

Montana Marten Reintroduction and Monitoring Report

September 2023



Central Montana Pine Marten Reintroduction

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Introduction

Pine marten are a small boreal mustelid with historic and contemporary value as a furbearer species. Although marten were historically present throughout the island mountain ranges of central Montana (Gibilisco 1994, Buskirk 2002), they were extirpated from or significantly reduced within these areas by 1930 due to unregulated overharvest, habitat loss, as well as broadcast poison predator control methods. Conservation measures allowed populations in western Montana to naturally recover throughout much of their historic range, but martens' inability to disperse over open terrain precluded them from re-colonizing several geographically isolated mountain ranges of central Montana (Hawley and Newby 1957, Buskirk and Ruggiero 1994).

Marten populations have been successfully reestablished across their historic North American range using translocations. Thirty-two (72%) of the 44 attempted marten reintroduction efforts (with known outcomes) conducted prior to 2012 were successful (Powell et. al. 2012), including two in island ranges east of the Rocky Mountains. Nine martens (4M, 5F) were translocated into the Big Belt Mountains in 1956 and FWP had detected the species there using camera traps since 2016. Similarly, a total of 125 martens (78M, 47F) were released in two areas of South Dakota's Black Hills in 1980 and again from 1990–1993. The marten population in the Black Hills is now self-sustaining and well connected (SDGF&P pers. comm. 2020).

To describe statewide marten habitat, Montana Fish, Wildlife and Parks (MFWP) and the Montana Natural Heritage Program (MNHP) developed a predictive habitat suitability model for marten in Montana (MNHP 2019). It incorporated 10 years of marten harvest locations and 18 statewide biotic and abiotic GIS layers in a Maxent marten habitat model. The model indicated that the Little Belt and Castle Mountains included some of the highest quality, unoccupied marten habitat in the state (Figure 1). Despite this area modeling as high-quality marten habitat, extensive snow-track, camera trap, and genetic surveys conducted by the USFS and FWP have failed to confirm marten presence in the Little Belt Mountain complex. Thus, in 2014, the Montana Fish & Wildlife Commission directed

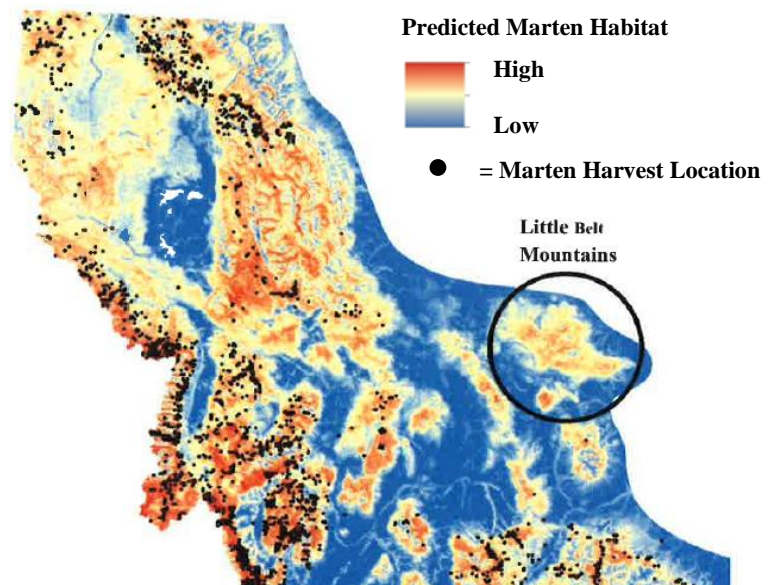


Figure 1. 2019 MNHP Maxent predictive marten habitat quality model and 2007–2018 marten harvest locations.

MFWP to develop a plan to restore marten to the Little Belt Mountains complex with an objective to “increase species diversity and facilitate marten range expansion back into the mountains of central Montana.”

