DFWT Vegetation Survey of Cover Crop Fields

November 2025 – March 2026

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Key Findings

The 2025-2026 vegetation survey monitored cover crop establishment and waterfowl grazing pressure in 297 fields across Metro Vancouver and the Fraser Valley over three survey rounds in November, January, and March. Overall vegetation cover declined from 71.8% in November to 52.0% by March, while mean grazing intensity increased from 0.17 to 1.05 over the same period. Region was the most significant driver of grazing pressure, with fields in Metro Vancouver experiencing higher grazing pressure than fields in the Fraser Valley throughout the survey period. Cereal Mix and Winter Cereals and Grasses maintained the highest percent vegetation cover, while the Multi-Species Mix fields showed the highest decline. Earlier planting dates were associated with significantly lower grazing intensity and greater vegetation cover in Metro Vancouver. The 2025–2026 season recorded the strongest cover crop performance and lowest grazing intensity of the past three survey years conducted in these regions.

Program Background

This vegetation study quantified the amount of grazing occurring on cover crop fields and assessed the value of several types of cover crops. Agricultural fields in the Fraser River delta provide important foraging and overwintering habitat for waterfowl. For the past eight years, Delta Farmland and Wildlife Trust (DFWT) has been conducting waterfowl surveys throughout Delta and south Richmond to assess waterfowl use of these fields. Surveys have been conducted in cooperation with Canadian Wildlife Service and Ducks Unlimited Canada, and they provide a useful overview of the abundance and diversity of waterfowl species found on croplands. The 2023-2024 season marked the first time DFWT expanded the cover crop program beyond Richmond and Delta, with farmers in Metro Vancouver and Abbotsford able to enroll. This expansion provides a larger sampling size of cover cropped fields and the ability to assess waterfowl activity past the borders of Richmond and Delta. The 2024-2025 program year expanded further to include the Fraser Valley.

Survey Methods

A total of 447 fields were enrolled in the cover crop program, and 36 fields in the cereal habitat enhancement program in 2025-2026. Vegetation surveys were carried out in Metro Vancouver and the Fraser Valley, from November 12th to 21st, January 13th to 23rd, and March 11th to 26th, focusing on vegetation height, cover, and the intensity of waterfowl grazing.

At each sample point, maximum vegetation height was measured to the nearest centimeter, and the percentage of vegetation cover was estimated within a 1 m by 1 m quadrat (Figure 1). The level of intensity of grazing was recorded as a number between zero and four, with zero being no grazing and four being completely grazed (Figure 2). Within each sample, vegetation was classified into 5 subcategories: Grasses, Brassicas, Legumes, Phacelia/Sunflower, and Weeds. The percentage of cover and grazing intensity was measured for each subsample to determine the dominant vegetation within fields planted with a diverse seed mix, as well as to see waterfowl grazing preferences.

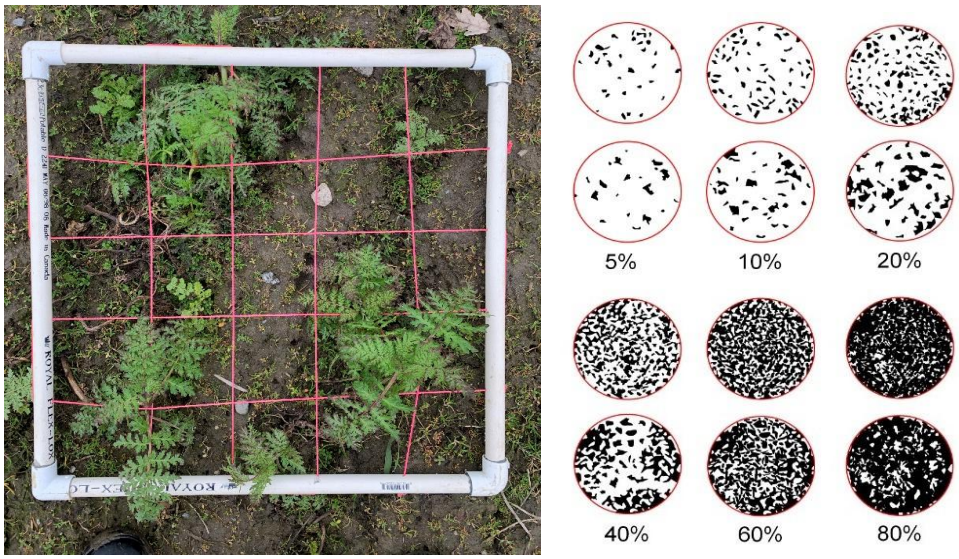

Figure 1. Example of 40% vegetation cover in a 1 m by 1 m quadrat using the Ministry of Forests, Lands and Natural Resource Operation's comparison chart for estimating cover percent.

Intensity 0	*Intensity 1*	*Intensity 2*	*Intensity 3*	*Intensity 4*
No grazing	<50% of vegetation height grazed	>50% of vegetation height grazed	Only stubs left	No cover crop left

Figure 2. Photos showing levels of intensity of grazing from lowest on the left to highest on the right.

Results

A total of 297 cover crop and Cereal Habitat Enhancement fields were surveyed. In the 2025-2026 program year, the cover crop program was offered in municipalities from Delta to Agassiz. The highest degree of participation came from Delta and Abbotsford, while several other municipalities contributed a smaller number of fields. For analysis purposes, fields were grouped into two regional categories: Metro Vancouver (n=163), which included Delta, Richmond, Surrey, and Langley; and the Fraser Valley (n=134), including Abbotsford, Chilliwack, and Agassiz.

Cover crop fields were categorized based on the species mix used for seeding, including four main types: Multi-Species Mix, Spring Cereal (Single Species), Winter Cereals and Grasses (Single Species), and Cereal Mix. The Multi-Species Mix (n = 48) included fields planted with a mixture of crimson clover, fava bean, oats, barley, purple top turnip, forage turnip, radish, and sunflowers. Spring Cereal fields (n = 153) were seeded with either barley or oats, while Winter Cereals and Grasses (n = 36) included either winter wheat, rye, ryegrass, or triticale. Cereal Mix fields (n=60) contained a mixture of cereals, including barley, rye, oats, winter wheat, and triticale.

Vegetation Cover

Overall vegetation cover declined throughout the survey season, from a mean of 71.8% in November to 64.0% in January and 52.0% by March (Table 1). Cereal Mix fields maintained the highest mean percent cover at 84.9%, with a low standard deviation of 16.7, suggesting fields had dense vegetation cover throughout the survey period regardless of round (Figure 3). Fields of Winter Cereals and Grasses also maintained a high percent cover, averaging 79.8% across the season. In contrast, Spring Cereal and Multi-Species Mix fields both averaged approximately 54% cover, with substantially higher standard deviations of 34.0 and 32.0, respectively, suggesting variability among individual fields within these categories. This suggests that while some fields performed well, others experienced significant cover loss over the season, likely driven by environmental factors and increasing waterfowl grazing pressure.

