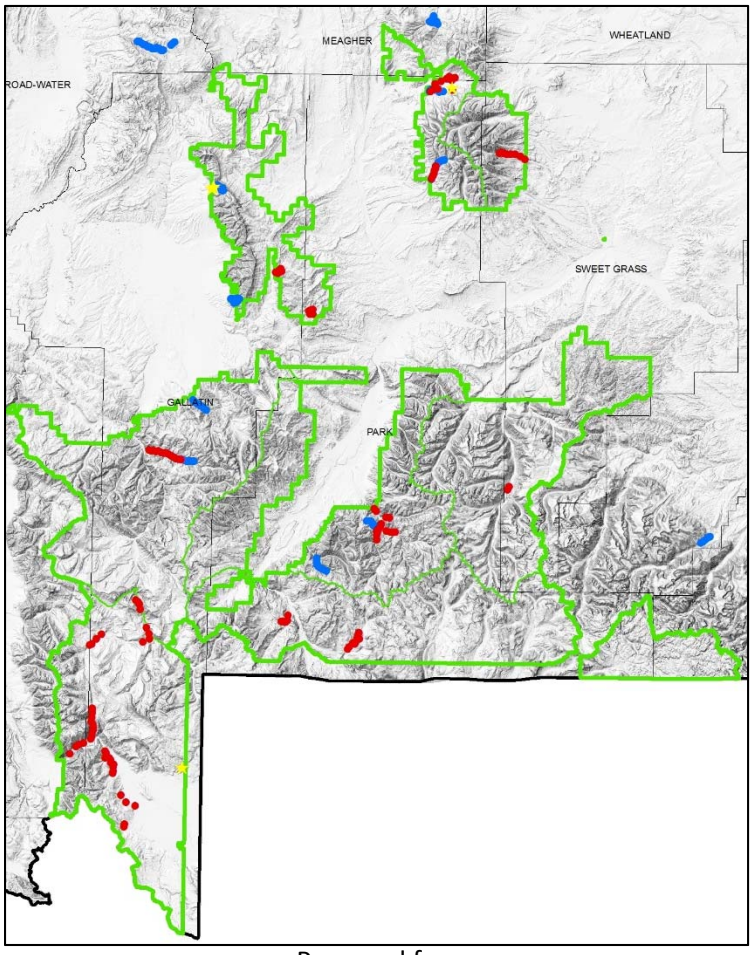
Flammulated Owl Surveys on the Big Timber, Bozeman, Gardiner, and Livingston Ranger Districts of the Custer Gallatin National Forest: 2013



Prepared for:
Custer-Gallatin National Forest

Prepared by:
Bryce A. Maxell
Montana Natural Heritage Program
a cooperative program of the
Montana State Library and the University of Montana

March 2016

MONTANA Natural Heritage Program

Flammulated Owl Surveys on the Big Timber, Bozeman, Gardiner, and Livingston Ranger Districts of the Custer Gallatin National Forest: 2013

Prepared for:

Custer Gallatin National Forest
10 East Babcock
Bozeman, MT 59771

Agreement Numbers:

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Prepared by:

Bryce A. Maxell

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P.O. Box 201800 • 1515 East Sixth Avenue • Helena, MT 59620-1800 • 406-444-3290

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EXECUTIVE SUMMARY

The Forest Service contracted with the Montana Natural Heritage Program to conduct surveys for Flammulated Owl (*Psiloscops flammeolus*) on the Big Timber, Bozeman, Gardiner, and Livingston Ranger Districts in June of 2013 to inform forest and project planning efforts for this Montana Species of Concern and Forest Service Sensitive Species. The major goals were to: (1) provide more widespread baseline survey coverage for Flammulated Owl in drier conifer forest types; and (2) record observations of all other species detected incidentally while in each management unit.

We identified fourteen focal areas across the five districts that had relatively larger areas of four potentially suitable Flammulated Owl habitat types that we could target for call playback surveys.

We conducted a total of 128 call station surveys on 12 survey routes, including four that overlapped spatially with routes surveyed previously in 2005. We failed to detect any Flammulated Owls during our surveys and only had seven detections of three owl species across all of our survey efforts: Western Screech-Owl was detected once on the Hebgen Lake District; Northern Saw-whet Owl was detected twice on the Hebgen Lake District and once on the Big Timber District; and Great Horned Owl was detected once on the Hebgen Lake District and twice on the Livingston District. Given these survey results, the small number of records reported for the species east of the upper Missouri River, and only 5 observation records in 3 widespread locations on the Bozeman, Livingston, and Hebgen Lake Districts, it seems likely that the species is either largely absent, or occurs at very low densities, on these districts. We recommend that future surveys for the species only be conducted in areas where forest management projects are being considered in highly suitable Flammulated Owl habitat.

During the course of our surveys we detected three Montana Species of Concern (Western Toad; Great Blue Heron, and Brewer's Sparrow) and two Potential Montana Species of Concern (Western Screech-Owl and Silver-haired Bat). Finally, we recorded 97 additional observations of 42 species that are not Montana Species of Concern.

ACKNOWLEDGEMENTS

This project would not have been possible without grants administered by the Custer Gallatin National Forest and Region One Office of the U.S. Forest Service. Jodie Canfield and Courtney Frost recognized the importance of gathering additional survey information for Flammulated Owls on the Big Timber, Bozeman, Gardiner, and Livingston Ranger Districts, set up contract modifications, provided forest stand information, and gave feedback on project implementation and survey prioritization. Scott Spaulding, Teresa Asleson, and Teresa Johnson assisted with contract management at the Region 1 Office of the U.S. Forest Service. Matt Bell created a mapset for suitable Flammulated Owl habitat that could be loaded onto GPS units and used to guide call station locations while in the field. Megan Fylling and Kristina Smucker with the Avian Science Center provided Flammulated Owl call sound files for conducting the surveys. At the Montana Natural Heritage Program, Erin Fairbank assisted with surveys, Darlene Patzer assisted with grant administration, and Scott Blum assisted with data entry.

This project was supported by an agreement between the Region One Office of the U.S. Forest Service, the Custer Gallatin National Forest, and the Montana Natural Heritage Program, a cooperative program of the Montana State Library and the University of Montana (09-CS-11015600-054).

TABLE OF CONTENTS

Introduction 1

Project need 1

Objectives 1

Methods 2

Selection of Survey Areas 2

Sampling Procedure 2

Storage and Availability of Data 3

Results and Recommendations 4

Literature Cited 5

LIST OF FIGURES

Figure 1. Administrative units on the Hebgen Lake, Bozeman, Livingston, Big Timber, and Gardiner Districts of the Custer Gallatin National Forest..... 6

Figure 2. Statewide Flammulated Owl observations, call surveys conducted prior to 2013 by others, and call surveys conducted in 2013 by the Montana Natural Heritage Program..... 7

Figure 3. Flammulated Owl observations, call surveys conducted prior to 2013 by others, and call surveys conducted in 2013 by the Montana Natural Heritage Program on the Hebgen Lake, Bozeman, Livingston, Big Timber, and Gardiner Ranger Districts..... 8

Figure 4. Focal survey areas identified across the the Hebgen Lake, Bozeman, Livingston, Big Timber, and Gardiner Ranger Districts..... 9

Figure 5. Focal survey area 1, Upper Sixteen Mile Road and Shields River Road on the Livingston District..... 10

Figure 6. Focal survey area 2, Cottonwood Creek and Rock Creek Roads on the Livingston District... 11

Figure 7. Focal survey area 3, Big Timber Creek Road on the Big Timber District..... 12

Figure 8. Focal survey area 4, Flathead Pass Road on the Bozeman District..... 13

Figure 9. Focal survey area 5, Bridger Canyon, Bracken Creek, and Jackson Creek Roads on the Bozeman District..... 14

Figure 10. Focal survey area 6, Mill Creek Road on the Livingston District..... 15

Figure 11. Focal survey area 7, Jardine Road along Bear Creek on the Gardiner District..... 16

Figure 12. Focal survey area 8, Main Boulder River Road on the Big Timber District..... 17

Figure 13. Focal survey area 9, Upper Gallatin River Canyon, Taylor Creek, and Big Sky Spur Roads on the Bozeman District..... 18

Figure 14. Focal survey area 10, Storm Castle Road on the Bozeman District..... 19

Figure 15. Focal survey area 11, Quake Lake and Beaver Creek Road on the Hebgen Lake District..... 20

Figure 16. Focal survey area 12, south Hebgen Lake area and Denny Creek Road on Hebgen Lake District..... 21

Figure 17. Focal survey area 13, Mulherin Creek and Cottonwood Creek Roads on Gardiner District... 22

Figure 18. Focal survey area 14, North Bridger Creek Road on the Big Timber District..... 23

LIST OF TABLES

Table 1. Flammulated Owl detections on the Hebgen Lake, Bozeman, and Livingston Ranger Districts…….....……..…… 24

Table 2. Summary of Flammulated Owl Call survey efforts, owl, and other species detections on the Hebgen Lake, Bozeman, Livingston, Big Timber, and Gardiner Ranger Districts in 2013 by the Montana Natural Heritage Program……..... 25

Table 3. Species detected, and numbers of unique spatial observations, on the Big Timber, Gardiner, Hebgen Lake, and Livingston Districts during 2013.....……..... 26

APPENDICES

Appendix A

Heritage Program Ranks: definitions for global and state conservation status ranks and Montana Species of Cocnern and Potential Species of Concern……A 1-4

INTRODUCTION

PROJECT NEED

The Forest Service is required by the National Forest Management Act to maintain a diversity of plant and animal species and accomplishes this, in part, through the enactment and revision of forest plans (NFMA 1976). The Custer Gallatin National Forest is currently initiating a forest plan revision. As part of this revision, the Forest Service must: (1) identify and assess available information for threated, endangered, proposed, and candidate species and potential species of conservation concern present in the plan area (36 CFR 219.6); and (2) select monitoring indicators that measure the effectiveness of plan components designed to maintain or restore the ecological conditions and key ecosystem characteristics necessary to provide for diversity of plant and animal communities and contribute to the recovery of, conserve, or maintain the viability of at risk species within the plan area (36 CFR 219.12).

The Flammulated Owl (*Psiloscops flammeolus*) is a small insectivorous neotropical migrant that is currently listed as a Montana Species of Concern and a U.S. Forest Service Sensitive Species (USFS 2011, Linkhart and Mccallum 2013, MTNHP & MTFWP 2016). The species is associated with mature and old-growth xeric Ponderosa Pine/Douglas-fir stands with large snags and a generally more open structure, but with understory thickets for roosting and singing, and the presence of abundant moths and beetles (Wright 1996, Wright et al. 1997, Linkhart and Mccallum 2013).

In May, June, and July of 2005, the Avian Science Center conducted call playback surveys for Flammulated Owl across Region 1 Forests in Montana, northern Idaho, and northwest South Dakota (Cilimburg 2006). These surveys detected Flammulated Owl on 29 percent of the 265 transects and 9 percent of the 2,695 points that were surveyed across Region 1. However, they failed to detect Flammulated Owls east of 111.5 west longitude, with no detections on the Custer Gallatin National Forest or the former Lewis & Clark National Forest (Cilimburg 2006, MTNHP 2016). These results are consistent with the failure to detect the species with certainty on the Livingston Ranger District of the Custer Gallatin National Forest during previous survey efforts (Brelsford 1992) and the small number of records for the species east of the upper Missouri River, with only 5 records in 3 widespread locations on the Bozeman, Livingston, and Hebgen Lake Districts (MBDC 2012, MTNHP 2016, Figures 1-3, Table 1).

OBJECTIVES

Given the Sensitive status of Flammulated Owl, their presence in commercially important timber stands in other portions of Region 1, and the lack of baseline survey effort for the species on the Hebgen Lake, Bozeman, Livingston, Big Timber, and Gardiner Districts of the Custer Gallatin National Forest, the Forest Service contracted with the Montana Natural Heritage Program to conduct call playback surveys for the species during June of 2013. The major goals of this survey effort were to: (1) provide more widespread baseline survey coverage for Flammulated Owl in drier conifer forest types; and (2) record observations of all other species detected incidentally while in each management unit.

METHODS

SELECTION OF SURVEY AREAS

Following Smucker et al. (2008), we identified potential Flammulated Owl habitat to target for call surveys using Region 1 U.S. Forest Service Vegetation Mapping. We defined primary habitat as Ponderosa Pine, Douglas-fir, or other shade-intolerant tree species with tree sizes of >15 inches diameter at breast height (DBH) and canopy cover <40%. We defined secondary habitat as Ponderosa Pine, Douglas-fir, or other shade-intolerant tree species with tree size >10 inches DBH, south-facing slopes, and canopy cover <25%. We then subdivided both the primary and secondary habitats by areas that occurred within 500 meters of roads and areas that occurred more than 500 meters from roads. Visual examination of these four potentially suitable Flammulated Owl habitat types in the GIS across the Hebgen Lake, Bozeman, Livingston, Big Timber, and Gardiner Ranger Districts resulted in the identification of 14 focal survey areas with larger areas of potentially suitable habitat to target for survey (Figure 4). We developed a mapset of these four potentially suitable Flammulated Owl habitat types and loaded it onto Garmin GPS units so that the areas could be easily targeted for survey in the dark.

