SAIS User Survey

Summary Report 2021

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Scottish Avalanche Information Service
sportscotland

Overview

The summary report covers the following topics:

A. General summary and main findings

B. SAIS survey respondents' profile and avalanche knowledge

C. SAIS survey respondents' familiarity with SAIS reports

D. SAIS survey respondents' understanding of the hazard scale and danger rose

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Based on a survey design by Professor Philip Ebert, Dr David Comerford (University of Stirling), and Mark Diggins (SAIS).

Survey response data is available online: http://hdl.handle.net/11667/192

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UKRI Arts and Humanities Research Council

A. General summary and main findings

In total, we received 1193 recorded responses of which a total of 715 answered all questions. Given the length of the survey (~15min), and recruitment methods, the survey sample is possibly biased towards more advanced users of the SAIS user population.

Overall users are very appreciative of the service with high ratings for the website and information presented. Survey respondents tend to regularly use the service and in relevant ways. A high proportion of survey respondents claim to use the advanced information presented in the SAIS bulletin (i.e. avalanche problems information).

Written feedback from survey respondents encouraged the service to expand by providing more educational material or videos to be displayed on the website, as well as surveys that include assessments and correct answers. SAIS may thus want to consider whether to move from an avalanche forecasting service to a broader avalanche risk management service that also includes educational components.

Main findings and recommendations:

1. At least **4 in 10** survey respondents are either unsure about or have the wrong understanding of the "striped" areas (localized hazards) used in some forecasts. Given that a wrong understanding can lead to an underestimate of the relevant risks, the use of the "striped area" should be reconsidered or its presentation improved.
2. Roughly **1 in 5** survey respondents don't know that there are five avalanche hazards. A better presentation of the hazard levels should help fill this knowledge gap.
3. Understanding of what each hazard level means could be improved. Respondents interpret the hazard levels *moderate, considerable,* and *high* in different ways. Consistent messaging throughout the textual description and the hazard level description (at a national and international level) is important.
4. Survey respondents fall roughly into the following user categories: **~1 in 10** survey respondents are what we call *basic users*: they draw mainly on the avalanche danger scale in their planning. **3 in 10** survey respondents are what we call *intermediate users*: they mainly draw on the danger rose, aspect, and altitude in their planning. **~6 in 10** survey respondents are what we call *advanced users*: they draw on all previous information and the avalanche problem information in their planning. Consider whether any design changes are needed to cater for the high proportion of advanced users on SAIS website.
5. Black and white version of the danger rose leads to a reduced understanding in some contexts and their use should be discouraged.

B. SAIS Survey Respondents Profile and Avalanche Knowledge

General Profile of survey respondents

Survey respondents cover a wide range of winter activities with many respondents engaging in different types of winter sports activities, most having extensive experience (>10 years) and spend more than a week in the mountains each winter.

A skewed gender balance in the respondents is not unsurprising and coheres with website data traffic. Also there are likely more male winter sports participants than female in Scotland. Overall, we have a good response rate from a wide range of age groups and education backgrounds, though follow-up surveys targeting younger user in the under 30 age group would be beneficial, as we have low numbers of respondents compared to other age groups.

Avalanche Knowledge

Overall survey respondents seem fairly confident in being able to recognize situations in which they could trigger avalanches and identify avalanche and non-avalanche terrain. A high proportion of respondents had formal training in avalanche decision-making which again suggests that the sample is possibly biased towards more educated and advanced users. There is a significant number of respondents who are self-taught and, it seems, availability of relevant and local avalanche courses is an issue. Also, in written responses some respondents seem to suggest that avalanche courses are not important to them since SAIS information as well as a risk-averse mind set is enough as a risk management tool.

- There is potentially a market for more avalanche courses throughout the UK (and online courses for those not living close to Outdoor teaching centres).
- Some participants express doubts of the added value of formal avalanche training over available books and self-taught material.
- Consider presenting the SAIS information as only one (important) aspect of avalanche awareness and avalanche risk management. It is best used in combination with additional knowledge in mountain safety.
- Overview of detailed results, see appendix A.

C. SAIS survey respondents' familiarity with SAIS reports

Most respondents were familiar with the SAIS website and their bulletins. Only 9 respondents didn't know about the service. It's clear that the service is regarded as a very useful and important resource and 95 out of 100 respondents rated the SAIS website as easy to use.

Most respondents use the SAIS service regularly to stay up to date with conditions throughout the winter and draw on the information early during the planning phase, i.e. SAIS information feeds into the decision where to pursue winter activities.

A minority of respondents use the SAIS information only once they know where to pursue their activities or don't use it in the planning phase at all. Important is that most respondents tend to use all the information offered by the SAIS in their planning. So, roughly 6 out of 10 respondents count as advanced users and draw on the avalanche problem, aspect and altitude, and hazard rating in the planning phase, while 3 out of 10 are intermediate users and use the hazard rating, aspect, and altitude in their planning, only 1 out 10 are only use the hazard rating. Most advanced users (8 out of 10) claim that the avalanche problem information is either very important or extremely important to them. However, these findings might be an indication that the survey respondents are biased towards more advanced users. Further research that draws on website traffic or "on the spot" user survey can help identify potential biases in this survey.

Finally, **2 in 10** respondents claim not to use SAIS information during the mountain day, which might make sense in situations in which planning is extensive and any hazards have been identified early. Given our survey, we cannot say more about the exact reasons why people do not use SAIS information during the day. Interestingly, most respondents do not make use of the BAA app and claim to remember all the relevant information.

- Highlight the relevance and importance of advanced information, such as the avalanche problem, to beginner and intermediate users. 4 out of 10 users do not draw on that information in their planning.
- Consider making advanced information more easily accessible given its important to a range of users.
- Advertise the BAA app for easy use during the day on the mountain. Make sure it has a download function so it can be easily used when no data is available.
- Overview of detailed results, see appendix B.

D. SAIS survey respondents' understanding of the hazard scale and danger rose

7 in 10 survey respondents correctly answered the question how many avalanche hazard levels there are (five). 15% of respondents opted for four hazard level, which given that level 5 (very high) is extremely rarely used maybe not unsurprising. The other 15% were either unsure or opted for three or six hazard levels as their response. However, respondents often had difficulties to correctly specify the relevant levels in their own words.

Respondents' understanding of the hazard level moderate, considerable, and high seems to vary. For example, with respect to the hazard level considerable, 4 in 10 respondents think it means "triggering an avalanche is *possible* from one person", while roughly the same number (4 in 10) think that it means that "triggering is *likely* from one person". Also, 5 in 10 individuals think that a "high" hazard level means that "triggering is *very likely* from one person" when in fact it tends to be defined as "triggering is *likely* from one person". Consistent messaging about the meaning of the different hazard levels is important throughout the website. Note that we found discrepancies in the use of verbal probabilities (terms like "likely", "possible", etc) in the descriptors for the different hazard levels in Scotland and in other countries (such as the descriptors used by the EAWS).

Respondents understanding of the danger rose, i.e. their ability to identify the danger areas on a map given the danger map seems to be good in that between 8-9 out of 10 respondents identified the most important danger zones. However, there is room for improvement. One important finding is that the black and white display of the danger rose did reduce understanding when the danger rose was more complicated and involved both considerable and high hazard levels.