Recent genetic studies have revealed that Montana is home to both North American marten species (*Martes caurina* and *M. americana*) with *M. americana* occurring primarily in northwest Montana and *M. caurina* occurring primarily in the southwest part of the state (Dawson and Cook 2012). It is thought that Pacific marten (*M. caurina*) likely occupied the Little Belt Mountain complex prior to local extirpation. As part of FWP’s commitment to restoring native species to their historic range, FWP staff committed to translocating Pacific marten from southwest Montana into the Little Belts complex starting in December of 2020.

Marten Translocations (2020–2023)

MFWP partnered with several volunteer marten trappers throughout southwest Montana to assist with capture efforts. By sourcing marten from a large geographic area, the genetic diversity of the reintroduced population was increased, improving the likelihood of establishing a self-sustaining population. Marten were captured annually between 1 November and 15 February using modified live traps and custom built wooden den boxes (Figure 2). The den boxes were detachable and allowed staff and volunteers to transport marten from the capture site to be processed and released. Prior to release, FWP staff sedated each marten (Figure 3), collected a blood sample on a Whatman card for genetics, weighed each animal, and determined sex. Recording the sex of captured animals was imperative, as the sex ratio (measured as n males : n females) of reintroduced populations is critical to ensuring their long-term viability. While under sedation, marten were also provided oxygen, vital rates were monitored, and body and tooth condition were assessed. After data collection, sedation was antagonized, and each marten was placed back into a den box for a short recovery period, followed by translocation and release (Figure 4).



Figure 2. Marten live-trap and attached den



Figure 3. Female marten under sedation.



Figure 4. Marten emerging from den box at Castle Mountain release site.

For the first two winters (2020–2021 and 2021–2022) of these translocation efforts, a total of 77 marten (50M, 27F) were released into the Little Belt Mountains. This last winter (2022–2023), 28 marten (18M, 10F) were released into the Castles for a total of 105 marten translocations into the Little Belt Mountain Complex over this three-year period (Table 1 and 2).

Table 1. General source locations of translocated male and female marten by year in Southwest, Montana, USA (2020–2023).

Capture Data (2020-2023)				
Location	Year	# Males	# Females	Total
Gallatin Range	2020-2021	4	1	5
	2021-2022	1	3	4
	2022-2023	3	0	3
Madison Range	2020-2021	1	0	1
	2021-2022	20	13	33
	2022-2023	8	7	15
Pioneers	2020-2021	8	4	12
	2021-2022	7	1	8
	2022-2023	7	3	10
Pintlers	2020-2021	3	4	7
	2021-2022	1	1	2
Beaverheads	2020-2021	5	0	5

Table 2. Number of male and female marten released into areas of the Little Belt Mountain Complex, Montana, USA (2020–2023).

Release Data (2020-2023)				
Location	Year	# Males	# Females	Total
Little Belt Mountains	2020-2021	21	9	30
	2021-2022	29	18	47
Castle Mountains	2022-2023	18	10	28
Total		68	37	105