SAMPLING PROCEDURE

We conducted call playback surveys between 17 June and 27 June during the incubation period for Flammulated Owls when detection probabilities were likely to be at their highest and followed standardized protocols that have previously been used across Region 1 Forests (Cilimburg 2006, Barnes and Belthoff 2008, Smucker et al. 2008, Fylling et al. 2010). Each evening we initiated surveys at least 30 minutes after sunset, but moonlight illumination did vary across our sampling period and across survey routes and moon illumination was very bright during some of our surveys. Call stations along road survey routes were separated by a minimum distance of 500 meters, but were often separated by much larger distances in order to locate all call stations near potentially suitable Flammulated Owl habitat types (Figures 5-18).

At each call station, we used FoxPro NX3 game callers loaded with adult territorial calls and broadcast them at full volume from the megaphone end of the caller. In the field under calm conditions, calls could be heard at distances of 200+ meters. At each call station, an initial two-minute silent listening period was followed by four rounds of 30 seconds of calls (7.5 seconds in each of the 4 cardinal directions) and 90 seconds of silent listening. Thus, there were a sum total of 10 minutes of calls and silence at each call station, broken down as follows with seconds of calls shown in bold and seconds of silence shown in normal font: 120-**30**-90-**30**-90-**30**-90-**30**-90.

Throughout the time spent at each call station, observers stayed vigilant to detect territorial owl calls or other animal sounds. When an owl responded with territorial calls, surveyors recorded the bearing and estimated the distance to the calls. During periods of silence observers also recorded birds and other animal species detected aurally or visually. Surveyors also recorded locations of animals detected incidentally while driving or camping.

A GPS unit was used to navigate to each call station and record the exact location surveyed. Time of survey initiation was recorded at each call station and moon phase (day since new moon) and visibility (yes or no) and weather conditions were noted. Sky conditions were recorded as: 0 = <30% cloud cover; 1 = 30-70% cloud cover; 2 = >70% cloud cover; 3 = visibility impaired beyond 30 meters; 4 = light drizzle; 5 = constant snow; 6 = constant rain. Wind conditions were recorded as: 0 = smoke rises vertically (<1 mph); 1 = wind direction shown by smoke drift (1-3 mph); 2 = leaves rustle, breeze felt on face (4-7 mph); 3 = leaves and small twigs in constant motion (8-12 mph); 4 = raises dust, small branches in motion (13-17 mph; and 5 = small trees sway (18-24 mph). Noise conditions were recorded as: 0 = no noise; 1 = some noise, but can hear very well; 2 = moderate noise with distant birds tough to hear, but can still hear within 200 meters; 3 = loud noise affecting ability to detect most birds; and 4 = very loud stream or other noise making it difficult to hear anything at all. No surveys were conducted during sky conditions of 4-6, wind conditions of 4 or 5, or noise conditions of 4.

Storage & Availability of Data

All Flammulated Owl call playback survey information and locations of detections of animals during surveys or made incidentally are stored in databases at the Montana Natural Heritage Program in the Montana State Library in Helena and are made available online through the Montana Natural Heritage Program's MapViewer so that it is integrated with other survey and incidental observation data and more readily available for forest and project-level planning efforts http://mtnhp.org/mapviewer/

Results & Recommendations

We conducted a total of 128 call station surveys on 12 survey routes across the Hebgen Lake, Bozeman, Livingston, Big Timber, and Gardiner Ranger Districts (Table 2, Figures 5-18). Unfortunately, weather conditions precluded survey of focal area 4, the Flathead Pass Road on the Bozeman District in the vicinity of three previous Flammulated Owl detections (Figure 8, Tables 1 & 2), focal area 14, the North Bridger Creek Road on the Big Timber District (Figure 18), and a large portion of focal area 8 along the Main Boulder River Road on the Big Timber District (Figure 12). Four of the 12 routes surveyed overlapped spatially with routes surveyed in 2005 by the Avian Science Center (Cilimburg 2006). These include focal area 1, the Upper Shields River Road on the Livingston District (Figure 5), focal area 2, the Cottonwood Creek Road on the Livingston District (Figure 6), focal area 6, the Mill Creek Road on the Livingston District (Figure 10), and focal area 10, the Storm Castle Road on the Bozeman District (Figure 14).

We failed to detect any Flammulated Owls during our surveys and only had seven detections of three owl species across all of our survey efforts: Western Screech-Owl was detected once on the Hebgen Lake District; Northern Saw-whet Owl was detected twice on the Hebgen Lake District and once on the Big Timber District; and Great Horned Owl was detected once on the Hebgen Lake District and twice on the Livingston District (Tables 2 & 3). Relatively cold weather occurred during some of our surveys; 73 (57%) of 128 call stations had start temperatures that were less than 50 ^{o}F (10 ^{o}C). However, it seems more likely that our results are simply consistent with other Flammulated Owl survey efforts on the Custer Gallatin National Forest that failed to detect the species during time periods when they should have been detectable (Brelsford 1992, Cilimburg 2006). Given these survey results, the small number of records reported for the species east of the upper Missouri River, and only 5 observation records in 3 widespread locations on the Bozeman, Livingston, and Hebgen Lake Districts (MBDC 2012, MTNHP 2016, Figures 1-3, Table 1), it seems likely that the species is either largely absent or occurs at very low densities on these districts. We recommend that future surveys only be conducted in areas where forest management projects are being considered in highly suitable Flammulated Owl habitat.

During the course of our surveys we detected three Montana Species of Concern: 3 observations of Western Toad; 3 observations of Great Blue Heron, 1 observation of Brewer's Sparrow (Table 2, Appendix A). We also detected two Potential Montana Species of Concern: 1 observation of Western Screech-Owl and 1 observation of Silver-haired Bat (Table 2, Appendix A). Finally, we recorded 97 additional observations of 42 species that are not Montana Species of Concern (Tables 2 & 3).

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Figure 1. Administrative units on the Hebgen Lake, Bozeman, Livingston, Big Timber, and Gardiner Districts of the Custer Gallatin National Forest.

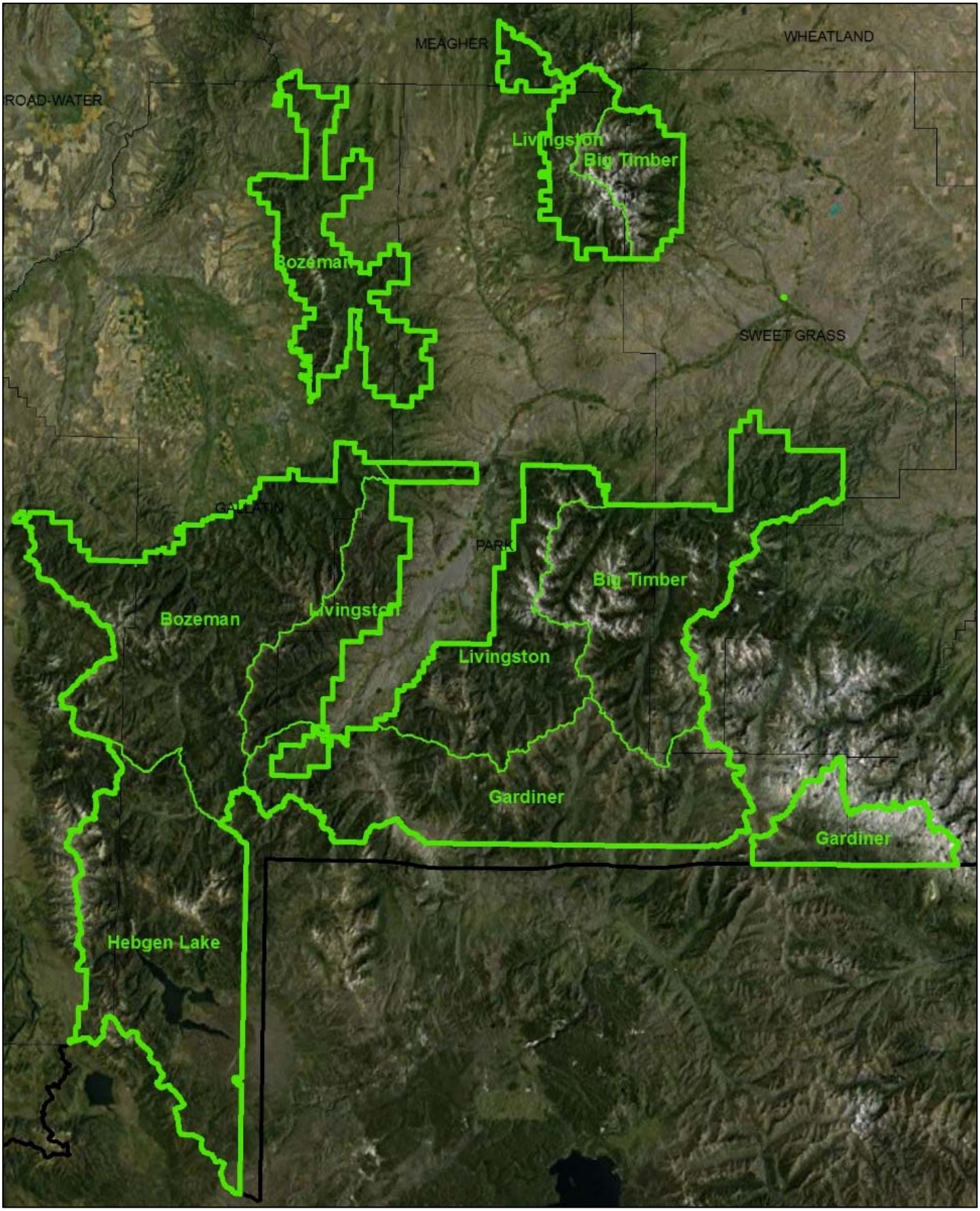

Figure 2. Statewide Flammulated Owl observations (yellow stars), call surveys conducted prior to 2013 by others (blue circles), and call surveys conducted in 2013 by the Montana Natural Heritage Program (red circles) statewide.

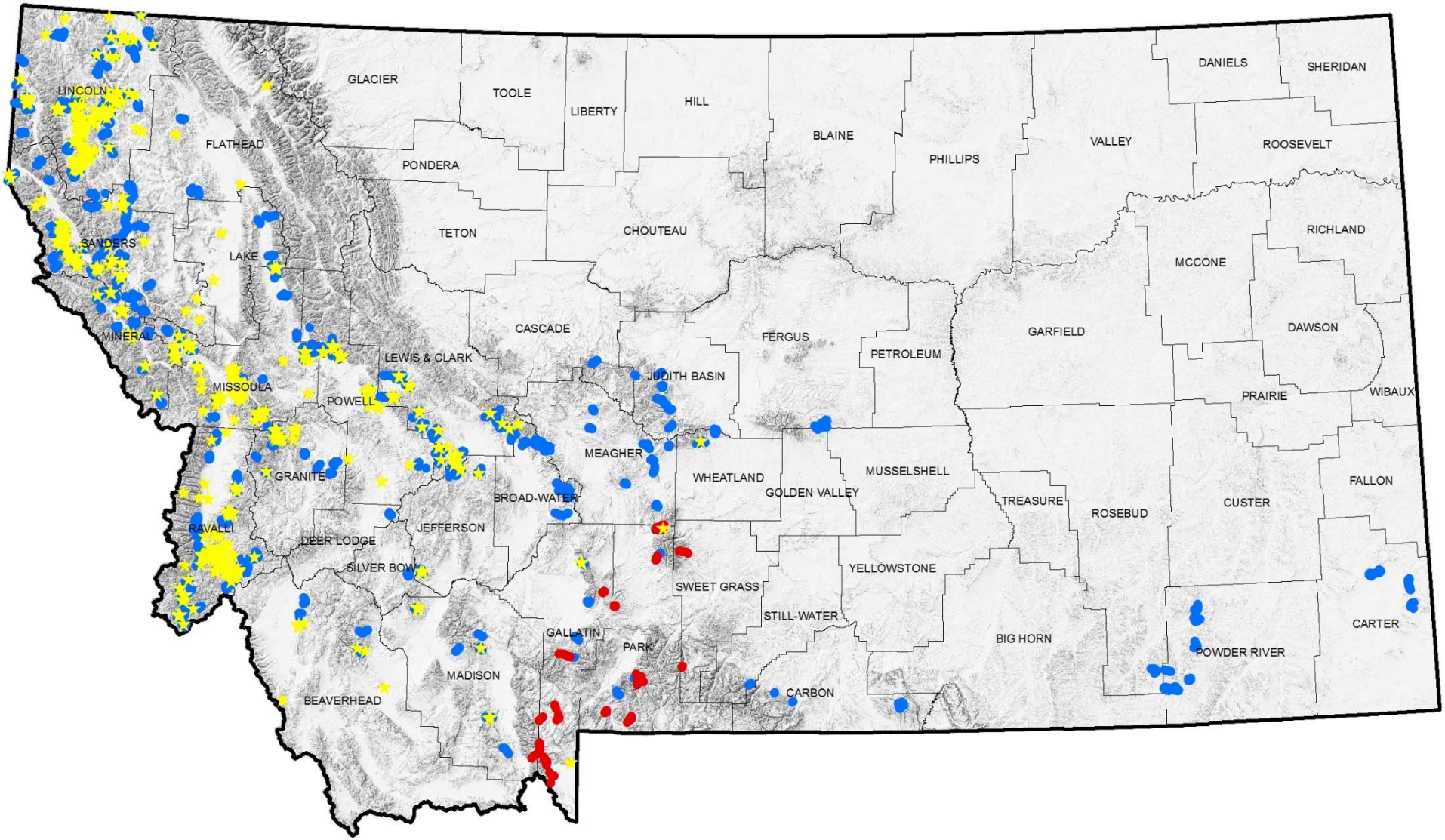

Figure 3. Flammulated Owl observations (yellow stars), call surveys conducted prior to 2013 by others (blue circles), and call surveys conducted in 2013 by the Montana Natural Heritage Program (red circles) on the Hebgen Lake, Bozeman, Livingston, Big Timber, and Gardiner Ranger Districts.