Finally, at most 6 out of 10 respondents did interpret correctly the so called "striped area" in the danger rose, with some exhibiting a wrong understanding that could lead to an underestimate of the relevant risks and with even more confusion amongst respondents for the black and white version.

Suggestions:

- Present the five hazard levels more clearly on the website to improve their understanding and consider clarifying their status given that only really four hazard levels are de facto used by the Scottish forecasting service.
- Respondents understanding of the official definitions of the hazard levels could be improved, though it seems that respondents' interpretation is risk-averse, i.e. they tend to, on average, overestimate the risk associated with each level.
- Further discussion of potential discrepancies between the descriptors used by EAWS and SAIS of the avalanche hazard levels is encouraged, with the aim of providing consistent and simple messaging. Clarity and consistency with respect to verbal probability terms ("likely", "possible") is advisable.
- Black and white displays of the danger rose, especially when they are complex, are to be discouraged. (However, consider alternative colours for colour blind users).
- The use of the "striped area" in the danger rose should be reconsidered or its presentation improved.
- Overview of detailed results, see appendix C.

Further Avenues for Research

- Prepare a more detailed analysis of the survey data and identify predictors that would help identify specific groups of people to help improve risk understanding and communication.
- Collaborate more closely with the web team to oversee potential changes based on the report on the SAIS website.
- Identify and create heatmaps of SAIS website use to see which information is most often used by SAIS users and compare this to self-reports in this survey.
- More research is needed on the understanding and use of verbal probability statements and respondents' interpretation of these terms in the context of the avalanche danger scale.
- Surveys that compares our findings with users groups in other European countries could provide important and helpful information to risk communication strategies.
- Further experimental work, including choice experiments, to test e.g. the demand for avalanche courses, and the relevance of avalanche information, are to be considered.

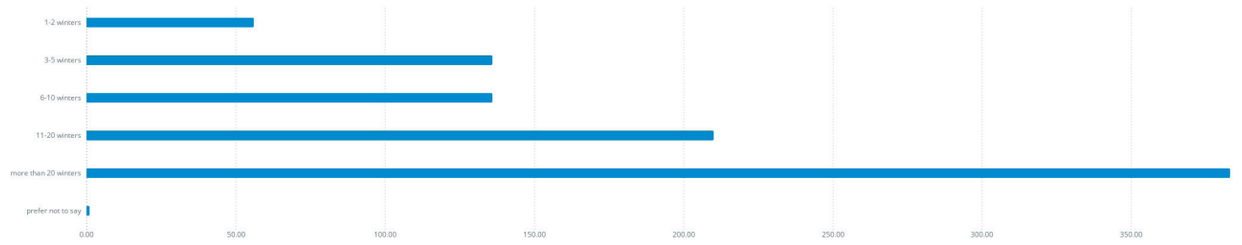
Appendix A

Q1. Which of the following winter sport activities do you actively engage in?

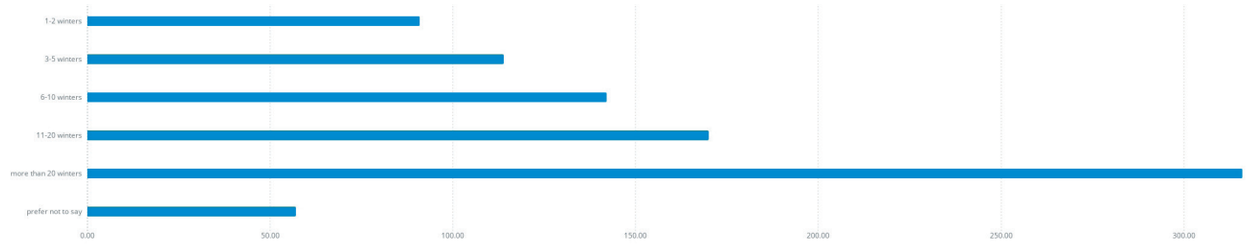
(multiple answers possible)

#	Question	Primary activity		Secondary activities		Total
1	Ski-touring (Backcountry skiing/snowboard)	50.92%	250	49.08%	241	491
2	Winter walking	54.92%	463	45.08%	380	843
3	Winter climbing/mountaineering	46.05%	315	53.95%	369	684
4	Off-piste skiing (lift assisted or near ski area)	26.70%	110	73.30%	302	412
5	Other winter activities	18.98%	26	81.02%	111	137

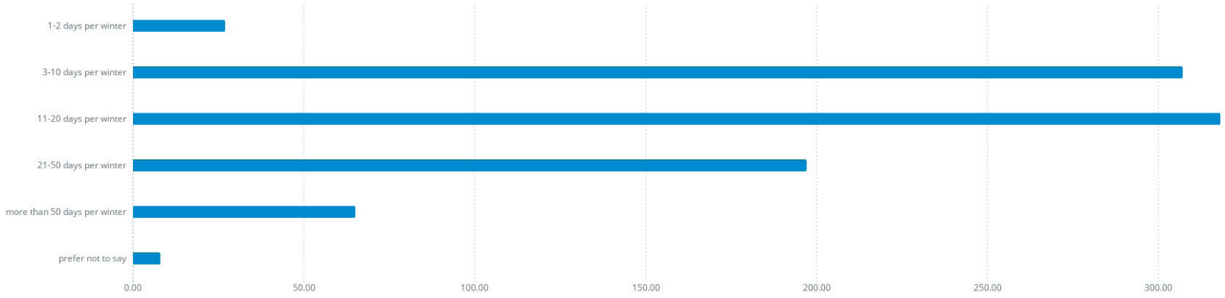
Q2. How much experience do you have in your primary winter outdoor activity? Number of winters



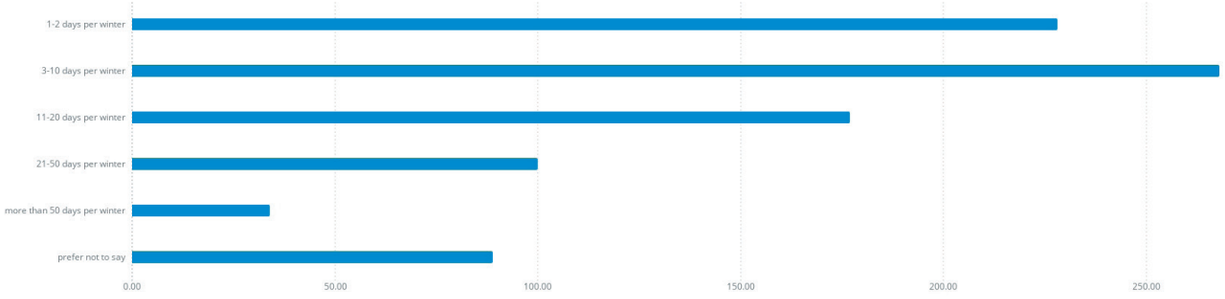
Q3. How much experience do you have in all your secondary winter outdoor activities combined? Number of winters