The Multi-Species Mix showed the steepest decline in cover of all categories, dropping from 71.9% cover in November to 33.8% by March (Figure 3). This decline is due to higher grazing pressure experienced by these fields in Metro Vancouver, where waterfowl activity was concentrated. In contrast, Cereal Mix and Winter Cereals and Grasses fields, which were predominantly planted in the Fraser Valley, maintained stable and high cover throughout the season. Total vegetation cover was significantly influenced by cover crop category ($p < 0.001$), region ($p < 0.001$), and survey period ($p < 0.001$), suggesting that the trend of cover loss across the season differed significantly among crop types.

Table 1Mean vegetation height (cm), percent cover, intensity of grazing (0-4), and total grazing, which was calculated to a maximum value of 400, which represents 100% grazed at intensity 4, of each cover crop type.

	Round 1 November 2025			Round 2 January 2026			Round 3 March 2026		
Cover Crop Species	**Average Vegetation Cover (%)**	**Average Vegetation Height (cm)**	**Average Intensity of Grazing (0-4)**	**Average Vegetation Cover (%)**	**Average Vegetation Height (cm)**	**Average Intensity of Grazing (0-4)**	**Average Vegetation Cover (%)**	**Average Vegetation Height (cm)**	**Average Intensity of Grazing (0-4)**
Spring Cereal	65.2	37.4	0.2	55.5	27.5	1	39.6	16.5	1.5
Cereal Mix	85.7	18.7	0	85.4	23.4	0.1	83.6	31.8	0.3
Winter Cereals and Grasses	77	17.2	0.1	81.7	21.6	0.2	81.5	30.8	0.3
Multi-Species Mix	71.9	49.5	0.2	55.3	40.2	0.8	33.8	27.9	1.3
Grand Total	71.8	33.1	0.2	64	28.1	0.7	52	23.2	1.1

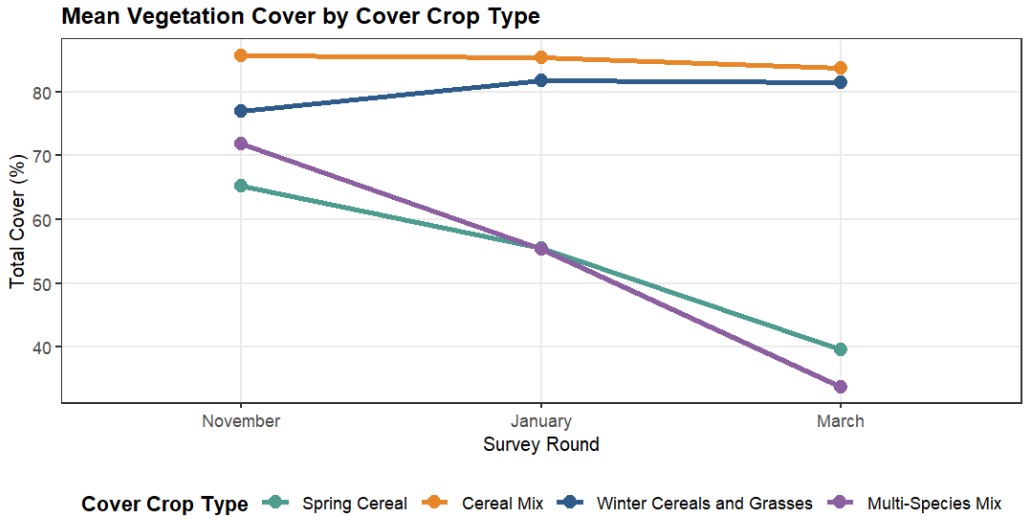

Figure 3 Mean percent vegetation cover (%) for each cover crop category across three survey rounds (November, January, and March).

Fields in the Fraser Valley maintained consistently high cover throughout the season, from 81.2% in November to 79% in March. Fields in Metro Vancouver established a lower average cover compared to the Fraser Valley, 63.8% in November, and dropped off steeply by March at 35.6% cover. Earlier planting was associated with a higher percent cover in the first two rounds of surveying in both Metro Vancouver and the Fraser Valley (Figure 4). In Metro Vancouver cover was significantly higher in earlier planted fields in all three survey rounds ($p<0.0001$), with each additional day from planting adding 0.49% to 0.55% cover. The Fraser Valley also had significantly higher cover in early planted fields in November and

January ($p<0.0001$), but by March this relationship was no longer significant ($p=0.157$), this may be due to a lack of waterfowl grazing and mild winter, allowing later planted fields to continue growing throughout the winter.

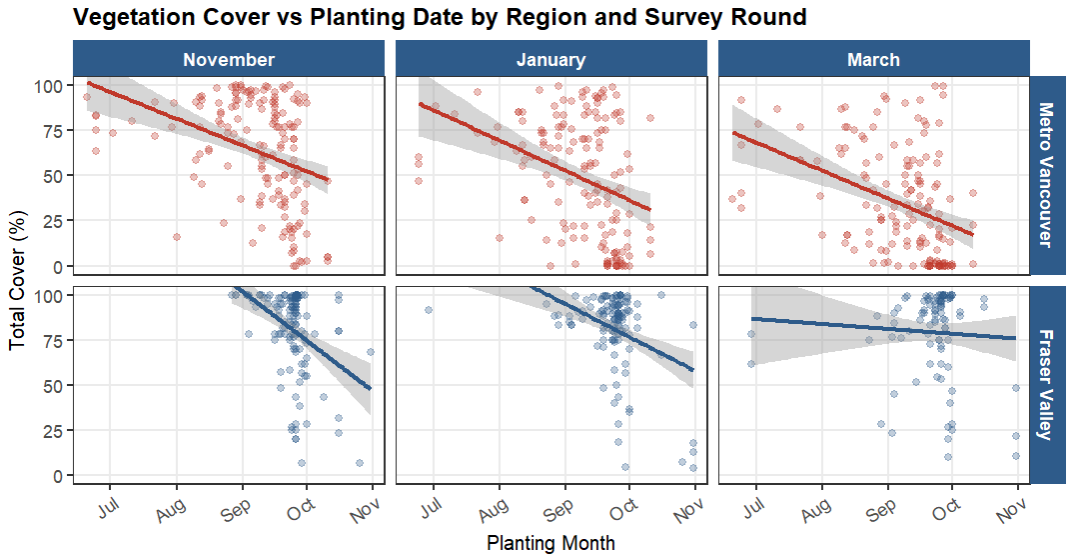

Figure 4 Mean percent vegetation cover (%) in Metro Vancouver and the Fraser Valley across three survey rounds (November, January, and March).

Weed cover remained low throughout each survey round across all cover crop types (Figure 5). There was no statistically significant difference between weed cover in different cover crop types ($p=0.093$) or regions ($p=0.088$). The Multi-Species fields showed slightly higher weed cover throughout the season, but this difference was not significant.

