FROM THE CHIC-CHOCS TO THE SEA-TO-SKY CORRIDOR: BACKCOUNTRY USER PREPAREDNESS

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ABSTRACT: Backcountry ski touring and splitboarding participation continues to grow across North America, raising the question of how preparedness is expressed among current backcountry users. This paper characterises avalanche safety preparedness among self-guided backcountry groups using two Canadian field datasets: a 2017–18 baseline from the Chic-Chocs (Parc national de la Gaspésie, Québec; 78 groups, 250 individuals) and a 2025–26 study in the Sea-to-Sky corridor (British Columbia; 48 groups, 133 individuals). Trailhead intercept interviews recorded avalanche safety equipment, formal avalanche training, rescue-step knowledge, terrain selection, and comprehension of the day's public avalanche bulletin, including danger rating and avalanche problem identification. In the Sea-to-Sky sample, 97.9% of groups were fully equipped and 100% had at least one formally trained member. Rescue-step knowledge was also high, with 89.6% of Sea-to-Sky groups naming five or more companion-rescue steps. Despite this, when group leaders were asked to state the day's official danger rating and avalanche problem(s), only 71.4% matched the Avalanche Canada danger rating exactly and 65.3% correctly identified the forecast avalanche problem. These findings suggest that, in a population where equipment, formal training, and rescue knowledge are widespread, an important dimension of preparedness may lie beyond access to gear and training, in the accurate comprehension and interpretation of avalanche bulletin information in the field.

KEYWORDS: backcountry recreation, avalanche safety, preparedness, avalanche bulletin comprehension, human factors, Sea-to-Sky corridor

1. INTRODUCTION

Backcountry skiing and splitboarding participation has grown substantially over the past decade. Avalanche fatality statistics consistently show that most accidents involve self-guided recreational groups, making the preparedness of this population a central concern for avalanche safety organizations. Preparedness is commonly measured through two proxies: possession of avalanche safety equipment (transceiver, shovel, probe) and completion of formal avalanche training. Fewer studies examine whether prepared users can correctly interpret and apply the information contained in the day's public avalanche bulletin once they are in the field.

This paper characterises backcountry user preparedness using two independent field datasets collected eight years apart in different regions of Canada. The first was conducted in the Chic-Chocs Mountains of the Gaspésie Peninsula, Québec, during the winter of 2017–18, in partnership with Avalanche Québec. The second uses the same core methodology in the Sea-to-Sky corridor of British Columbia during the winter of 2025–26. Beyond the equipment and training questions used in the original study, the 2025–26 study places greater emphasis on bulletin comprehension, asking groups to state the official danger rating and avalanche problem(s) forecast for the day. This addresses a gap identified in the human factors literature: studies of group dynamics show that recreational groups often place trust in the avalanche bulletin without verifying its content locally (Zweifel and Haegeli, 2014), and that correct interpretation of bulletin information varies by presentation format (Fisher et al., 2022).

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2. METHODS

2.1 Study areas and sampling

The Chic-Chocs baseline (2017–18) surveyed 250 individuals in 78 groups accessing backcountry ski terrain across multiple parking lots in Parc national de la Gaspésie, Québec. The Sea-to-Sky replication (2025–26) surveyed 133 individuals in 48 groups accessing terrain from three trailheads near Squamish and Whistler, British Columbia: the Sea-to-Sky Gondola, the Diamond Head parking lot, and Whistler Olympic Park (for Rainbow Mountain), across multiple field days in February and March 2026. Both studies used a trailhead intercept design, approaching groups at multiple access points as they departed for or returned from backcountry terrain and conducting brief structured interviews.

2.2 Survey instrument

The interview recorded, for the group and each individual: years recreating in the backcountry and in the specific study area, mode of travel (ski

or splitboard), avalanche safety equipment carried, highest level of formal avalanche training completed, terrain selected and its ATES rating, and whether the tour was planned using a formal preparation tool. Group leaders were additionally asked, unprompted, to state the day's official Avalanche Canada danger rating (three-elevation-band format) and to name the avalanche problem(s) identified in that day's bulletin.

2.3 Data treatment

Individual-level gear and training rates were calculated across all 133 valid Sea-to-Sky respondents. Group-level training was calculated as the presence of at least one certified individual within the group. Danger rating and avalanche problem responses were compared against that day's published Avalanche Canada forecast for exact match (danger rating) and inclusion of the forecast problem type in the respondent's answer (problem identification); 48 group-level responses were recorded for this comparison.