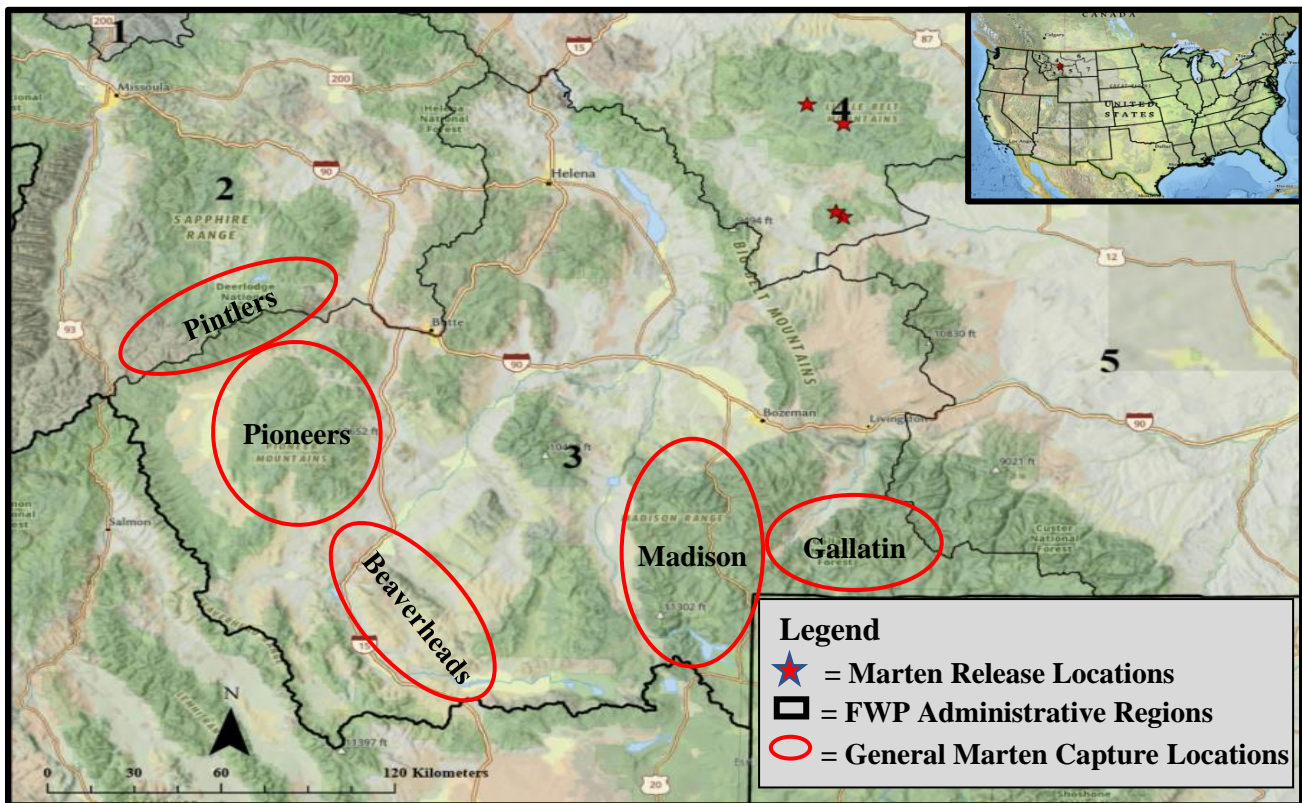


Figure 5. Map of general marten capture areas and release locations in the Little Belt and Castle Mountains, Montana, USA (2020–2023).

Post-Release Monitoring

Beginning in 2022, a plan was developed to implement a systematic monitoring program to measure the survival, occupancy, and abundance of reintroduced marten. During winter 2022–2023, 20 marten monitoring stations were deployed across the Little Belt Mountains. Each station consisted of a beaver carcass or deer leg wired to a tree > 2 meters from the ground, a 4-ounce canister with multiple holes drilled in it was filled with cotton balls and Gusto lure as a long-distance scent attractant, and a trail camera was placed > 3 meters from the bait tree. Each station was placed within a 3.75-km by 3.75-km cell that had > 50% high-quality modeled marten habitat from 1 December to 31 March (Figure 7; MNHP 2019, Lukacs et al. 2020). This cell size represented the average home range of a female marten (Lukacs et al. 2020). These efforts yielded two detections – both of which were near primary release sites used in preceding years. The results of this pilot effort and other verified marten detections have confirmed marten survival and dispersal and will inform FWP biologists in refining the survey methods for the ongoing monitoring work.



Figure 6. Marten photographed at camera trap station in 2023.