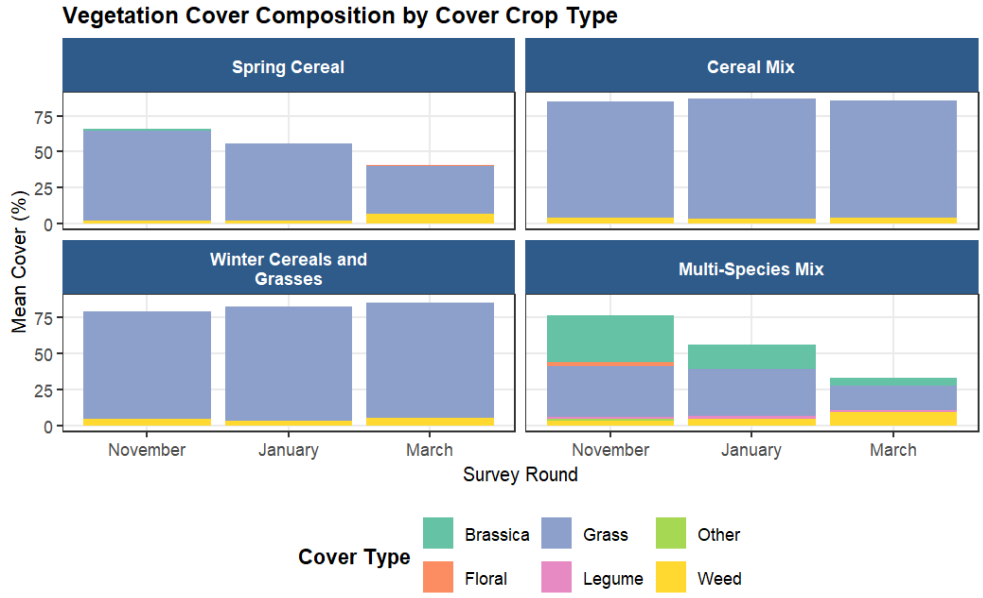

Figure 5 Mean percent cover (%) of each vegetation type (grass, brassica, legume, floral, weed, and other) within each cover crop category across three survey rounds (November, January, and March).

Vegetation Height

Vegetation height decreased throughout the winter in the Multi-Species and Spring Cereal mixes. Both the Cereal Mix and Winter Cereals and Grasses categories continued to increase in height over the winter, likely due to the majority of these fields being planted in the Fraser Valley and experiencing light grazing pressure compared to Metro Vancouver (Figure 6). Amongst all cover crop types, the Multi-Species mix maintained the highest vegetation height from November to January compared to each other category, with the Cereal Mix and Winter Cereals and Grasses having the tallest vegetation in March (Figure 6).

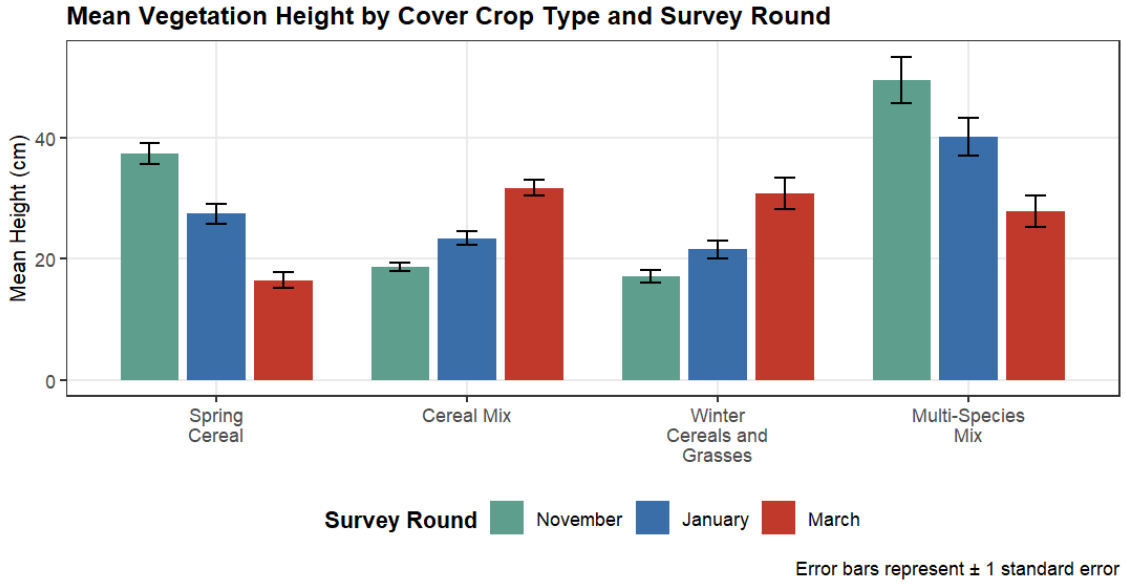

Figure 6 Mean vegetation height (cm) for each cover crop category across three survey rounds (November, January, and March) in the 2025–2026 survey season. Error bars represent ± 1 standard error.

Vegetation height was significantly impacted by the cover crop type ($p<0.001$). But region was not a significant predictor of vegetation height ($p=0.781$), crops in the Fraser Valley and Metro Vancouver were grazed at different levels but their heights were comparable once cover crop type was accounted for, suggesting that height differences was driven by what was planted, rather than where the fields were located (Figure 7). Fields in Metro Vancouver were predominantly planted with a Multi-Species mix or a Spring Cereal, which overall were taller than Cereal Mix and Winter Cereals and Grasses which were largely planted in the Fraser Valley. Fields in Metro Vancouver were taller in November at 41.3 cm on average, but dropped to 18.3 cm by March, while fields in the Fraser Valley continued to gain height throughout the season from 23.3 cm in November to 31.3 cm in March.

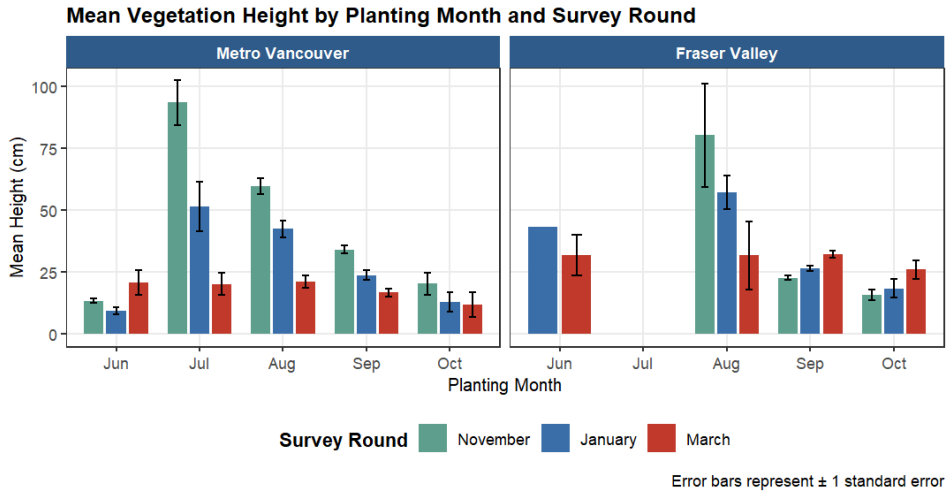

Figure 7 Mean vegetation height (cm) for each cover crop category across three survey rounds (November, January, and March) in Metro Vancouver and the Fraser Valley. Error bars represent ± 1 standard error.

Planting date had a significant effect on vegetation height in both regions during the November and January surveys (Figure 8). In Metro Vancouver, each additional day from planting increased vegetation height by 0.71 cm, while in the Fraser Valley it added 0.48 cm (both $p < 0.0001$). By March, however, planting date no longer had a significant effect on vegetation height in either region, with Metro Vancouver retaining only a small effect ($p = 0.040$) and the Fraser Valley showing no significance ($p = 0.800$). These results suggest that earlier planting allows cover crops more time to establish before the November and January surveys, but that this advantage disappears by the end of the survey period.