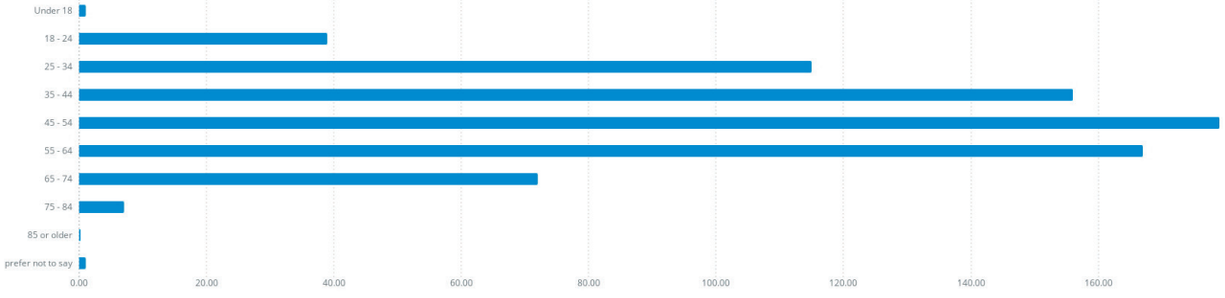
Q4. **Average number of days per winter in Scotland only (primary and secondary). If Covid-19 has significantly affected your winter activities, please provide your estimate for "normal", i.e. pre-Covid, times.**



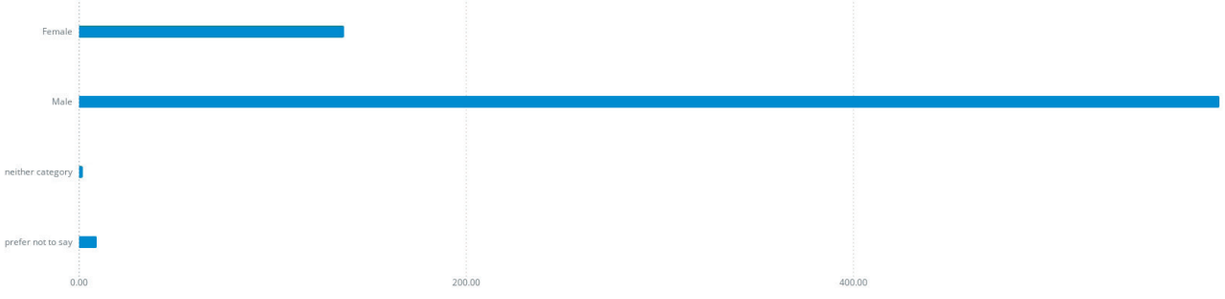
Q5. **Average Number of days per winter outside Scotland (primary and secondary). If Covid-19 has significantly affected your winter activities, please provide your estimate for "normal", i.e. pre-Covid, times.**



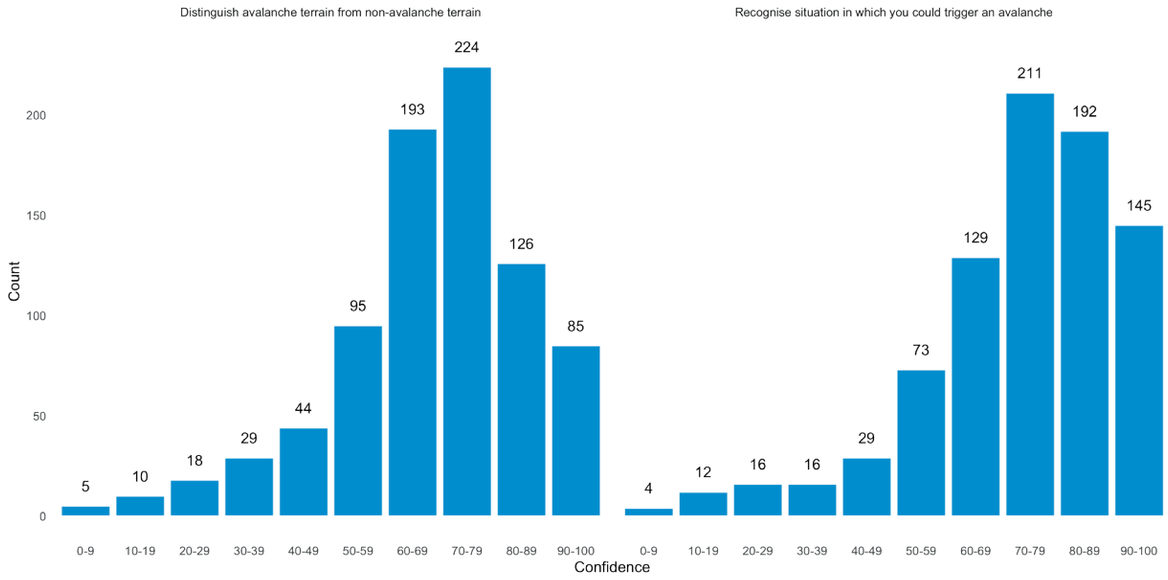
Q6. **Age**



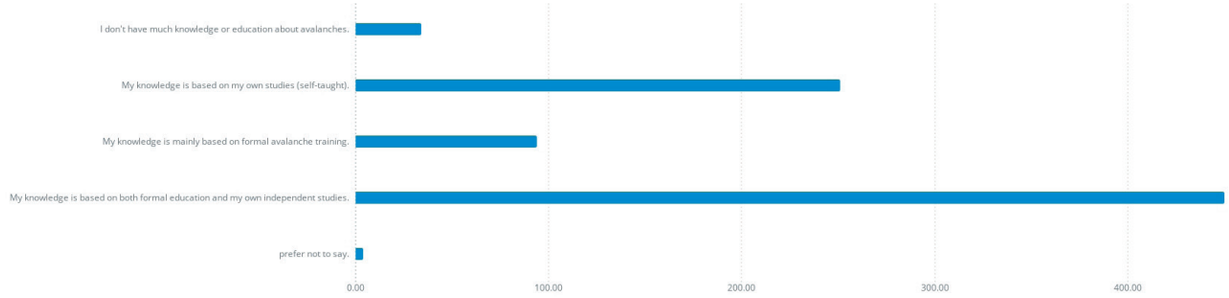
Q7. What gender do you most identify with



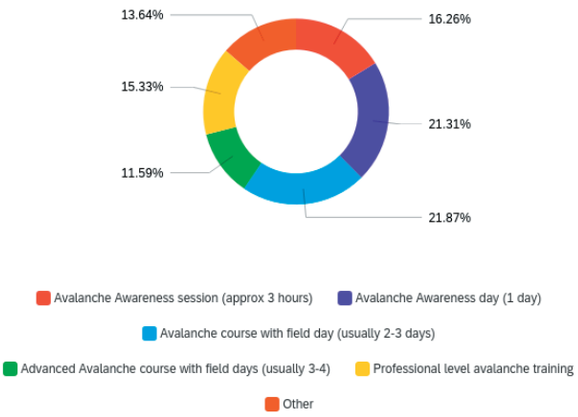
Q9. Please rate your confidence in your personal ability



Q10. What is your avalanche education background?

