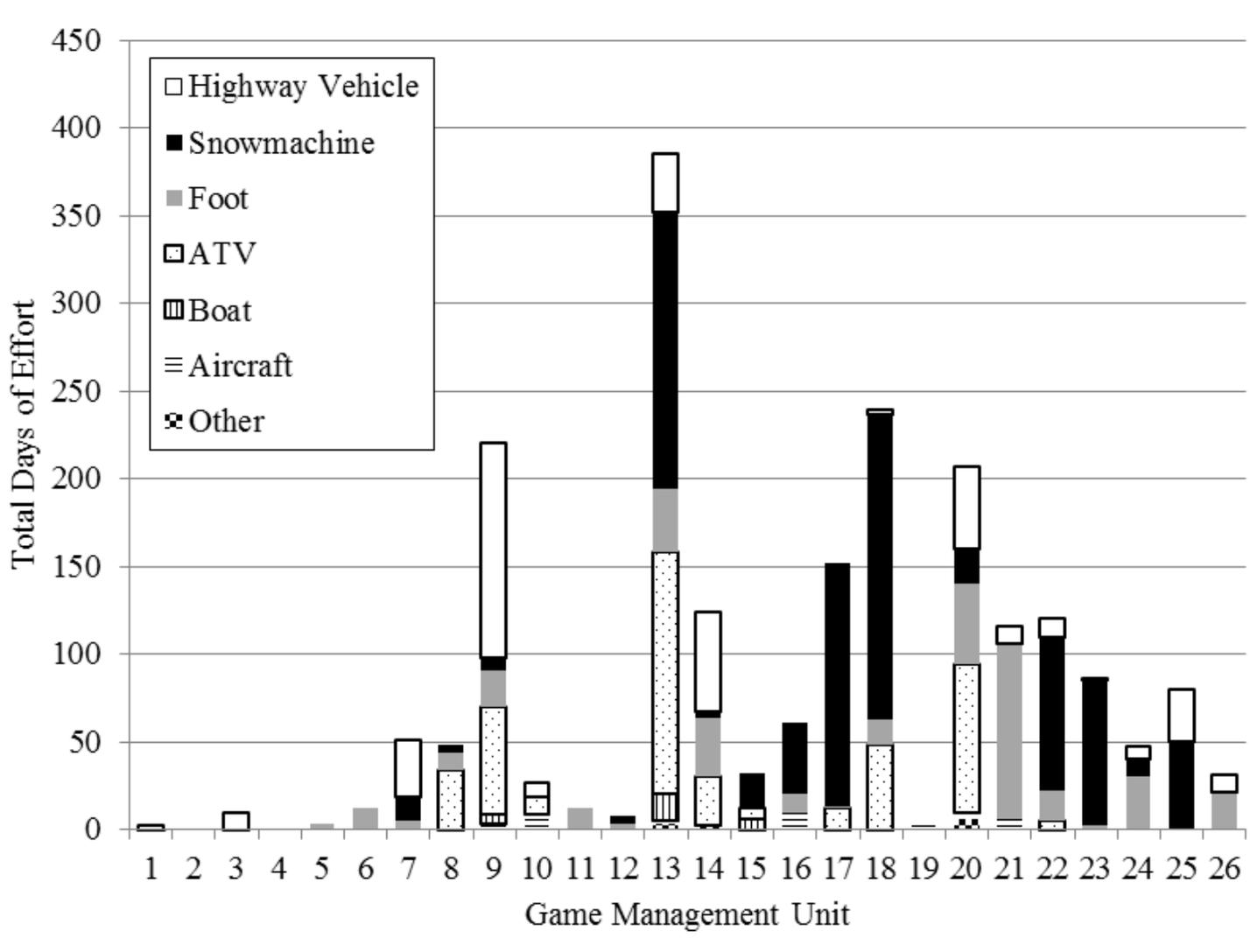


Figure B1. Total effort (hunting days) by transportation method used to hunt ptarmigan, RY13.