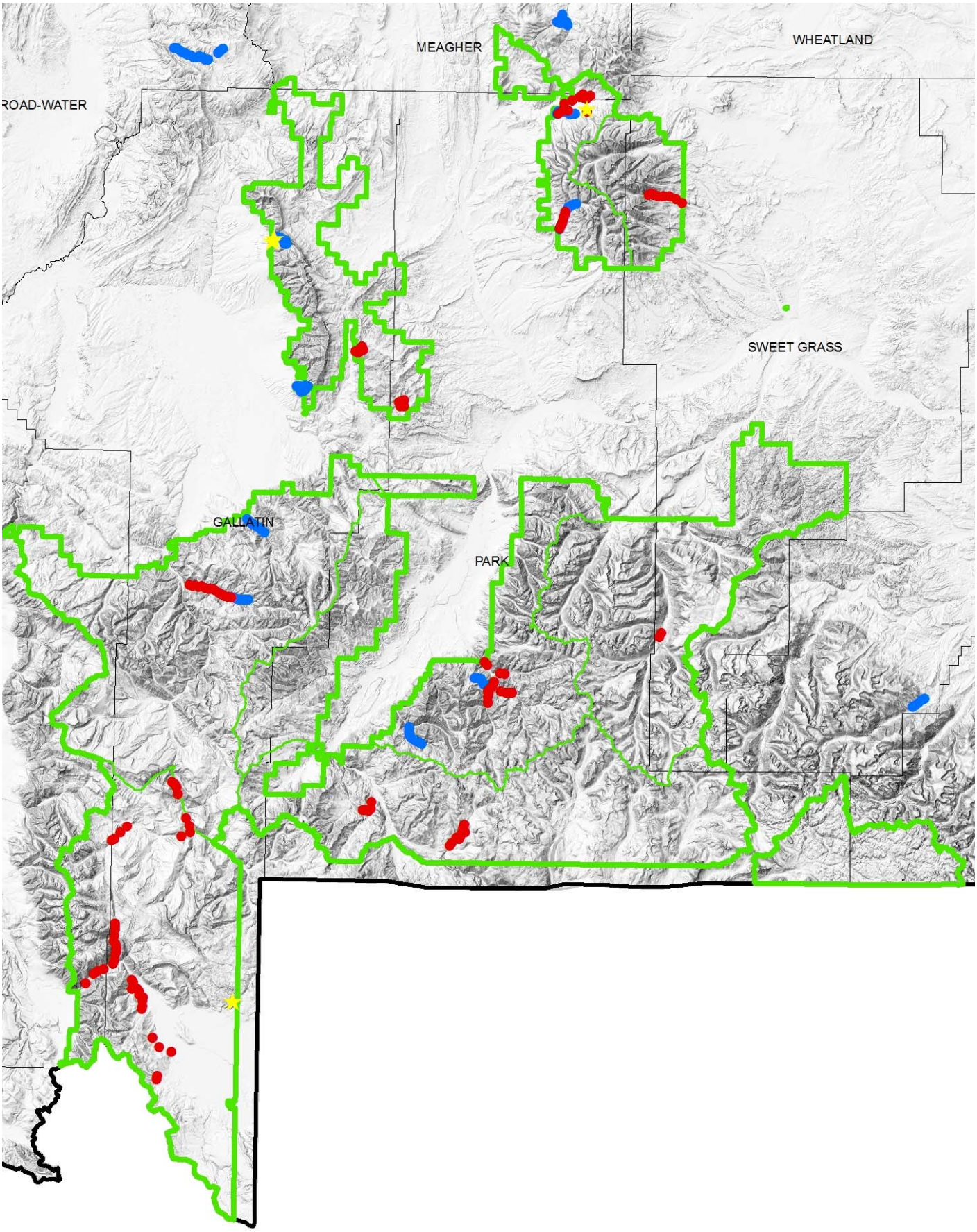

Figure 4. Focal survey areas identified across the the Hebgen Lake, Bozeman, Livingston, Big Timber, and Gardiner Ranger Districts (purple stars). Primary habitat within 500 meters of a road (dark green), primary habitat more than 500 meters from a road (light green), secondary habitat within 500 meters of a road (dark orange), and secondary habitat more than 500 meters from a road (light orange).

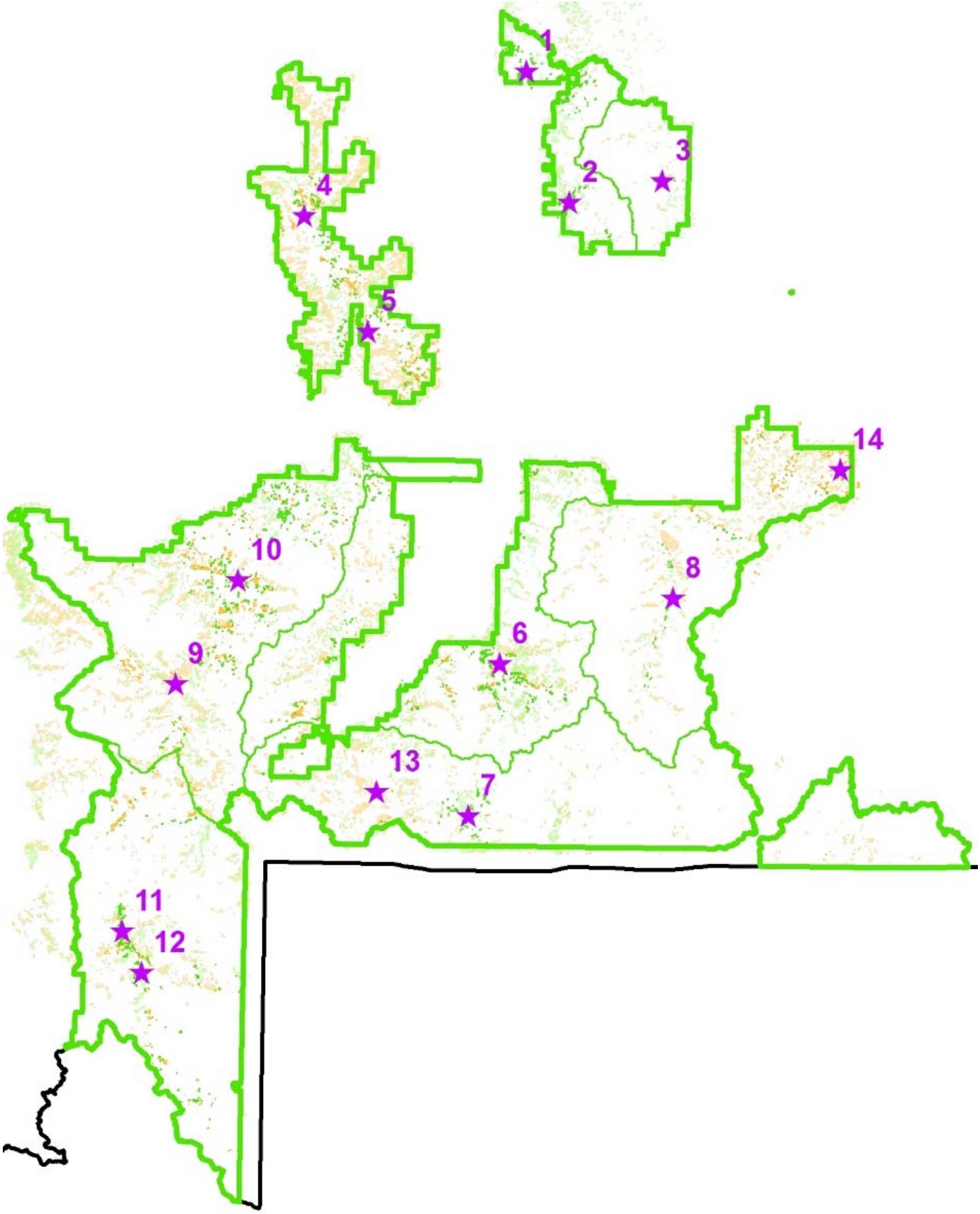

Figure 5. Focal survey area 1, Upper Sixteen Mile Road and Shields River Road on the Livingston District. Flammulated Owl observations (yellow star), call surveys conducted prior to 2013 by others (blue circles), and call surveys conducted in 2013 by the Montana Natural Heritage Program (red circles). Primary habitat within 500 meters of a road (dark green), primary habitat more than 500 meters from a road (light green), secondary habitat within 500 meters of a road (dark orange), and secondary habitat more than 500 meters from a road (light orange).

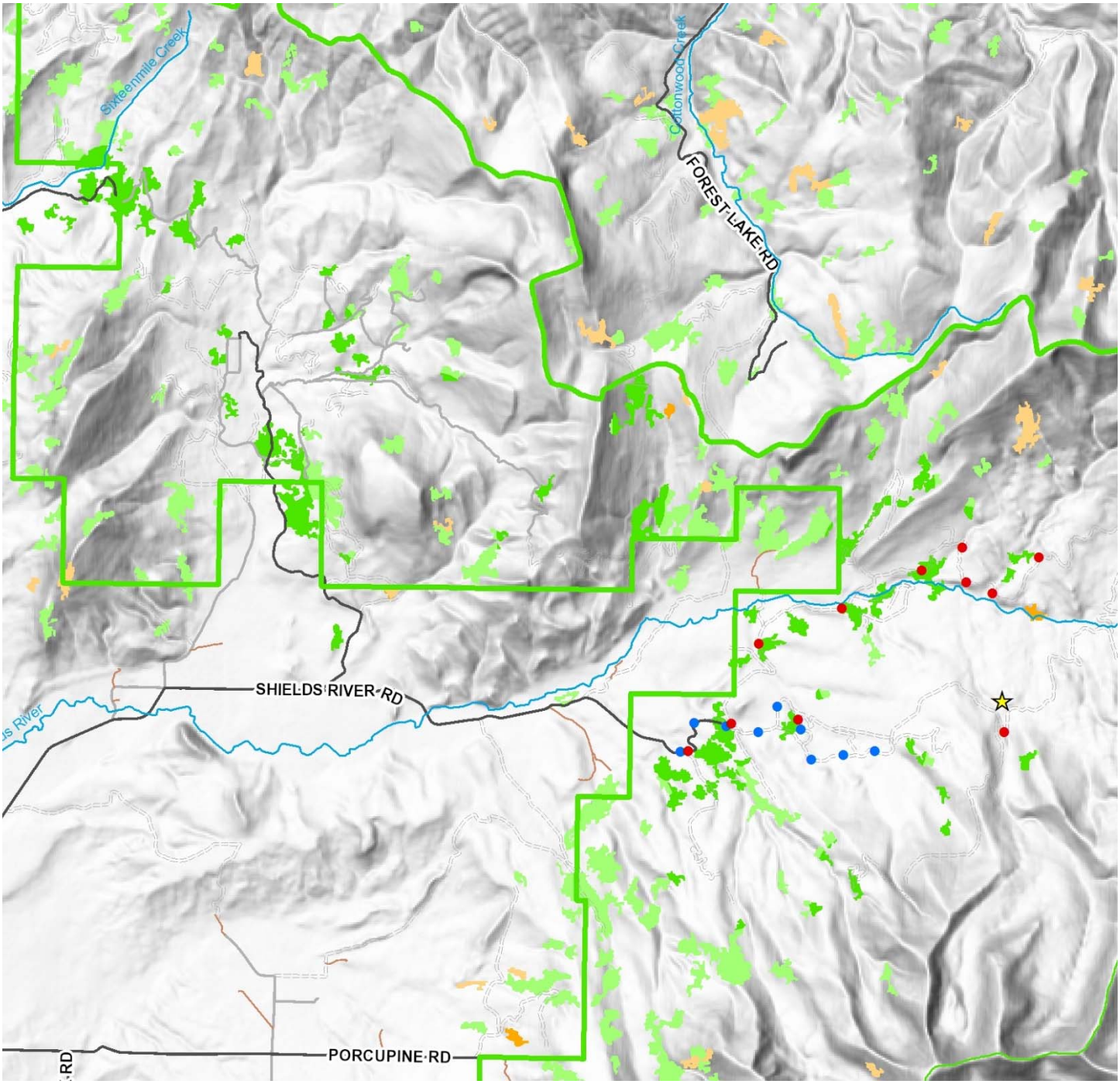

Figure 6. Focal survey area 2, Cottonwood Creek and Rock Creek Roads on the Livingston District. Call surveys conducted prior to 2013 by others (blue circles), and call surveys conducted in 2013 by the Montana Natural Heritage Program (red circles). Primary habitat within 500 meters of a road (dark green), primary habitat more than 500 meters from a road (light green), secondary habitat within 500 meters of a road (dark orange), and secondary habitat more than 500 meters from a road (light orange).