Fields in Metro Vancouver were planted significantly earlier than those in the Fraser Valley ($p<0.0001$). On average Metro Vancouver fields had 61.8 growing days between planting and the first survey, compared to just 45.7 days for Fraser Valley fields. This later planting date likely contributed to lower vegetation height observed in the Fraser Valley fields in November. Once waterfowl grazing pressure increased in January and March in Metro Vancouver, Fraser Valley fields had a taller height as they continued to grow undisturbed.

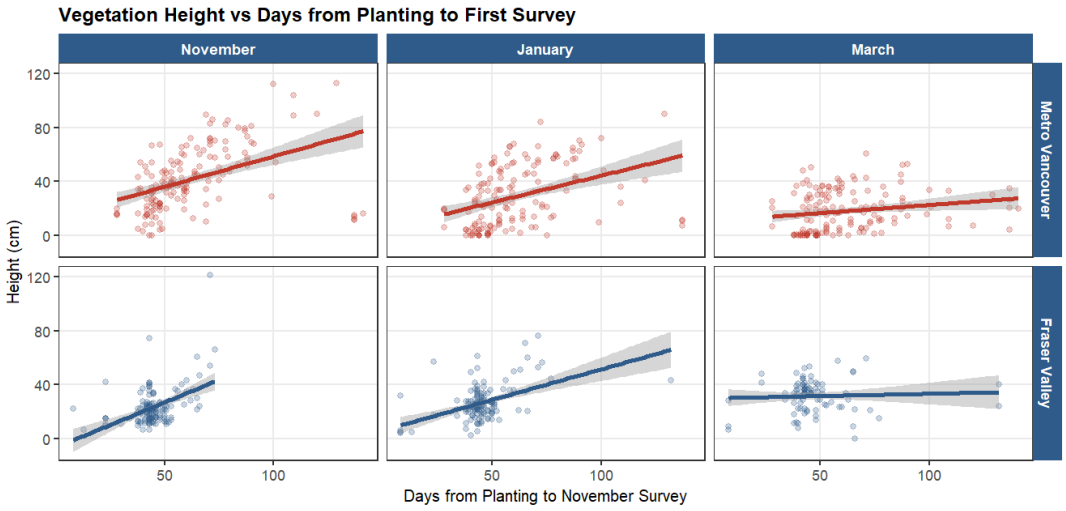

Figure 8 Relationship between planting date and vegetation height (cm) in Metro Vancouver and the Fraser Valley across three survey rounds (November, January, and March).

Waterfowl Grazing

In November only 36 fields (12.1%) showed some evidence of waterfowl grazing, with only 2 fields (0.7%) being grazed completely to the roots. By January this jumped substantially to 115 fields (40.4%) showing some evidence of grazing and 11 fields (3.9%) being fully grazed. In March a similar proportion of fields had been grazed (44.1%). In March, 28 fields could not be assigned a grazing intensity level due to an inability to discern between waterfowl grazing, flooding damage, or winterkill damage. These fields were excluded from March grazing intensity calculations which may lead to underestimation of true grazing pressure in March.

Table 2 Mean vegetation height (cm), percent cover, intensity of grazing (0-4), and total grazing, which was calculated to a maximum value of 400, which represents 100% grazed at intensity 4, of each cover crop type based on region.

	NOVEMBER				JANUARY				MARCH			
REGION	Total Cover (%)	Grazing Intensity (0-4)	Height (cm)	Total Grazing (0-400)	Total Cover (%)	Grazing Intensity (0-4)	Height (cm)	Total Grazing (0-400)	Total Cover (%)	Grazing Intensity (0-4)	Height (cm)	Total Grazing (0-400)
METRO VANCOUVER	63.84	0.29	41.26	23.19	49.75	1.27	29.31	107.22	35.63	1.7	18.28	141.76
FRASER VALLEY	81.15	0.01	23.33	0.12	81.22	0.09	26.74	4.00	79.03	0.16	31.31	9.61

Grazing intensity was on average lowest in November at 0.17, and increased to 0.74 by January and 1.05 in March. The percent of fields grazed plateaued in January, and the intensity of grazing increased throughout this period, suggesting that by January, most fields which were going to be grazed had already been visited by waterfowl, and from January to March the main change was the intensity of grazing on already affected fields. Over the past three survey years, grazing intensity decreased each year. On average, grazing intensity was 0.43 in 2024-25 and 0.72 in 2023-24, and by March, intensity had increased to 1.1 in 2024-25 and 2.08 in 2023-24.

Fields in Metro Vancouver experienced significantly higher grazing intensity than those in the Fraser Valley throughout the entire survey period (Figure 9). In Meto Vancouver, mean grazing intensity rose from 0.29 in November to 1.27 in January and 1.70 by March, while vegetation cover decreased from 63.8% to 35.6%, and height dropped from 41.3cm to 18.3cm (Table 2). While in the Fraser Valley, fields remained largely ungrazed, as grazing intensity did not exceed 0.16 in any round, and vegetation cover remained high between 79.0% and 81.2% throughout the season.

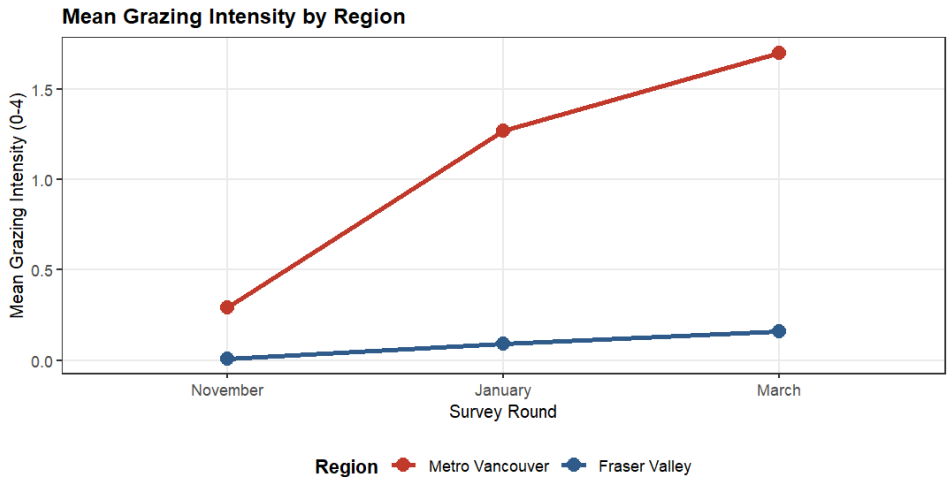

Figure 9 Mean waterfowl grazing intensity (0–4) in Metro Vancouver and the Fraser Valley across three survey rounds (November, January, and March).

In Metro Vancouver planting date had a significant effect on grazing intensity in all three survey rounds, November ($p=0.008$), January ($p<0.001$), and March ($p=0.003$) (Figure 10). Each additional day between planting and the first survey round reduced grazing intensity by approximately 0.008 units in November ($p=0.008$), 0.021 units in January ($p<0.001$) and 0.020 units in March ($p=0.003$), independent of cover crop species. This is consistent with results found in the 2024-25 survey, which suggested that fields with later planting dates were associated with higher levels of grazing. In the Fraser Valley, planting date had no significant effect on grazing intensity in any of the survey rounds, November ($p=0.165$), January ($p=0.575$), and March ($p=0.542$). This may be because grazing pressure in the Fraser Valley was overall low and mean intensity did not exceed 0.16 in any round.