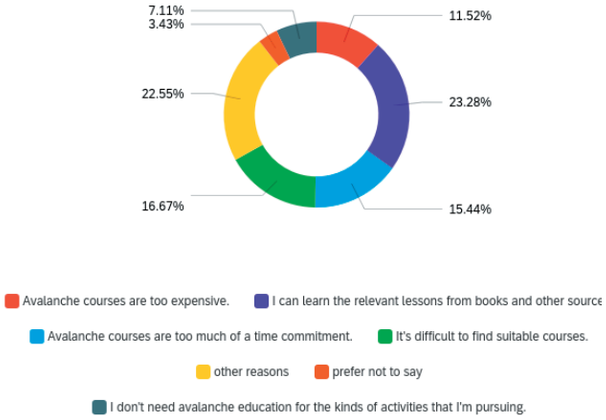


Q11. What is the highest level of formal avalanche training?



Q12. Why haven't you taken a formal avalanche safety course?

(multiple answers possible)



Text Responses

It is something if like to do but have not yet made the time for

I have received ad hock training during winter training. never serched out more in depth courses

It's difficult to get on a course

deliberately select low risk (rounded) hills

beyond very general principles I'm unconvinced that avalanche education is particularly illuminating; too many avalacnhes still hit well-educated users.

Basics covered on winter skills courses I have taken, and i'm fairly risk-averse on the hill

Both time for suitable courses and also where the courses are held

I keep meaning too...

I booked onto a course in 2020 but.... Covid. Prior to 2020, I struggled to find Scotland specific courses.

We are highly avalanche risk averse and avoid slopes/aspects for which the risk is even moderate

How do you book with so much weather variance!

I have taken "less formal" avalanche safety courses, but I tend to avoid areas where avalanches are likely.

Felt I gained enough knowledge through self learning and from peers

So far I've only ever gone out if it was considered relatively safe, with others who are knowledgeable, if I was to do more, particularly skiing I would take lessons and use a guide.

Rely on expert guide in such conditions.

I haven't felt I required one because I don't take part in activities where there is a high risk of avalanches.

My location prohibits time allowed to go on courses

I am a hillwalker - I really do not like to venture on to avalanche slopes.

I avoid risk areas, getting on a bit!

I have done winter skills courses which have cover avalanche hazards

Haven't gotten round to it/time commitment

It's hard to go on a course because of Covid

Have had informal training from friends with suitable training

Experience, remembering historic avalanche activity locations and associated weather and build up patterns,, following the weather and self-predicting the avalanche risk then corroborating via SAIS and re-evaluating against snow distribution on the day and considering aspects.

Not readily available in my local area

Time

been on winter skills course, this covered a bit of avalanche theory

If I had the money and time I would sign up to a formal course ASAP.

It's something I'm very ignorant about, but I would like to learn - is there a course for me? If so I don't know about it

Have never considered a course

Haven't got round to it yet

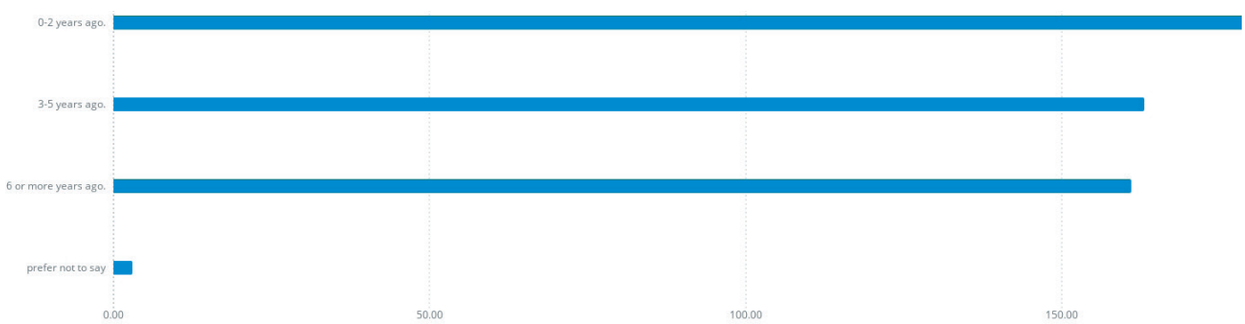
Not yet had opportunity

I live in Sussex, not many avalanche courses here!

Relatively speaking the amount/nature of activities I do doesn't feel like it warrants a dedicated course over and above what I can read online / from SIAS
It is something I need to do. Considering before next winter
Plenty of experience
I'm still new to mountain activities with avalanche risk and go into mountains with a Winter ML.
Never got round to it
I hike with more avalanche knowledgeable people than me.
Try to avoid avalanche areas
Some formal training, but mostly self taught
Use SAIS to reduce avalanche risks
Simply avoid areas where there is an avalanche risk
Just never got round to it!
Wasn't aware of these courses.
Tend to avoid areas of higher avalanche risk through SAIS information and on field observations

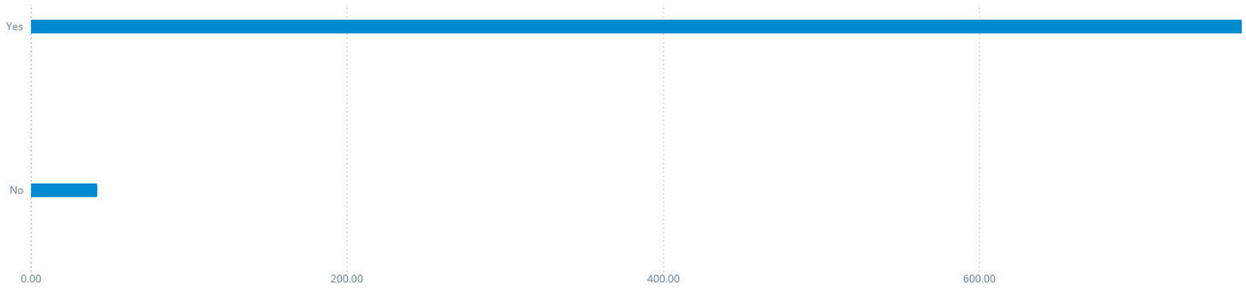
Not yet found the time but I intend to
No good excuse.
Was due to do one this season but covid restrictions cancelled it
I absorb avalanche info when i go out with more experienced people.
I've been in an avalanche and all the courses in the world wouldn't have made much of a difference
I have very knowledgeable peers, internal staff training opportunities. I still plan to access formal training in the near future.
My partner has been on multiple avalanche courses and I'm currently learning from him in conjunction with my own studies
I hadn't thought to do it.
I don't get much time off work so when I do I would rather carry out my activity instead of booking onto a course. (short sighted I know)

Q13. When did you complete your most recent formal avalanche training or refresher?

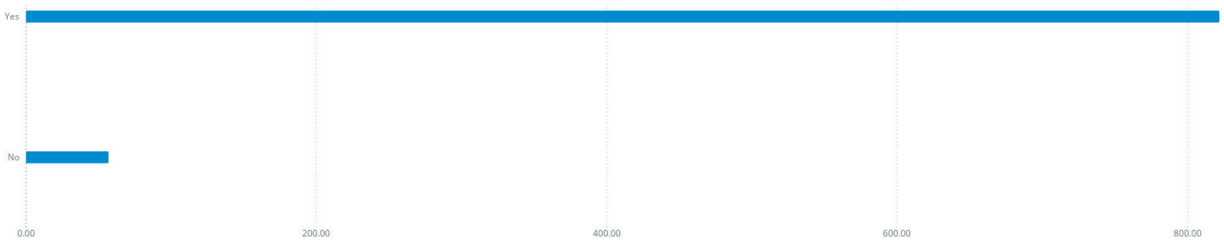


Appendix B

Q14. Have you ever accessed avalanche forecasts (see picture) issued by the Scottish Avalanche Information Services (SAIS)?