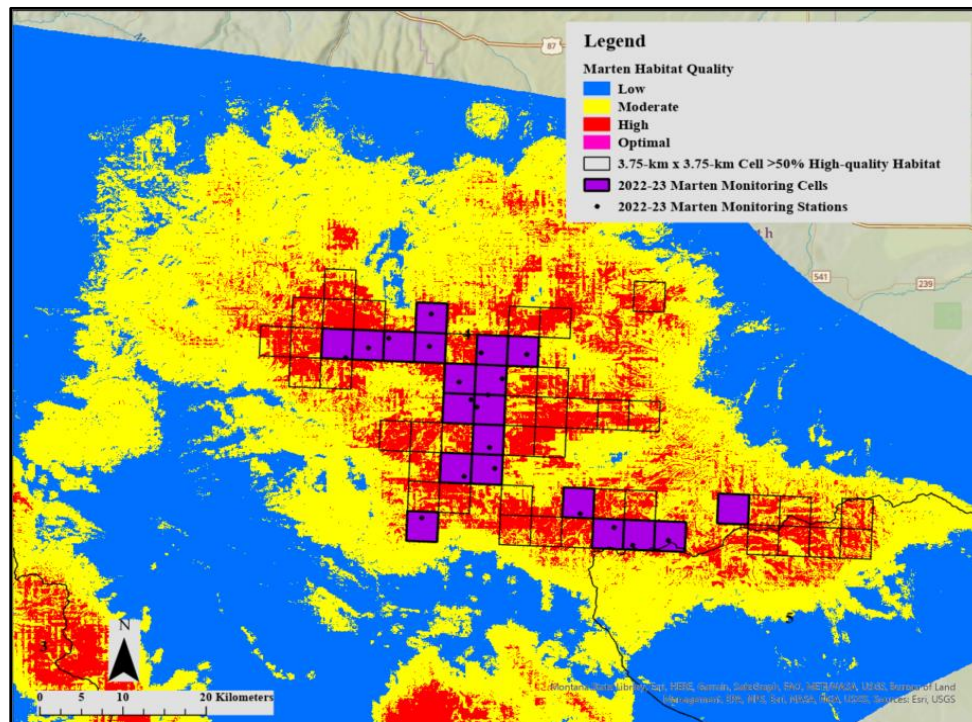


Figure 7. A frame of inference and specific sample location for 2022–2023 marten occupancy monitoring in the Little Belt Mountains of central Montana. The frame of inference is set to 3.75 x 3.75-km cells that are >50% high-quality modeled marten habitat (MTNHP 2020).

Up-and-coming Marten Monitoring Projects and Translocation Efforts

Ample opportunity remains for marten restoration and augmentation in central Montana. The current predictive habitat model indicates that patches of suitable habitat exist in the Snowy, North Bridger, and Crazy Mountains. Harvest records and input from local biologists suggest that marten are mostly absent, or in very low density from all of these ranges. Plans for the winter of 2023–2024 include reintroductions of marten into the Bridger Mountains north of Bozeman with further translocations into the other patches of suitable, marten habitat in central Montana following the North Bridgers (Figure 7).