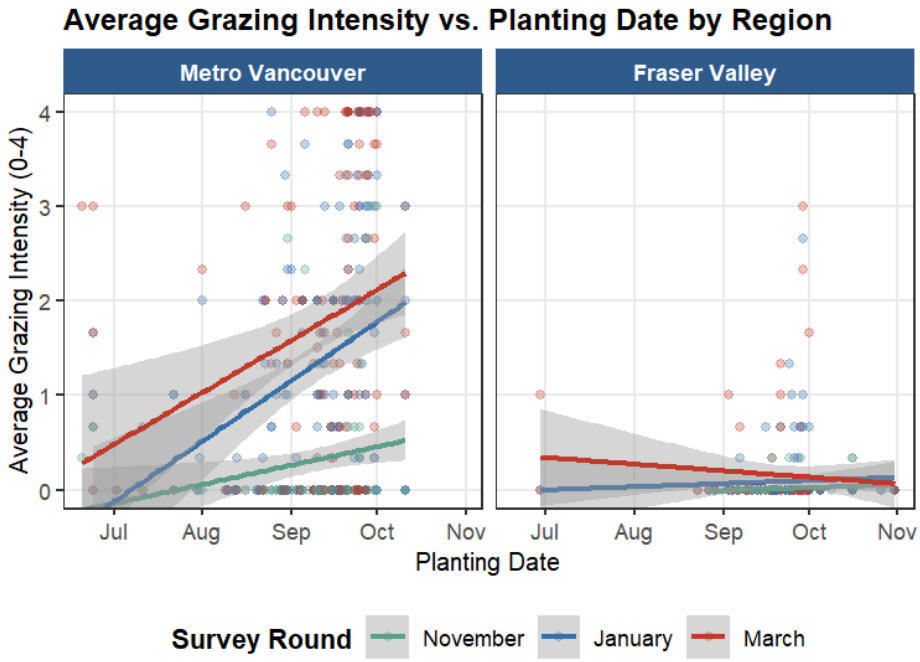

Figure 10 Mean waterfowl grazing intensity (0–4) in relation to planting date for Metro Vancouver and the Fraser Valley across three survey rounds (November, January, and March).

Waterfowl grazing was primarily driven by region rather than by cover crop type. Fields in Metro Vancouver experienced significantly higher grazing pressure than fields in the Fraser Valley across all categories of cover crop type (Figure 11). Within the Metro Vancouver region, Spring Cereal fields were the most heavily grazed, and experienced significantly higher grazing than the Multi-Species fields (p=0.002), though no other categories had significant differences.

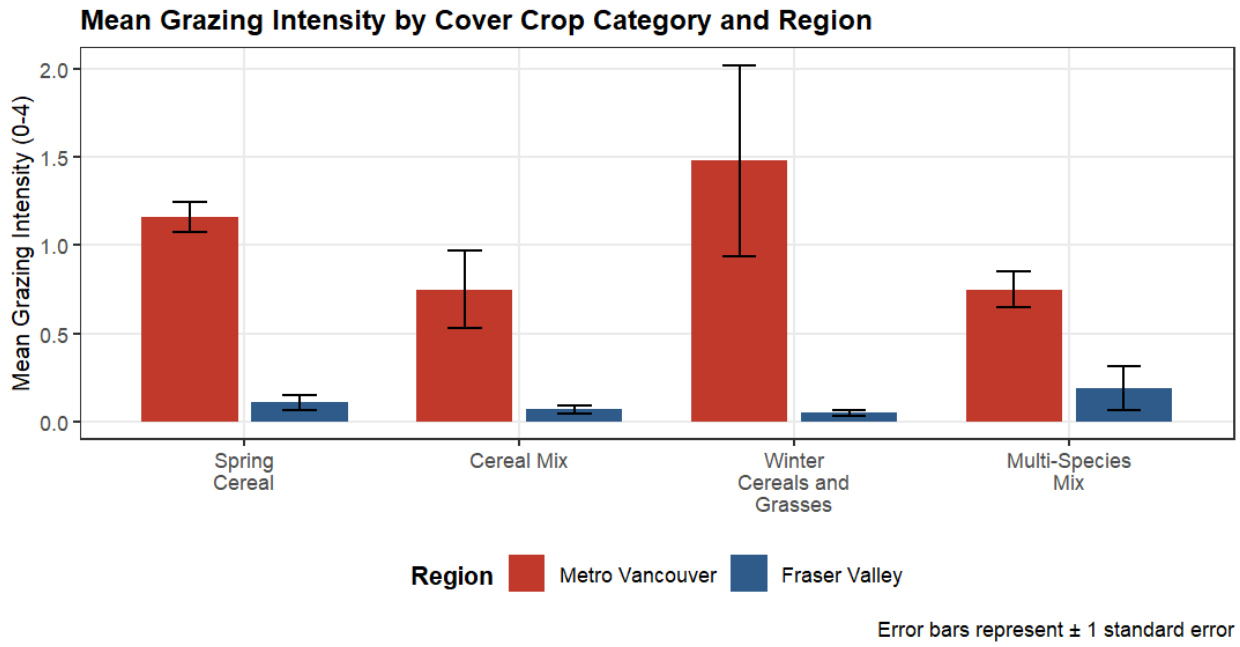

Figure 11 Mean waterfowl grazing intensity (0–4) for each cover crop category in Metro Vancouver and the Fraser Valley, averaged across all three survey rounds (November, January, and March).

Multi-Year Analysis

Across three survey years a decline in waterfowl grazing pressure was observed. Grazing intensity differed significantly among all three years (p<0.003), with the 2023-24 season experiencing the highest grazing pressure and 2025-26 the lightest pressure. This trend was most apparent in November, where the proportion of fields showing any evidence of grazing declined from 30.6% in 2023–24 to 18.7% in 2024–25 and just 12.1% in 2025–26. Throughout all three survey years, the region in which fields were located was the most significant driver of grazing intensity. Metro Vancouver fields experienced significantly higher grazing intensity than fields in the Fraser Valley in every year and across all types of cover crop (p<0.001) (Figure 12).