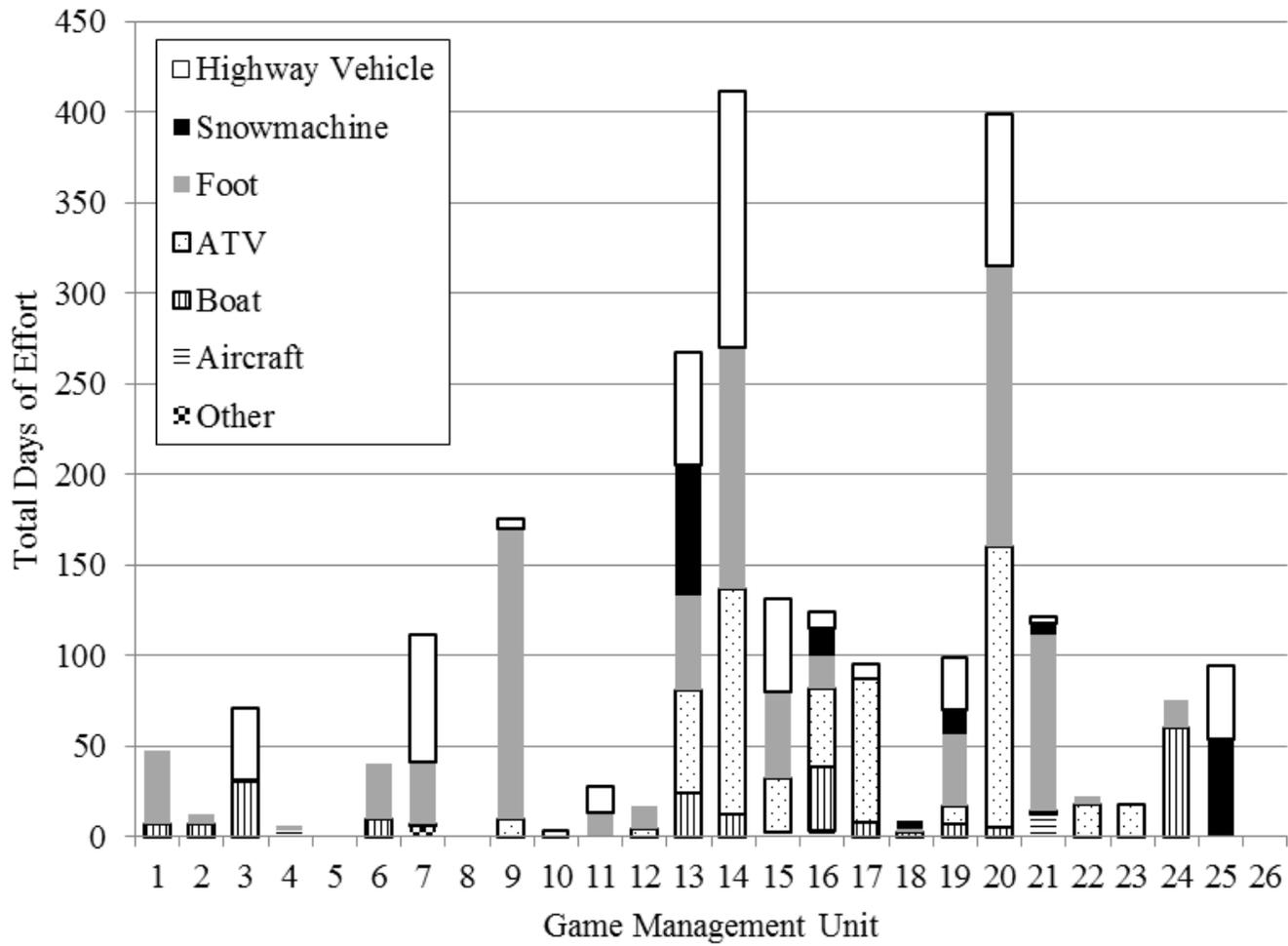


Figure B2. Total effort (hunting days) by transportation method used to hunt spruce grouse, RY13.