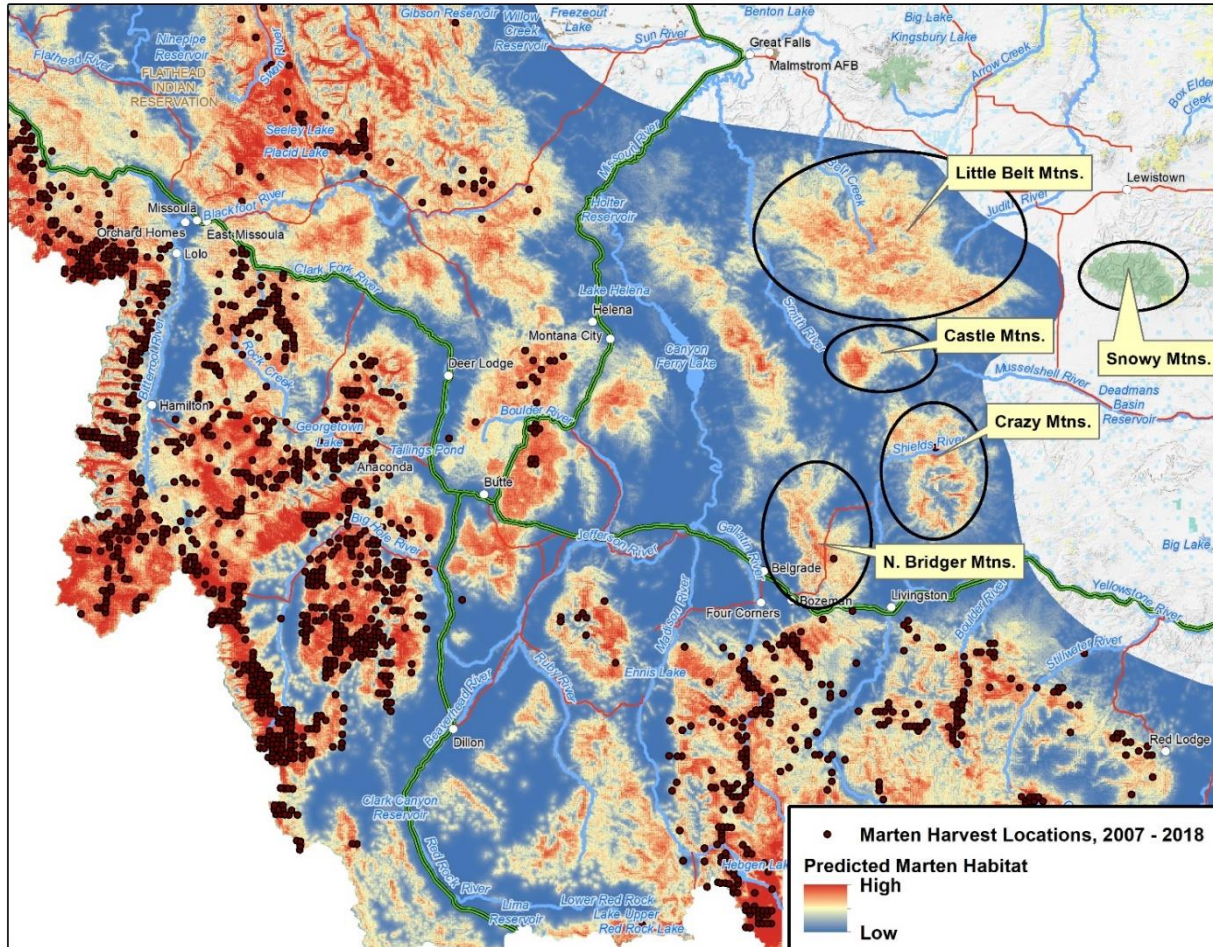


Figure 7. Central Montana marten restoration sites, predicted marten habitat, and recent marten harvest locations.

In addition to the on-going marten translocation efforts, a PhD candidate at Montana State University will be starting Fall of 2023 with the goal to develop products that can be used for statewide marten monitoring and management. The specific objectives of this project include developing 1) a predictive habitat model for marten at the statewide scale, 2) assessing marten species identification and distribution statewide, and 3) developing and evaluating occupancy monitoring (in the field and via simulation) as a means of monitoring marten over space and time. This project plans to address information gaps and develop a monitoring methodology for

marten that can be applied within a statewide monitoring framework. This will enhance FWP's ability to manage marten harvest, restore marten populations via translocation where needed, and evaluate the impact of other management activities, such as marten harvest or large-scale habitat changes, on marten populations.

As part of the on-going monitoring efforts of the newly established populations of translocated marten, a masters project has been approved to start as early as the Fall of 2024. The goal of this project is to develop a systematic post-release monitoring program that can be used to assess the efficacy of ongoing marten reintroduction efforts in central Montana. The proposed research includes 1) an evaluation of the population dynamics and behavior of newly reintroduced marten populations including post-release survival, reproduction, and spatial use; 2) recommendation of criteria to be met before reintroduced marten populations are open to legal, regulated harvest.