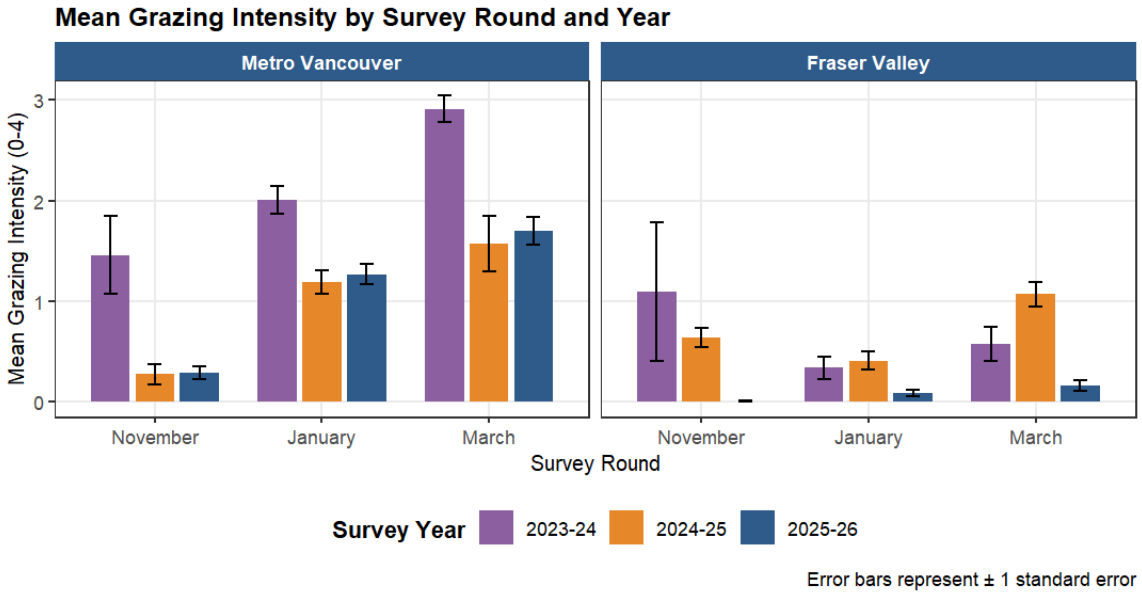

Figure 12 Mean waterfowl grazing intensity (0–4) by survey round (November, January, and March) and survey year (2023–24, 2024–25, and 2025–26) in Metro Vancouver and the Fraser Valley.

Alongside the decline in grazing intensity, vegetation cover improved significantly each year. In 2025-26, fields retained approximately 14 percent more cover than in 2023-24, and 24 percent more than 2024-25 ($p<0.0001$) (Figure 13). Vegetation height was also significantly greater in 2025-26 than either previous year ($p<0.0001$), while the 2023-24 and 2024-25 seasons were comparable in height ($p=0.592$).

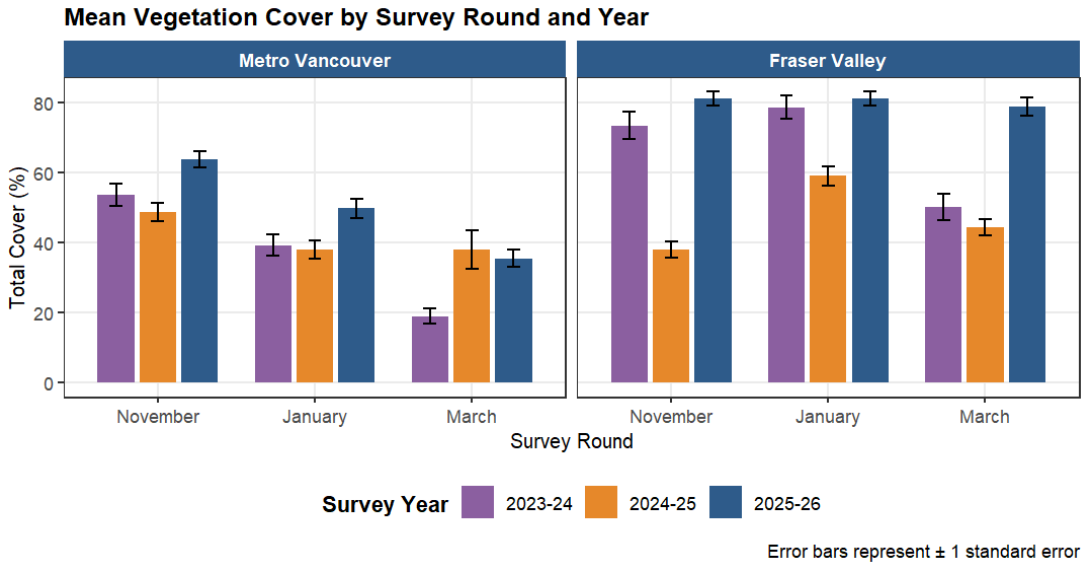

Figure 13 Mean percent vegetation cover (%) by survey round (November, January, and March) and survey year (2023–24, 2024–25, and 2025–26) in Metro Vancouver and the Fraser Valley

Within Metro Vancouver planting date had a significant effect on grazing intensity, with earlier planted fields experiencing significantly less grazing, independent of cover crop type, in both the 2025-26 and 2024-25 surveys. This demonstrates the importance of early establishment as a strategy to reduce waterfowl grazing pressure and ensure a successful establishment of cover crops. In the Fraser Valley, planting date showed no significant relationship with grazing intensity, likely because grazing pressure in the region was too low to detect any effect.

Conclusion

The results of the 2025–2026 vegetation survey highlight several patterns in waterfowl grazing and cover crop performance. Within Metro Vancouver, where grazing pressure was highest, planting date was one of the most significant factors associated with improved cover crop establishment, and reduced waterfowl grazing intensity throughout the survey season, with earlier planted fields retaining more vegetation height and cover and experiencing less waterfowl grazing. Cereal Mix and Winter Cereals and Grasses had the highest and most consistent cover throughout the season and may be a potential option for farmers in higher pressure areas who are seeking to maximize cover crop retention over winter.

Overall, in the 2025–2026 season cover crops in Metro Vancouver and the Fraser Valley had the strongest cover establishment and lowest grazing pressure compared to the past three years of vegetation surveys in this region. The decline in waterfowl grazing pressure observed in this year's survey may be due to warmer than average winter conditions across the region. The lack of freezing temperatures or snowfall throughout the winter allowed cover crops to persist throughout the entire season, providing an abundance of foraging material for waterfowl, which may have reduced their concentrated grazing pressure on individual fields.

