



ANNUAL REPORT 2025



MARMOT
RECOVERY FOUNDATION

ACKNOWLEDGEMENTS

We recognize the unique and enduring relationship that exists between Indigenous People and their traditional territories, and honor with gratitude the people who have stewarded it since time immemorial. Much of the work that we carry out takes place on the traditional territories of the 'Namgis, Kwakiutl, Wei Wai Kum, We Wai Kai, K'omoks, Mowachaht/Muchalaht, Snaw-Naw-As, Qualicum, Hupacasath, Tseshaht, Snuneymuxw, Stz'uminus, Songhees, Esquimalt First Nations and Cowichan Tribes. We are grateful for the opportunity to learn and work on their traditional lands.

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This report was prepared by Kevin Gourlay, Shayn McAskin, Malcolm McAdie, and Adam Taylor.

EXECUTIVE SUMMARY

The endangered Vancouver Island marmot (*Marmota vancouverensis*, Swarth, 1911) is one of only five endemic land mammals in Canada (Nagorsen, 2004). The Vancouver Island marmot is recognized as an endangered species under the B.C. *Wildlife Act* and is on the B.C. Red List of species at risk. Nationally, it is listed under Schedule 1, Endangered, on the Species-at-Risk Act. Internationally, the International Union for Conservation of Nature (IUCN) lists the species as Critically Endangered. A recovery program for the marmot was launched in 1996, and 2025 was the 29th year of intensive recovery efforts.

During 2025, the Foundation conducted core field and conservation breeding activities intended to lead to achieving recovery goals for the species. Field work objectives were intended to (i) increase the number of marmots in the wild and protect the persistence of existing colonies, (ii) support wild reproduction, (iii) restore critical habitat, (iv) relocate marmots found in unsuitable habitat, and (v) monitor the wild population. The Wilder Institute/Calgary Zoo helped the Foundation to monitor marmots at several colonies while also piloting new technologies that can be used to collect field data on the Vancouver Island marmot. Data from their team have been incorporated into the results reported here.

Conservation breeding objectives were intended to (i) maintain a safeguard against potential catastrophic or stochastic events in the wild, (ii) act as a long-term genetic reservoir, (iii) refine appropriate management and husbandry techniques for the successful captive maintenance and propagation of Vancouver Island Marmots, (iv) assist directed research, and (v) provide sufficient numbers of individuals for release towards the eventual restoration of the wild population. This year saw the highest overall wild population counts ever recorded in the Vancouver Island marmot, for the second year in a row. Approximately 420 marmots were observed in the wild by the end of the season, distributed across 37 colonies in two main regions and two extralimital areas. Twenty colonies produced 116 pups over 41 litters, the highest number of pups ever recorded. There were 45 mortalities documented in 2025. Survey effort was similar to the previous 2-year average at most colonies, with a slight shift in effort from Nanaimo Lakes to the Strathcona region.

In total, 41 marmots from the conservation breeding program and 14 marmots with some level of previous wild-living experience were released or translocated to augment 17 priority colonies. Twenty-nine feeders were installed at 19 colonies to improve the early season survival and reproductive potential of ~299 marmots. Forty-two marmots were trapped over the season and subsequently re-released or translocated for various reasons. Since 2003, the Conservation Breeding Program has resulted in the release of 726 captive-bred marmots out to the wild. Currently there are 124 marmots in the Conservation Breeding Program, including 36 potential breeding pairs for 2026.

This report presents the results from the 2025 season.

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1. INTRODUCTION

This report is primarily intended for partners in the Vancouver Island marmot recovery effort to facilitate planning of 2026 recovery actions. Others may find it informative or useful for research. In this report, you will find descriptions of the approach, methodology and results of activities conducted by the Marmot Recovery Foundation during the 2025 field season. These results include data collected by the Foundation's Field and Animal Care teams, as well as observations from the Wilder Institute/Calgary Zoo research team. Collectively, this document refers to all these groups as "field teams". The information shared here is current and accurate to the best of our ability. If you are looking for additional information about recovery planning for the Vancouver Island marmot, please refer to the Provincial Recovery Plan (Vancouver Island Marmot Recovery Team, 2017), Federal Recovery Strategy (Environment and Climate Change Canada, 2020) or visit the Foundation's website. Within this report any mention of the "Recovery Plan" refers to the Provincial document, unless otherwise noted.

2. ABOUT THE VANCOUVER ISLAND MARMOT

The Recovery Plan describes the species as follows:

"The Vancouver Island marmot (*Marmota vancouverensis*) is British Columbia's only endemic mammal species; it lives only in mountainous areas on Vancouver Island. For 7–8 months of the year (approximately early October to May), family groups of Vancouver Island marmots hibernate in underground burrows called hibernacula. During the 4 to 5-month active season in which they breed, raise young, and regain weight, marmots continue to use their underground burrow systems for resting, avoiding summer heat, and protection from predators. They also spend considerable time above ground foraging, resting, sunning, and interacting with other marmots. Marmots typically live in colonies and when above ground, they rely on alarm calls to warn others in the colony that a predator is nearby. The main predators of the Vancouver Island marmot are Golden Eagles, Cougars, and Grey Wolves," (Executive Summary, p.v).

"Because of their reliance on alpine and subalpine habitat, Vancouver Island marmots are not distributed uniformly on the landscape. On a small spatial scale, marmots live in colonies that typically include one to two family groups (Nagorsen, 2005). Multiple colonies can live on a single mountain. Within this document, the term "site" is synonymous with "mountain." Marmots living at the same site can, therefore, disperse or move between colonies without leaving the alpine or subalpine habitat; marmots dispersing between sites must travel through lower-elevation forest habitats. Because alpine and subalpine areas on mountains are separated by areas of unsuitable marmot habitat, it is thought that Vancouver Island marmots have a metapopulation structure (Bryant, 1996); marmot colonies on the same mountain form a subpopulation, and subpopulations are linked by occasional dispersal. The subpopulations that are (or could be) linked by these dispersal events comprise the metapopulation. Dispersal events do not occur between marmot metapopulations because they are isolated by distance. Two metapopulations of Vancouver Island marmots currently exist, one in the Nanaimo Lakes area of south-central Vancouver Island and one further north in the Strathcona region," (Section 3.2, p.3).

3. ABOUT THE RECOVERY EFFORT

The Vancouver Island marmot initially was designated as endangered in 1978 by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Additional protections have been provided by Canada's Species at Risk Act, and British Columbia's Wildlife Act, Forest and Range Practices Act, Private Forest Land Management Act, and Oil and Gas Activities Act. Intensive recovery efforts to increase the population size and distribution have been ongoing since 1996. Perhaps the most critical recovery activity was the initiation of a conservation breeding and reintroduction program in 1997 and which continues to date. There are presently three facilities that breed marmots for the recovery program: the Wilder Institute/Calgary Zoo, the Toronto Zoo, and the purpose-built Tony Barrett Mount Washington Marmot Recovery Centre operated by the Marmot Recovery Foundation. Since 2003, the conservation breeding program has released 726 marmots born in the Conservation Breeding Program and re-released 12 wild-born marmots that had been brought into the Conservation Breeding Program. During the same period, the number of occupied marmot colonies has grown from 5 to 37.

The Recovery Plan describes as its goal the establishment of two or more persistent, geographically distinct metapopulations of Vancouver Island marmots within the species' historic range. It also specifies seven key objectives:

1. Increase the number of marmots through augmentation and, if possible, by increasing survival rates and reproductive rates in the wild.
2. Maximize opportunities for successful dispersion between colonies.
3. Maintain a large and genetically diverse captive breeding population that can produce adequate numbers of release candidates to support population recovery.
4. Prioritize the maintenance of genetic variability in the global population until recovery goals are met.
5. Reduce knowledge gaps surrounding: (a) natural levels of variability in survival and reproductive rates in the wild; (b) factors that determine key demographic rates; and (c) the best method to monitor population size and key demographic rates long term.
6. Develop and implement a plan for reducing intensive management as metapopulations recover.
7. Develop and implement a sound strategy to ensure sufficient resources are available to support recovery efforts until recovery goals are met.

Objectives 1-5 are the focus for this report of 2025 activities, results, and observations.

4. WILD POPULATION

The known, wild-living population of Vancouver Island marmots is currently distributed in two metapopulations and three extra-limital¹ colonies. The Nanaimo Lakes metapopulation (Figure 1a) includes 15 occupied natural colonies and 37% of wild-living marmots. The Strathcona metapopulation (Figure 1b) includes 19 occupied colonies and 57% of the wild-living marmot population. Clayoquot Plateau, in west-central Vancouver Island, contains approximately 4% of the wild-living population. Two colonies on the North Island were confirmed occupied in 2025, with initial survey counts contributing 1.4% of the wild population.

The Foundation classifies a colony site as “unoccupied” when there was no marmot sign detected on its most recent two surveys. Colonies were classified as “data deficient” when Foundation staff felt there was insufficient data to assess their occupancy. Some data deficient colonies have not been surveyed for several years.

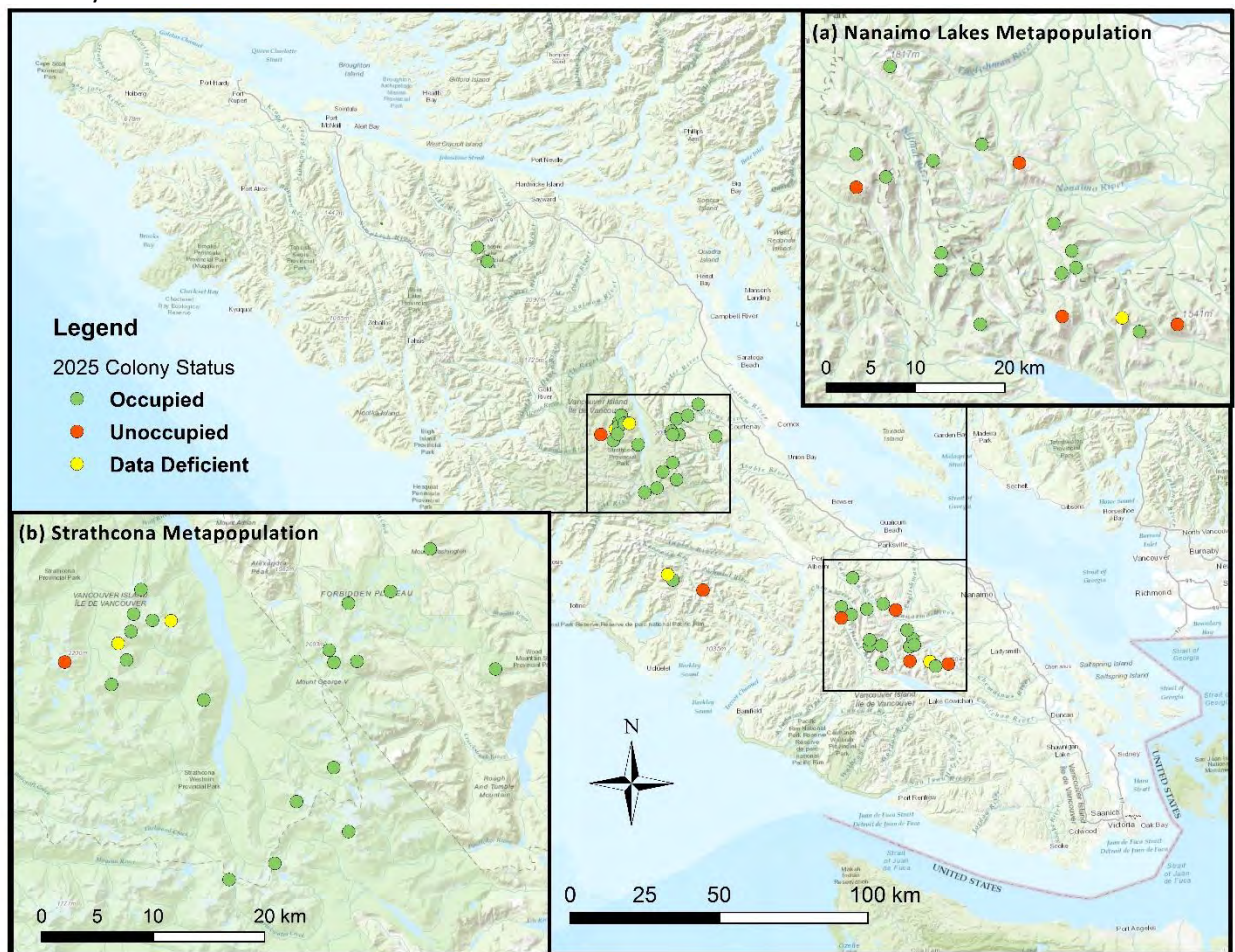


Figure 1. Distribution of the Vancouver Island marmot in the wild (November 2025), including occupied, unoccupied and data deficient colony sites in the (a) Nanaimo Lakes and (b) Strathcona regions.

¹ Colonies outside of metapopulation are identified in the Recovery Strategy as extra-limital.

4.1 Summary of the Wild Population

It has been 22 years since the wild population of Vancouver Island marmots reached its lowest point. In 2003, only 22 individuals were able to be located by the end of the field season. That same year also marked the first release of four marmots bred in the Conservation Breeding Program to the wild. This year, 420 Vancouver Island marmots were counted, the highest number of marmots ever observed in the wild.

The 2025 field season saw continued growth in the wild-living population of Vancouver Island marmots, with population increases in both metapopulations and across all age classes. The largest reproductive output in the Vancouver Island marmot was recorded in 2025, for a second consecutive year, with 116 pups across 41 litters. The age class which experienced the greatest increase overall compared to last year were adults (+20%, n=212 vs. n=176), followed by pups (+9%, n=116 vs. n=106), with similar counts of yearlings (+1%, n=90 vs. n=89, Figures 1,2).

Following the implementation of the stepping-stone methodology, the Strathcona metapopulation has grown faster than the Nanaimo Lakes metapopulation, and is now the larger of the two for the second year in a row (Figure 3). Compared to the Nanaimo Lakes meta-population it has a larger percent of the wild population (57% vs 37%), and a greater proportion of both adults (n=114 vs. n=80) and pups (n=72 vs. n=42). The Strathcona metapopulation increased from last year (+21%; n=242 vs n=200), while Nanaimo Lakes remained stable (+2%; n=156 vs n=153) despite receiving a larger contribution from conservation releases and translocations (net; +15 vs +26).

The distribution of marmots increased on the landscape in both metapopulations and at two previously data deficient extra-limital colonies. In the Nanaimo Lakes, occupation was confirmed this year at Mount Service (n=1), north of the existing colony at Mount Landale. In Strathcona, a new colony was documented at Mount Phillips (n=5), a former release site. New occupation was also documented to the north of the existing Castlecrag colony around Moat Lake (n=9), and east from the Marble Meadows colony towards Wheaton, Marblerock and Limestone Lakes.

Marmots at Flower Ridge, a site which was reintroduced in 2024, survived overwinter, and the site received additional translocations this year, and received dispersing marmots from the recently reoccupied neighbouring Drinkwater colony. Occupation between these two colonies is now 15 marmots spread across six sublocations, up from no marmot occupation in 2023. This continues a trend of increasing connectivity between larger established colonies within Strathcona, and a significant increase in the population and known distribution of marmots in the mountains south of Buttle Lake over the past few years.

Marmots were previously reintroduced to northern Vancouver Island from 2007 to 2009, with releases to Mount Cain and Mount Seth. During the last surveys in 2012 and 2015, crew were unable to detect many of the remaining marmots and the colonies were presumed extirpated. In spring of 2025, Foundation staff confirmed marmot persistence at both these colonies, with surveys and wildlife cameras documenting 6 marmots across two occupied colonies at Mount Cain and Mount Seth.

At Steamboat Mountain in Clayoquot Plateau Provincial Park, a significant increase in the wild population and distribution across the mountain was documented in 2024, however it was not surveyed this year due to camera failure and weather.

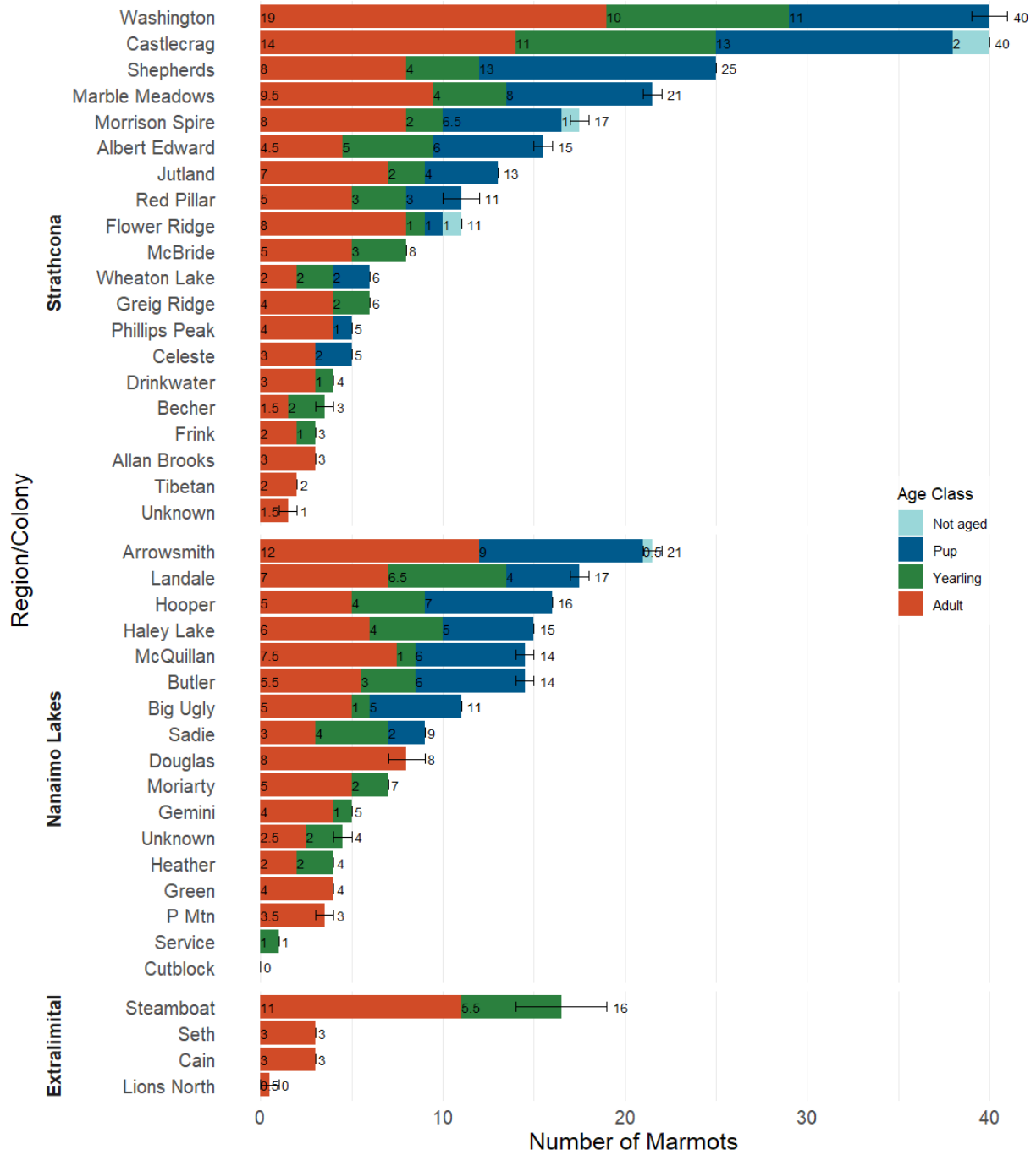


Figure 1. Mean and range of high and low counts of wild marmots by colony and age class.