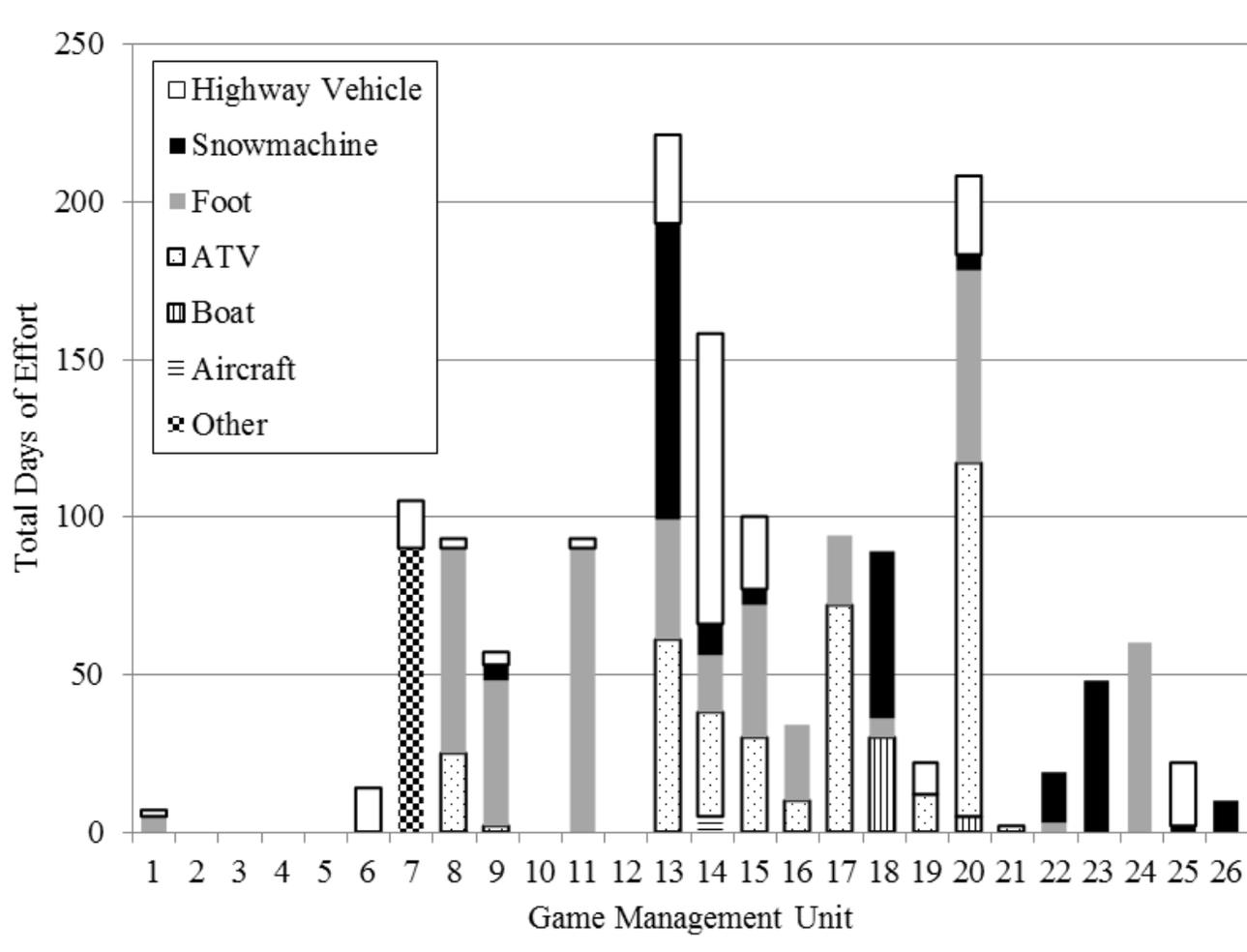


Figure B3. Total effort (hunting days) by transportation method used to hunt snowshoe hare, RY13.