Appendix

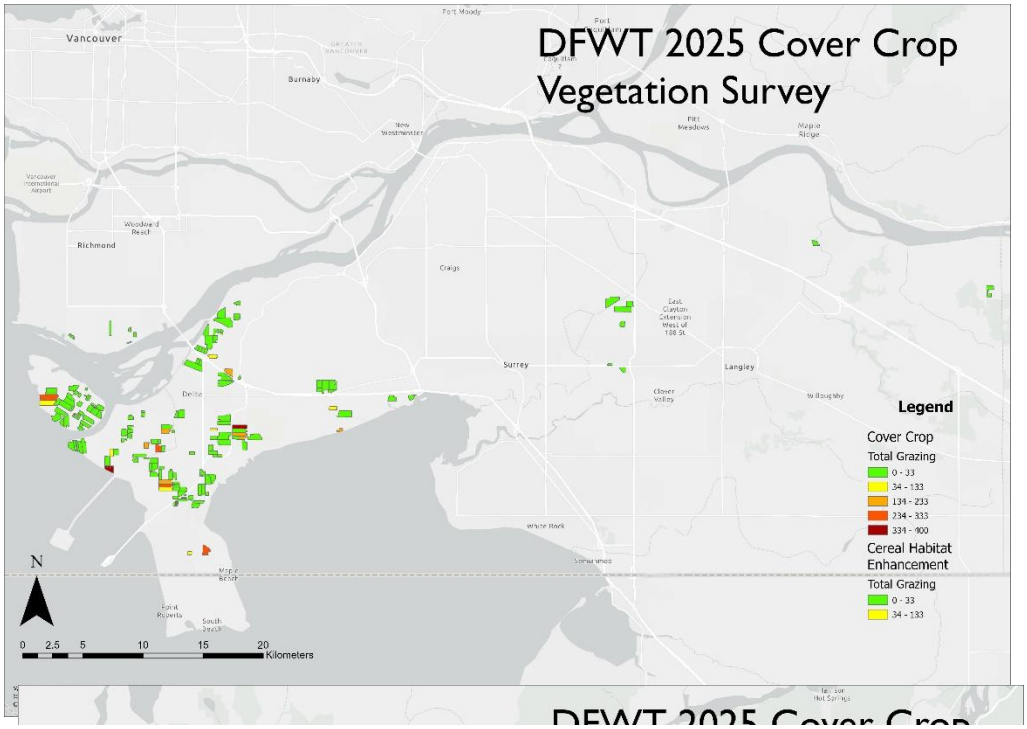

Figure 2 Map of total waterfowl grazing pressure in Metro Vancouver during the first survey round (November 2025) of the 2025–2026 survey season. Total grazing is calculated as a maximum value of 400, representing 100% of vegetation grazed at an intensity of 4, and is shown for each cover crop field surveyed.

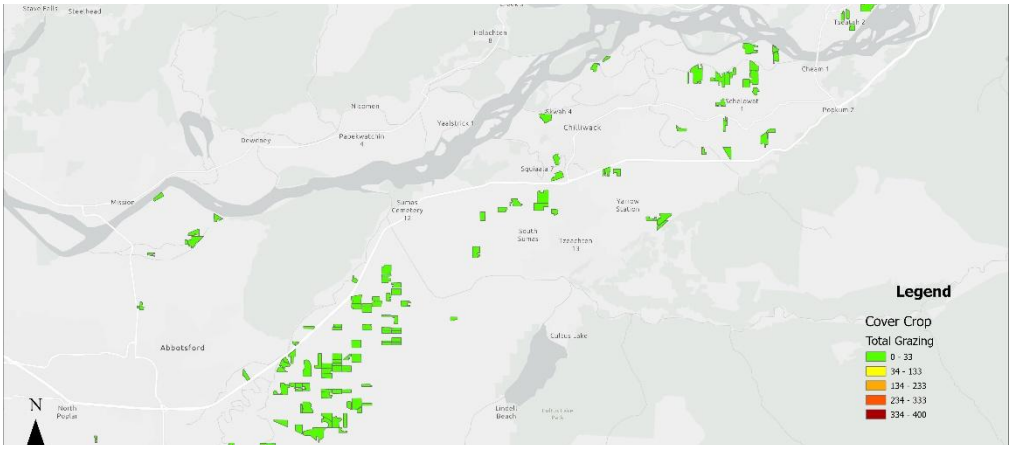

Figure 1 Map of total waterfowl grazing pressure in the Fraser Valley during the first survey round (November 2025) of the 2025–2026 survey season. Total grazing is calculated as a maximum value of 400, representing 100% of vegetation grazed at an intensity of 4,

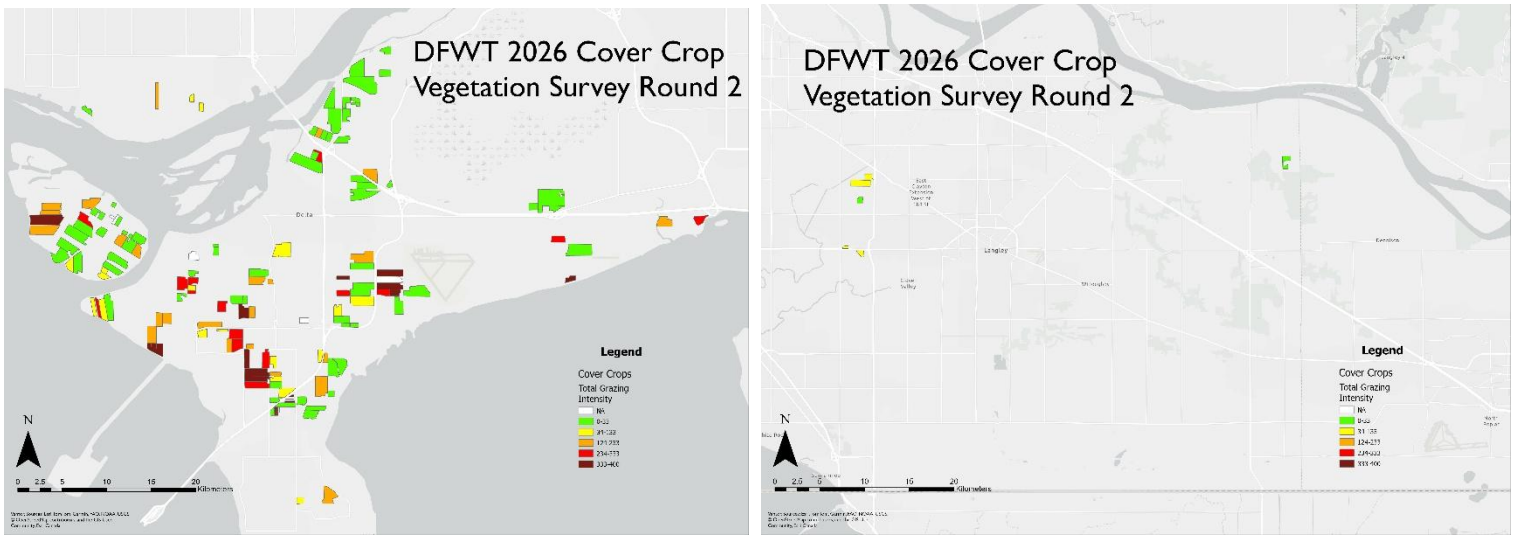

Figure 4 Map of total waterfowl grazing pressure in Metro Vancouver during the second survey round (January 2026) of the 2025–2026 survey season. Total grazing is calculated as a maximum value of 400, representing 100% of vegetation grazed at an intensity of 4,