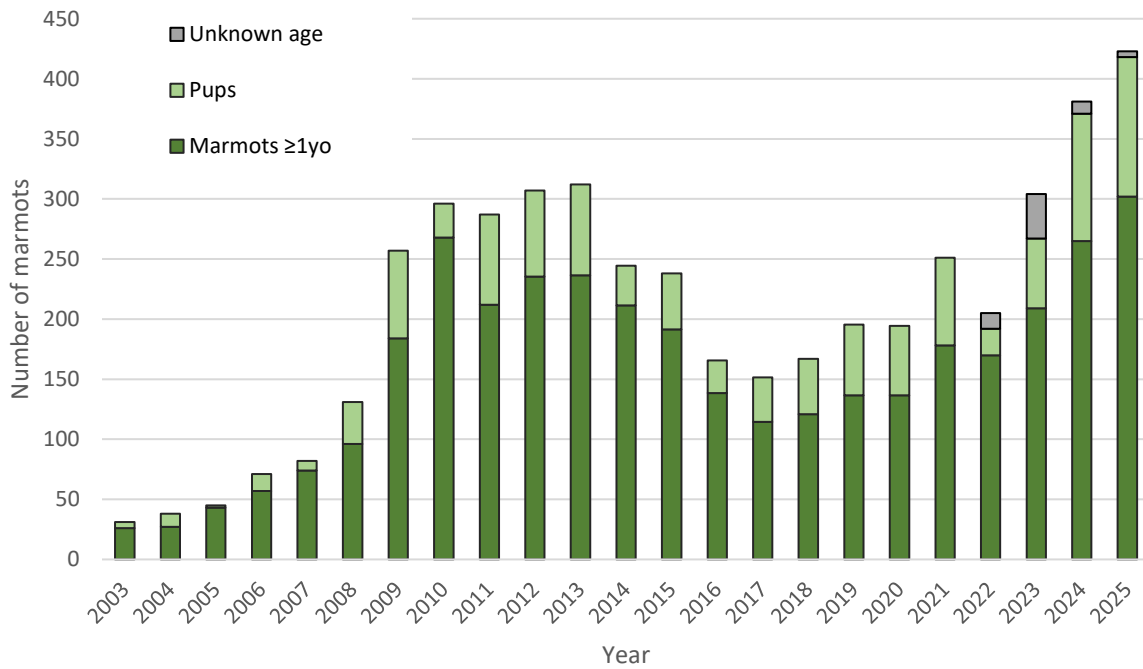


Figure 2. Mean population counts by age class (2003-2025).

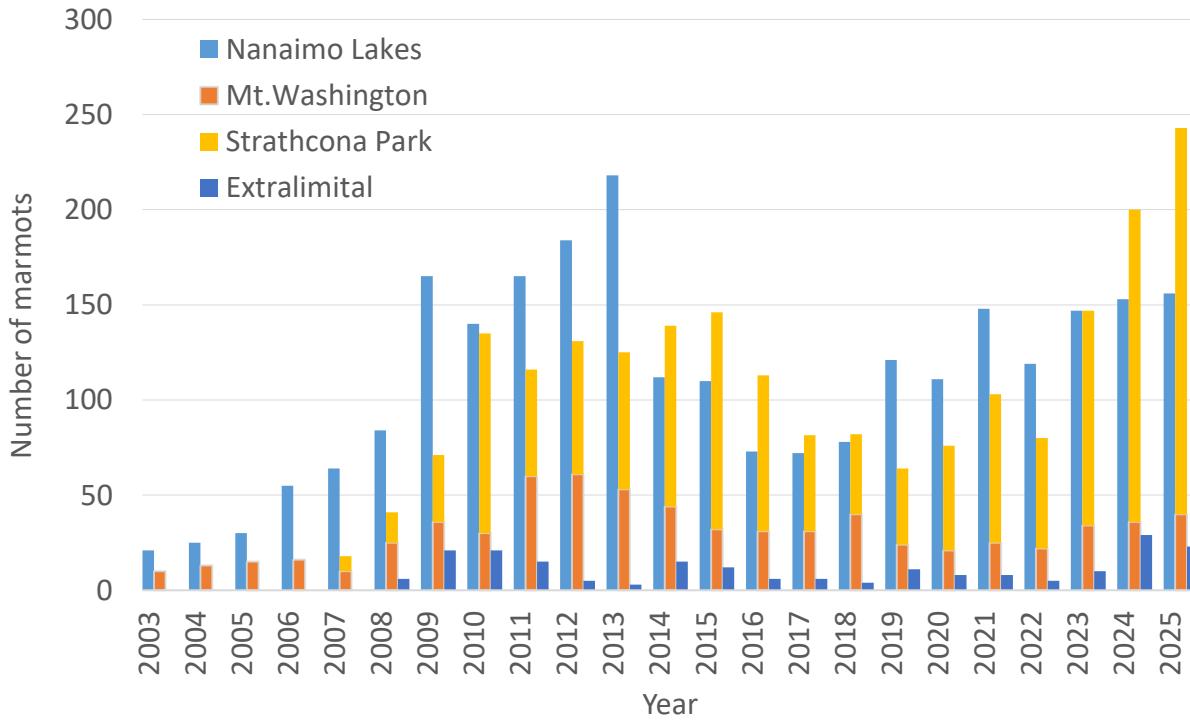


Figure 3. Mean population counts by region (2003-2025).

4.2 Expanded Habitat Occupation

In 2025, Foundation staff confirmed occupation at four colonies previously categorized as “Data Deficient”. Two extra-limital colonies, Mt Cain and Mt Seth on the North Island were surveyed by staff and confirmed as occupied for the first time since 2015, with three marmots documented at each colony. In Strathcona Park, Mount Phillips was confirmed occupied for the first time since 2016, with five marmots, including pups. In the Nanaimo Lakes, one of our wildlife cameras confirmed a marmot at Mount Service, north of an established colony at Mount Landale.

At other colonies, expanded habitat occupation was documented in 2025 (Table 1). At Castlecrag Mountain in eastern Strathcona Provincial Park, new sublocations were documented towards Moat Lake. West of Buttle Lake in Strathcona, marmot occupation continues to expand with hiker reports and surveys confirming new areas of occupation around Wheaton, Marblerock and Limestone lakes in the Marble Meadows area. Flower Ridge and Drinkwater colonies in southern Strathcona Provincial Park were a hotspot of marmot movement in 2025. After a successful re-introduction to Flower Ridge in 2024, followed up with releases in 2025 to both Flower and Drinkwater, marmots have since spread out across multiple sublocations. Dispersal and occupation were documented from Flower Ridge, across neighbouring Mount Septimus, to Drinkwater, and after a confirmed hiker report in late 2025, further west to Big Interior Mountain. There is not enough evidence to determine if this is a new colony or a single marmot temporarily occupying the site during a dispersal, but the trend is positive for these colonies in southern Strathcona.

Table 1. Expanded habitat occupation in 2025.

Region	Colony	# 1+ yo	# Pups	Notes
North Island	Mt Cain	3	0	Staff documented occupation at this colony in 2025, for the first time since 2015. The colony had not been surveyed in many years as it was presumed extirpated.
North Island	Mt Seth	3	0	Staff documented occupation at this colony in 2025 for the first time since 2015. The colony had not been surveyed in many years as it was presumed extirpated.
Strathcona Provincial Park	Moat Lake (Castlecrag)	6	3	Staff documented two new occupied sublocations at Moat Lake near the colony of Mount Castlecrag. Both of these new sublocations had marmots of multiple age classes suggesting established family units and successful reproduction here in previous years.
Strathcona Provincial Park	Flower Ridge	7	1	After multiple years without occupation, the colony received a reintroduction of four marmots in 2024. After a successful hibernation, they were joined in 2025 with the release of an additional three marmots. Several marmots at Flower Ridge have spread out from the Prices Pass release sublocation into nearby sublocations at Green Lake, the Ash Drainage, and into the Prices Valley towards north aspect of Septimus. Dispersal to and from the neighbouring Drinkwater colony occurred in 2025, and reproduction was also documented at

				Prices Pass with one pup observed with a pair of our 2024 reintroduction releases.
Strathcona Provincial Park	Septimus / Flower Ridge (Price Creek Valley)	3	0	Mount Septimus is located between the Flower Ridge and Drinkwater colonies that have been the focus of recent reintroduction releases. Foundation staff documented marmot activity on the south and west aspects in 2024, and active dispersals to Prices Creek Valley on the north aspect in 2025. It received dispersals of marmots from Flower Ridge, Drinkwater, and Red Pillar, with all three marmots confirmed on site for hibernation, although it is uncertain if it will prove to be an established colony.
Strathcona Provincial Park	Drinkwater	3	0	Drinkwater was reported to the Foundation by hikers in 2024, near to a historical release site. Staff confirmed occupation with a single marmot observed on a subsequent survey, and in 2025, 3 marmots were released to re-establish a colony. Dispersal was documented this year between Drinkwater and the nearby Flower Ridge and Septimus colonies.
Strathcona Provincial Park	Big Interior	1	0	In 2025, the Foundation received a hiker report and photos of a marmot at Big Interior Mountain, only ~2km from nearby Drinkwater colony.
Strathcona Provincial Park	Phillips	4	1	Staff documented occupation at Mount Phillips in 2025, with five marmots observed.
Strathcona Provincial Park	Wheaton / Marble Lakes	4	2	The Foundation received multiple hiker reports of marmots in the Marble Meadows area including around Marblerock Lake, and west of Wheaton Hut. Staff documented reproduction at Wheaton Lake, marmot occupation at Limestone Lake, and a new hibernaculum between Wheaton Hut and the Morrison Spire ridge.
Nanaimo Lakes	Service	1	0	Nearby to the Landale-El Capitan colony, Mount Service was confirmed occupied in 2025 by Foundation staff.

4.3 Mortalities

The Foundation tracks mortalities using temperature-sensitive radio transmitters, allowing us to determine the body temperature of the individual remotely. Mortalities can only be conclusively detected during the core field season while marmots are active (June 1st -August 31st). Once a mortality has been detected, staff attempt to recover the mortality promptly to determine the cause of death, usually by analyzing the location, timing, and condition of the remains. Please contact the Foundation for a more exhaustive explanation of our process of determining cause of mortality.

The Foundation detected 45 mortalities during the 2025 field season (Figure 4), including 40 marmots which are believed to have died this season, and an additional 5 which may have died at an earlier date. Fourteen (14) mortalities were of marmots released from the conservation breeding program this year. Predation continues to be the biggest source of mortality, and cougars continue to be the primary predator of marmots.

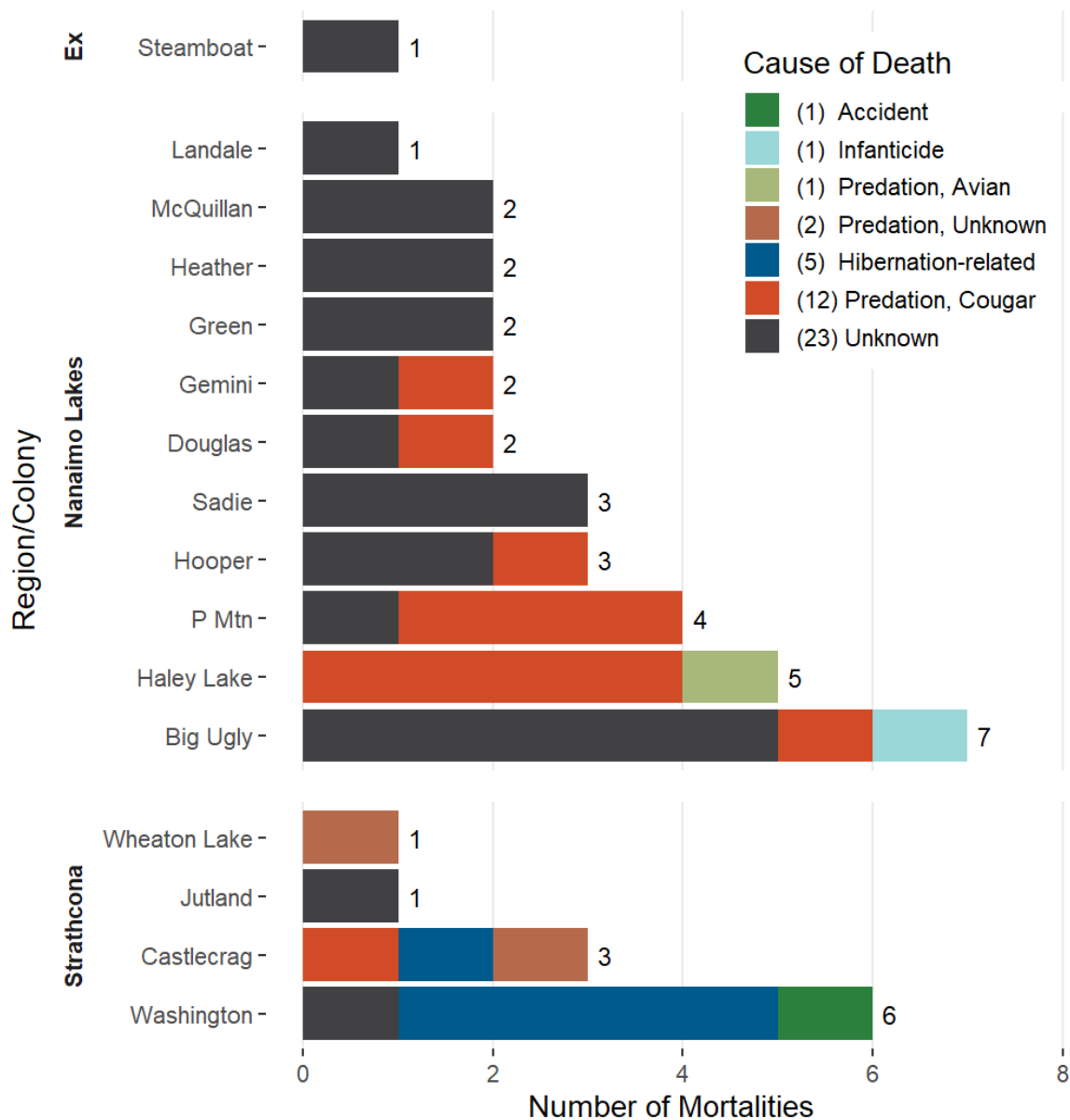


Figure 4. Summary of Mortalities confirmed in 2025 and their suspected causes

4.4 Reproduction

Marmots typically breed in May after arousing from hibernation. Pups emerge above ground in late June-early July after a one-month gestation and a one-month lactation. Female marmots often exhibit reproductive skipping, typically reproducing every second year to regain sufficient body condition to successfully wean a litter of pups.

This year saw the highest rate of reproductive output ever recorded in the Vancouver Island marmot, for the second year in a row (Table 2). Early-season snow melt-off and increased supplemental feeding resulted in increased food availability and better body condition for females, which may have supported the increased reproduction.

Table 2. Weaned pups counted in 2025. *indicates a known pup mortality. Pup mortalities are included in reproductive output, but do not contribute to hill count.

Region	Colony	Litters	Average Pup Count
Nanaimo Lakes	Arrowsmith	3	9
	Big Ugly	1	6*
	Butler	2	6
	Haley Lake	1	5
	Hooper	2	8*
	Landale	2	4
	McQuillan	3	6
	Sadie	1	2
	Strathcona	Albert Edward	2
Castlecrag		4	13
Celeste		1	2
Flower Ridge		1	1
Jutland		2	4
Marble Meadows		3	8
Morrison Spire		4	6
Phillips Peak		1	1
Red Pillar		1	3
Shepherds		3	13
Washington		3	11
Wheaton Lake		1	2
Sum			41
Count	20		

4.5 Dispersals

The Foundation tracks marmot movements in point data using manual radio telemetry. This means it is not possible to determine the exact route a marmot takes while dispersing, however we are able to determine if a marmot makes a move from one colony to another, or into ephemeral habitat. The foundation successfully tracked more dispersal than typical this year (Table 3).