Q15. Throughout the winter do you typically access information issued by the SAIS for your winter activity?



Q16. You mentioned that you either haven't accessed SAIS forecasts or that you don't typically access their services. Can you explain why this is the case? (multiple answers possible)

Text Responses

I dont get out as much as I used to, due to age arthritis etc otherwise |I would be using the SAIS service far more frequently. I was a confident and able winter moiuntaineer when younger. the SAIS is a valuable service in scotland and it should be used and referenced more

At my age I tend to revisit the same locations. Am aware of localised risks and generally avoid known problem areas.

I have limited experience of winter climbs, typically in eastern hills with low to negligible avalanche risk - I have only become aware of the SAIS and have started to incorporate it into my winter ascent planning as I undertake more challenging winter climbs.

use other avalanche info

I look at the conditions and only use the SAIS if there seems to be a risk (not often in recent years!)

Most of the time nowadays I'm on very familiar ground with very low risk. I do use SAIS on the odd occasion where I visit more hazardous sites..

I don't avoid the forecasts because they are too complicated, but worth noting I do find them complicated to learn.

I often access the MWIS reports/snow conditions first and then look at SAIS forecasts if there appears to be a risk.

I tend to plan my walks where there is no risk of avalanche

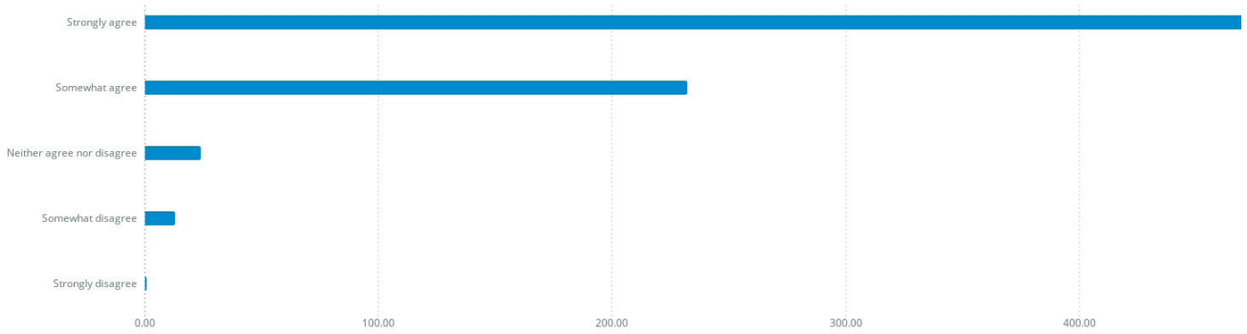
I avoid areas where avalanches are likely if there is snow around

I do access them but I am generally in areas where I feel confident to make my own assessment.

I use Be Avalanche Aware!

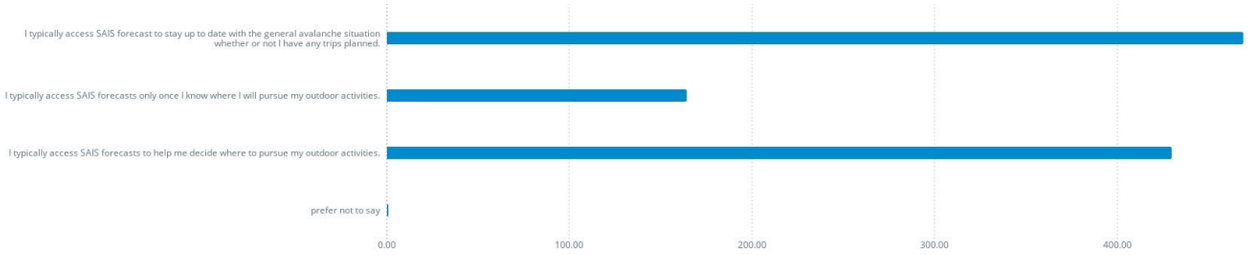
I have begun to consult them recently

Q17. To what extent do you agree with the following statement: "Overall, I find the SAIS website easy to use"

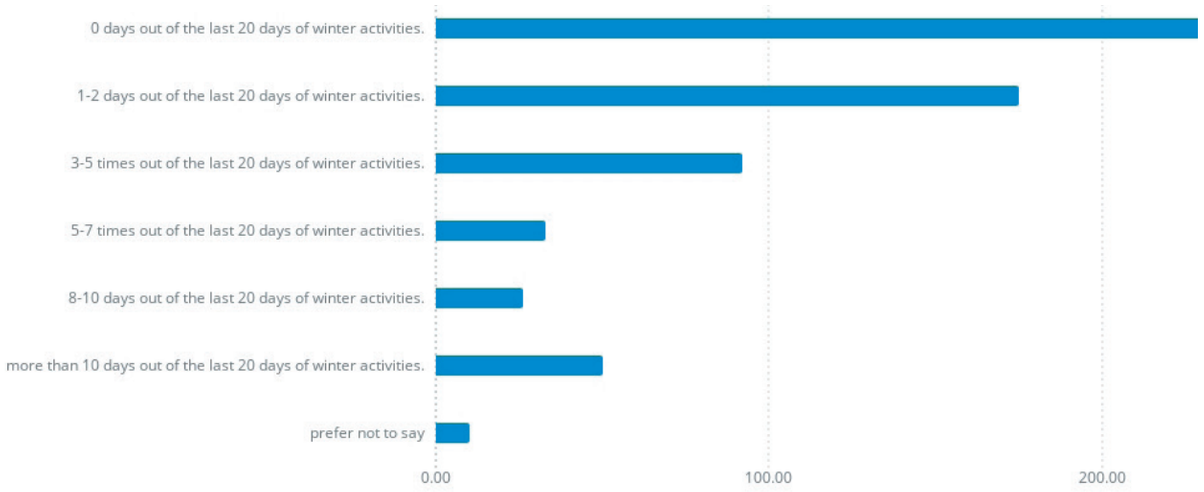


#	Answer	%	Count
14	Strongly agree	67.03%	547
15	Somewhat agree	28.43%	232
16	Neither agree nor disagree	2.94%	24
17	Somewhat disagree	1.59%	13
18	Strongly disagree	0.00%	0
	Total	**100%**	**816**

Q18. Which of the following statements best describes your access to avalanche forecasts:

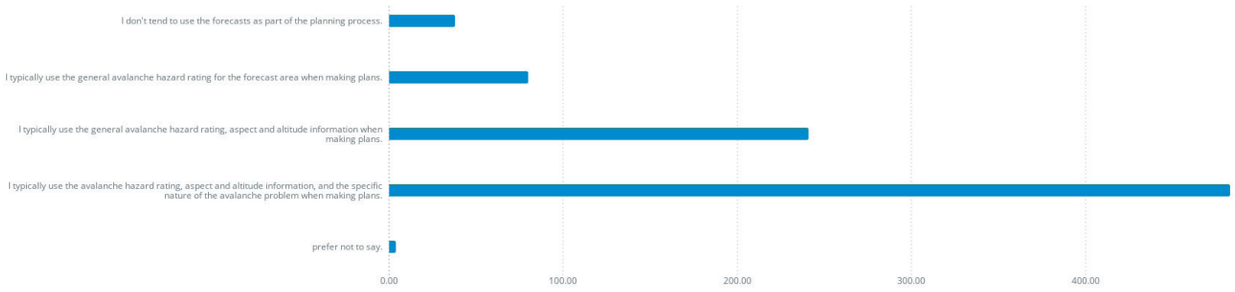


Q19. How often have you left your house to pursue your winter activities without consulting the SAIS Avalanche forecast (assuming there is a forecast issued for the relevant area).