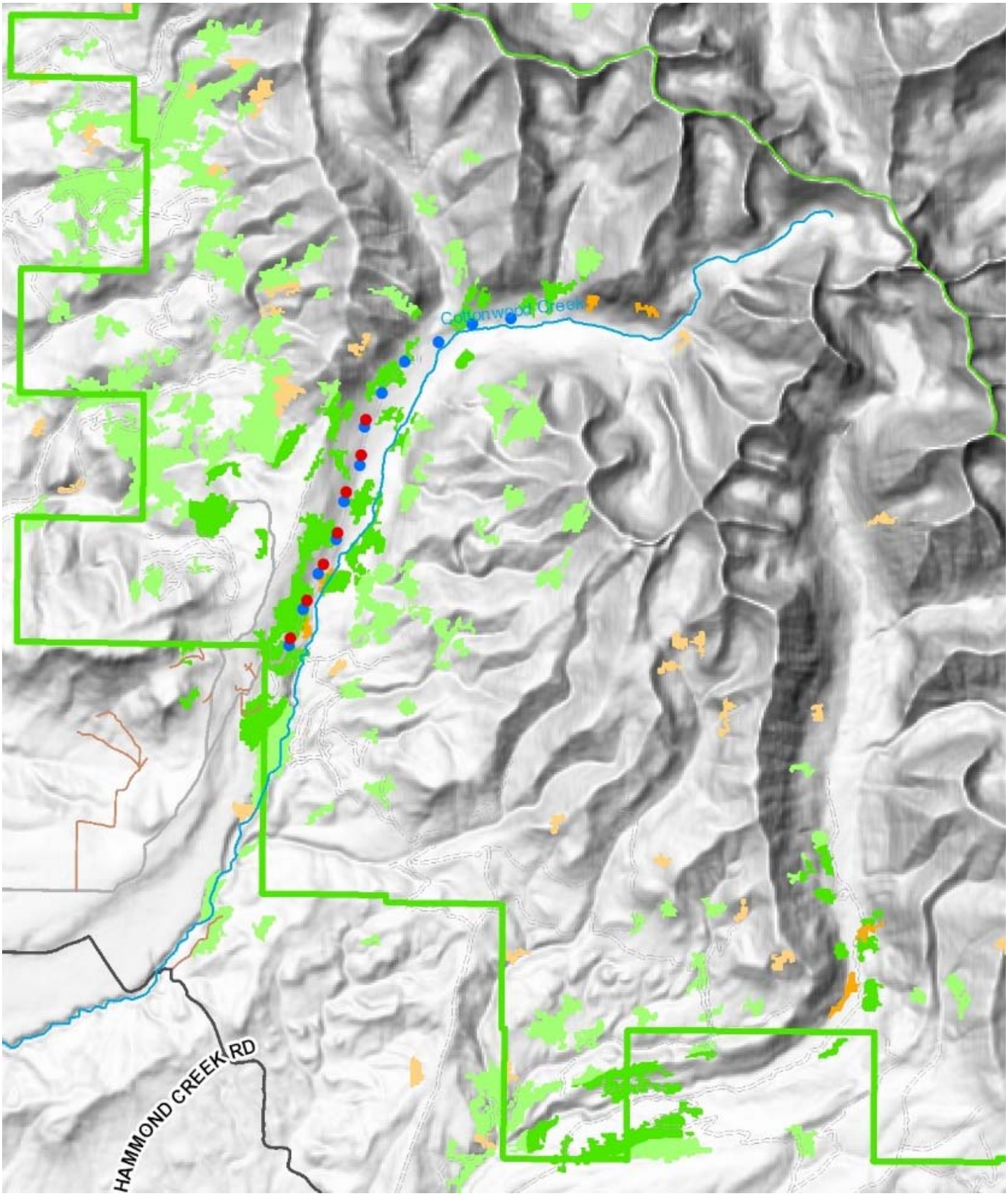

Figure 7. Focal survey area 3, Big Timber Creek Road on the Big Timber District. Flammulated Owl call surveys conducted in 2013 by the Montana Natural Heritage Program (red circles). Primary habitat within 500 meters of a road (dark green), primary habitat more than 500 meters from a road (light green), secondary habitat within 500 meters of a road (dark orange), and secondary habitat more than 500 meters from a road (light orange).

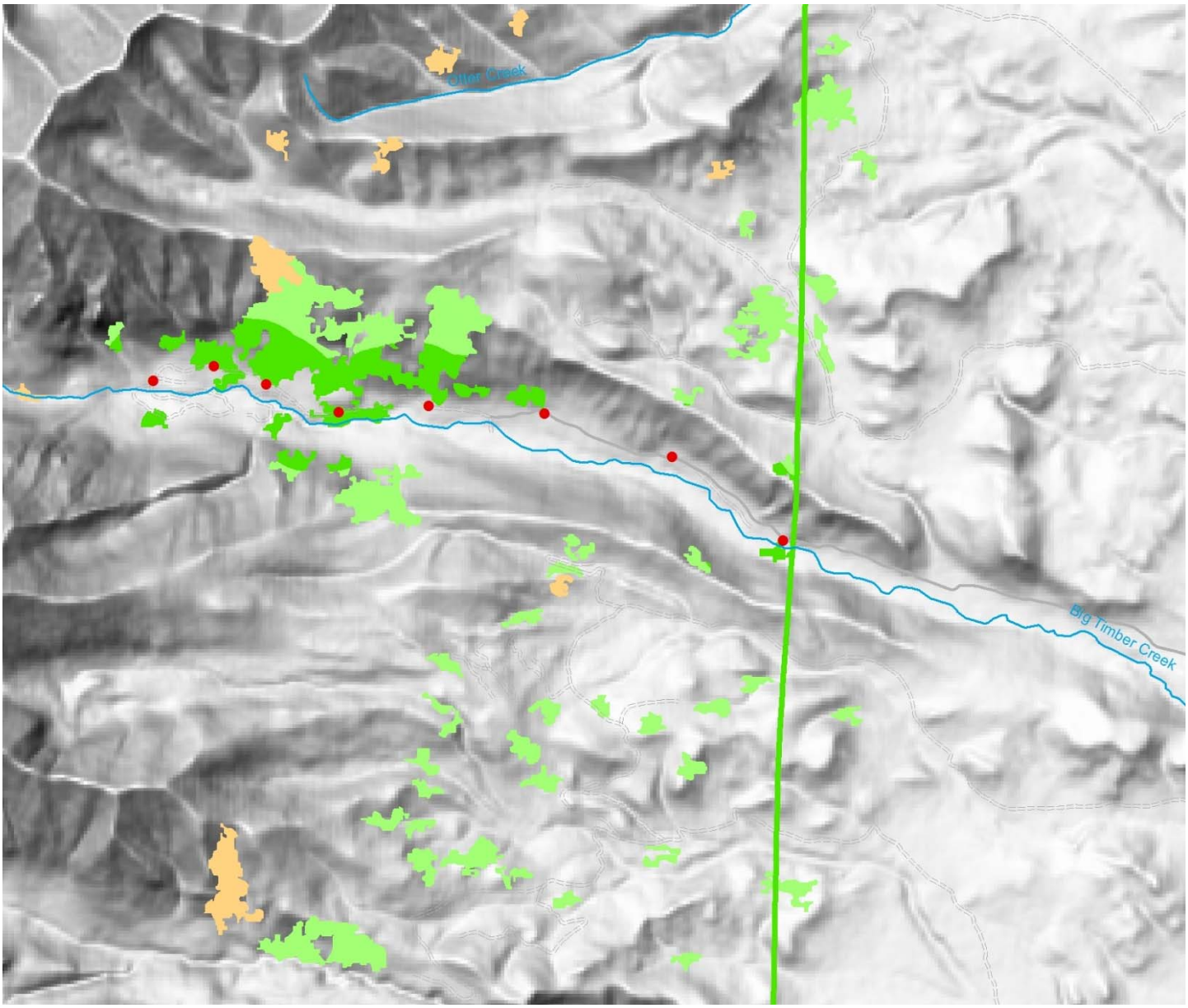

Figure 8. Focal survey area 4, Flathead Pass Road on the Bozeman District. Flammulated Owl observations (yellow star) and call surveys conducted prior to 2013 by others (blue circles). Call surveys were not conducted in 2013 by the Montana Natural Heritage Program due to a storm. Primary habitat within 500 meters of a road (dark green), primary habitat more than 500 meters from a road (light green), secondary habitat within 500 meters of a road (dark orange), and secondary habitat more than 500 meters from a road (light orange).

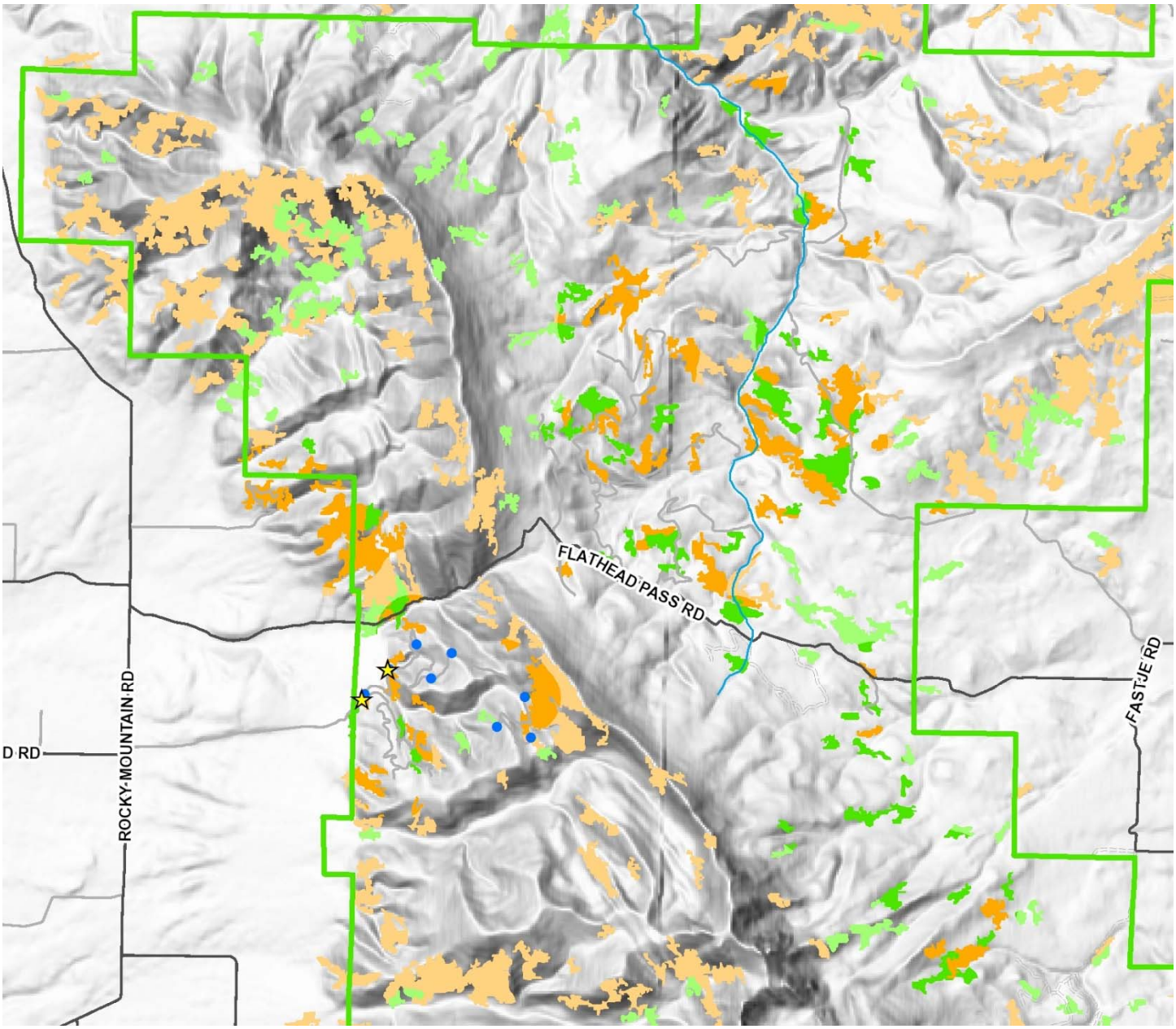

Figure 9. Focal survey area 5, Bridger Canyon, Bracken Creek, and Jackson Creek Roads on the Bozeman District. Flammulated Owl call surveys conducted in 2013 by the Montana Natural Heritage Program (red circles). Primary habitat within 500 meters of a road (dark green), primary habitat more than 500 meters from a road (light green), secondary habitat within 500 meters of a road (dark orange), and secondary habitat more than 500 meters from a road (light orange).