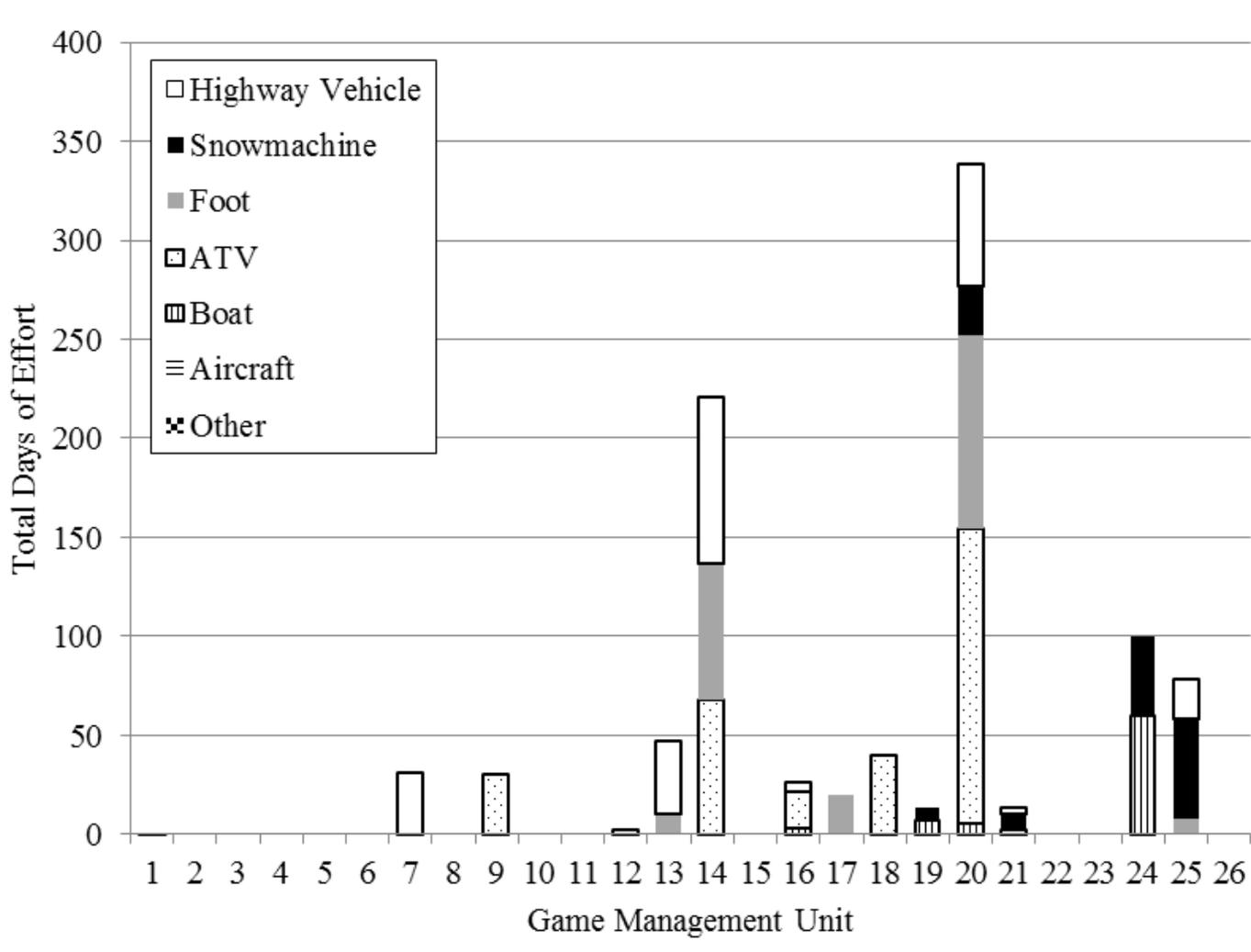


Figure B4. Total effort (hunting days) by transportation method used to hunt ruffed grouse, RY13.