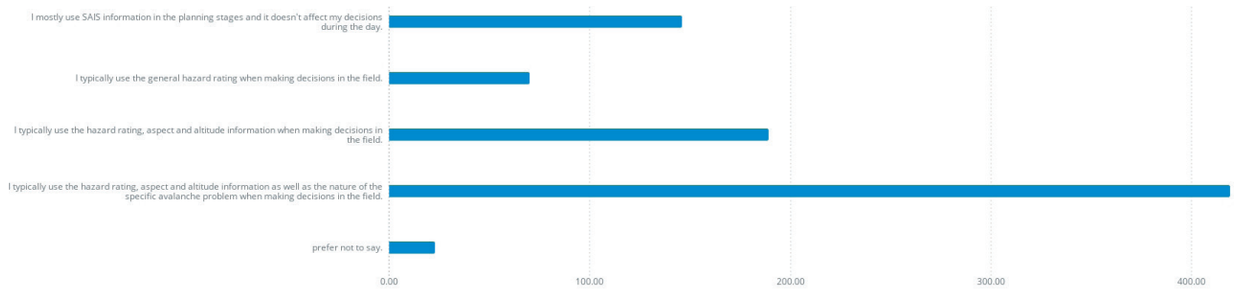
Answer	%	Count
0 days out of the last 20 days of winter activities	55.84%	488
1-2 days out of the last 20 days of winter activities	20.02%	175
3-5 times out of the last 20 days of winter activities	10.53%	92
5-7 times out of the last 20 days of winter activities	3.78%	33
8-10 days out of the last 20 days of winter activities	2.97%	26
More than 10 days out of the last 20 days of winter activities	5.72%	50
Prefer not to say	1.14%	10
Total	**100%**	**874**

Q20. Which of the following statements best describes what information you use from avalanche forecasts when you are planning a winter activity.



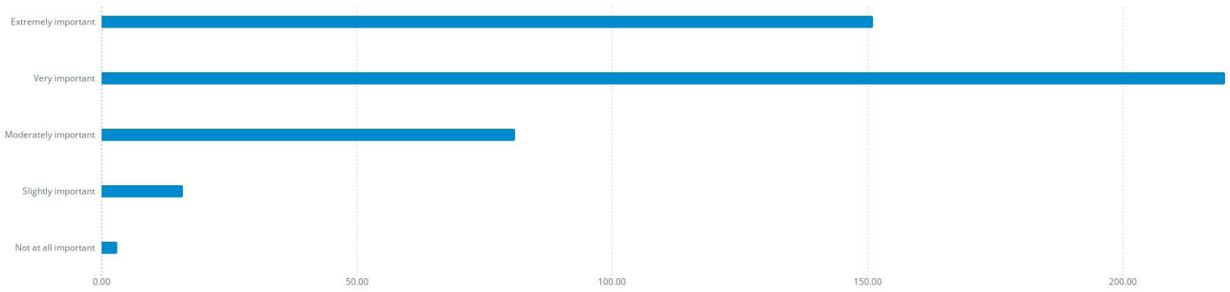
Answer	%	Count
Prefer not to say	0.47%	4
I typically use the general avalanche hazard rating for the forecast area when making plans	9.46%	80
I typically use the general avalanche hazard rating, aspect and altitude information when making plans	28.49%	241
I typically use the avalanche hazard rating, aspect and altitude information, and the specific nature of the avalanche problem when making plans	57.09%	483
I don't tend to use the forecasts as part of the planning process	4.49%	38
Total	**100%**	**846**

Q21. Which of the following statements best describes your use of avalanche forecasts when making decisions during your day in the field.



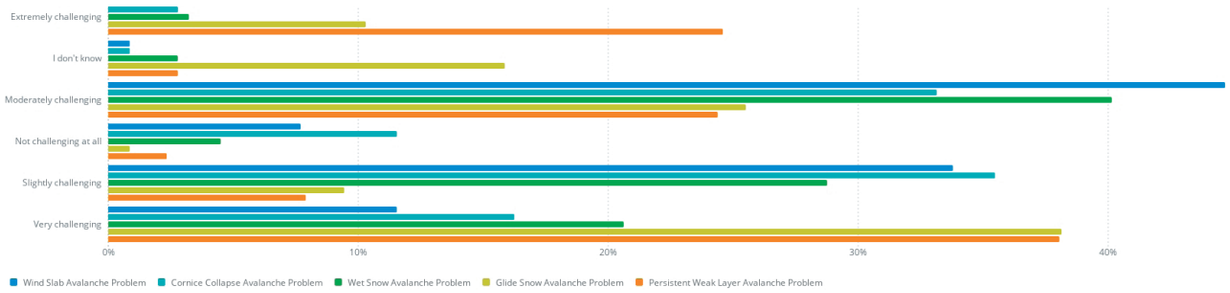
#	Answer	%	Count
1	I mostly use SAIS information in the planning stages and it doesn't affect my decisions during the day	17.24%	146
2	I typically use the general hazard rating when making decisions in the field	8.26%	70
3	I typically use the hazard rating, aspect and altitude information when making decisions in the field	22.31%	189
4	I typically use the hazard rating, aspect and altitude information as well as the nature of the specific avalanche problem when making decisions in the field	49.47%	419
6	Prefer not to say	2.72%	23
	Total	**100%**	**847**

Q22. You indicated earlier that you use the avalanche problems to inform your decision-making. How important to your own decision-making is the SAIS information about Avalanche Problems?



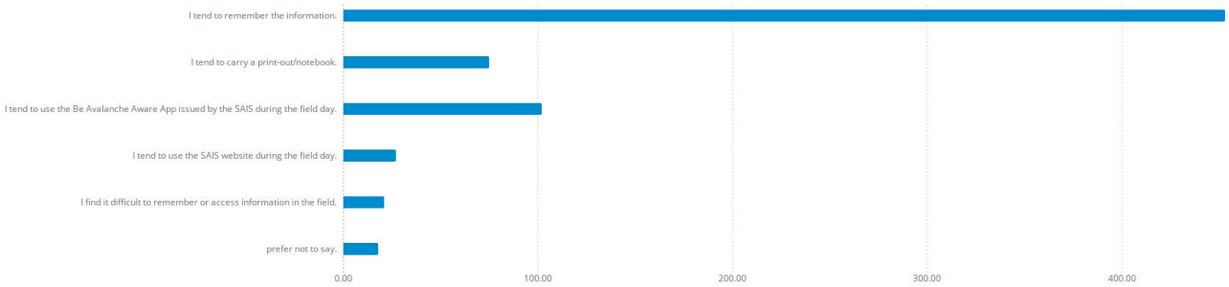
#	Answer	%	Count
9	Extremely important	32.06%	151
10	Very important	46.71%	220
11	Moderately important	17.20%	81
12	Slightly important	3.40%	16
13	Not at all important	0.64%	3
	Total	**100%**	**471**

Q23. How challenging do you think is it to assess avalanche hazard in the field for each of the following avalanche problems.