Table 3. Dispersals

Region	Origin	Destination	Marmot	Age	Sex	Distance	Notes
Nanaimo Lakes	Butler	Unknown	Bosco	1	M	4+ km	2025 Release, westward dispersal
	Butler	Bell Creek	Clayo	1	F	2 km	2025 Release
	Sadie	Moriarty	Landon	3	M	13 km	2023 Release to Hooper
	Gemini	Hooper	Odell	2	M	17 km	2024 Release to Haley, dispersed via Green
	Gemini	Sadie	Ultimo	2	M	15 km	2024 Release to Haley
Strathcona	Castlecrag	Allan Brooks	Salmon	2	M	7 km	Wild-born Castlecrag
	Castlecrag	Allan Brooks	Sebastion	2	M	7 km	Wild-born Castlecrag
	Celeste	Henshaw Creek	Lyell	2	M	8 km	2025 Release
	Red Pillar	Prices Creek	Miso	2	F	9 km	Wild-born Red Pillar
	Flower Ridge	Drinkwater	Gilligan	2	M	5 km	2024 Release
	Flower Ridge	Prices Creek	Rundle	2	M	2 km	2025 Release
	Drinkwater	Prices Creek	Lamar	2	M	2 km	2025 Release
	Drinkwater	Flower Ridge	Shawn	1	M	5 km	2025 Release



Photo 1 Two of Esmeralda's Pups. Adam Taylor, 2025.

4.6 Overwinter Mortality

Due to monitoring limitations, the Foundation cannot always distinguish between hibernation-related mortalities and shoulder-season mortalities from other causes such as predation or post-emergence emaciation. As such, mortalities from all known or unknown causes are included in the overwinter survival analysis, and these mortalities are not assumed to be associated exclusively with hibernation. Remains of two unknown marmots were recovered near the entrance to hibernacula, suggesting post-emergence emaciation.

At the end of the 2024 season, 78 telemetered marmots were included in the overwinter survival analysis. An additional seven marmots were added to the analysis this spring as they were detected alive. The Foundation defines a marmot as having died overwinter when it was detected alive on or after September 15 of the previous year, and still on inactive signal by mid-June of the current year. Of the 85 marmots included, 6 marmots died over the winter from unknown cause (Table 4).

Table 4. Overwinter survival and mortality in 2025.

Region	Survival	Mortalities
Nanaimo Lakes	94% (32/34)	Frink, Priddis
Strathcona	100% (20/20)	
Washington	87% (27/31)	Snowball, Leena, Geordi La Forge, Langdon
Total	92% (79/85)	

4.7 Environment

The Foundation tracks changes in marmot habitat characteristics within each active season, and from year to year. Several environmental variables have been identified that influence key characteristics of marmot habitat which support marmot persistence over time. Winter snowpack has a significant influence on every aspect of marmot life history and the habitat which supports them, from snow energy clearing tree ingress, to melt water supporting vegetation growth and forage availability well into the summer. Within-season weather patterns can also significantly influence marmot persistence. Severe weather events such as heat domes and changing precipitation patterns affect marmot activity patterns, predator detection efficacy, and forage availability.

4.7.1 Snowpack

The 2024-25 winter saw a lower-than-average snowpack on Vancouver Island, at 70% of normal as of May 1st, with early spring melt-off at lower elevation colonies. Snowpack melted off earlier in the Nanaimo Lakes than the normal, and at about average in Strathcona (Figures 5,6). A third consecutive low snowpack year may be supporting the strong reproduction observed again this year. Early snowmelt increases availability of early-season forage for females to regain body condition post emergence. In Alpine marmots (*Marmota marmota*) and Yellow-bellied marmots (*Marmota flaviventris*), low snow years have been associated with decreased hibernation success due to less thermal insulation creating greater temperature fluctuation inside the hibernaculum (Rézouki et al, 2016). The Foundation has not observed the same correlation in Vancouver Island marmots, in either this year or previous years of low snowpack. However, the small sample sizes available for the Vancouver Island marmot make it difficult to draw any conclusions about the impact of snowpack on hibernation success in this species.

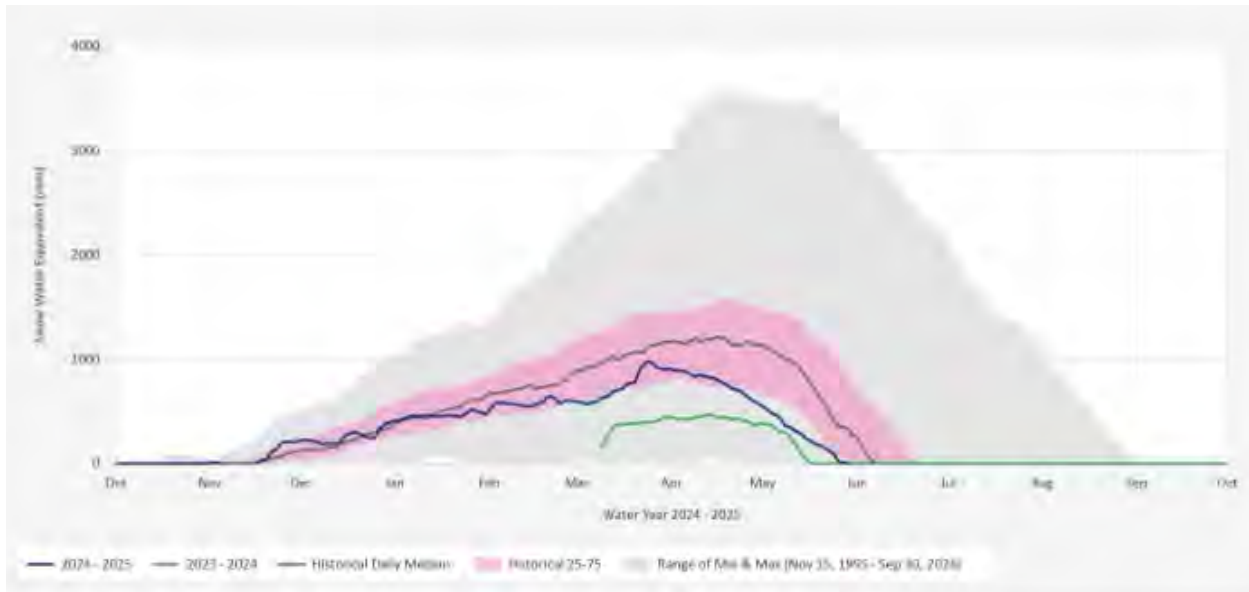


Figure 5. Snow water accumulation at Jump Creek in the Nanaimo Lakes region (2024-25; MOF 2025).

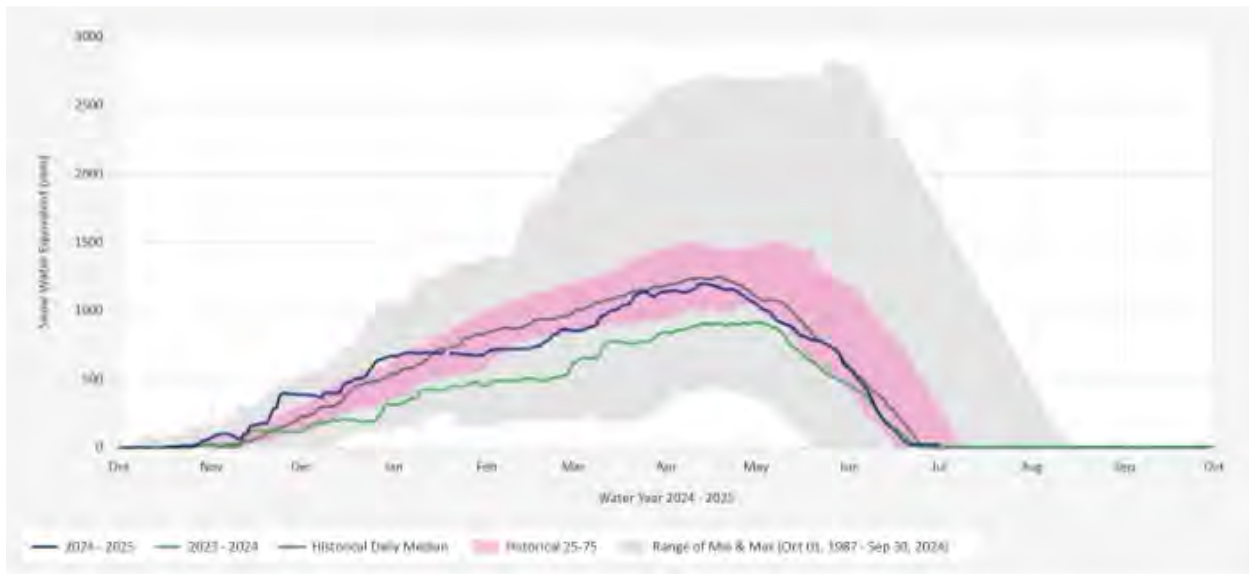


Figure 6. Snow water accumulation at Wolf River in the Strathcona region (2024-25; MOF 2025).

4.7.2 Weather

In the mountains of Vancouver Island, the 2025 season weather followed a normal pattern. Following snowmelt in early season, alpine meadows were lush through July, followed by senescence in later summer on southern aspects. At some colonies, marmots move in late summer to north aspects where vegetation is still green. Fall conditions were wet and cold, with marmots detected going into hibernation in early October followed by snow accumulation in the mountains starting mid-October.

5. RECOVERY EFFORTS

The Foundation’s recovery work is supported by our partners and stakeholders, including the Provincial Government, Mosaic Forest Management, Mount Washington Alpine Resort, the Wilder Institute/Calgary Zoo, the Toronto Zoo, and the Recovery Implementation Group. The Marmot Recovery Foundation’s efforts for the 2025 field season aimed to increase the overall number of marmots in the wild, protect the persistence of existing colonies through augmentation and the promotion of breeding opportunities, habitat restoration to address tree ingress, increase the distribution of marmot colonies on the landscape through re-introduction, and support the growth and future breeding capacity of the wild colony on Mt. Washington.

5.1 Releases from Conservation Breeding Program

Vancouver Island marmots are bred in a collaboratively managed conservation breeding program with sites at the Wilder Institute/Calgary Zoo, the Toronto Zoo, and the Tony Barrett Mount Washington Marmot Recovery Centre. The young of the year originating from the Zoos are transported to the Marmot Recovery Centre in the fall and spend their first hibernation there before a portion become release candidates for the wild as yearlings. Release decisions are made based on individual animal health, genetic contributions, and the needs of the Conservation Breeding Program. Table 5 lists all marmots born in the Conservation Breeding Program released to the wild for the first time in 2025.

See the Conservation Breeding Program update in Section 6 for a full update on the status of the captive population.



Photo 2 Kevin Gourlay hikes marmots into Greig Ridge. Photo Adam Taylor, 2025.

Table 5. Conservation-bred releases in 2025.

Region	Colony	Marmot	Sex	Origin
Nanaimo Lakes	Butler	Clayo	Female	Calgary Zoo
		Bosco	Male	TB Mt. Washington Ctr
	Gemini	Clio	Female	Calgary Zoo
		Lincoln	Male	TB Mt. Washington Ctr
	Landale	Burrard	Male	Calgary Zoo
		Della	Female	Calgary Zoo
	Moriarty	Pudge	Male	TB Mt. Washington Ctr
		Snow Pea	Female	Toronto Zoo
	Hooper	Grover	Male	TB Mt. Washington Ctr
		Hollywood	Male	TB Mt. Washington Ctr
		Marcy	Female	TB Mt. Washington Ctr
		Big Ugly	Edamame	Male
		Garbanzo	Male	Toronto Zoo
		Chyana	Female	TB Mt. Washington Ctr
		Lentil	Male	Toronto Zoo
		Haley Lake	Toba	Male
	Kammat		Male	Calgary Zoo
		Myra	Female	Calgary Zoo
		Haro	Female	Calgary Zoo
	Heather	Beanie	Male	TB Mt. Washington Ctr
		Blinkie	Male	TB Mt. Washington Ctr
		Lucille	Female	Toronto Zoo
		Maeby	Female	Toronto Zoo
	P Mtn	Suess	Male	TB Mt. Washington Ctr
		Tula2	Female	TB Mt. Washington Ctr
		Tuxedo	Male	TB Mt. Washington Ctr
		Summer2	Female	TB Mt. Washington Ctr
	Sadie	Piggot	Male	TB Mt. Washington Ctr
		Kiwi	Female	TB Mt. Washington Ctr
		Kamala	Female	TB Mt. Washington Ctr
		Mickey	Male	TB Mt. Washington Ctr
	Strathcona	Washington	Gob	Male
Shimmer			Male	TB Mt. Washington Ctr
Mung Bean			Male	Toronto Zoo
Tobias2			Male	Toronto Zoo
Nova2			Female	TB Mt. Washington Ctr
Dolly			Female	TB Mt. Washington Ctr
Fossli			Male	Calgary Zoo
Sutil			Female	Calgary Zoo
Tahsis			Female	Calgary Zoo
Trin	Female	Calgary Zoo		
Total			41	

5.2 Moving Marmots

Marmots can follow many different life pathways as we manage the population by moving marmots to accomplish various recovery objectives such as augmenting small colonies and maximizing genetic outbreeding. This means it can be difficult to label all possible scenarios that a marmot may take. After their initial release from the conservation breeding program, some marmots are recaptured and subsequently re-released to the same colony or translocated to a different colony for various reasons. Wild-born marmots are sometimes trapped and brought into the conservation breeding program for various reasons. They may stay in care as part of the breeding program, or stay only for a short period of time and then may be re-released to the same colony or translocated to a new colony. All marmot movements, excluding marmots from the Conservation Breeding Program which are being released to the wild for the first time, are accounted for here.

5.2.1 Re-releases and Translocations

There were 14 marmots with some level of previous wild-living experience that were released back into the wild this year (Table 6). Marmots which were released to the same colony where they were captured after a period in care are considered re-releases, whereas if they were moved to a different colony they are considered translocations.

Table 6. Marmots translocated or re-released.

Region	Receiving Colony	Marmot	Sex	Age	Origin
Strathcona	Becher	Hazel2	Female	1	wild-born
		Soren	Female	1	wild-born
	Celeste	Ice Cream	Female	2	Toronto Zoo
		Lyell	Male	2	Calgary Zoo
	Drinkwater	Shawn	Male	1	wild-born
		Selkie	Female	1	wild-born
		Lamar	Male	2	Tony Barrett Mt Washington
		Flower Ridge	Timbit	Male	2
		Henrietta	Female	2	Calgary Zoo
	Greig Ridge	Rundle	Male	2	Calgary Zoo
		Castilleja	Female	1	wild-born
		Kananaskis	Male	2	Calgary Zoo
	Tibetan	Luna	Female	2	Tony Barrett Mt Washington
		Spruce	Male	2	Calgary Zoo
Total	Sum	14			

5.2.2 Wild Trapping

Wild marmots are trapped for various reasons including health checkups, weights, transmitter implants or replacement, translocation, removal from unsuitable habitat, and contributions to the conservation breeding program. Marmots were trapped by both Marmot Recovery Foundation field teams and the Wilder Institute/ Calgary Zoo research field teams, and data from both teams is reported here.

Wild-living marmots frequently show up in areas of ephemeral or unsuitable habitat. The Foundation continues to manage marmots living in unsuitable habitat based on their unique circumstances and projected timeframe for safe occupancy and removal from the site. When possible, these marmots are trapped and receive a thorough health evaluation at the Tony Barrett Mount Washington Marmot Recovery Centre and are translocated into Strathcona Provincial Park to augment existing colonies there.

A total of 69 trapping events were completed this year, involving 42 unique marmots, down slightly from 47 unique marmots last year (Figure 7). In 2025, five marmots were captured in cut blocks for translocation, and there were no marmots captured from the wild with the intent to augment the Conservation Breeding Program.

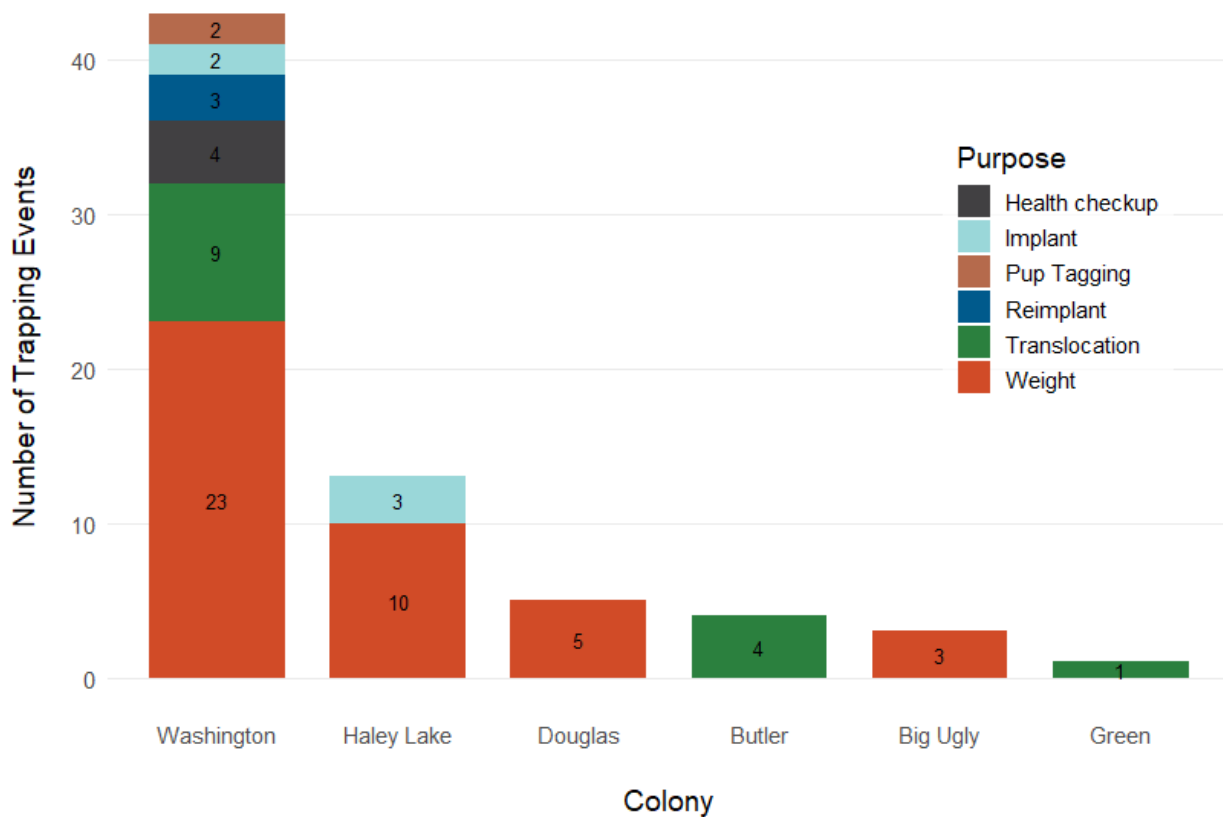


Figure 7. Wild marmot capture events at each colony, grouped by trapping purpose. Includes captures conducted by Wilder Institute/Calgary Zoo field teams.