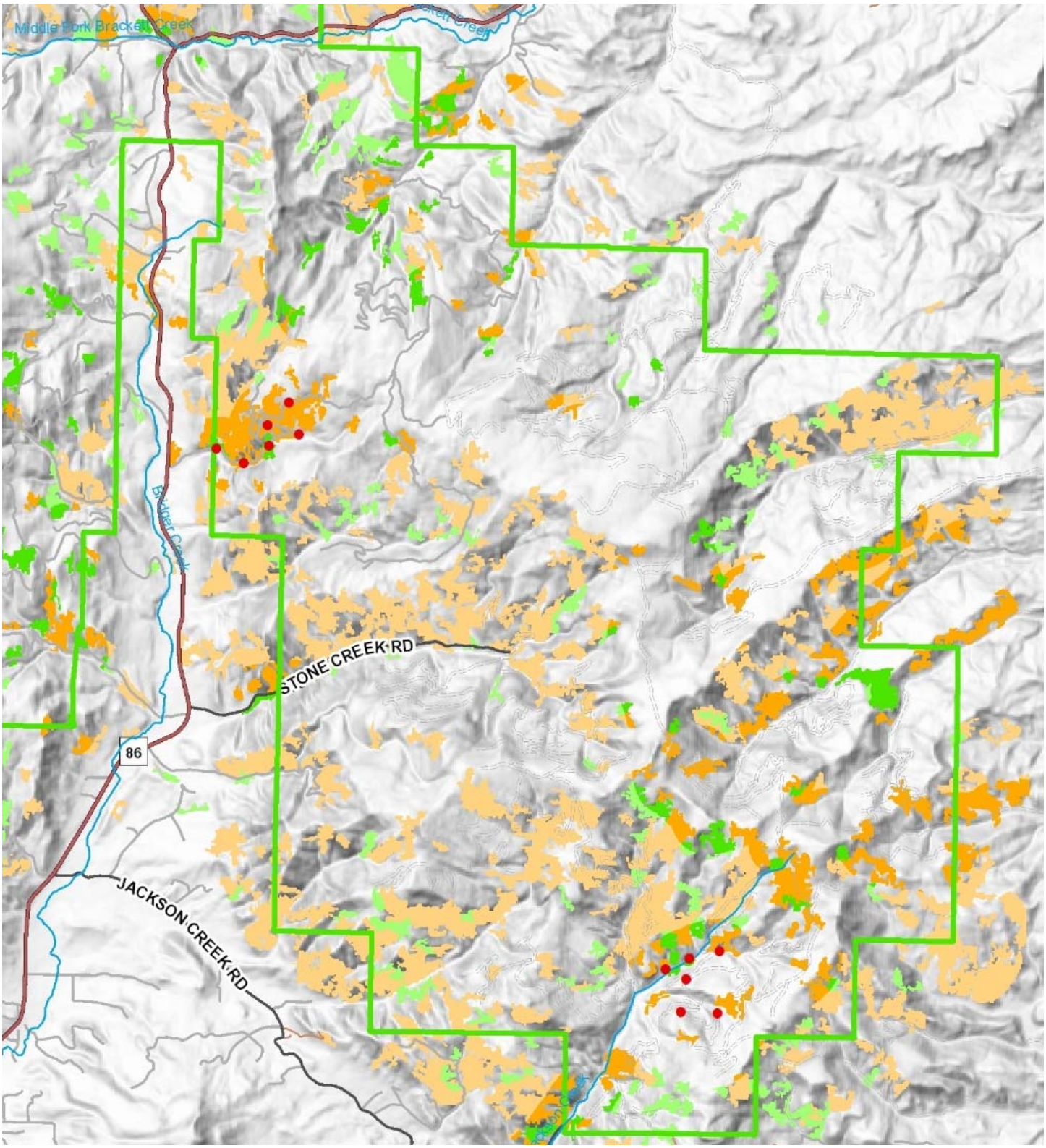

Figure 10. Focal survey area 6, Mill Creek Road on the Livingston District. Flammulated Owl call surveys conducted prior to 2013 by others (blue circles) and call surveys conducted in 2013 by the Montana Natural Heritage Program (red circles). Primary habitat within 500 meters of a road (dark green), primary habitat more than 500 meters from a road (light green), secondary habitat within 500 meters of a road (dark orange), and secondary habitat more than 500 meters from a road (light orange).

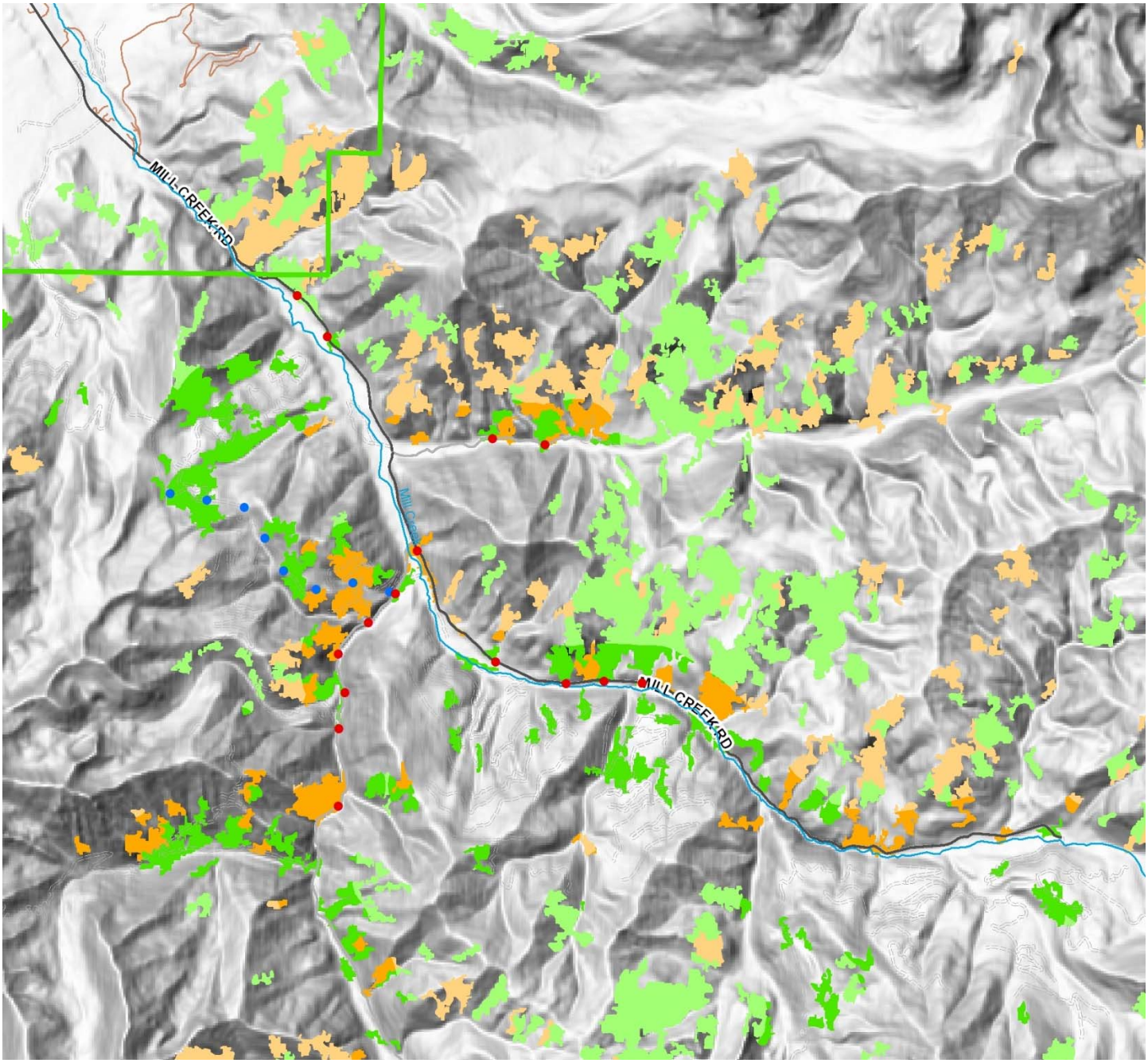

Figure 11. Focal survey area 7, Jardine Road along Bear Creek on the Gardiner District. Flammulated Owl call surveys conducted in 2013 by the Montana Natural Heritage Program (red circles). Primary habitat within 500 meters of a road (dark green), primary habitat more than 500 meters from a road (light green), secondary habitat within 500 meters of a road (dark orange), and secondary habitat more than 500 meters from a road (light orange).

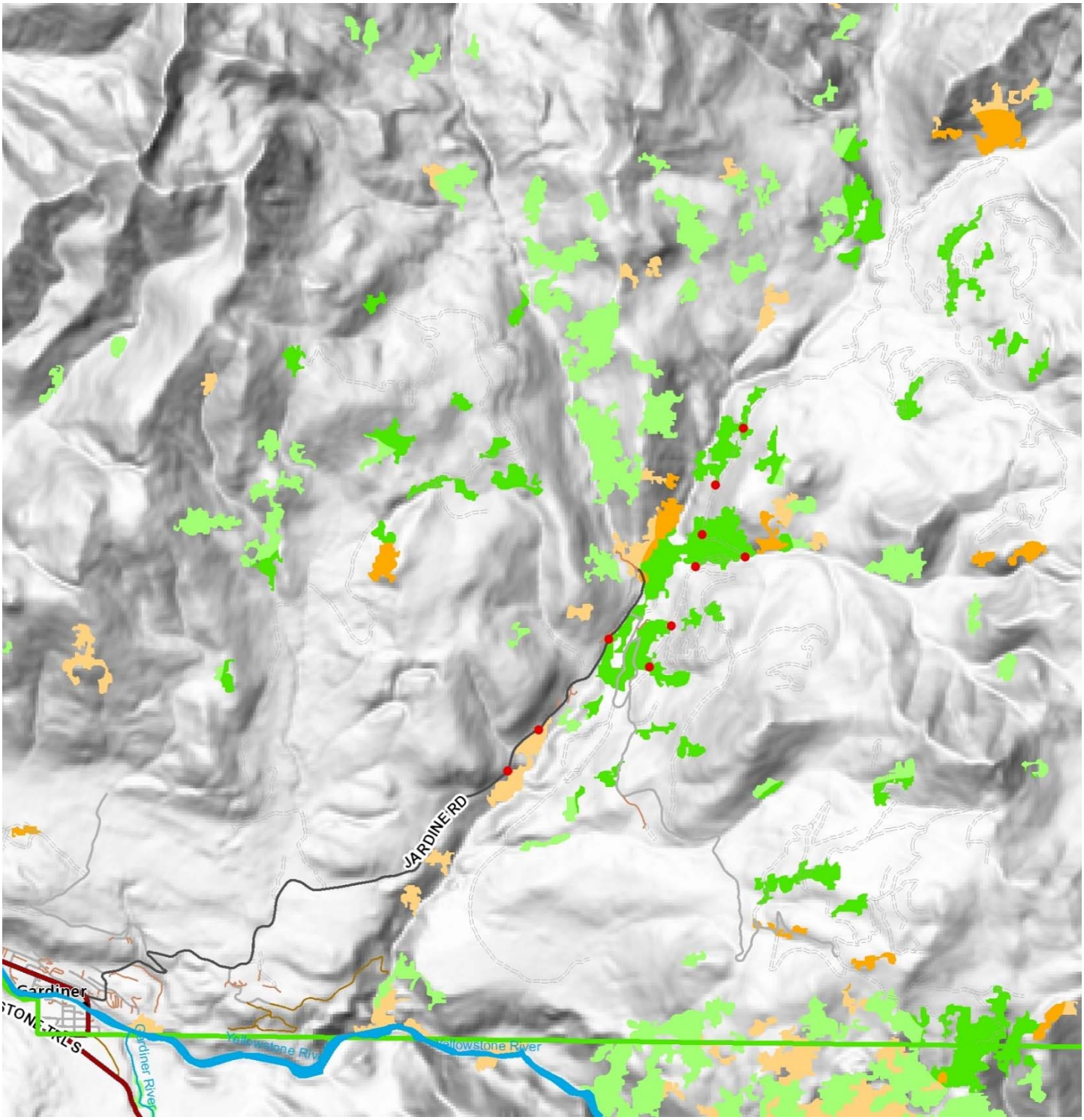

Figure 12. Focal survey area 8, Main Boulder River Road on the Big Timber District. Flammulated Owl call surveys conducted in 2013 by the Montana Natural Heritage Program (red circles). Surveys were terminated early as a result of high winds. Primary habitat within 500 meters of a road (dark green), primary habitat more than 500 meters from a road (light green), secondary habitat within 500 meters of a road (dark orange), and secondary habitat more than 500 meters from a road (light orange).