#	Question	Not challenging at all		Slightly challenging		Moderately challenging		Very challenging		Extremely challenging		I don't know		Total
1	Wind Slab Avalanche Problem	7.69%	36	33.76%	158	44.66%	209	11.54%	54	1.50%	7	0.85%	4	468
2	Cornice Collapse Avalanche Problem	11.54%	54	35.47%	166	33.12%	155	16.24%	76	2.78%	13	0.85%	4	468
3	Wet Snow Avalanche Problem	4.51%	21	28.76%	134	40.13%	187	20.60%	96	3.22%	15	2.79%	13	466
4	Glide Snow Avalanche Problem	0.86%	4	9.42%	44	25.48%	119	38.12%	178	10.28%	48	15.85%	74	467
5	Persistent Weak Layer Avalanche Problem	2.35%	11	7.91%	37	24.36%	114	38.03%	178	24.57%	115	2.78%	13	468

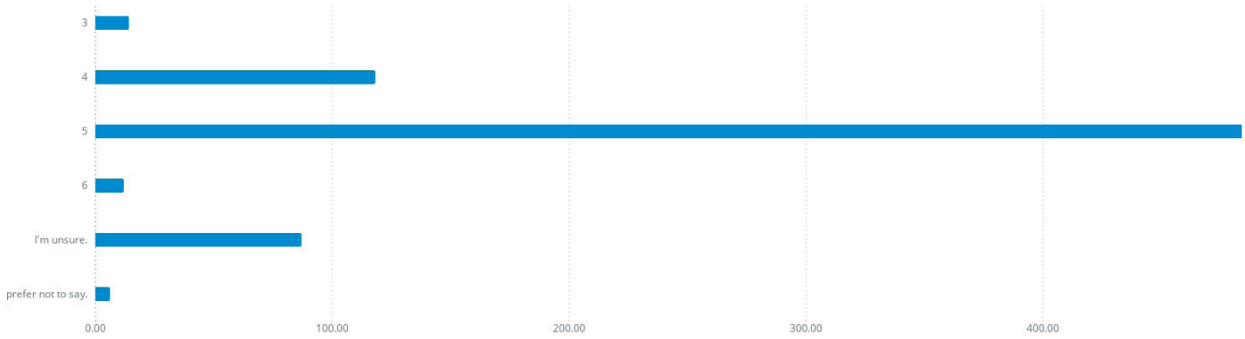
Q24. How do you access SAIS information during your day in the field?



Answer	%	Count
I tend to remember the information	65.09%	453
I tend to use the Be Avalanche Aware App issued by the SAIS during the field day	14.66%	102
I tend to use the SAIS website during the field day	3.88%	27
Prefer not to say	2.59%	18
I tend to carry a print-out/notebook	10.78%	75
I find it difficult to remember or access information in the field	3.02%	21
Total	**100%**	**696**

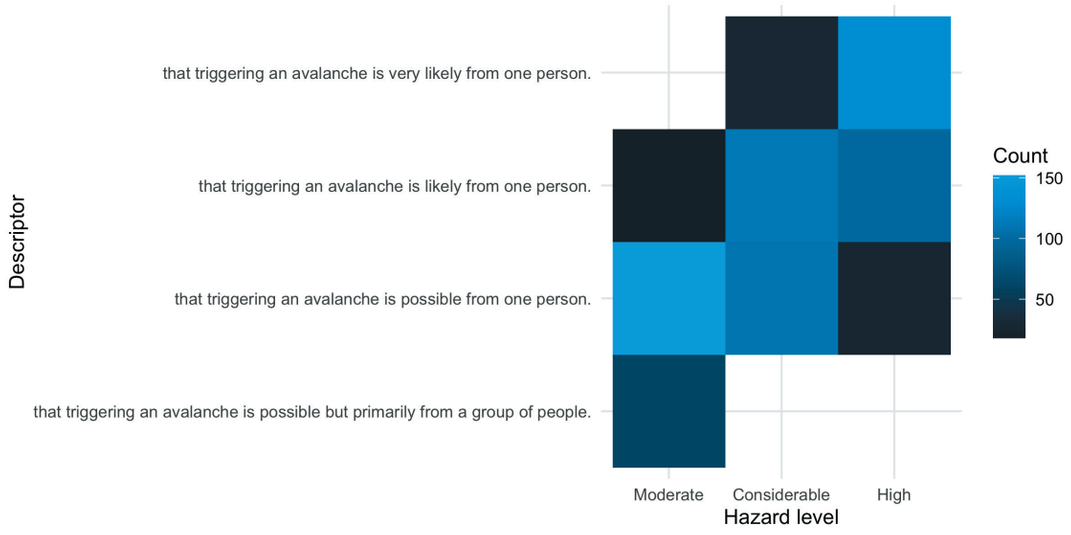
Appendix C

Q25. Do you know how many different avalanche hazard levels are used by SAIS in their forecasts?

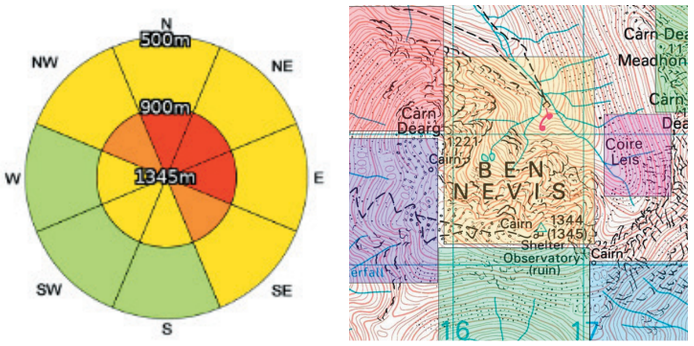


#	Answer	%	Count
1	3	1.76%	14
3	4	14.81%	118
4	5	70.26%	560
5	6	1.51%	12
6	I'm unsure	10.92%	87
7	Prefer not to say	0.75%	6
	Total	**100%**	**797**

Q26. What do the hazard levels (moderate, considerable, high) mean to you?



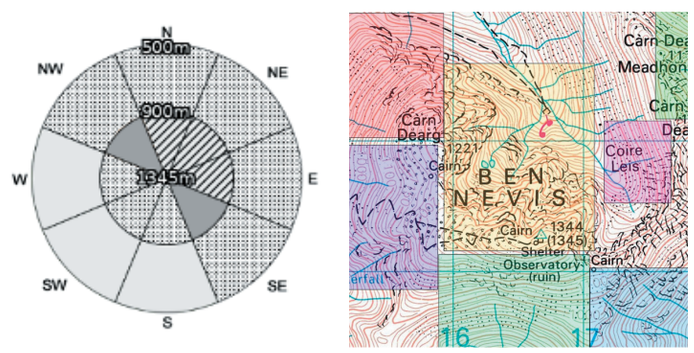
Q27. Choose all the areas on the map that have at least considerable avalanche hazard as illustrated in the danger rose. (Regions turn green once chosen).