5.3 Wild Transmitter Implants

The Foundation surgically implants radio telemetry transmitters in a subset of the wild-living population to facilitate the monitoring of their survival, hibernation, and location. Transmitter batteries last three to four years and then can sometimes be replaced. Collecting radio-telemetry data informs a variety of management decisions about the allocation of resources, such as the distribution of supplemental feeders, selection of sites needing augmentation, identification of successful colonies able to provide wild-living marmots for translocation, and the rescue of marmots from unsuitable habitat.

In 2025, all transmitters were implanted by the Foundation’s veterinarian, Dr. Malcolm McAdie. Implanted marmots were aged 1yo or older, and surgeries were conducted in or after June to allow marmots to regain some body condition following their hibernation (Table 7). All captive-bred and translocated marmots are released with active radio-transmitters.

Table 7. Transmitter implants of wild-living marmots.

Colony	Marmot	Age	Sex	Date	Intent
Butler	Castilleja	2	Female	2025-07-14	Translocation
	Hazel2	2	Female	2025-07-14	Translocation
	Soren	2	Female	2025-07-08	Translocation
Haley Lake	Baloo	2	Female	2025-07-04	New wild resident implant
	Mama	4	Female	2025-07-03	New wild resident implant
	Rupert2	2	Male	2025-07-03	New wild resident implant
Washington	Bluebell	6	Female	2025-06-17	Resident female, reimplanted
	Dorothy	3	Female	2025-06-24	New wild resident implant
	Hobbs	6	Male	2025-06-17	Resident male, reimplanted
	Jordan	7	Female	2025-07-31	Resident female, reimplanted
	Punky	2	Female	2025-06-18	New wild resident implant
	Selkie	2	Female	2025-06-17	Translocation
	Shawn	2	Male	2025-06-18	Translocation
Total	13				

5.4 Supplemental Feeding

The Foundation provides supplemental food (also Mazuri leaf-eater biscuits) to marmots in the spring, when snow limits the amount of available food for marmots and bears are less likely to discover and empty the feeders. Spring feeding effort decreased (29 feeders) compared to last year (36 feeders) due to bear activity near the feeders (Table 8).

Table 8. Supplemental Feeding in 2025.

Region	Colony	# of Feeders	Biscuit Quantity (kg)	Number of marmots potentially benefiting
Clayoquot Plateau	Steamboat	1	11.0	16
Nanaimo Lakes	Arrowsmith	2	22.7	21
	Gemini	1	10.0	5
	Heather	1	5.7	4
	Landale	2	21.0	17
	McQuillan	1	11.0	14
	Moriarty	1	11.3	7
	Sadie	1	11.0	9
Strathcona	Albert Edward	2	22.0	15
	Castlecrag	2	22.0	40
	Celeste	1	11.0	5
	Flower Ridge	1	11.0	11
	Jutland	1	11.0	13
	Marble Meadows	3	33.7	21
	McBride	2	22.7	8
	Morrison Spire	1	11.0	17
	Red Pillar	1	11.0	11
	Shepherds	1	11.3	25
	Washington	4	14.5	40
Total	19 colonies	29 Feeders	284.81 kg	~299 marmots

5.5 Habitat Restoration

In Vancouver Island marmot habitat, climate change has resulted in more precipitation arriving as rain, and less as snow. Historically, energy from snow movement in the form of avalanches and snow creep has kept the marmot's habitat free of trees. Reduced amounts of snow energy have allowed for elevational tree-creep, slowly changing these historically open habitats into young forests. This reduces the habitat availability and quality for species that rely on sub-alpine and alpine meadows. For marmots, an increase in tree cover in alpine meadows means more stalking cover for predators, and shorter sightlines from important look-out rocks that marmots use to detect and evade predators. The Foundation monitors tree ingress in marmot meadows and attempts to restore alpine meadows by removing young coniferous saplings before they become established.

In recent years, the Foundation has conducted habitat restoration at colonies with the goal of increasing local survival rates and preserving long-term habitat suitability. This habitat restoration has included the removal or partial delimiting of trees in marmot habitat. These trees and low branches provide stalking cover to terrestrial predators and convert marmot’s alpine meadow habitat to young forest. By reopening long continuous lines of sight, marmots may have a better opportunity to detect and evade predators. For the fifth consecutive year, the Foundation was granted funding for habitat improvement projects during the months of October – November. In 2025, Habitat Restoration was conducted at three important marmot colonies with significant tree ingress, including a site in the Strathcona region for the first time (Table 9). This work follows best management practices including mitigation efforts to avoid short-term and/or long-term damage to known burrows and/or hibernacula. Further details on methodology, best management practices, and photo analysis results can be found within the Foundation’s “Tree Change in Vancouver Island Marmot Colonies: Best Management Practices, Past Efforts, & Photo Analysis” report.

Table 9. Habitat Improvement.

Colony	Person Days	Hectares Improved	Description of Work
Castlecrag	30	2	Crew camped out over four days in mid-October, working to restore habitat in three focal areas. Sightlines were significantly increased from key marmot features, re-opening alpine meadows on the south aspect sublocations. Current marmot occupation, documented cougar predation, and significant tree ingress classified this site as high priority for restoration work, and was completed with permit from BC Parks.
Landale	10	1	Single day of work concentrated in core habitat area of the Lomas Lake sublocation, clearing sightlines from key marmot features like the hibernaculum. Current marmot occupation, documented cougar predation, and restricted sightlines from tree ingress classified this site as high priority for restoration work.
Washington	9	1	Single day of restoration work at multiple focal areas on the east runs of the ski hill, targeting specific active features where sightlines were restricted by young conifer growth. This site provided us easy access after early season snowfall, and an opportunity to improve sightlines for translocation marmots.

5.5.1 Evaluation Plan for Habitat Improvement

The primary goal of the Foundation's habitat improvement activity is to increase local success of marmots and preserve long-term habitat suitability for marmots. However, modifying habitat occurs in an ecosystem context, and the Foundation also seeks to minimize impacts on non-target species or even improve outcomes for flora and fauna that rely on the same open meadow habitat as Vancouver Island marmot. The Foundation evaluates the impact of habitat improvement for marmots and monitors key indicators of positive and negative impacts on other species and ecosystem functions.

To assess the impact of habitat restoration on marmot outcomes, the Foundation is planning to conduct a study on treated sites using a before-after control-impact (BACI) structure analysis to assess the impact of restoration on three levels of key response variables: frequency of cougar predation, individual marmot survival, and colony-level population growth.

A total of 13 colonies received habitat restoration from 2016 to 2025, totally ~35 hectares of restored habitat. Some colonies were treated multiple times over subsequent years; the year of first treatment will be used as the before and after impact threshold. The before and after periods will be balanced by the number of years of available data in the after period. Analyses will be restricted to a maximum of four years pre and post treatment to minimize the impact of long-term variation. Sites treated in 2025 will be excluded as no "after treatment" period exists yet. Control sites have never received habitat restoration but were otherwise managed and surveyed in the same way as treated sites. Over the study period, marmot colonies varied in size from 0 to 45 individuals, with an average of 8 individuals. Over the same period, 123 cougar predation events have been documented across treated and control colonies. Following is a basic outline for the three analyses:

- 1) Cause-specific mortality: Does the occurrence of successful cougar predation events decrease at restored colonies post-treatment relative to control colonies? We predict that cougars will not be as successful in hunting marmots' post-treatment at treated colonies as a result of decreased stalking cover and improved predator detection and evasion by marmots. Cougar predation data at treated and control colonies will be modelled using a logistic regression Generalized Linear Mixed Model (binomial distribution), with treatment and period as predictor variables of direct interest (fixed effects), taking into account baseline colony-level and annual-level variation in cougar predation rates (random effects).
- 2) Individual-level survival: Do marmots survive longer overall post-treatment at treated sites compared to control sites? Habitat restoration may benefit marmots via other mechanisms such as improved forage availability and improved escape terrain by uncovering burrows and talus which had become overgrown. We predict these benefits result in an overall increase in individual survival. Marmot survival data at treated and control colonies will be modelled using a logistic regression Generalized Linear Mixed Model (Bernoulli distribution), with treatment and period as predictor variables of direct interest (fixed effects), taking into account baseline colony-level and annual-level variation in survival rates (random effects).
- 3) Colony-level population growth: Do colonies see overall growth in population numbers post-treatment? We predict the cumulative benefit of habitat restoration will ultimately lead to increase in colony size, after a lag period. This may be a result of increased available suitable

habitat and burrow infrastructure for colony expansion, increased reproduction and recruitment, and increased stability/persistence of the dominant pair of marmots. Population counts will be modelled using a Generalized Linear Mixed Model (Poisson distribution) with treatment and period as predictor variables of direct interest (fixed effects), taking into account baseline colony-level and annual-level variation in hill counts (random effects).

The Foundation also monitors key indicators that may indicate treatments are impacting ecosystem composition and/or function (Table 10).

Table 10. Key indicator species and the goals of monitoring these species.

Species monitored	What's being monitored	What it indicates
Conifers	Newly established conifers in treated areas.	Rapid return of conifers to treated areas indicates that improvements may be short-lived. Recruitment of new conifers in sub-alpine habitat is stochastic, so several years of monitoring is needed.
<i>Erythronium</i> genus	Emergence of lilies in treated areas. Changes in lily communities adjacent to treated areas	Lily bulbs persist under the soil for years as tree ingress begins altering a site. Emergence of lilies species following treatment indicates a return of previously present meadow-type habitat. Lilies are very sensitive to changes in hydrology. Persistence and return of lilies following treatment suggest that soil hydrology was not changes by treatment. Lilies are sensitive to soil compaction. Reduction in lilies adjacent to treated area may indicate that implementing treat is compacting meadow soils, and alternative methodology is needed to conserve meadow integrity.
<i>Cyperaceae</i>	Sedges of various species are abundant in and near marmot habitat. The Foundation monitors patches of sedges near treated areas, particularly those just downslope of treatments.	Sedges are sensitive to changes in hydrology. Changes in the sedge community, especially downslope of treatments, may indicate that treatments are impacting soil hydrology, and changes to methodology may be needed to avoid adverse impacts on non-target species.
<i>Broad-leaf Plantain</i>	Broad-leaf Plantain (<i>Plantago major</i>) is a wide-spread invasive species that can thrive at higher elevations.	The introduction of any invasive species in restored areas could indicate that treatments are creating conditions and/or vectors that enable the establishment and spread of invasive plants. Plantain is a wide-spread invasive known to occur at high elevations in other jurisdictions but has not been recorded in marmot habitat. If detected following treatment, changes to methodology may be needed.

Results of assessment will be reported in the 2026 annual report.

5.6 Invasive Species of Concern

In 2025, at least three Yellow-bellied marmots were located on Vancouver Island, one Eastern Cottontail was seen on a camera-trap at high elevation, and dandelion was documented in Haley Lake Ecological Reserve.

Yellow-bellied Marmot - *Marmota flaviventris*

The Marmot Recovery Foundation received reliable reports of least three Yellow-bellied marmots, in Courtenay, Victoria, and Nanaimo. The Marmot Recovery Foundation is not aware of the fate of any of these marmots.

Yellow-bellied marmots (*M. flaviventris*) are a species of colonial marmot found in western mainland Canada and the United States. Although *M. flaviventris* can live in mountains at high elevations, in British Columbia they are often associated with low-elevation habitat in the Thomson Okanagan and Kootenay and Chilcotin regions, though they occupy other areas of the province as well. They often occupy a range of natural and artificial habitat, including orchards, farmlands, and golf courses where they are frequently viewed as a pest species. As urban centres in these areas have expanded, *M. flaviventris* has also been found to thrive in more developed areas of towns and cities.

Unlike the Vancouver Island marmot, *M. flaviventris* is not native to Vancouver Island, but they have been sighted on the Island with increasing frequency in recent years. This is likely part of a province-wide problem in which marmots have been unintentionally transported from colony locations to non-historic habitat, traveling in bus baggage compartments, vehicle engine bays, and shipments of equipment and agricultural supplies. Of particular concern to the Foundation is the capacity for *M. flaviventris* to introduce novel diseases and pathogens that could potentially decimate Vancouver Island marmot colonies. Transmission could result from direct contact, or via an intermediate host, such as the soles of hiking boots. The Recovery Plan assesses the risk of Invasive & other problematic species, genes & diseases as medium-to-high impact with slight to serious severity (Vancouver Island Marmot Recovery Team 2017).

On Vancouver Island, *M. flaviventris* have been sighted at various urban and rural locations from Victoria up to Courtenay.

Eastern Cottontail - *Sylvilagus floridanus*

On reviewing camera trap footage from Mount Castlecrag (Strathcona Provincial Park), one Eastern Cottontail Rabbit was observed at a camera at approximately 1500m elevation.

Eastern Cottontail are known to be widespread on eastern Vancouver Island at lower elevations, where they are recognized as a threat to Garry Oak and related ecosystems. They are often associated with other invasive plant species such as Scotch Broom and Black Hawthorn. To the best of the Foundation's knowledge, this is the first record of an Eastern Cottontail in relatively undisturbed high-elevation habitat.

Eastern Cottontail could be direct competition for Vancouver Island marmot forage in high elevation habitat, be a vector for diseases, and provide an additional food source for predators that may then move on to marmots. The introduction of Cottontail rabbits has been associated with the establishment of breeding pairs of Golden eagle (*Aquila chrysaetos*) on Vancouver Island, which in turn may have contributed to the marmot's decline.

The sighting was reported to BC Parks.

Dandelion - *Taraxacum officinale*

Numerous patches of Dandelion have been documented in open meadow habitat in the Haley Lake Ecological Reserve. The source of this species is unknown, and its impact on meadow flower assemblages is unknown. Dandelion is not a health concern for marmots, and they are likely to foraging on it. However, it may be an indicator of broader habitat change.



Photo 3 Heather Heim surveys for marmots using radio-telemetry. Photo Tyler Gill, 2025.

5.7 Monitoring

The Foundation monitors the status of Vancouver Island marmots in the wild in order to make strategic and informed decisions about recovery efforts. Monitoring provides information about colony locations, rates of survival and reproduction, causes of mortality, and the age- and sex- structure and size of colonies. This information directly influences the selection of release sites and release candidates, the installation of spring supplemental feeders, and the identification of habitat needing improvement to facilitate colony growth and persistence. Information about annual mortality and reproduction forms the basis of our understanding of the species' population and conservation status.

5.7.1 Methodologies

Effectively monitoring marmots can be challenging due to the difficulties accessing their sub-alpine habitat, the marmot's semi-fossorial behaviour, and crepuscular activity patterns during the summer months. For this reason, the Foundation uses several approaches to monitoring. Prior to marmots being released or translocated, all marmots are implanted with radio-telemetry transmitters (Holohil A1-2TH) that have a battery life of four years. These transmitters send out a unique radio signal that changes pulse rate according to body temperature; living marmots are warm, and their transmitters send out a faster pulse than those of deceased or hibernating marmots. This facilitates survival and location monitoring of these marmots which enables the Foundation to evaluate a marmot's post-release success. The Foundation also implants a subset of wild marmots, which provides the same survival and location data.

A subset of transmitters are furnished with Weepit or IButton data loggers, which record the body temperature of the marmot for up to two years. This data can be retrieved either by recovery of the transmitter after mortality, or wirelessly through the abdominal wall if the individual is recaptured. For a typical telemetry survey, two to four crew members hike into marmot habitat and used receivers (Telonics TR-8) and three or five element antennas to scan through a set of frequencies unique to individual marmots. When crew detect a pulse on a frequency, the number of pulses per minute is recorded and indicates whether the marmot is alive (≥ 30 ppm), possibly alive (29ppm) or dead/hibernating (≤ 28 ppm). If a dead marmot is accessible for recovery, field teams attempted to track the transmitter to its resting location to collect information about the cause and timing of the mortality and recover the transmitter for refurbishing and data retrieval. Aerial telemetry conducted from helicopters is also an important monitoring tool, particularly for colonies in Strathcona where ground access is more challenging.

Visual surveys of marmot colonies form a significant component of the responsibilities of annual, seasonal field crew hired by the Foundation. During a visual survey, one or more team members sit at vantage points near a marmot sublocation and use binoculars and/or a spotting scope to count and age marmots based on their size, pelage, and presence or absence of ear tags. Crew use telemetry to identify the known individuals in the area (whether observed or just detected) and then summarize the number of untelemetered tagged and untagged individuals that are observed.

Field crew typically conduct surveys in the morning (6-10am) or if on overnight trips, during the late afternoon and evening (3-9pm) to match the marmots' natural activity pattern. On day trips, most visual surveys last for one to three hours and cover several sublocations depending on the size of the field team. On overnight trips, field crew often survey a colony for closer to eight hours in a single day. It takes several surveys over the course of a field season for the Foundation to feel confident in the

estimate of a colony's size and composition; overnight trips with larger teams typically provided the Foundation with a faster and more comprehensive understanding of colony size and composition. Wildlife cameras are deployed at marmot hibernacula and burrows and at supplemental feeders to capture video and audio footage of marmots. Cameras are also occasionally used to confirm that unsuitable habitats have not been recolonized by marmots, and to identify predators in or near marmot habitat. Cameras are essential at remote colonies such as those in Strathcona that can not be accessed for regular, on-the-ground surveys. The Foundation uses the unique appearance of marmots, particularly their molt pattern, size, and the presence or absence of ear tags, to distinguish and age individuals. The Foundation also evaluates marmot behavior in the videos as this can provide clues about the social structure of the colony. Videos are reviewed quickly during the field season, and in greater depth in the off-season (November and December). The foundation uses the program Timelapse2 to tag and archive videos.