3. RESULTS

3.1 Equipment and training

In the Sea-to-Sky sample, 127 of 133 individuals (95.5%) carried complete avalanche safety equipment, and 47 of 48 groups (97.9%) were fully equipped, meaning every member carried a transceiver, shovel, and probe. Formal avalanche training was reported by 117 of 133 individuals (88.0%); at least one trained group member was present in all 48 groups (100%). The sample was predominantly formed with ski touring (115 individuals) over splitboarding (18), with a mean age of 34.5 years (range 17–69) and 36.1% women (48 of 133). Most groups and individuals were correctly able to identify the piece of terrain they were going to venture in for the day based out of the Avalanche Terrain Exposure Scale.

3.2 Trip planning and rescue knowledge

At the group level, 44 of 48 groups (91.7%) reported consulting both the avalanche bulletin and the weather forecast before departing, 3 groups (6.3%) reported no formal preparation tool, and 1 group (2.1%) consulted weather only. When asked to name the steps of a companion rescue, groups named a mean of 6.7 steps (n=48), and 43 of 48 groups (89.6%) named five or more steps.

3.3 Bulletin comprehension

Of 48 group-level responses collected on the day's official forecast, 35 (71.4%) matched the Avalanche Canada danger rating exactly across all three elevation bands, and 32 (65.3%) correctly identified the avalanche problem(s) named in that day's bulletin. This is notably lower than the equipment, training, and rescue-step figures above, indicating a gap between accessing a forecast and accurately reproducing its content.

3.4 Context: Chic-Chocs baseline

The Chic-Chocs 2017–18 baseline provides historical context for the current Sea-to-Sky characterisation. In that study, 151 of 250 individuals (60%) carried complete equipment, but only 52% of the 78 groups were fully equipped; 51 of 250 individuals (20.4%) had formal avalanche training, present in 33 of 78 groups (42%). At the group level, 56% consulted both the bulletin and the weather forecast, 15% used no formal tool, and 50% correctly stated the day's Avalanche Québec risk index. For rescue knowledge, 26% of Chic-Chocs groups named a five-step companion rescue sequence, and 41% named five or more steps. These historical data help contextualise the preparedness profile observed in the Sea-to-Sky sample; they are not treated as a longitudinal comparison because the studies represent different regions and populations.

Table 1: Preparedness characteristics documented in the Chic-Chocs (2017–18) and Sea-to-Sky (2025–26) field studies, group-level unless noted.

Measure	Chic-Chocs	Sea-to-Sky
Groups / people	78 / 250	48 / 133
Full gear (grp.)	52%	97.9%
Gear (indiv.)	60%	95.5%
Indiv. training	20.4%	88.0%
Group ≥1 trained	42%	100%
Used bltn.+wx	56%	91.7%
5+ rescue steps	41%	89.6%
Danger match	50%	71.4%
Problem ID'd	n/a	65.3%

4. DISCUSSION

The Sea-to-Sky sample showed high levels of equipment ownership, formal avalanche training, and rescue-step knowledge. These measures provide a picture of a population with widespread access to basic avalanche preparedness resources. The remaining gap in danger-rating and avalanche-problem identification suggests that preparedness cannot be fully characterised through equipment, training, and rescue knowledge alone. The sample was older on average (34.5 vs. 31 years) and included a higher proportion of women (36.1% vs. 20.8%), illustrating that user characteristics and local context may also shape the preparedness profile observed.

The near-ceiling equipment, training, and rescue-step figures in the Sea-to-Sky sample draw attention to another dimension of preparedness: information comprehension. The observed problem-identification and danger-rating match rates are consistent with prior findings that bulletin format and presentation influence correct comprehension (Fisher et al., 2022), and echo earlier observations that recreational groups may trust a bulletin's headline rating without verifying its underlying content in the field (Zweifel and Haegeli, 2014). The Chic-Chocs baseline also provides useful context: even in 2017–18, groups that reported consulting the bulletin did not always reproduce its content correctly.

4.1 Limitations

Both studies used trailhead intercept sampling at a limited number of access points per region, which may bias the samples toward users who frequent those locations and does not capture users accessing terrain elsewhere. The Sea-to-Sky danger-rating and problem-identification analysis (n=48) is smaller than the full equipment and training sample, and comprehension was self-reported at the time of interview rather than tested under field conditions. The two studies were conducted in different regions eight years apart rather than as a longitudinal study of the same population, so temporal and regional effects cannot be separated.

5. CONCLUSION

This study does not close the question it opens. In the Sea-to-Sky sample, where avalanche safety equipment, formal training, and rescue-step knowledge were widespread, 28.6% of group leaders did not correctly state the day's official danger rating, and 34.7% did not correctly identify the forecast avalanche problem. This points to a gap between accessing information and accurately comprehending it in the field, and the stakes make it one worth closing. Future work should test this comprehension gap directly against bulletin presentation format and extend data collection to additional trailheads and user groups to assess how representative these findings are of the broader backcountry population. As instructors, guides, and researchers, we need to find better ways to communicate risk to all types of backcountry users.

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