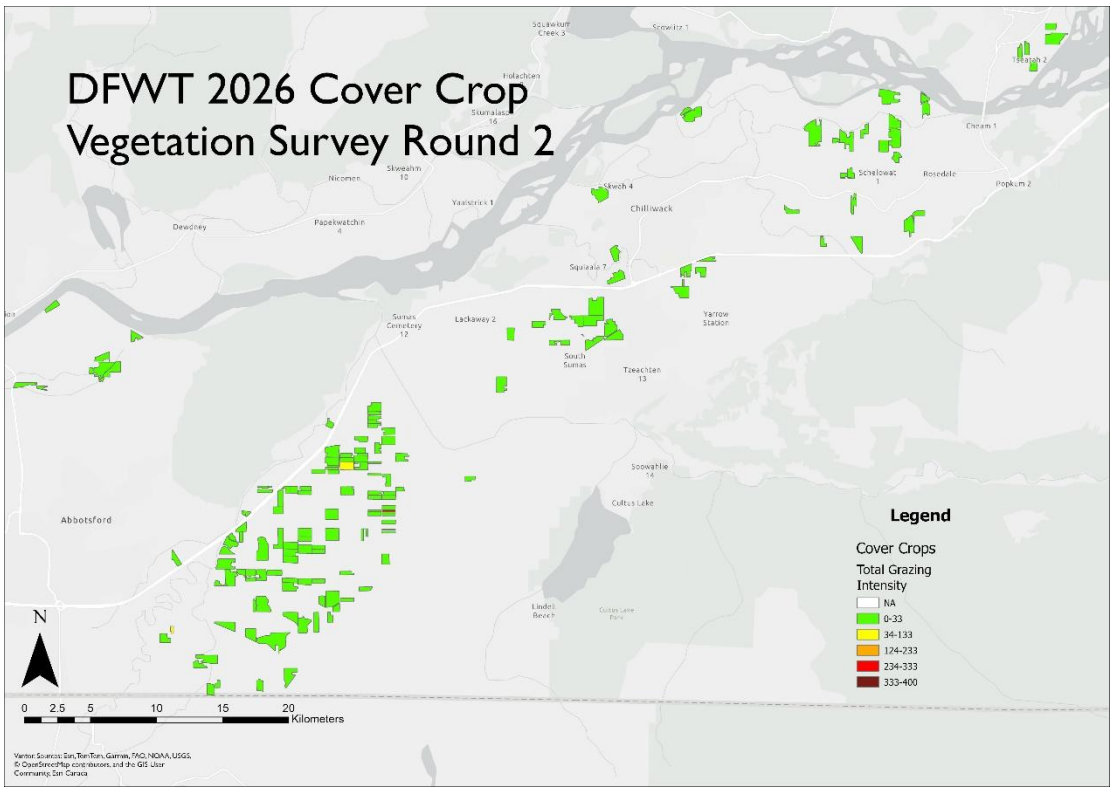

Figure 3 Map of total waterfowl grazing pressure in the Fraser Valley during the second survey round (January 2026) of the 2025–2026 survey season. Total grazing is calculated as a maximum value of 400, representing 100% of vegetation grazed at an intensity of 4, and is shown for each cover crop field surveyed.

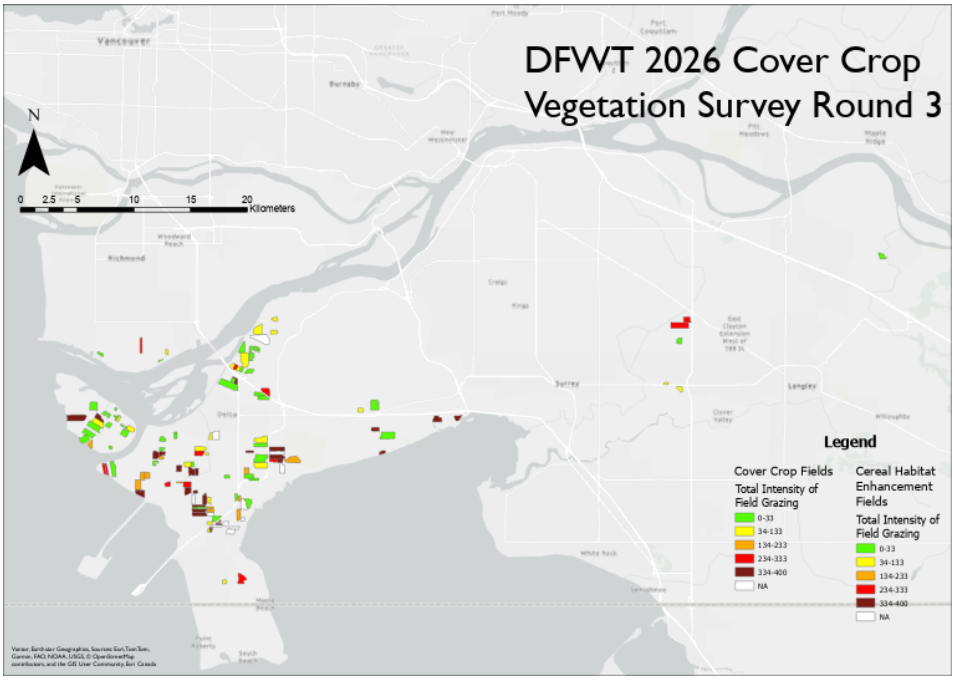

Figure 5 Map of total waterfowl grazing pressure in Metro Vancouver during the third survey round (March 2026) of the 2025–2026 survey season. Total grazing is calculated as a maximum value of 400, representing 100% of vegetation grazed at an intensity of 4, and is shown for each cover crop field surveyed.

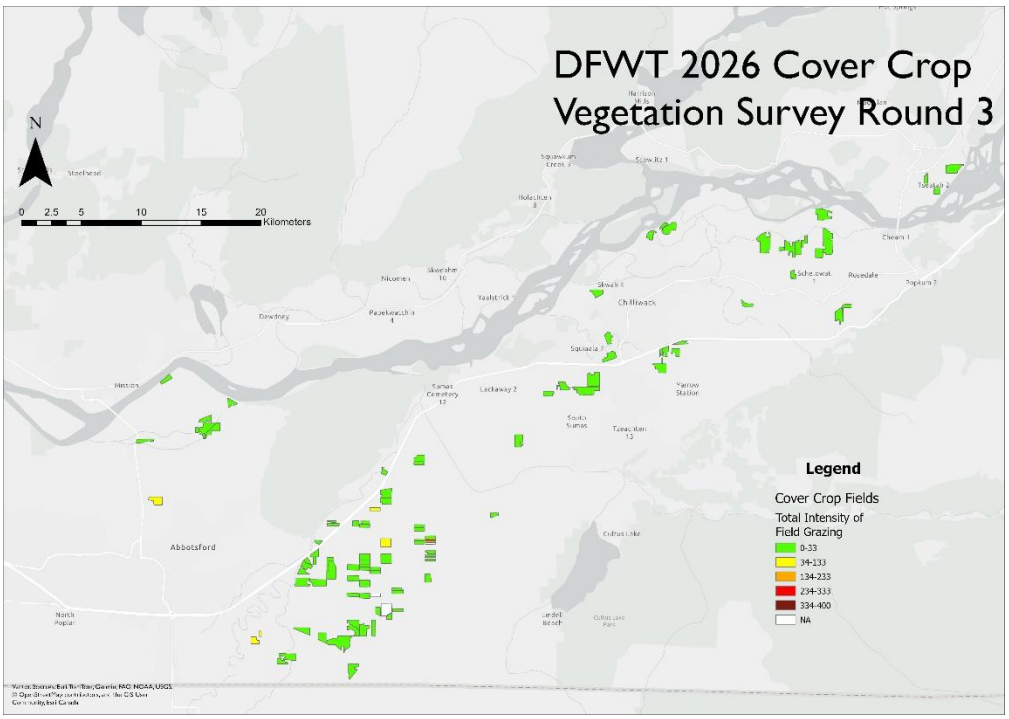

Figure 6 Map of total waterfowl grazing pressure in the Fraser Valley during the third survey round (March 2026) of the 2025–2026 survey season. Total grazing is calculated as a maximum value of 400, representing 100% of vegetation grazed at an intensity of 4, and is shown for each cover crop field surveyed.