In 2025 the Foundation greatly benefitted from the regular presence of teams from Wilder Institute/Calgary Zoo. The Wilder Institute/Calgary Zoo visited five colonies regularly in the Nanaimo Lakes and Strathcona regions, plus numerous exploratory trips into other sites. For a greater level of detail about monitoring methodologies, please contact the Marmot Recovery Foundation.



Photo 4 Camp during a survey of Strathcona Provincial Park. Photo Shayn McAskin, 2025.

5.7.2 Remote Camera Results

Camera traps contributed significantly to our hill counts and understanding of marmot habitat use by both marmots and other species (Table 11). Some commonly observed species using marmot habitat features include Black Bear, Black-tailed Deer, Pacific Marten, Vancouver Island Ermine, Ruffed Grouse, Roosevelt Elk, and Cougar (Figure 8).

Table 11. Camera trapping effort in 2025.

Region	Colony	Timeframe	# of Camera Traps	# of unique marmots detected
Clayoquot Plateau	Steamboat	May-October	1	0
Nanaimo Lakes	Arrowsmith	May-October	6	12
	Butler	June-October	3	7
	Douglas	May-October	1	5
	Gemini	May-October	1	3
	Green	May-October	2	3
	Heather	May-October	2	3
	Hooper	May-October	1	4
	K-Block	May-October	1	0
	Landale	May-October	4	15
	McQuillan	May-October	2	5
	Moriarty	May-October	2	2
	Sadie	May-October	2	4
	Service	July-October	1	1
Schoen	Cain	June-October	3	3
Strathcona	Albert Edward	June-October	2	11
	Becher	June-October	4	1
	Castlecrag	June-October	3	10
	Celeste	June-October	1	4
	Drinkwater	June-October	1	3
	Flower Ridge	June-October	1	0
	Frink	August-October	1	4
	Greig Ridge	June-October	1	4
	Jutland	June-October	3	13
	Marble Meadows	June-October	4	24
	McBride	June-October	2	7
	Morrison Spire	June-October	1	2
	Red Pillar	June-October	1	8
	Shepherds	June-October	1	7
	Washington	May-October	13	2
	Wheaton Lake	July-October	1	4
Total			72	171

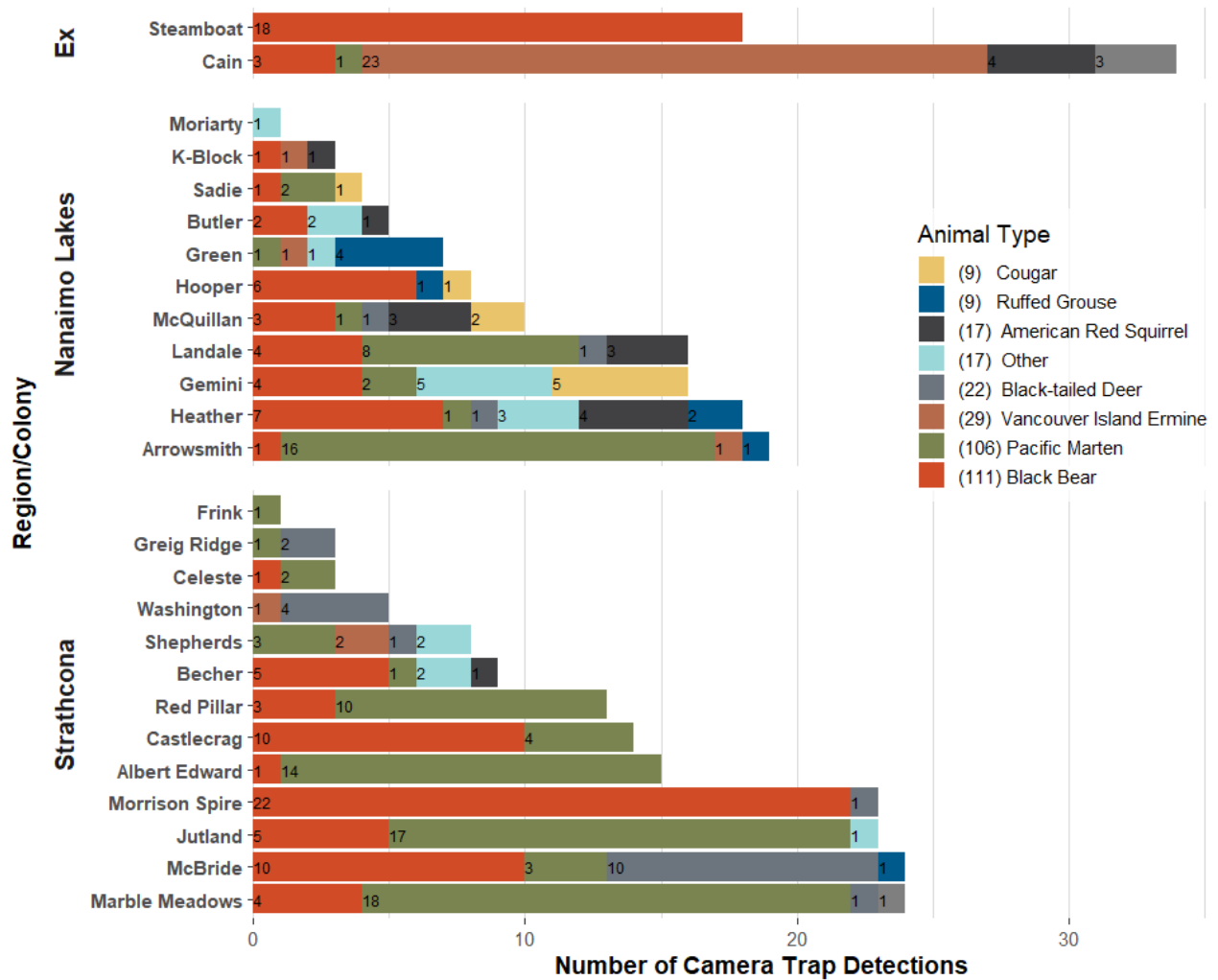


Figure 8 Notable non-marmot animal detections on camera traps by colony and region.

5.7.3 Summary of Monitoring Effort

In 2025, the foundation continued its expanded field presence with three field teams for most of the season. Along with the continued presence of the WICZ team at six focal colonies, search effort was comparable this year to the previous two years. The continued additional resources also allowed us to explore new sites and infrequently surveyed sites, particularly in Strathcona Provincial Park and Schoen Lake Provincial Park.

Visual Survey effort is measured in number of total person-hours spent observing marmot habitat at each colony, including ground surveys, drone flights, and helicopter flights. Some historic colonies are not reported in the figure below (Figure 9).

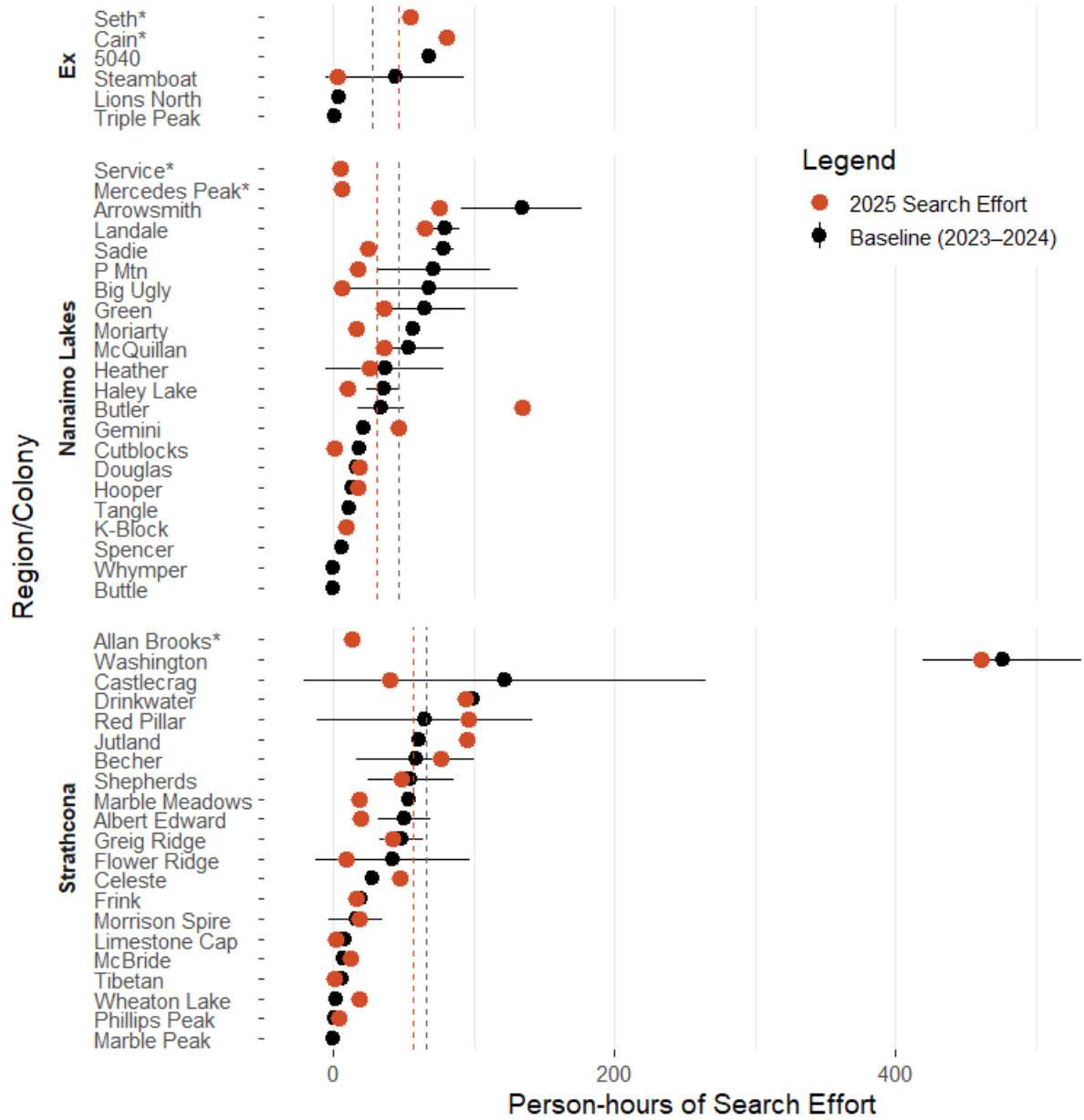


Figure 9. MRF monitoring effort by region and colony in 2025 compared to the previous two years \bar{x} (SD). Dashed lines indicate mean 2025 and baseline search effort by region. *Indicates new colonies monitored for the first time this year.

5.7.4 Community Contributions to Monitoring

Reports from the community at large, particularly those who work or recreate in or near marmot habitat, make important observations that can improve recovery efforts. Since 2017, the Foundation has made greater outreach efforts to solicit observations and looks forward to building more partnerships with hiking and outdoor recreation organizations in the future. In 2025, the Foundation received 54 marmot reports (Table 12). These reports supplement our monitoring efforts.

Table 12 Significant reports from the public in 2025.

Region	Location	Nature of Report(s)	Significance
Nanaimo Lakes	Mt Landale	Report, photographs, location	Numerous reports of a marmot near the summit of Mt Landale overlooking the hiking trail.
Strathcona	Mt. Washington	Hiker reports, photographs.	Many reports from visitors documenting resident marmots.
Invasive Species	Victoria-area, Nanaimo-area	Reports, photographs	Reports of Yellow-bellied marmots in the Greater Victoria area, Nanaimo, and the Comox Valley.



Photo 5 Tobias and Shimmer in their release box. Photo Adam Taylor, 2025.

6. TONY BARRETT MOUNT WASHINGTON MARMOT RECOVERY CENTRE

6.1 Background

The Tony Barrett Mount Washington Marmot Recovery Centre (“the Centre”) received its first Vancouver Island marmots on October 15, 2001, and 2026 represents the Centre’s 25th year of operation. From 2001 to 2012 the Centre operated year-round as a quarantine, pre-release, and conservation breeding center. Reintroductions and augmentations involving marmots from the Conservation Breeding Program (which began in 2003) resulted in significant growth of the wild population. Because of this apparent success, the conservation breeding program was intentionally downsized in 2012. From 2013 to 2017 the Centre functioned as a seasonal quarantine, pre-release (i.e., marmots coming from the other conservation breeding facilities in the spring and being prepared for release) and staging facility (temporary holding of marmots prior to translocation, primarily from the wild Mount Washington colony to sites in Strathcona). Field inventory conducted in the years following 2012 indicated that the wild population was slowly declining and that it had not gotten to the point where it was self-sustaining. Therefore, its status remained precarious, and the species continued to be at risk. In response, the conservation breeding program was re-intensified. The Centre was recommitted to overwintering release marmots during the winter of 2017/18 and returned to being a year-round, multipurpose facility (including hibernation and preparation of release marmots, maintenance of breeding pairs and future breeders) in 2019.

Year-round operation of the Centre significantly increases the program’s overall capacity for conservation breeding and releases, and it has given MRF staff greater flexibility in responding to management situations (for example recapturing wayward releases or marmots under predation threat, holding marmots unsuitable or not ready for release, or temporary holding of translocation marmots or those originating from unsuitable habitat). The installation of remote monitoring technology at the Centre (including internet access CCTV cameras, real-time temperature sensors and a power outage alert system) has allowed MRF to safeguard the winter operation of the Centre with a regular, but significantly reduced on-site presence, while ensuring the safety of the hibernating marmots and the Centre itself. Staff from the Mount Washington Alpine Resort have continued to play an essential role in snow management and overall support of the Centre.

6.2 Operations in 2025

- In September of 2024, prior to the 2024/25 hibernation, two young pairs were moved from the Centre to the Calgary Zoo, and one male was sent to the Toronto Zoo. This was done to establish new pairs in support of the conservation breeding program. A total of 17 pups (and two unpaired, adult females) were received from Calgary, and 13 pups arrived from Toronto (overall total = 37 moves).
- In early December 2024, it was apparent that one of the Centre’s older marmots (“Rascal”) was experiencing excessive hibernation weight loss and was having ongoing and progressive difficulties using his hind legs. His abdomen was also significantly distended with fluid. Given the poor prognosis and the implications for his quality-of-life post-hibernation, he was peacefully euthanized in late December. Remarkably, he was 16.6 years old. As a yearling he was originally implanted with a transmitter in 2009 at Mount Washington and was taken into captivity in 2019 (due to a construction conflict in the vicinity of his burrow). Because his transmitter had failed, we were not certain about his exact identity until he had passed, and the transmitter could be

examined. He was a friendly, charismatic marmot and will be missed by Centre staff. Postmortem examination indicated that he was suffering from significant heart disease, a common finding in older, captive marmots.

- At the end of 2024, there were 90 marmots hibernating at the Centre (compared to 114 during the winter of 2024 / 25), including 18 potential breeding pairs (compared to 22 during the winter of 2024 / 25). Hibernation was unremarkable, except for an 11-year-old female, who experienced a significant loss of body condition. She survived hibernation but was found dead on June 10. She was eating until shortly before her death. Results of a postmortem examination are pending.
- The 17 remaining breeding pairs produced 7 litters. One of the litters consisted of a singleton pup that appeared, during a routine nest-box check, to be markedly underdeveloped and anatomically disproportionate. As expected, this pup did not survive to weaning age and was found dead in the pair's outside enclosure. Another un-weaned pup from a large litter of 6 was found dead (but intact) outside the entrance to its natal nest-box. The final tally for 2025 was 6 weaned litters (35.3% success of pairs, below the cumulative average of 47.7%) and 19 healthy pups. In 2025, a deliberate reduction in the number of individuals (114 in 2024 compared to 90 in 2025) and breeding pairs (22 in 2024 compared to 17 in 2025) at the Centre appears to have reduced the amount of aggression and disturbance observed within the social groups.
- In previous years, unilateral, facial abscesses have been observed in several of the Centre pups. All received treatment and their abscesses resolved satisfactorily. Although facial abscesses have been an occasional occurrence (and have been previously identified at all conservation breeding facilities), the number of observed cases at the Centre was unprecedented. It was suspected that marmot pups are susceptible to this problem at approximately three months of age when they are in the process of replacing their deciduous premolars and attaining their first molars. A change in the composition and texture of their commercial, pelleted ration (a change which occurred in 2022) which was crumblier and tended to create a more persistent, paste-like coating or film in their mouths, probably contributed to the number of cases. In response to this problem, plastic trays were placed under food bowls to facilitate containment and efficient removal of spilt pellets, and reduce the possibility of pups consuming older, spoiled, or soured pellets from the enclosure substrate. Beginning in 2024, a firmer pelleted ration from another supplier has been fed during the critical teething period to further reduce this problem. One self-resolving, facial abscess occurred in a 2024 pup, and no abscesses were observed in 2025. The type of plastic tray was changed during the 2025 season. The marmots were much less inclined to chew on these new trays, and the trays were more easily cleaned of any pellet debris.
- A total of 41 captive-born yearlings were released to the wild (10 to Mount Washington, 31 to Nanaimo Lakes).
- 9 captive-release marmots (7 released to Mount Washington in 2024, 1 released at Butler Peak in 2024, and 1 at the Haley Lake Ecological Reserve in 2024) were recaptured and translocated into Strathcona (these individuals are referred to as steppingstone or pre-conditioned marmots).