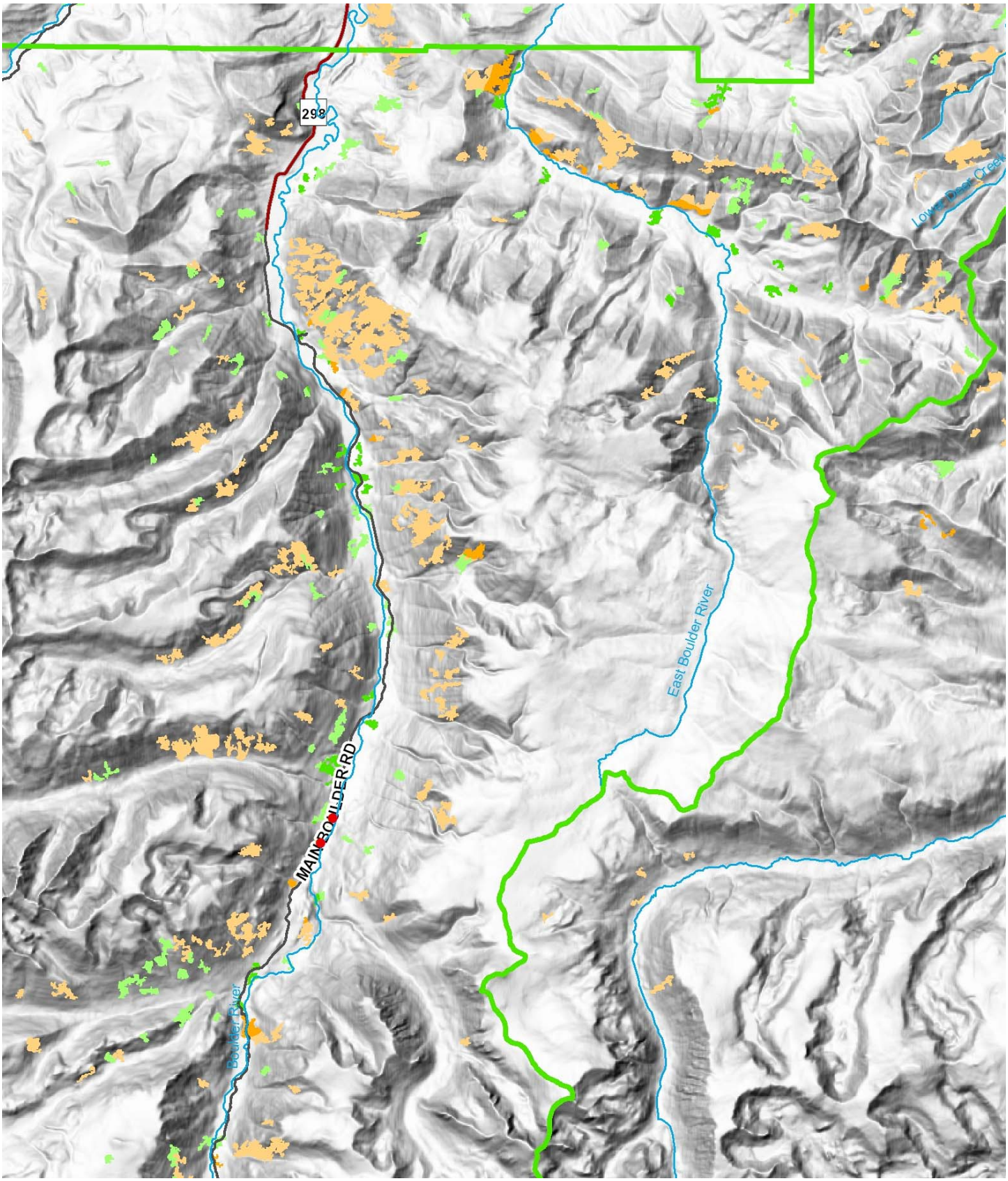

Figure 13. Focal survey area 9, Upper Gallatin River Canyon, Taylor Creek, and Big Sky Spur Roads on the Bozeman District. Flammulated Owl call surveys conducted in 2013 by the Montana Natural Heritage Program (red circles). Primary habitat within 500 meters of a road (dark green), primary habitat more than 500 meters from a road (light green), secondary habitat within 500 meters of a road (dark orange), and secondary habitat more than 500 meters from a road (light orange).

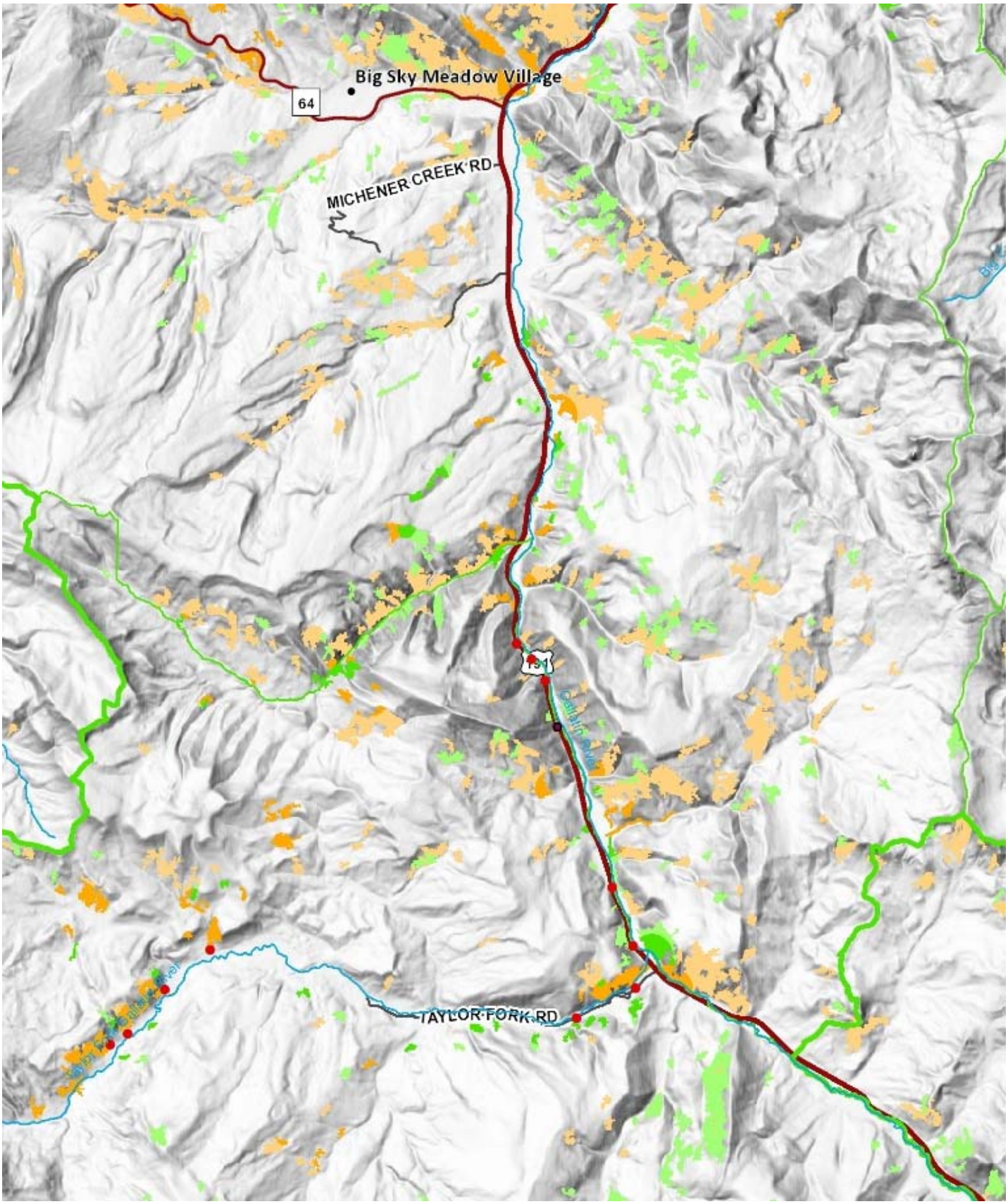

Figure 14. Focal survey area 10, Storm Castle Road on the Bozeman District. Flammulated Owl call surveys conducted prior to 2013 by others (blue circles) and call surveys conducted in 2013 by the Montana Natural Heritage Program (red circles). Primary habitat within 500 meters of a road (dark green), primary habitat more than 500 meters from a road (light green), secondary habitat within 500 meters of a road (dark orange), and secondary habitat more than 500 meters from a road (light orange).

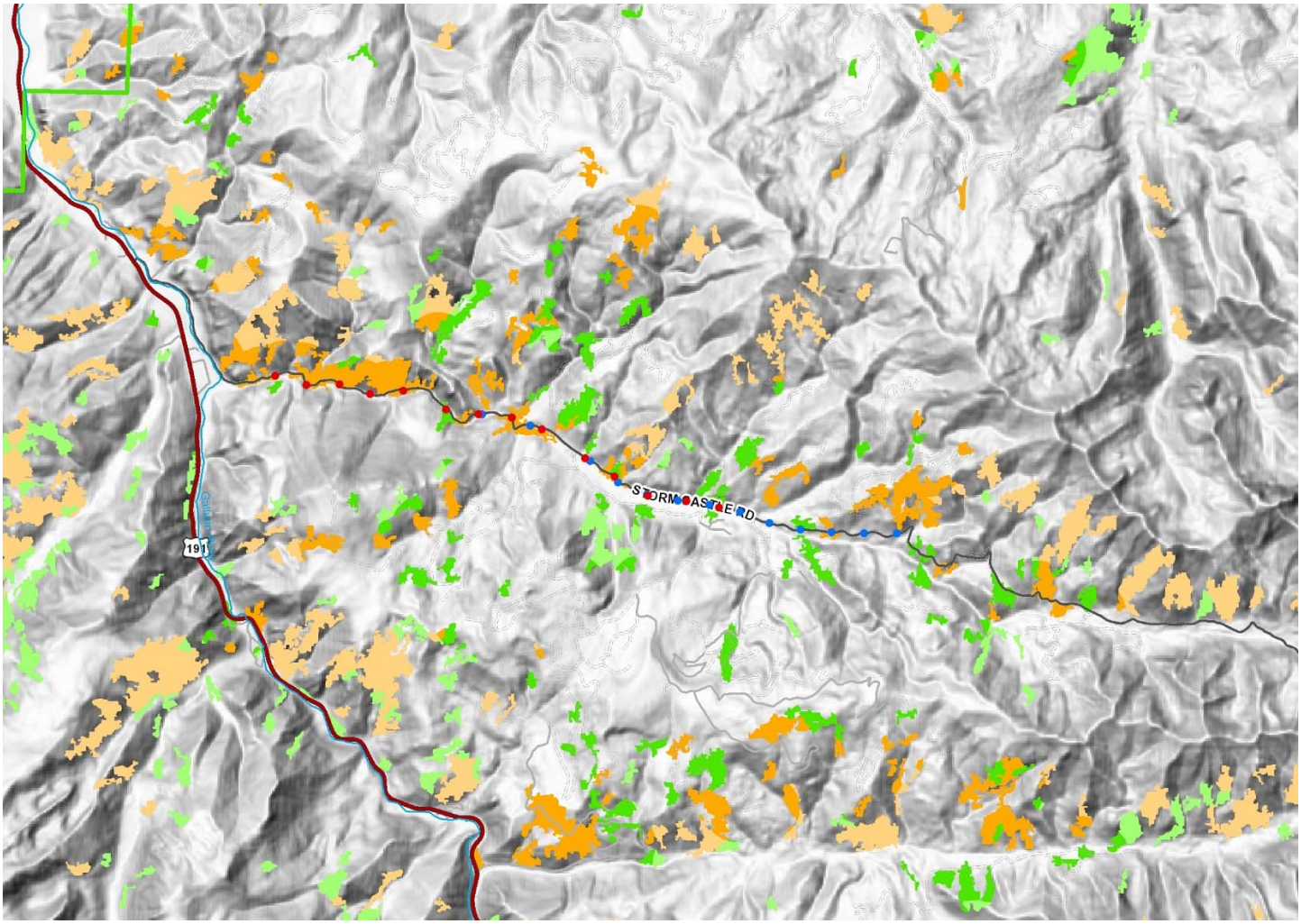

Figure 15. Focal survey area 11, Quake Lake and Beaver Creek Road on the Hebgen Lake District. Flammulated Owl call surveys conducted in 2013 by the Montana Natural Heritage Program (red circles). Primary habitat within 500 meters of a road (dark green), primary habitat more than 500 meters from a road (light green), secondary habitat within 500 meters of a road (dark orange), and secondary habitat more than 500 meters from a road (light orange).