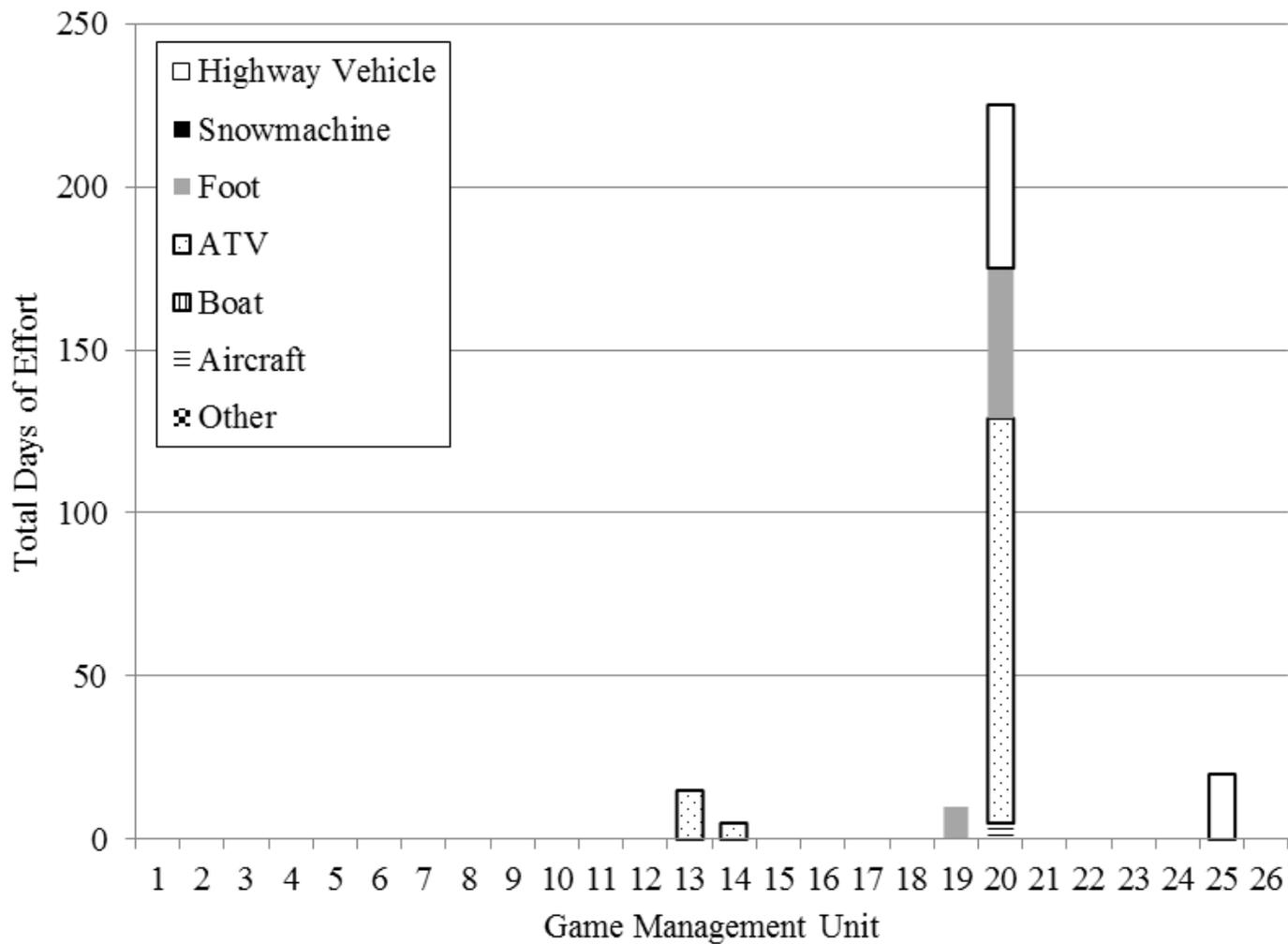


Figure B5. Total effort (hunting days) by transportation method used to hunt sharp-tailed grouse, RY13.