- In late May, one of these 7 individuals from Mount Washington was observed by field staff to be above ground, but markedly lethargic and unresponsive. She was easily manipulated into a trap and brought to the Centre for evaluation and support. Based upon her low weight, depressed behavior, and the findings of her physical exam, she was determined to be suffering from post-hibernation emaciation (profound weight loss associated with her first wild hibernation). She was initially isolated and made a full recovery following careful dietary management by Centre staff (this case and previous experiences have indicated that even severely emaciated post-hibernation marmots can rebound if provided with suitable security and nutritional support).
- The release of one of the “steppingstone” individuals needed to be delayed after he sustained facial bite wounds from his female enclosure mate. The wounds were relatively superficial and healed satisfactorily over approximately one week. This type of overt aggression is unusual under these circumstances, but marmots are highly individualistic and it is possible that the female was being territorial.
- In August, another 2024, post-release marmot at Mount Washington was found to be exhibiting profound depression and dyspnea (difficulty breathing). He was easily captured and brought into the Centre. Unfortunately, he died during his initial evaluation. The results of a postmortem are pending, but the initial indication is that he was suffering from a pyothorax (buildup of pus in the chest cavity) possibly arising from a penetrating wound or abscess.
- Two wild born yearlings from Mount Washington and 3 yearlings from a logged area below Butler Peak were captured, temporarily housed, and then translocated into Strathcona.
- To accommodate and stage the 9 steppingstone and 5 translocation marmots in the period prior to relocation, they were primarily housed in the east and southeast, outside enclosures at the Centre (with some resident marmots being temporarily locked inside). Although this presented a suitable, short-term solution, staff had to take additional measures (barriers, shade sails, careful temperature monitoring) to ensure that the enclosures of the marmots held outside remained sufficiently cool during hot summer days.
- During 2025 a total of 55 marmots were manipulated in support of ongoing recovery efforts (41 captive releases, 9 stepping-stone or pre-conditioned and 5 translocations).
- One of the males released to Mount Washington in 2025 started to show a regular presence at the Centre. As it got closer to hibernation it was felt that he would probably take up residence in the vicinity of, or underneath the Centre, and it was very likely that he would choose an unsuitable or untested hiberaculum. To avert this possibility, he was recaptured and will be held at the Centre until re-release in 2026.
- Late in the season, a 5-year-old male at the Centre sustained significant trauma to his left eye. Due to the severity of the damage, he has probably lost both vision and structure of the affected eye. During the height of this episode, he received treatment and remained otherwise healthy and exhibited good appetite and weight gain. Prior experience indicates that one-eye marmots continue to thrive under captive conditions, and there are no indications that this will affect his long-term health or breeding potential.
- During the regular, annual examinations that are conducted in September, it was discovered that one of the non-breeding, mentor marmots (a female with bilateral, congenital cataracts)

had experienced significant weight loss. Further evaluation led to the discovery of a large abdominal mass, which had multiple, extensive adhesions to the small intestine. Although the results of postmortem examination are pending, the mass appeared to be an abdominal abscess. Due to the extensive tissue involvement and poor prognosis, this individual was euthanized.

- In September 2025, prior to the 2025/26 hibernation, three marmots (one 2-year-old and two yearlings) were moved from the Centre to the Wilder Institute/Calgary Zoo, and three yearlings were sent to the Toronto Zoo to facilitate pairings in support of the conservation breeding program. A total of 17 pups and one, unpaired, adult female were received from Calgary, and 10 pups arrived from Toronto (overall total = 33 moves).
- At the end of 2025, there were 89 marmots hibernating at the Centre including 19 potential breeding pairs, 39 release marmots, four unpaired adult females (the captive population currently has more adult females than adult males), and eight pups being retained in the conservation program for future breeding.

6.3 Outlook for 2026

Currently there are 89 marmots hibernating at the Centre, including 19 potential breeding pairs and 40 to 41 potential release candidates for 2026 (Figure 10).



Photo 6 Marmot Release at Mount Washington. Photo adam Taylor, 2025.

7. SUMMARY OF CONSERVATION BREEDING PROGRAM

7.1 Project Chronology

- **Late 1980s and throughout the 1990s** – The rare Vancouver Island marmot’s wild population demonstrates steady and precipitous declines.
- **1996** – An attempt to translocate 6 wild marmots from ephemeral, logged habitat to a natural, historical subalpine meadow at Mount McQuillan ends in failure. The 4 marmots that remained at the release site died in a communal burrow during hibernation.
- **1997** – Six wild marmots are captured and sent to the Toronto Zoo (TZ). This is done pre-emptively to serve as a safeguard against a catastrophic event in the wild and to provide zoo staff with an opportunity to work out the best practices for managing and breeding marmots.
- **1998** – The Calgary Zoo (CZ) joins the fledgling conservation breeding program and receives four marmots. This is done to provide additional space and to manage risk by not having all captive marmots maintained at a single facility. The total population (wild and captive) reaches its nadir with 86 known individuals.
- Ongoing declines in the wild lead to the conclusion that there were too few wild marmots to support a program of wild translocations or other management activities, and that the wild population would not spontaneously rebound on its own. Rather than just serving as a safeguard measure, captive breeding (with the goal of genetic preservation and reintroduction) is identified as the only reasonable option for minimizing the imminent risk of species extinction and ultimately increasing wild populations within a reasonable timeframe.
- The Marmot Recovery Foundation is established as a registered charity to “fund, facilitate, promote, and carry out activities necessary to assist and enhance the survival of this species” including intensive captive breeding and reintroduction.
- **2000** – The conservation breeding program celebrates its first breeding success at the CZ.
- The Mountain View Conservation and Breeding Society (MVF) joins the program as a third conservation breeding facility.
- Construction begins on the Tony Barrett Mount Washington Marmot Recovery Centre.
- **2001** – The Centre receives its first marmots, just prior to the 2001/02 hibernation. The program now consists of three zoological institutions and a dedicated facility located within the natural range of the marmots.
- **2002** – TZ and MVF welcome their first litters of pups.
- **2003** – All four captive facilities have successful reproduction. The conservation breeding population is reliably growing due to captive births. The program conducts its inaugural release of captive marmots into Nanaimo Lakes. The four released marmots do well for 45 days, but then three are killed by a cougar within the course of two days. The remaining survivor is brought back into captivity. The wild population reaches its nadir with 22 known individuals at 5 sites.
- **2004** – As the conservation breeding population grows, captive releases continue in Nanaimo Lakes and Mount Washington, incorporating the difficult lessons learned in 2003.

- A captive male successfully breeds with a solitary, wild female after being released in the early spring directly into her hibernaculum.
- Released marmots successfully survive the summer.
- **2005** – Captive releases emerge from their first wild hibernation and survive their second summer.
- **2006** – After emerging from their second successful hibernation, a pair of captive-release marmots produce their first litter in the wild at the Haley Lake Ecological Reserve.
- **2007** – In addition to Nanaimo Lakes and Mount Washington, captive releases are initiated in Strathcona Park and Mount Cain.
- **2009** – Captive marmots are released in the Clayoquot Plateau.
- **2012** – After a decade of releases, the wild population has grown significantly from less than 30 marmots at five sites in 2003 to an estimated 375 marmots at 25 sites. The size of the captive population and the number of releases are significantly downsized. Releases into Nanaimo Lakes (NL) are curtailed and the focus shifts to augmenting the Strathcona population. The Centre becomes a seasonal, non-breeding facility.
- **2014** – After 14 years of operation, including effective breeding, MVF leaves the captive program.
- **2016** – Declines in the wild population indicate that the wild population has not yet achieved sufficient resiliency or sustainability and that it is still small and vulnerable to stochastic events like drought, predation, harsh winters, etc. Re-establishing intensive captive breeding and reintroduction is identified as an integral part of supporting continued growth of the wild population.
- Wild marmots are strategically captured to reinvigorate the demographic and genetic integrity of the captive population.
- **2017** – The Marmot Recovery Centre recommitted to overwintering release marmots during the winter of 2017/18.
- Captive releases resume in Nanaimo Lakes.
- **2019** – The Marmot Recovery Centre returned to serving as a year-round, multipurpose facility, including hibernation and preparation of release marmots, maintenance of breeding pairs and future breeders.
- **2022** - Breeding success at all three of the participating facilities allows for resumption of operational captive releases in 2023.
- **2024** – Releases from captivity exceed 700 (over 21 seasons). The total population (wild and captive) exceeds 500 individuals for the first time in the history of Vancouver Island marmot inventory.
- **2025** – MRF field crew confirms that marmots continue to persist at Mount Cain and Mount Seth which were release sites for captive marmots between 2007 and 2009. The success of the previous efforts was deemed to be questionable until this onsite confirmation.
- **2026** – The conservation breeding program enters its 29th year.

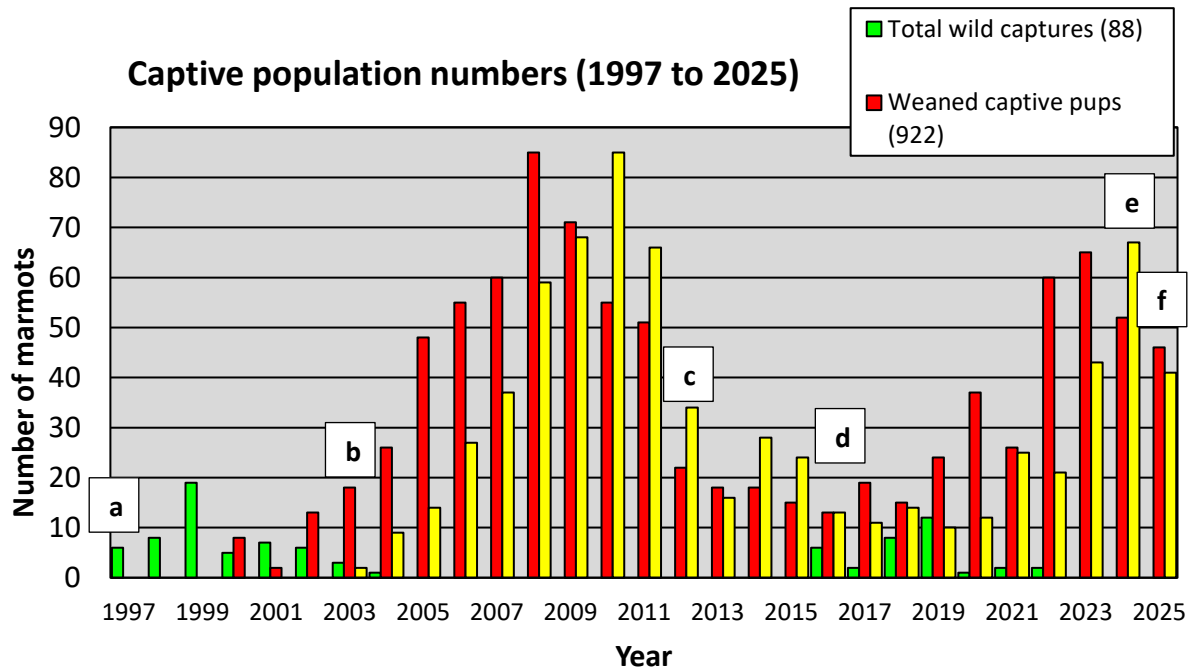


Figure 10. Number of marmots in the Conservation Breeding Program 1997-2025 a) 1997 – captive program is initiated with six wild marmots being sent to the Toronto Zoo. b) 2003 – wild population reaches nadir with 22 known individuals at 5 sites. Captive reintroduction efforts begin. c) 2012 – Captive population and captive releases are curtailed due to apparent success of program. d) 2016 – Captive program is genetically and demographically reinvigorated due to declines in the wild population. e) 2024 - the global population of Vancouver Island marmots (wild and captive) exceeds 500 individuals. This population level has not been approached in the previous 45+ years. f) 2025 – in the 28th year of the conservation breeding program, the total number of captive births since its inception exceeds 900 and the number of captive-born marmots released to the wild exceeds 700.

7.2 Founders

A total of 55 wild marmots were originally captured from the wild between 1997 and 2004 and these individuals became the foundation of the conservation breeding program. Due to the apparent success of reintroductions and growth of the wild population, the conservation breeding program was intentionally downsized in 2012. The wild population subsequently declined and in 2016 the Marmot Recovery Team approved the capture of additional wild marmots to reinvigorate the demographic and genetic integrity of the Conservation Breeding Program population. An additional 31 wild-born individuals were strategically or opportunistically captured between 2016 and 2019. In 2021 a two-year-old, wild-born female was opportunistically captured at Mount Washington due to the late season predation risk. She successfully bred at the Centre in the spring of 2022 and has been retained in the conservation breeding program. In 2022 two wild pups were captured from the Labor Day Lake cut block following the predation death of their mother and one of these individuals was retained for breeding. No wild marmots were added in 2023, 2024 or 2025. To date, a total of 88 wild marmots have been captured for the conservation breeding program.

7.3 Reproduction

2025 represented the 28th potential breeding season and the 26th consecutive year of successful breeding in captivity (2000 – 2025).

In the spring of 2025, there were 32 breeding pairs (where the male and female are both 2 years of age or older).

- TORONTO ZOO produced 2 litters and 10 pups (from 5 pairs)
- CALGARY ZOO produced 6 litters and 17 pups (from 10 pairs)
- TBMWMRC produced 6 litters and 19 pups (from 17 pairs).

For a total of 14 weaned litters and 46 (43.8% success).

7.4 Hibernation

There were 127 marmots in the Conservation Breeding Program at the start of the 2024 / 25 hibernation. There were four hibernation mortalities. From the winter of 1997/98 to the winter of 2024/25 there have been a total of 2,484 individual marmot hibernations in captivity with 41 mortalities. Therefore, 2,443 or 98.3% of the hibernations in the Conservation Breeding Program have been successful over 28 winters. During these 28 winters there has been one pup hibernation mortality and no mortality in yearlings. This level of success has remained consistent. Over 70% of the hibernation mortalities have been associated with age-related conditions, predominantly cardiovascular disease, and neoplasia (cancer). Presumably, older, compromised marmots get to a point where they are unable to cope with the extreme physiological alterations and demands imposed by hibernation. Typically, they die during hibernation or remain active without properly entering torpor. In some cases, the marmots succumb after hibernation, possibly due to the demands of an increased metabolic rate. Most cellular activity may be senescent during hibernation; however, activity of neoplastic cells may be particularly aggressive once the marmots are once again euthermic and cellular activity is increased.



Photo 7 Aidan Carey, Kestrel DeMarco, & Kevin Gourlay release a marmot. Photo Adam Taylor, 2025.

7.5 Mortalities

There have been 153 mortalities in the Conservation Breeding Program since the program began in 1997 (Table 13, Figure 11). The causes include 39 cardiovascular, 35 infectious / inflammation, 28 neoplasia, 23 iatrogenic / management (including 4 quarantine-associated), 11 cardiovascular & neoplasia, six congenital / early onset, three unknown causes, two intervertebral disc degeneration, two mesenteric torsions, one cardiovascular with infection / inflammation, one cardiovascular with chronic renal disease and two pending.

Table 13. Mortalities in the Conservation Breeding Program by cause.

Diagnosis category	Number of cases
cardiovascular (25.5%)	39
infectious / inflammation (22.9%)	35
neoplasia (18.3%)	28
iatrogenic / management (15.0%)	23
cardiovascular & neoplasia (7.2%)	11
congenital (4.0%)	6
unknown (2.0%)	3
intervertebral disc degeneration (1.3%)	2
mesenteric torsion (1.3%)	2
pending (1.3%)	2
cardiovascular & infectious / inflammation (0.7%)	1
cardiovascular with chronic kidney disease (0.7%)	1
Diagnosis category	Number of cases
cardiovascular (25.5%)	39
infectious / inflammation (22.9%)	35
neoplasia (18.3%)	28
iatrogenic / management (15.0%)	23
cardiovascular & neoplasia (7.2%)	11
congenital (4.0%)	6
unknown (2.0%)	3
intervertebral disc degeneration (1.3%)	2
mesenteric torsion (1.3%)	2
pending (1.3%)	2
cardiovascular & infectious / inflammation (0.7%)	1
cardiovascular with chronic kidney disease (0.7%)	1

Causes of mortality in captive Vancouver Island marmots (1997 to 2025, total = 153).

Postmortem results in two case are pending

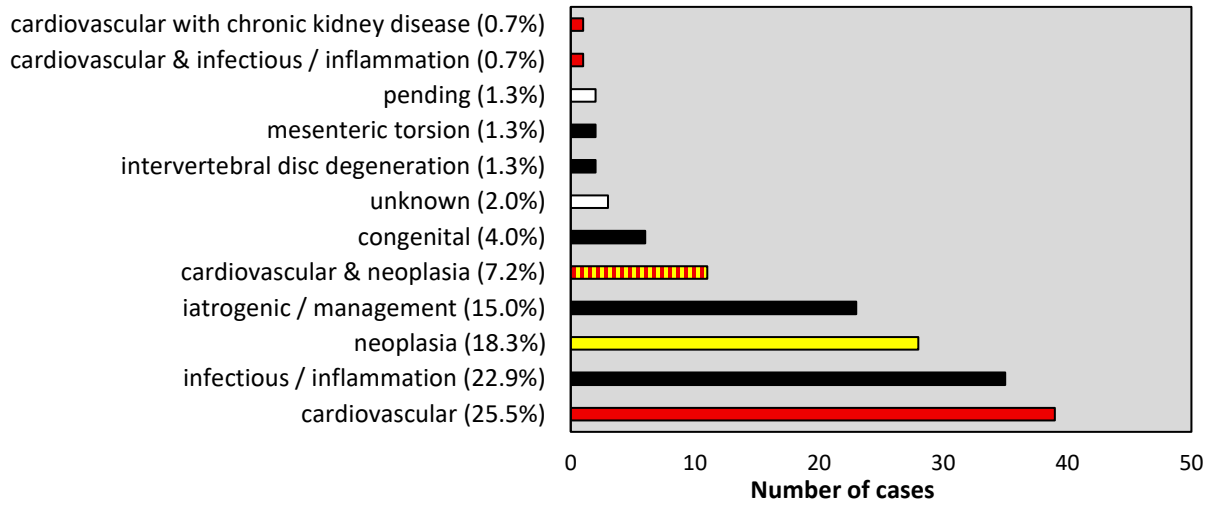


Figure 11. Causes of mortality in captive Vancouver Island marmots.



Photo 8 "Gob". Photo Adam Taylor, 2025.

7.6 Releases

Releases began in 2003 and from 2003 to 2025 (22 seasons) a total of 747 marmots born in the Conservation Breeding Program have been released to the wild from the Centre (21 wild-born and 726 captive-born marmots). Of the 21 wild-born marmots, 9 were maintained temporarily and 12 were entered into the Studbook as potential breeders (and then subsequently released).