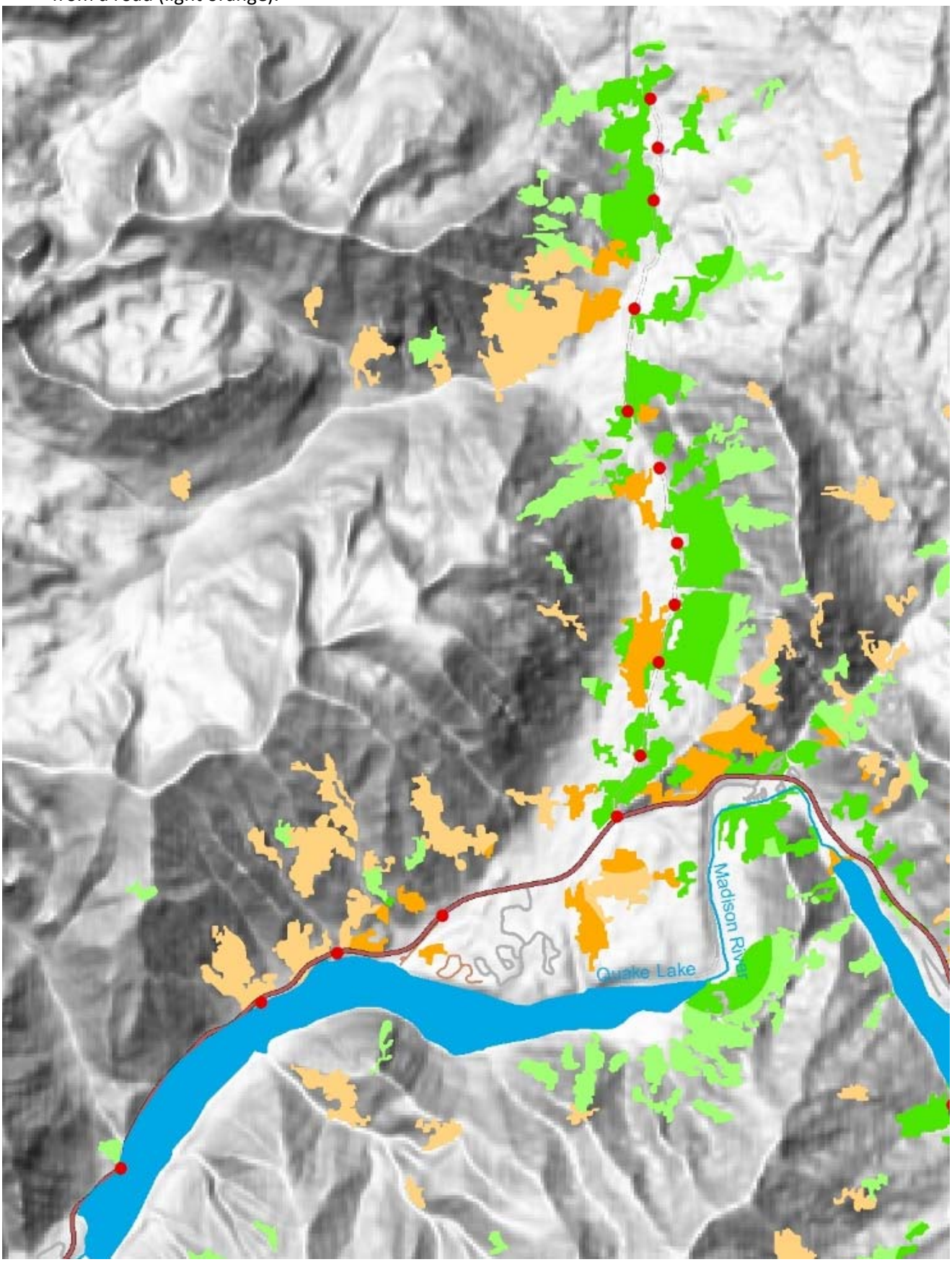

Figure 16. Focal survey area 12, south Hebgen Lake area and Denny Creek Road on Hebgen Lake District. Flammulated Owl call surveys conducted in 2013 by the Montana Natural Heritage Program (red circles). Primary habitat within 500 meters of a road (dark green), primary habitat more than 500 meters from a road (light green), secondary habitat within 500 meters of a road (dark orange), and secondary habitat more than 500 meters from a road (light orange).

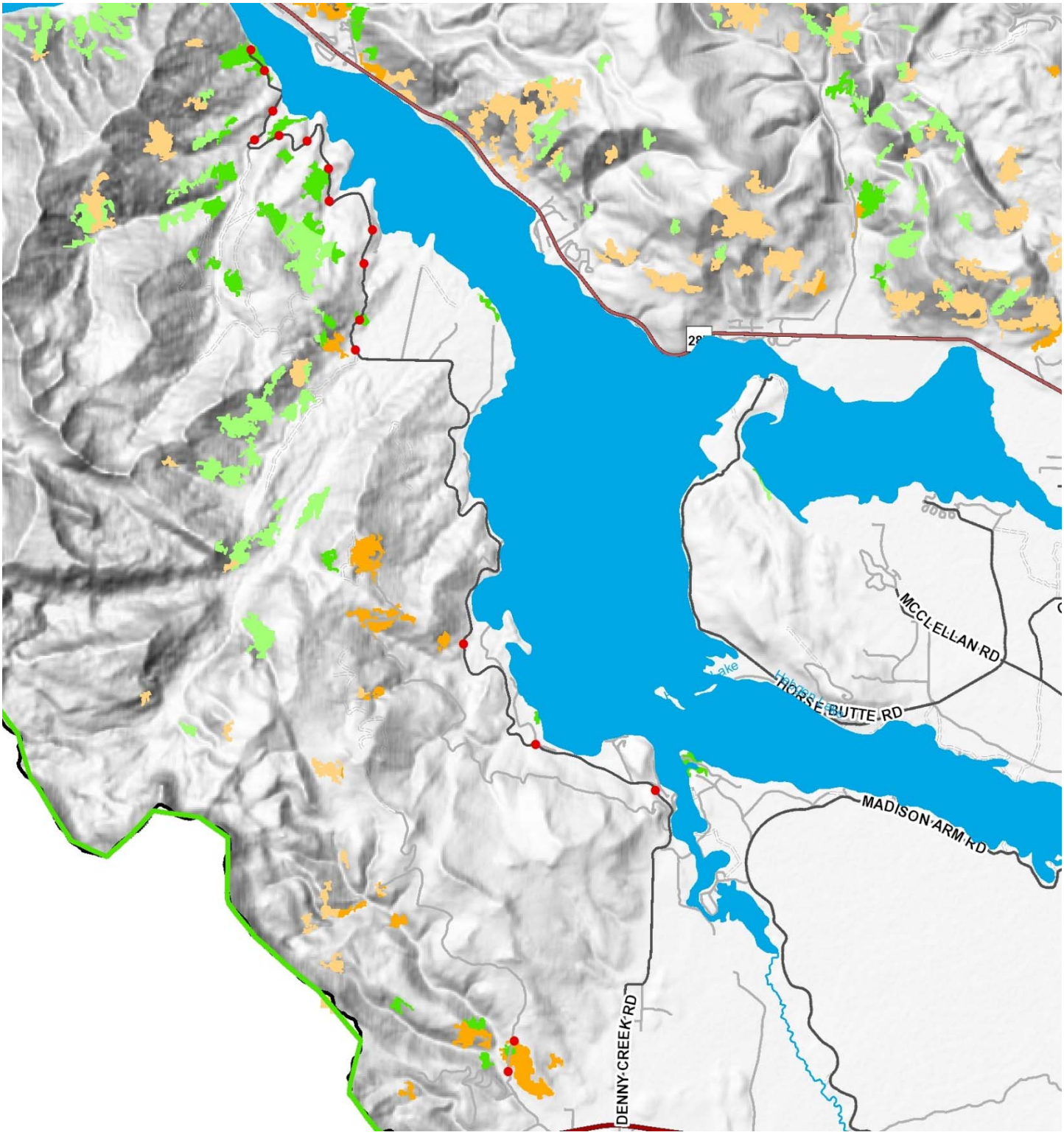

Figure 17. Focal survey area 13, Mulherin Creek and Cottonwood Creek Roads on Gardiner District. Flammulated Owl call surveys conducted in 2013 by the Montana Natural Heritage Program (red circles). Primary habitat within 500 meters of a road (dark green), primary habitat more than 500 meters from a road (light green), secondary habitat within 500 meters of a road (dark orange), and secondary habitat more than 500 meters from a road (light orange).

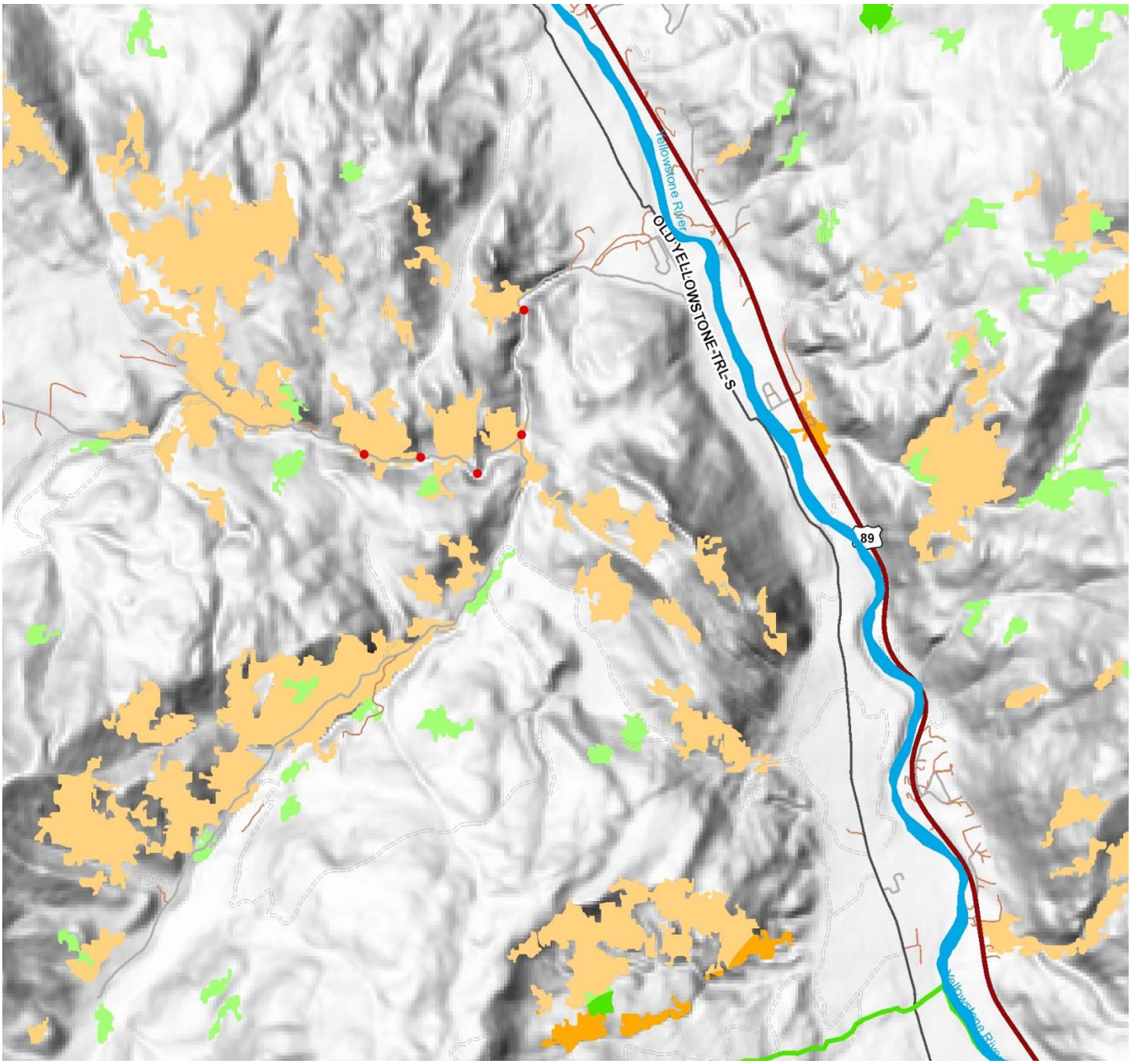

Figure 18. Focal survey area 14, North Bridger Creek Road on the Big Timber District. No Flammulated Owl call surveys were performed in 2013 due to poor weather conditions. Primary habitat within 500 meters of a road (dark green), primary habitat more than 500 meters from a road (light green), secondary habitat within 500 meters of a road (dark orange), and secondary habitat more than 500 meters from a road (light orange).

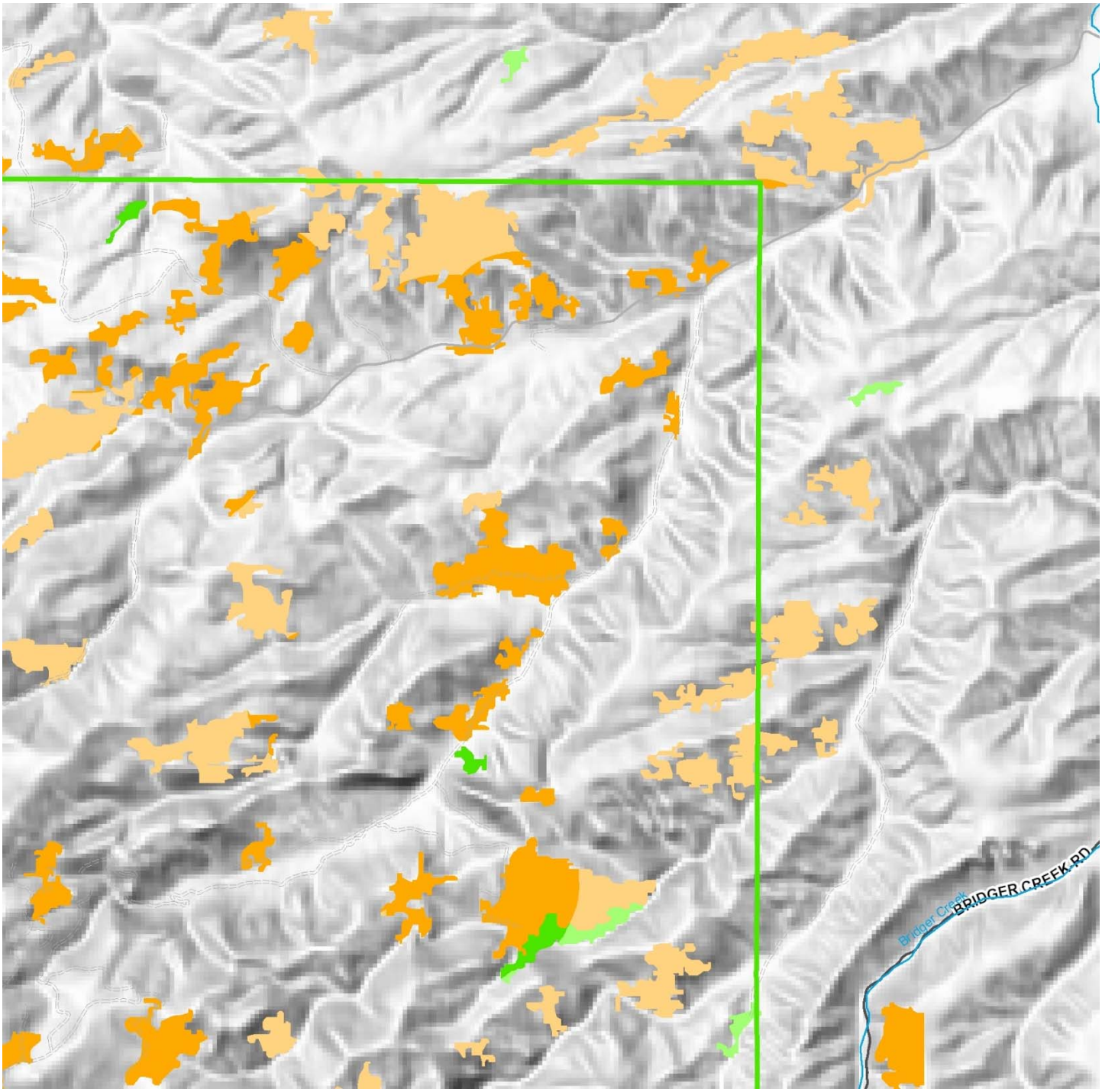

Table 1. Flammulated Owl detections on the Hebgen Lake, Bozeman, and Livingston Ranger Districts. See MBDC (2012) for descriptions of observation (obs) type.