Example of Danger Rose in colour

#	Question	Off		On		Total
1	Red (top left)	17.74%	33	82.26%	153	186
2	Yellow (top middle)	10.22%	19	89.78%	167	186
3	Green (top right)	43.01%	80	56.99%	106	186
4	Light Green (bottom middle)	72.58%	135	27.42%	51	186
5	Blue (bottom right)	24.19%	45	75.81%	141	186
6	Purple (middle left)	77.96%	145	22.04%	41	186
7	Pink (middle right)	39.78%	74	60.22%	112	186

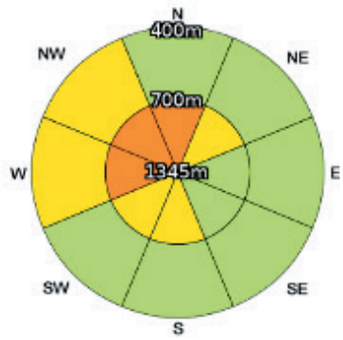
Q28. Choose all the areas on the map that have at least considerable avalanche hazard as illustrated in the above danger rose. (Regions turn green once chosen)

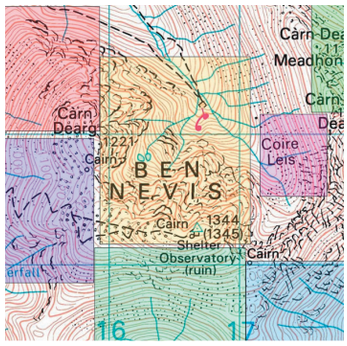


Example of Danger Rose in black and white

#	Question	Off		On		Total
1	Red (top left)	38.80%	71	61.20%	112	183
2	Yellow (top middle)	18.03%	33	81.97%	150	183
3	Green (top right)	68.31%	125	31.69%	58	183
4	Light Green (bottom middle)	72.13%	132	27.87%	51	183
5	Blue (bottom right)	38.25%	70	61.75%	113	183
6	Purple (middle left)	77.60%	142	22.40%	41	183
7	Pink (middle right)	46.45%	85	53.55%	98	183

Q29. Choose all the areas on the map that have at least considerable avalanche hazard as illustrated in the danger rose.
(Regions turn green once chosen)

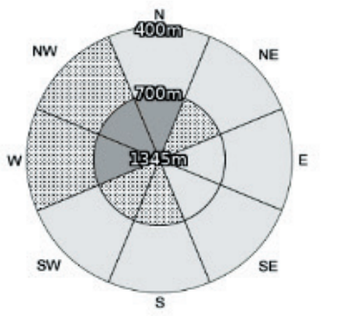


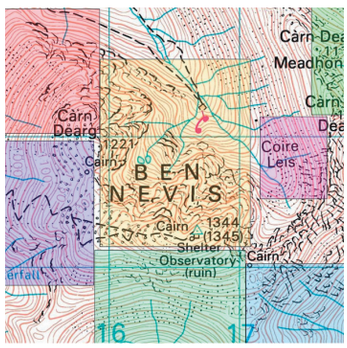


Example of Danger Rose in colour

#	Question	Off		On		Total
1	Red (top left)	18.18%	34	81.82%	153	187
2	Yellow (top middle)	18.72%	35	81.28%	152	187
3	Green (top right)	64.17%	120	35.83%	67	187
4	Light Green (bottom middle)	77.54%	145	22.46%	42	187
5	Blue (bottom right)	80.75%	151	19.25%	36	187
6	Purple (middle left)	25.67%	48	74.33%	139	187
7	Pink (middle right)	30.48%	57	69.52%	130	187

Q30. Choose all the areas on the map that have at least considerable avalanche hazard as illustrated in the danger rose.
(Regions turn green once chosen)

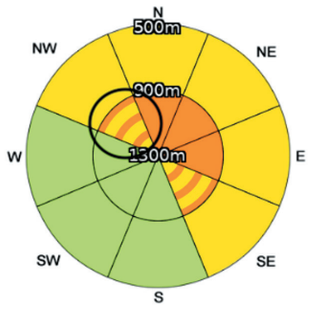




Example of Danger Rose in black and white

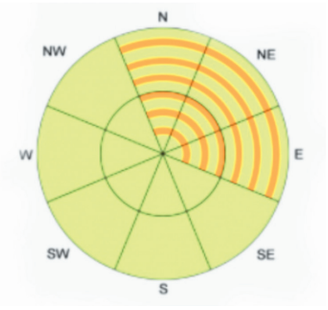
#	Question	Off		On		Total
1	Red (top left)	17.99%	34	82.01%	155	189
2	Yellow (top middle)	15.87%	30	84.13%	159	189
3	Green (top right)	85.19%	161	14.81%	28	189
4	Light Green (bottom middle)	62.42%	118	37.57%	71	189
5	Blue (bottom right)	77.25%	146	22.75 %	53	189
6	Purple (middle left)	22.75 %	43	77.25 %	145	189
7	Pink (middle right)	31.75%	60	68.25%	129	189

Q31. How do you interpret the orange-yellow striped area within the black circle on this danger rose? (multiple answers are possible)



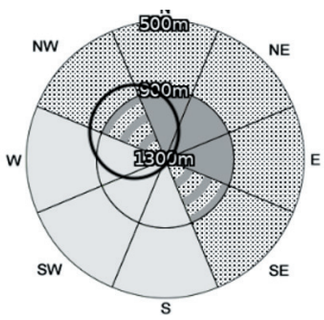
#	Answer	%	Count
1	There are smaller localised areas of snow which present a considerable hazard, otherwise it is moderate.	59.18%	145
2	There is significant uncertainty in the forecast. The hazard for the area ranges from moderate to considerable.	19.59%	48
3	The hazard is greater than moderate but below considerable.	10.61%	26
4	I'm not quite sure how to interpret the striped area.	10.61%	26
	Total	**100%**	**245**

Q32. How do you interpret the orange-green striped area on this danger rose? (multiple answers are possible)



#	Answer	%	Count
1	There are smaller localised areas of snow which present a considerable hazard, otherwise it is low.	54.69%	134
2	There is significant uncertainty in the forecast. The hazard for the area ranges from low to considerable.	20.82%	51
3	The hazard is greater than low but below considerable.	10.20%	25
4	I'm not quite sure how to interpret the striped area.	14.29%	35
	Total	**100%**	**245**

Q33. How do you interpret the striped area within the black circle on this danger rose? (multiple answers are possible)



#	Answer	%	Count
1	There are smaller localised areas of snow which present a considerable hazard, otherwise it is low.	52.26%	127
2	There is significant uncertainty in the forecast. The hazard for the area ranges from low to considerable.	9.47%	23
3	The hazard is greater than low but below considerable.	11.11%	27
4	I'm not quite sure how to interpret the striped area.	27.16%	66
	Total	**100%**	**243**

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