In 2025 we exceeded 700 releases of captive-born marmots. This represents 8.25 captive-born pups for every wild capture. Overall, 726 of 876, or 82.9%, of the captive-born pups have been released to the wild (not including pups born in 2025 who will be released in 2026) with an average of 32.5 releases per year (range 4 to 85).

Of the 726 captive-born pups that have been released, 172 were born in Toronto, 199 were born in Calgary, 98 at Mountain View and 257 at the Tony Barrett Mount Washington Marmot Recovery Centre. Of the 747 total releases, 327 went to Nanaimo Lakes (43.8%), 182 to Mount Washington (24.4%), 22 to Mount Cain / Mount Seth (2.9%), 28 to Clayoquot (3.7%) and 188 to Strathcona (25.2%; Figure 12). It should be noted that marmots born in the conservation breeding program are no longer released directly into Strathcona. A more effective strategy has been to release these marmots into the wild at Mount Washington (where survival is normally high) and then translocated to Strathcona if they survive their first wild hibernation.

Distribution of marmots released from the Conservation Breeding Program (total = 747)

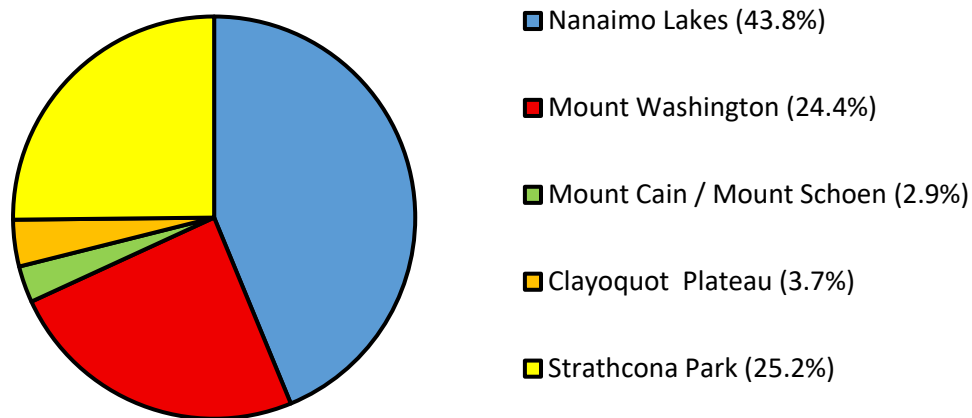


Figure 12 Distribution of releases from the Conservation Breeding Program

7.7 Current Conservation Breeding Program Numbers

There are currently 124 marmots in the conservation breeding program including 89 marmots at the Centre (including 19 breeding pairs in 2026), 16 marmots at Toronto Zoo (8 pairs) and 19 marmots at the Calgary Zoo (9 pairs). Approximately 39 of the marmots currently at the Centre will be release candidates in the summer of 2026. Exact numbers will depend upon individual marmot health, individual reproductive performance, and overall reproductive performance of the conservation breeding population in the spring / early summer of 2026.

OVERALL CONSERVATION BREEDING (CAPTIVE) POPULATION NUMBERS (1997 to January 2026)

88 wild captures + 922 weaned pups – 738 releases – 153 mortalities + 5 recaptures = 124 (105 captive-born & 22 wild-born, Figure 13, Tables 14-16). *Note: 738 does not include marmots held in captivity on a temporary basis*

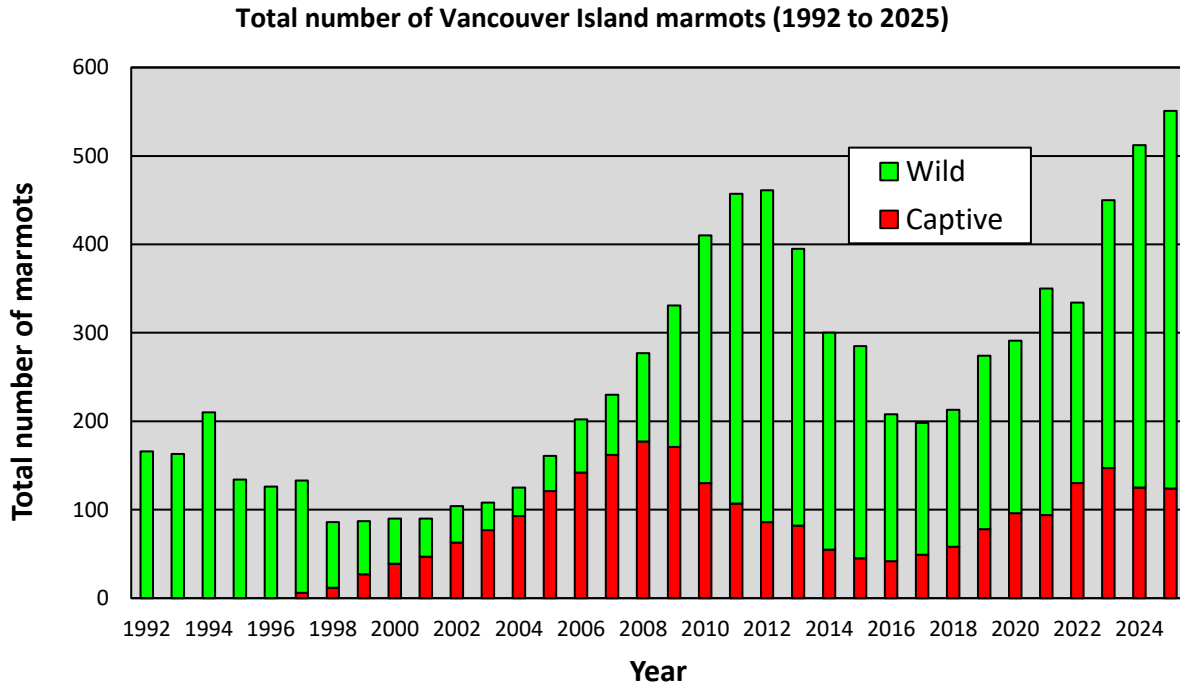


Figure 13. Total number of Vancouver Island marmots, including captive and wild populations, by year.

Table 14. Source of marmots brought into the conservation breeding program. Note: in 2023, 2024 and 2025 no individuals were captured for the conservation breeding program.

COLONY SITE	COLONY TYPE	ADULTS	2-YEAR- OLDS	YEARLINGS	PUPS	TOTAL
SHERK LK	LOGGED	4	3	1	4	12
K44	LOGGED	2	0	2	8	12
MT FRANKLIN	LOGGED	2	0	1	1	4
D13	LOGGED	1	0	0	0	1
PAT LK	LOGGED	1	0	0	0	1
MT WASH	SKI HILL	5	1	2	11	18
KNIGHT LAKE	LOGGED	0	0	0	2	2
NW BAY	LOGGED	1	0	0	5	6
LDL TRAILHEAD	LOGGED	0	0	0	1	6
WHISKEY CK	EXTRALIMITAL	0	1	0	0	1
TOTAL – OTHER		16	5	6	32	59
GREEN SUMMIT	NATURAL	0	2	1	2	5
“P” MTN	NATURAL	0	0	0	4	4
BIG UGLY	NATURAL	0	0	1	2	3
MT MORIARTY	NATURAL	1	0	0	2	3
HEATHER MTN	NATURAL	0	0	0	2	2
HOOPER	NATURAL	0	0	1	1	2
SADIE	NATURAL	0	0	0	1	1
McQUILLAN	NATURAL	0	0	0	1	1
HALEY LAKE	NATURAL	0	0	0	2	2
ARROWSMITH	NATURAL	0	0	0	2	2
MARBLE MEADOWS	NATURAL	0	0	0	2	2
CASTLECRAG	NATURAL	0	0	0	2	2
TOTAL – NATURAL		1	2	3	23	29
OVERALL TOTAL		17	6	9	54	88

Table 15. Annual summary of ages of marmots released from the Marmot Recovery Centre by year. "Number of Releases" includes 9 wild-born individuals that were brought into care and assigned a studbook number and subsequently released to the wild. This aligns with the studbook, but these life paths are recorded differently in other tables (e.g. Table 15 below).

YEAR	NUMBER OF RELEASES	% OF PREVIOUS YEAR	ADULTS	2 YEAR-OLDS	YEARLINGS	PUPS	RECAPTURES
2003	4		3	1	0	0	1
2004	9	225	2	7	0	0	0
2005	15	167	2	6	7	0	0
2006	31	207	5	9	17	0	1
2007	37	119	3	12	22	0	0
2008	59	159	6	17	30	6	0
2009	68	115	9	5	48	6	0
2010	85	125	16	12	46	11	0
2011	66	78	19	6	29	12	0
2012	34	52	5	5	24	0	0
2013	16	47	0	0	16	0	0
2014	29	175	9	3	17	0	0
2015	24	83	10	0	14	0	0
2016	13	54	0	0	13	0	0
2017	11	85	0	0	11	0	0
2018	14	127	0	0	14	0	0
2019	13	71	0	0	13	0	0
2020	15	150	0	0	15	0	0
2021	25	208	0	0	25	0	1
2022	23	81	0	3	20	0	1
2023	47	195	0	2	45	0	0
2024	68	151	0	9	59	0	0
2025	41	60	0	0	41	0	0
TOTAL	747		89	97	526	35	4

Table 16. Summary of marmot conservation translocations including captive-releases, pre-conditioned (or stepping stone) marmots and wild translocations (2003 to 2025).

Year	Nanaimo Lakes			Mount Wash	Mount Cain / Schoen		Strathcona			Clayoquot		Annual total of captive releases	Annual total of wild-born translocations	Annual total of pre-conditioned
	Captive-release	Wild-born translocation	Pre-conditioned	Captive-release	Captive-release	Pre-conditioned	Captive-release	Wild-born translocation	Pre-conditioned	Captive-release	Wild-born translocation			
2003	4	1	0	0	0	0	0	0	0	0	0	4	1	0
2004	7	1	0	2	0	0	0	0	0	0	0	9	1	0
2005	13	0	0	2	0	0	0	0	0	0	0	15	0	0
2006	29	0	1	3	0	0	0	0	0	0	0	31	0	1
2007	24	0	0	0	4	0	9	0	0	0	0	37	0	0
2008	29	1	0	10	6	0	14	0	0	0	0	59	1	0
2009	27	0	1	0	12	1	22	0	0	6	0	68	0	2
2010	2	0	0	0	0	0	77	0	0	6	0	85	0	0
2011	26	0	0	17	0	0	19	0	0	4	0	66	0	0
2012	0	0	0	17	0	0	17	9	4	0	1	34	10	4
2013	0	1	0	16	0	0	0	16	11	0	0	16	17	11
2014	0	0	0	15	0	0	14	13	8	0	0	29	13	8
2015	0	1	0	13	0	0	11	12	4	0	0	24	13	4
2016	0	0	0	9	0	0	4	10	5	0	0	13	10	5
2017	6	5	3	5	0	0	0	3	0	0	0	11	8	3
2018	9	2	0	5	0	0	0	5	4	0	0	14	7	4
2019	6	8	2	2	0	0	0	5	1	2	0	10	13	3
2020	6	0	0	7	0	0	0	3	0	0	0	15	3	0
2021	17	0	0	8	0	0	0	4	0	2	0	25	4	0
2022	14	1	0	8	0	0	0	3	0	0	0	22	4	0
2023	29	1	0	10	0	0	0	3	2	4	0	43	4	2
2024	45	0	0	18	0	0	0	4	5	4	0	67	4	5
2025	31	0	0	10	0	0	0	5	9	0	0	41	5	9
TOTAL	324	22	7	177	22	1	187	95	53	28	1	738	118	61
Number of years	18	10	4	19	3	1	9	14	10	7	1	23	17	13
23	353			167	23		335			29		917		

Since 1992 there have been a total of 822 mortalities documented in the free-ranging marmot population. This includes mortalities in 491 captive-release, 29 pre-conditioned (or stepping-stone), 73 translocated and 229 wild marmots.

8. RESEARCH PARTNERSHIPS

The Marmot Recovery Foundation relies on science to make sound, evidence supported decisions as we work to recover the wild population of the Vancouver Island marmot. While the Foundation is not a research organization, it collaborates with research partners to answer questions which will advance recovery efforts. In 2025, the Foundation collaborated on the projects noted below.

- Food Supplementation (Wilder Institute / Calgary Zoo)
- Endoparasites of captive and wild marmots (Kevin Gourlay and Jamie Gorrell, Vancouver Island University)
- Home range estimates of free-ranging marmots (Haley Andersen and Jamie Gorrell)
- G.I.T. Microbiome (Pauline Van Leeuwen, Laurentian University)
- Stress evaluation using hematology, etc. and stress effects of post release survival (Sarah Falconer, Laurentian University)
- Genetic basis of melanism in different marmot species (Kendall Mills and Link Olsen, University of Alaska)
- Diet, lipid metabolism, body composition, and hibernation (Jessica Aymen, University of Guelph)
- Genetic evaluation of degenerative heart conditions (Jaimie Warren and Doug Whiteside, University of Calgary)
- Diet metagenomics (Jasmine Janes, University of Northern B.C.)
- Marmot nutrition (Sarra Gourlie, Beth McGregor, CMG nutrition advisors at Toronto Zoo)
- Morbidity and mortality (Malcolm McAdie)
- Factors influencing reproduction (Laura Graham)
- Social reproductive suppression (Phoebe Edwards)
- Seasonal changes in vegetation and its impact on habitat suitability and predation risk (Julia Kobetitch/Royal Roads University)
- Diagnosis and evaluation of heart disease including radiology, ECGs, and biomarkers (Doug Whiteside, University of Calgary, Wilder Institute / Calgary Zoo)
- Sample biobanking (Toronto Zoo)
- Genomics and modelling postdocs (Jamie Gorrell, UNBC)

Research published in 2025 that involved the Foundation's collaboration include:

- Le, S., Coffin, C. S., & Whiteside, D. P. (2025). Evaluating The Utility Of Radiographic Vertebral Heart Score And Left Atrial Heart Size For Diagnosis Of Dilated Cardiomyopathy In Marmot Species As A Potential Model For Other Rodent Species. *Journal of Zoo and Wildlife Medicine*, 56(4), 747-755.
- Vasile, M. (2025). Eagles, Marmots, Humans: Knowing Wildlife Through Fieldwork. *Springs: The Rachel Carson Center Review*, (8).

9. FIELD SAFETY SUMMARY

There were no serious safety incidents in 2025. Staff continued to take a proactive approach to hazard identification and mitigation and were quick to report new hazards as they emerged. Injuries and close calls were discussed as a team and incorporated into the Foundation's safety program for next season.

9.1 Safety Program

The Foundation maintains a safety program to protect staff and minimize risks while working in inherently hazardous and demanding terrain of Vancouver Islands mountains. This safety program includes:

- Job Safety Analysis: identify and review all potential hazards and mitigation
- Field Safety Plans: pre-field review of conditions and plan for each team
- On-Site Safety Chats: field day tailgate review and ongoing discussion of hazards and mitigation
- Check-in Monitoring System: 3 hour team check-ins with safety co-ordinator while in the field
- Emergency Response Plan: logistics and evacuation procedure for an emergency incident
- OHS Monthly Meetings: review any incidents and safety concerns each month as a team

9.2 Training

Training courses help ensure staff have current and ongoing safety skills to meet the challenges and risks of our work.

Base courses for all staff:

- Wilderness First Aid
- Avalanche Skills Training AST-1
- Bear Safety
- Resource Road Driver Safety
- Helicopter Hover Exit

Additional courses:

- Chainsaw Operator Safety
- Mountain Weather Forecasting
- ATV Operator
- Drone Pilot

9.3 Incidents

There were three minor incidents that occurred in 2025, with no major incidents or close-calls to report.

Minor Incidents:

- Ankle sprain: A crew member hiking in early season in Strathcona Park experienced an ankle sprain on a long field day while descending with a heavy load. They did not require treatment and gave the injury rest to recover before easing back into field days. Months later the crew member experienced a minor re-injury of the ankle sprain while carrying a heavy load on a survey trip. Rest and modified work duties were taken at the crew members discretion and served as a reminder that minor injuries can reoccur after recovery.
- Knee sprain: A crew member hiking between marmot habitat during an overnight survey in Strathcona Park, slipped on wet vegetation in a gully resulting in a sprained knee. They were able to hike out and sought medical treatment at a clinic followed by physiotherapy as the injury

recovered. Modified work was provided in the following weeks with office duties and easing into light field days at Mt Washington at the crew members discretion. They worked their way back to regular field days in the fall, while taking precautions to avoid reinjury.

- Overextended leg strain: On the last field day of the season in late fall, a crew member was hiking down a section of trail and overextended their leg. The strained muscle did not require treatment and healed with rest over the following week.



Photo 9 Shayn McAskin carries a marmot feeder. Photo Tyler Gill.

10. RECOMMENDED APPROACH FOR 2026

The Provincial Recovery Plan for the Vancouver Island Marmot (VIM RT 2017) recommends several recovery objectives for the wild population (Table 4, pages 29-31). This section lists several activities that the Foundation believes will contribute to these objectives. These plans are subject to change at the advice of the Vancouver Island Marmot Recovery Implementation Group. In the simplest terms, the Foundation recommends providing support to the wild population when possible and prioritizing long-term recovery actions over short-term gains.

The overall direction for this year should be to continue to build existing colonies and support marmots that are establishing new colonies, while identifying habitats and points that support dispersal. This includes four primary recommendations for 2026:

- Release marmots from the Conservation Breeding Program strategically to maximize their recovery impact.
- Translocate marmots to Strathcona Provincial Park to support emerging colonies and dispersal routes.
- Restore marmot habitat to mitigate degradation resulting from climate change-induced tree creep.
- Continue conservation breeding efforts and manage the Tony Barrett Mount Washington Marmot Recovery Centre to condition 2026 release candidates, produce release candidates for 2026, and assist in managing wild marmots as need arises.