Date Range	Location	Observer	Obs Type	Comments	No. Adults	No. Juvs
7/27/1993	Bozeman District Johnson Canyon, E of canyon mouth where road cuts ridgeline	Atkinson, Eric	B	Two begging fledglings and one adult male responded to territorial hoot from observer. Fledglings below road in dense pole/mature doug fir stand canopy 40 feet with 85% closure with vaccinium, maple and columbine understory. Male above road in open mature doug fir stand canopy 45-50 feet with 40% closure with brome, lupine and columbine understory (more details on form).	1	2
8/8/1993	Bozeman District Johnson Canyon, E of canyon mouth where road cuts ridgeline	Atkinson, Eric	b	Observer reports a male owl 'sang one complete song' during visit to measure habitat for observations of 7/27 (Bird_ID 18824 and 407853). Fledglings below road in dense pole/mature doug fir stand - canopy 40 feet with 85% closure - with vaccinium, maple and columbine understory. Male above road in open mature doug fir stand - canopy 45-50 feet with 40% closure - with brome, lupine and columbine understory (more details on form for 7/27).	1	0
7/27/1993	Bozeman District Johnson Canyon, W of canyon mouth	Atkinson, Eric	B	One begging fledgling and one adult male responded to territorial hoot from observer. Fledgling in thick, mature doug fir stand - canopy 40 feet with 70% closure - with houndstongue, brome, timothy and aster ground cover. Male in open meadow ringed by mature, tall doug fir - canopy 75 feet with 15% closure - with mixed grass/forb ground cover (more details on form).	1	1
6/2/1992	Livingston District Buck Creek area, Upper Shields River	Fouse, Fred	t	Two birds observed.	2	0
7/7/1994	Hebgen Lake District Landbird Monitoring Program PointID 6009	Avian Science Center	b	Species observation data gathered by Avian Science Center during standard 10-minute point count survey with trained observers. See Avian Science Center website for details on methodology at http://avianscience.dbs.umt.edu/	1	0

Table 2. Summary of Flammulated Owl Call survey efforts, owl, and other species detections on the Hebgen Lake, Bozeman, Livingston, Big Timber, and Gardiner Ranger Districts in 2013 by the Montana Natural Heritage Program.

Ranger District	No. Call Stations Surveyed Prior to 2013	No. Call Stations Surveyed in 2013	No. Flammulated Owl Detections Across all Years	No. Owl Species Detected in 2013	No. of other Species Detected in 2013	Total No. of Animal Observations in 2013
Hebgen Lake	0	44	1	3	42	97
Bozeman	44	26	3	0	0	0
Livingston	38	33	1	1	1	4
Big Timber	0	10	0	1	0	1
Gardiner	0	15	0	0	4	4

Table 3. Species detected, and numbers of unique spatial observations, on the Big Timber, Gardiner, Hebgen Lake, and Livingston Districts during 2013. Observations include those made during the Flammulated Owl call surveys as well as those made incidentally whle in the area. The table is sorted first by Montana Species of Concern (SOC) and Potential Species of Concern (PSOC), then taxonomically. See Appendix A for Montana status and statre rank definitions.

Big Timber District

Montana Status	Common Name	Scientific Name	State Rank	Number of Observations
	Northern Saw-whet Owl	*Aegolius acadicus*	S4	1

Gardiner District

Montana Status	Common Name	Scientific Name	State Rank	Number of Observations
	Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	S5B	1
	American Robin	*Turdus migratorius*	S5B	1
	Warbling Vireo	*Vireo gilvus*	S5B	1
	White-crowned Sparrow	*Zonotrichia leucophrys*	S5B	1

Hebgen Lake District

Montana Status	Common Name	Scientific Name	State Rank	Number of Observations
SOC	Western Toad	*Anaxyrus boreas*	S2	3
SOC	Great Blue Heron	*Ardea herodias*	S3	3
SOC	Brewer's Sparrow	*Spizella breweri*	S3B	1
PSOC	Western Screech-Owl	*Megascops kennicottii*	S3S4	1
PSOC	Silver-haired Bat	*Lasionycteris noctivagans*	S4	1
	Boreal Chorus Frog	*Pseudacris maculata*	S4	2
	Osprey	*Pandion haliaetus*	S5B	2
	Red-tailed Hawk	*Buteo jamaicensis*	S5B	1
	Spotted Sandpiper	*Actitis macularius*	S5B	2
	Wilson's Snipe	*Gallinago delicata*	S5	2
	Great Horned Owl	*Bubo virginianus*	S5	1
	Northern Saw-whet Owl	*Aegolius acadicus*	S4	2
	Common Nighthawk	*Chordeiles minor*	S5B	1
	Calliope Hummingbird	*Selasphorus calliope*	S5B	1
	Northern Flicker	*Colaptes auratus*	S5	2
	Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	S5B	2
	Barn Swallow	*Hirundo rustica*	S5B	1
	Mountain Chickadee	*Poecile gambeli*	S5	2
	Red-breasted Nuthatch	*Sitta canadensis*	S5	1
	Ruby-crowned Kinglet	*Regulus calendula*	S5B	5
	Mountain Bluebird	*Sialia currucoides*	S5B	1
	Swainson's Thrush	*Catharus ustulatus*	S5B	2

	American Robin	*Turdus migratorius*	S5B	8
	Cedar Waxwing	*Bombycilla cedrorum*	S5B	1
	Warbling Vireo	*Vireo gilvus*	S5B	5
	Yellow Warbler	*Setophaga petechia*	S5B	2
	Yellow-rumped Warbler	*Setophaga coronata*	S5B	7
	Western Tanager	*Piranga ludoviciana*	S5B	3
	Chipping Sparrow	*Spizella passerina*	S5B	6
	Vesper Sparrow	*Pooecetes gramineus*	S5B	1
	Savannah Sparrow	*Passerculus sandwichensis*	S5B	1
	Song Sparrow	*Melospiza melodia*	S5B	1
	White-crowned Sparrow	*Zonotrichia leucophrys*	S5B	2
	Dark-eyed Junco	*Junco hyemalis*	S5B	4
	Western Meadowlark	*Sturnella neglecta*	S5B	1
	Brown-headed Cowbird	*Molothrus ater*	S5B	1
	Pine Siskin	*Spinus pinus*	S5	3
	Myotis Spp	*Myotis Spp.*	SNR	2
	Big Brown Bat	*Eptesicus fuscus*	S4	1
	Red Squirrel	*Tamiasciurus hudsonicus*	S5	3
	Northern Pocket Gopher	*Thomomys talpoides*	S5	1
	Elk	*Cervus canadensis*	S5	1
	Terrestrial Gartersnake	*Thamnophis elegans*	S5	1
	Mourning Cloak	*Nymphalis antiopa*	S5	1

Livingston District

Montana Status	Common Name	Scientific Name	State Rank	Number of Observations
	Great Horned Owl	*Bubo virginianus*	S5	2
	Common Nighthawk	*Chordeiles minor*	S5B	2

APPENDIX A.

HERITAGE PROGRAM RANKS:

DEFINITIONS FOR GLOBAL AND STATE CONSERVATION STATUS RANKS AND MONTANA SPECIES OF CONCERN AND POTENTIAL SPECIES OF CONCERN

Heritage Program Ranks

The international network of Natural Heritage Programs employs a standardized ranking system to denote global (range-wide) and state status. Species are assigned numeric ranks ranging from 1 to 5, reflecting the relative degree to which they are "at-risk". Rank definitions are given below. A number of factors are considered in assigning ranks — the number, size and distribution of known "occurrences" or populations, population trends (if known), habitat sensitivity, and threat. Factors in a species' life history that make it especially vulnerable are also considered (e.g., dependence on a specific pollinator).

GLOBAL RANK DEFINITIONS (NatureServe 2003)

G1 Critically imperiled because of extreme rarity and/or other factors making it highly vulnerable to extinction

G2 Imperiled because of rarity and/or other factors making it vulnerable to extinction

G3 Vulnerable because of rarity or restricted range and/or other factors, even though it maybe abundant at some of its locations

G4 Apparently secure, though it may be quite rare in parts of its range, especially at the periphery

G5 Demonstrably secure, though it may be quite rare in parts of its range, especially at the periphery

T1-5 Infraspecific Taxon (trinomial) —The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank

STATE RANK DEFINITIONS

S1 At high risk because of extremely limited and potentially declining numbers, extent and/or habitat, making it highly vulnerable to extirpation in the state

S2 At risk because of very limited and potentially declining numbers, extent and/or habitat, making it vulnerable to extirpation in the state

S3 Potentially at risk because of limited and potentially declining numbers, extent and/or habitat, even though it may be abundant in some areas

S4 Uncommon but not rare (although it may be rare in parts of its range), and usually widespread. Apparently not vulnerable in most of its range, but possibly cause for long-term concern

S5 Common, widespread, and abundant (although it may be rare in parts of its range). Not vulnerable in most of its range

COMBINATION RANKS

G#G# or S#S# Range Rank—A numeric range rank (e.g., G2G3) used to indicate uncertainty about the exact status of a taxon

QUALIFIERS

NR	Not ranked
Q	**Questionable taxonomy that may reduce conservation priority**—Distinctiveness of this entity as a taxon at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon in another taxon, with the resulting taxon having a lower-priority (numerically higher) conservation status rank
X	**Presumed Extinct**—Species believed to be extinct throughout its range. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered
H	**Possibly Extinct**—Species known from only historical occurrences, but may never-the less still be extant; further searching needed
U	**Unrankable**—Species currently unrankable due to lack of information or due to substantially conflicting information about status or trends
HYB	**Hybrid**—Entity not ranked because it represents an interspecific hybrid and not a species
?	**Inexact Numeric Rank**—Denotes inexact numeric rank
C	**Captive or Cultivated Only**—Species at present is extant only in captivity or cultivation, or as a reintroduced population not yet established
A	**Accidental**—Species is accidental or casual in Montana, in other words, infrequent and outside usual range. Includes species (usually birds or butterflies) recorded once or only a few times at a location. A few of these species may have bred on the one or two occasions they were recorded
Z	**Zero Occurrences**—Species is present but lacking practical conservation concern in Montana because there are no definable occurrences, although the taxon is native and appears regularly in Montana
P	**Potential**—Potential that species occurs in Montana but no extant or historic occurrences are accepted
R	**Reported**—Species reported in Montana but without a basis for either accepting or rejecting the report, or the report not yet reviewed locally. Some of these are very recent discoveries for which the program has not yet received first-hand information; others are old, obscure reports
SYN	**Synonym**—Species reported as occurring in Montana, but the Montana Natural Heritage Program does not recognize the taxon; therefore the species is not assigned a rank
*	A rank has been assigned and is under review. Contact the Montana Natural Heritage Program for assigned rank
B	**Breeding**—Rank refers to the breeding population of the species in Montana
N	**Nonbreeding**—Rank refers to the non-breeding population of the species in Montana

MONTANA ANIMAL SPECIES OF CONCERN

Montana Animal Species of Concern are native Montana animals that are considered to be "at risk" due to declining population trends, threats to their habitats, and/or restricted distribution. Montana Species of Concern are defined as vertebrate animals with a state rank of S1, S2, or S3. Because documentation for invertebrates is typically less complete than for vertebrates, only those ranked S1 or S2 are included as SOC. Invertebrates with a range rank extending below S2 (e.g., S2S3) are included as SOC only if their global ranks are G2G3 or G3, or if experts agree their occurrence in Montana has been adequately documented.

MONTANA ANIMAL SPECIES OF POTENTIAL CONCERN

Montana Potential Animal Species of Concern are animals for which current, often limited, information suggests potential vulnerability or for which additional data are needed before an accurate status assessment can be made. Vertebrate species with a rank indicating uncertainty (SU), a "range rank" extending below the S3 cutoff (e.g., S3S4), or those ranked S4 for which there is limited baseline information on status are considered Potential Species of Concern. Invertebrates of concern with global ranks other than G1, G2, or G3 and with state ranks below S2 or range ranks extending below S2 (e.g., S3S4) are treated as Potential Species of Concern.