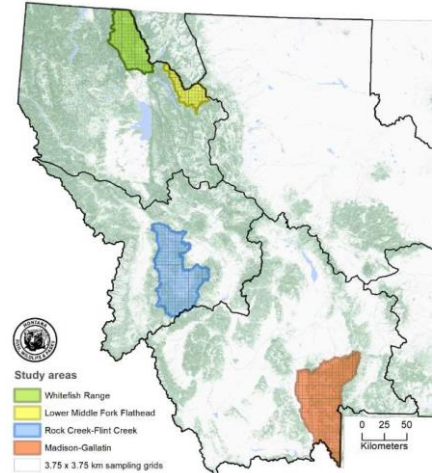


Figure 8. Tentative study areas for field-based studies of marten occupancy, including portions of FWP regions 1, 2, and 3 in western Montana, USA.

The products from these two projects will provide a wholistic picture into the two marten species we have in Montana, their delineation and hybridization zones, an updated habitat quality model, an occupancy modeling approach for statewide monitoring, a measure of efficacy for marten translocations including vital rates and cause-specific-mortality, and criteria for deeming the translocation efforts successful and complete. In preparation for the genetic side of these studies, FWP biologists are actively gathering voluntary muscle tissue samples from successful marten trappers. Please reach out to your regional furbearer biologist for more details ([Jessy Coltrane](#), R1; [Tyler Parks](#), R2; [Claire Gower](#), R3).

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Literature Cited:

- Buskirk, S. W. and L. F. Ruggiero. 1994. American Marten in American Marten, Fisher, Lynx, and Wolverine in the Western United States. General Technical Report RM-254. USDA Forest Service. Fort Collins, CO.
- Buskirk, S. W. 2002. Conservation Assessment for the American Marten in the Black Hills National Forest, South Dakota and Wyoming. USDA Forest Service, Rocky Mountain Research Station Forestry Sciences Laboratory, Missoula, Montana, USA.
- Dawson, N. G., and J. A. Cook. 2012. Behind the genes: diversity of North American martens (*Martes american* and *M. caurina*) In: Biology and conservation of martens, sables, and fishers: A new synthesis. Cornell University Press, Editors: K. B. Aubry, W. J. Zielinski, M. G. Raphael, G. Proulx, and S. W. Buskirk, pp. 23–38.
- Gibilisco, C. J. 1994. Distributional dynamics of martens and fishers in North America. In: Buskirk, S. W.; Harestad, A. S.; Raphael, M. G., comps., eds. Martens, sables, and fishers: biology and conservation. Ithaca, New York, USA: Cornell University Press: 59–71.
- Hawley, V. D., and F. E. Newby. 1957. Marten home ranges and population fluctuations in Montana. *Journal of Mammalogy* 38:174–184.
- Lukacs, P. M., D. E. Mack, R. Inman, J. A. Gude, J. S. Ivan, R. P. Lanka, J. C. Lewis, R. A. Long, R. Sallabanks, Z. Walker, S. Courville, S. Jackson, R. Kahn, M. K. Schwartz, S. C. Torbit, J. S. Waller, and K. Carroll. 2020. Wolverine occupancy, spatial distribution, and monitoring design. *Journal of Wildlife Management* 84:841–851.
- MNHP (Montana Natural Heritage Program). 2019. Marten (*Martes americana*) predicted suitable habitat modeling. Unpublished report. Montana Natural Heritage Program, Helena, Montana, USA.
- Powell, R., J. C. Lewis, B. Slough, S. Brainard, N. Jordan, A. Abramov, V. Monakhov, P. Zollner, and T. Murakami. 2012. Evaluating translocations of martens, sables, and fishers: testing model predictions with field data In: Biology and conservation of martens, sables, and fishers: A new synthesis. Cornell University Press, Editors: K. B. Aubry, W. J. Zielinski, M. G. Raphael, G. Proulx, and S. W. Buskirk, pp. 93–137.