10.1 Proposed Supports for the Wild Population

(i) *Releases from the Conservation Breeding Program*

There are 39 marmots currently at the Tony Barrett Mount Washington Marmot Recovery Centre identified as potential release candidates for 2026.

The Foundation recommends prioritizing release of yearlings in the conservation breeding program to Mt. Washington and the Nanaimo Lakes region. This strategy reflects best practices to optimize survival of marmots from the Conservation Breeding Program and maximize their impact on the wild population (Lloyd et al, 2019). The Foundation will seek guidance from the Recovery Team about whether a small number of marmots from the conservation breeding program should be released to the Clayoquot Plateau region to support genetic diversity in this isolated colony.

The Foundation will seek guidance from the Recovery Team on supporting the small colonies in the North Island with released marmots, and whether marmots directly from the conservation breeding program or translocated marmots are more suitable for this region.

(ii) *Translocations*

As per previous years, the Foundation will identify potential translocation candidates from the wild colony at Mt. Washington, including stepping-stone marmots and wild-born yearlings, and from marmots found in unsuitable habitats. The Foundation is not aware of any marmots currently occupying unsuitable habitat. However, those sites with a history of occupancy will be monitored in the spring once access allows. The Foundation will also

follow-up on any credible reports of marmots in unsuitable habitat or at inappropriate locations. If marmots are identified in these scenarios, the Foundation will determine what action is in the best interests of the individual marmots and the recovery of the species. Actions may include retention in the conservation breeding program, translocation, or short-term management of the marmots in unsuitable habitat. This latter situation has generally involved reproductive females or females with pups.

Sites within Strathcona Provincial Park is the recommended priority for marmots with wild experience. As discussed above, translocated marmots may also be released to North Island colonies. The relative scarcity of marmots for translocation will be a factor in determining what sites have the highest need for this group (versus marmots released directly from the conservation breeding program).

(iii) *Trapping and implants*

The Foundation will trap wild-living marmots with the goal of increasing the number of active transmitters, and collecting biometric data that inform recovery actions. The Foundation will prioritize trapping at Mount Washington, Haley Lake Ecological Reserve, and Castlecrag as focal sites for understanding marmot vital rates.

(iv) *Managing marmots in unsuitable habitat*

The Foundation will monitor unsuitable habitats where marmots have been located in the past, and respond to reports of dispersing marmots that are observed in unsuitable and/or unsafe locations. If appropriate, the Foundation will translocate these individuals to active colonies or bring them into the conservation breeding program.

(v) *Managing marmots on Mt. Washington Alpine Resort land*

The Foundation will continue to monitor marmots on Mt. Washington and will maintain strong communications with Resort staff and managers about unsuitable locations where marmots are spending time. Unsuitable locations may include features like roads, bike runs, water reservoirs, buildings and structures, and places with past or ongoing development activities. The Foundation will work with Resort staff to educate visitors about marmots, marmot viewing, and how to keep marmots safe during their time at the Resort. The Foundation will also investigate whether signage can be used to increase marmot safety.

(vi) *Supplemental feeding*

The Foundation will install supplemental feeders at 18 to 24 colonies, as weather and snow conditions allow. For each feeder that is installed, the Foundation will also install a motion-detecting remote camera that will record feeder use by marmots and the presence of other species.

The amount of food provided at each feeder will be similar to 2025, and slightly reduced from previous years. The goal of reducing food volume is to allow marmots to benefit from supplemental food during spring thaw but also ensure that marmots consume all the provided food before bears and other wildlife begin to access marmot habitat more regularly. Crew will assess snow levels and access to forage when determining the amount food to provide.

The Foundation recommends providing supplemental food at Mount Cain and Mount Seth.

This action will also provide an opportunity to document emergence sites, and camera trap monitoring of colonies about which little information is currently available.

(vii) *Habitat restoration*

The focus for 2026 will be on evaluating the impact and effectiveness of previous years' habitat restoration work, and implementing smaller scale on-the-ground habitat restoration efforts with partners. The Foundation will consult with the Recovery Team about implementing restoration work at Mount Cain in the North Island area.

Further information on habitat restoration, including best practices, tree cover ingress analysis, and past efforts can be found in the Foundation's 2022 report *Tree Change in Vancouver Island Marmot Colonies: Best Management Practices, Past Efforts, & Photo Analysis*.

(viii) *Predator deterrence*

In 2026, the Foundation plans to continue testing Foxlights. Foxlights use programmable, irregular flashing lights that may deter predators from spending time near the lights during twilight hours. Research from California has suggested that the effectiveness of Foxlights may decline after a few weeks. Other technologies deployed may include radio-devices that play human voices, and motion sensitive devices that produce sound and light. In hopes of achieving the best results, the Foxlights and other devices will be deployed in mid to late August when the highest rates of predation typically occur.

The Foundation tested Foxlights at Mount Washington in 2024 and 2025. The lights were deployed in an area where marmots had been predated by cougars in previous years. During deployment, there were no predations, however, no cougars were detected on camera traps during the period either. While not conclusive, results warrant continued testing.

In 2026, the Foundation will deploy Foxlights and possibly other deterrents at one or two colonies in the Nanaimo Lakes region to begin testing their effectiveness in settings with less human presence.

10.2 Proposed Monitoring and Inventory

(i) *Inventory*

The Foundation will conduct visits, repeated where possible, to each of the main colonies in the Nanaimo Lakes and Strathcona regions. This may include emergence flights (both helicopter and drone) in the spring to check for marmot presence at colonies believed to have been extirpated, new locations where colonies recently may have become established, and to locate hibernacula at known colonies lacking spatial data, as well as visits with an emphasis on ground-based inventory in July and August when pups could be seen and counted. Day-trips will be augmented by overnight trips at select sites, especially in periods of warm weather when marmots spend significant periods of the day underground. The Foundation has acquired additional wildlife cameras, and plans to expand the use of wildlife cameras in 2026.

(ii) *Mortality recovery*

The Foundation will attempt to recover transmitters and collect evidence from mortality sites in order to infer cause and timing.

(iii) *Investigation of new monitoring techniques*

The Foundation will continue to investigate using direction-finding software-defined radio to automate collecting data about marmot movements. We will also continue to explore the use of passive RFID readers in the field for detecting tagged marmots at feeders or hibernacula, as was trialled by the VIU team on Mt Washington in 2022.

The Foundation will continue to investigate the use of telemetry base-stations to improve monitoring efficiency and effectiveness. Base-stations may be able to record telemetered marmot movements both within and between colonies.

We will also continue to explore the applications of Unmanned Aerial Vehicles (UAVs) for surveying inaccessible sites, particularly during emergence surveys.

The Foundation will continue to include temperature loggers on selected implanted telemetry transmitters to assist with gathering more detailed biological data. These loggers are implanted in marmots being released at Mount Washington.

In 2026, the Foundation will begin using a new transmitter, the Holohil XM-3TDH, which is the replacement for the now discontinued Holohil AI-2TH. These transmitters will be preferentially implanted in marmots being released to Mount Washington.

(iv) *Collecting genetic samples from wild-living marmots*

The Foundation will trial techniques to collect hair samples from wild-living marmots at the Tony Barrett Mount Washington Marmot Recovery Centre, and expand into wild colonies if successful.

The Foundation will also opportunistically collect DNA sources from wild marmots, such as fresh fecal samples.

10.3 Proposed Actions for the Conservation Breeding Program

(i) *Conservation Breeding*

In recent years, increased capacity at the Tony Barrett Mount Washington Marmot Recovery Centre combined with programs at the Toronto Zoo and Wilder Institute/Calgary Zoo have resulted in significantly more releases to the wild. As predicted by the 2015 IUCN Population Viability Report, larger release numbers have played an important role in recent wild population growth. (Jackson et al, 2016).

Continuing conservation breeding at the Tony Barrett Mount Washington is a critical component to continued wild population growth.

(ii) *Translocation management and treatment of wild marmots*

The Tony Barrett Mount Washington Marmot Recovery Centre facilitates the translocation of wild-living marmots to sites in Strathcona Provincial Park which has contributed to large

population growth and colony expansion in this meta-population. Continuing this work is an important step to continued success for this meta-population.

A staffed and fully operating Marmot Recovery Centre also gives the Foundation options to treat and care for marmots from the wild as needed, and to manage wild marmots found in inappropriate habitats.

(iii) *Wild captures*

The Foundation consulted with Studbook Keeper John Carnio for the conservation breeding program to determine whether new additions to the program would be helpful from a genetic or pairings perspective. In 2026, if marmots are trapped with under-represented genetics, they may be added to the conservation breeding program. However, this is not the focus of trapping efforts. This action is based upon our basic conservation breeding management principles and recommendations from the Studbook keeper. This will act to safeguard the genetic legacy of these sites and will further enhance the overall genetic robustness of the conservation breeding population. This action has been endorsed by the Recovery Team and is contingent upon inventory results at these colonies (including survivorship and reproduction).

(iv) *Genetic Studbook*

In partnership with Dr. Tista Ghosh in the Gorrell/Janes Lab at the University of Northern British Columbia, the Foundation will continue the development of a studbook based on individual genetic profiles for marmots in captivity. This is a 3-year project that in the long term will provide better tools to conserve genetic variation in the conservation breeding and wild populations.

10.4 Biosecurity Measures

DNA analysis indicates that Vancouver Island marmots have low genetic diversity, potentially as a result of population bottlenecks, island isolation, or a combination thereof. This low genetic diversity puts the marmot population at greater risk to novel pathogens. To reduce the risk of accidentally introducing a novel pathogen, the Foundation will continue to take biosecurity measures. In the field this will include:

- Self-monitoring for illness.
- Sanitizing footwear and changing clothing between locations.
- Wearing masks and gloves when handling marmots, gear that will come into contact with marmots, or working in close proximity to marmot habitat features, such as active burrows or look out rocks;
- appropriate vaccinations to reduce spillover opportunities.

In the Tony Barrett Mount Washington Marmot Recovery Centre, biosecurity measures will be taken, including:

- Dedicated footwear and overalls inside marmot areas.
- Limiting visitor and non-necessary staff access; and
- Sanitizing footbaths before entering marmot areas.

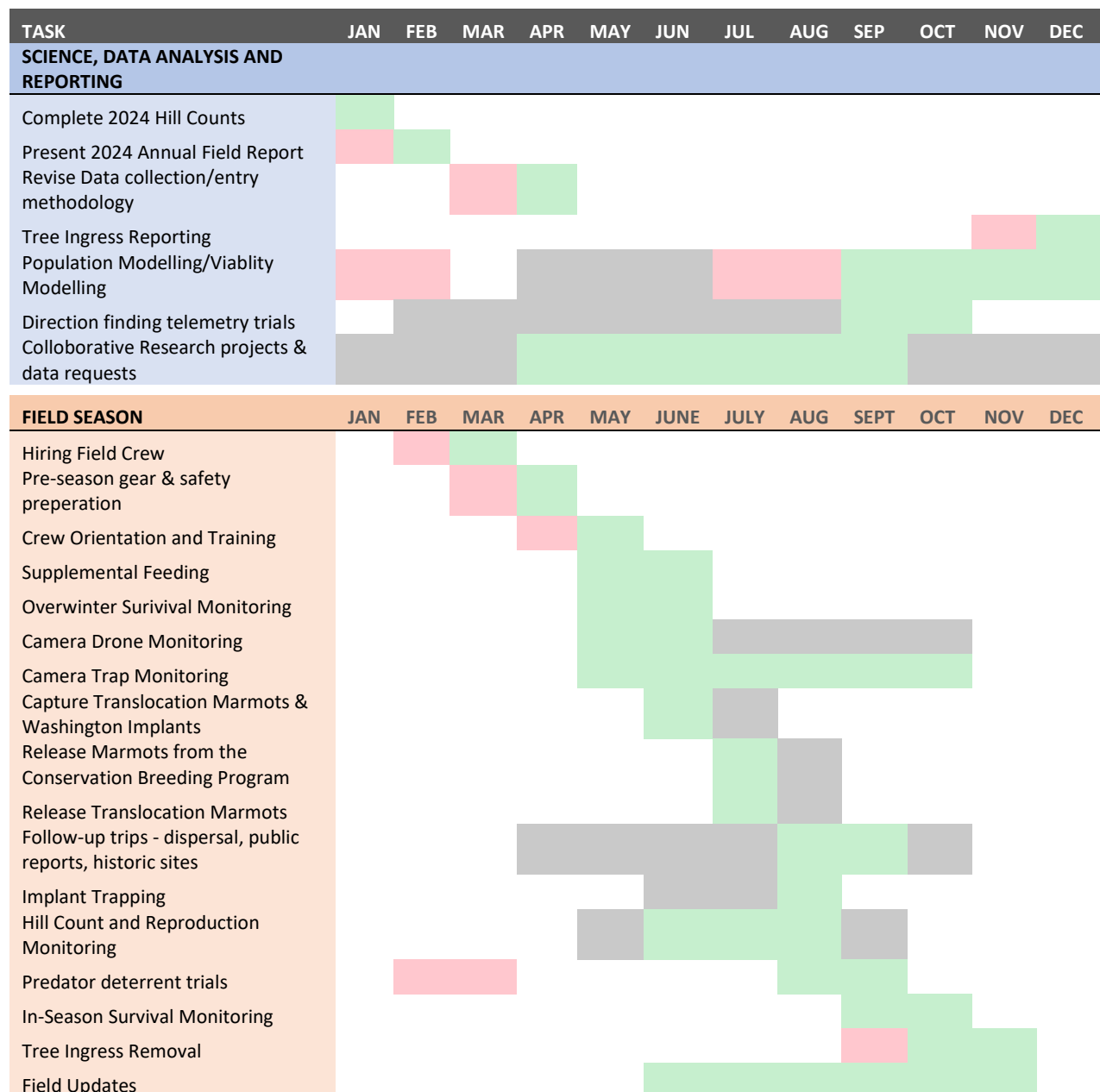
The Foundation will continuously review and update biosecurity measures in response to emerging threats and best practices.

10.5 Population, Habitat, and Viability Modelling

In partnership with Dr. Fernando Mercado Malabet at the Gorrell/Janes Lab at the University of Northern British Columbia, the Foundation has begun a multi-year project to model Vancouver Island marmot habitat, and the populations of the two metapopulations. This builds on a 2015 IUCN Population Viability Model (Jackson et al, 2015) but expands the scope of the modelling to both metapopulations, incorporates another 10 years of data, and provides the resources to more thoroughly investigate key sensitivities that drive marmot population trends.

10.6 Simplified Gantt Chart of Activities

Timelines for many of the Foundation’s activities overlap or are adjusted to meet weather conditions or emerging priorities. Below is a highly simplified Gantt chart of activities (Figure 14).



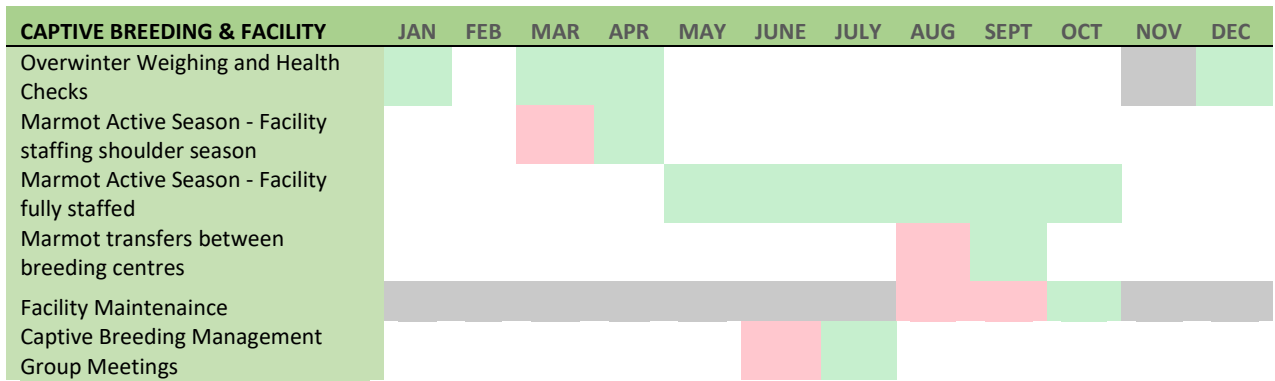


Figure 14. MRF annual operations plan Gantt chart. Red squares indicate planning and preparation periods, green indicates implementation, and grey indicates opportunistic and/or ongoing activities.



Photo 10 Field Team. L to R Back: Kevin Gourlay, Geric Coutts, Jakob Andrian, Aidan Carey, Tyler Gill. Front: Kestrel DeMarco, Heather Heim, Shayn McAskin. Photo Adam Taylor, 2025.

11. FUTURE DIRECTIONS

The Foundation acknowledges that some activities that would greatly benefit the recovery effort have not been possible due to funding constraints, the scope of an activity, or the need for external expertise and/or resources. These activities include, but are not limited to:

- Explore acoustic monitoring as a technique to monitor marmot presence, especially in complex habitats where cameras and visual observation struggle to reliably find marmots.
- Continued exploration of non-lethal predator deterrent methods, including predator-detering lights but also additional technologies or methodologies that have not been explored and/or tested in previous years.
- Research into marmot dispersal and habitat needs for marmots when outside core colony areas. The Foundation has begun testing base stations and direction-finding software defined radio, but significant additional opportunity exists to explore marmot dispersal and landscape use.
- Collection and mapping of information about the marmot's extent of historic occupation, especially in the northern and western portions of the marmot's historic range.
- Research into the extent and characteristics of climate change induced habitat change that has occurred in marmot meadows to date.
- Exploration of supplementary or alternative geolocation technologies for re-capture of Vancouver Island marmot location data.

Items that have been identified in the past that are now in progress include:

- Further incorporation of advances in our understanding of marmot genetics into the Foundation's management of the captive and wild populations.
- The development of population models that incorporate data collected since 2015 and the Strathcona metapopulation.

The Foundation encourages partnership and collaboration in working to address these challenges.

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MARMOT

RECOVERY FOUNDATION

PO Box 2332 Stn A, Nanaimo, B.C., V9R 6X6
Tel: 250 390-0006 | Email: info@marmots.org
www.marmots.org