SPOTTED OWL SURVEYS IN THE CEDAR RIVER WATERSHED

2008 Surveys

Seattle Public Utilities
Cedar River Watershed
King County, Washington

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RAEDEKE ASSOCIATES, INC.

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TABLE OF CONTENTS

Page

LIST OF TABLES

Table **Page**

LIST OF FIGURES

Figure **Page**

1.0 INTRODUCTION

The Cedar River Watershed is one of the primary sources of water for the City of Seattle and encompasses a large reservoir – Chester Morse Lake. Much of the forest in the watershed has been previously harvested and now occurs in multi-age stands of second-growth timber. The Watershed consists of over 90,000 acres of predominantly forested, mountainous lands extending from the Cascade Crest, just south of Snoqualmie Pass in central Washington, westward to just south of North Bend, Washington. Approximately 14,000 acres or 6.5% of the forest land in the Watershed has not been harvested, and exists as natural stands of mature and old-growth forest.

The majority of old-growth forest in the Cedar River Watershed occurs in 6 distinct patches. These are primarily located in the upper reaches of the watershed (Figure 1). There are historic northern spotted owl (*Strix occidentalis caurina*) responses within these 6 patches of old forest; however, none of the established sites have had documented detections of a spotted owl since 1997. Surveys at one spotted owl site were performed annually from 1997 through 2000 (D.R. Herter, S. Nickelson, pers. obs.). Blanket surveys for spotted owls were conducted at the 6 old forest patches in 2005 (Raedeke Associates, Inc. 2005). No spotted owls were detected during these surveys.

In the summer of 2008, Raedeke Associates, Inc. staff conducted a series of calling surveys for northern spotted owls in the same 6 patches of old forest within the Cedar River Watershed. This survey program was initiated as part of the requirements set forth under the Cedar River Watershed Habitat Conservation Plan (HCP; City of Seattle 2000), established in 2000. This agreement between the City of Seattle, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service was developed to protect habitat within the watershed for selected birds, mammals, and fish. According to the Plan, a thorough survey for spotted owls at old forest patches within the watershed would occur within 3-10 years following its acceptance.

The 2005 spotted owl study constituted the initial survey of the watershed for the purpose of determining the presence or absence of spotted owls following the establishment of the HCP. The 2008 study represents the second year of surveys within this 10 year period following the establishment of the HCP.

2.0 METHODS

The 2008 spotted owl survey procedures followed recommended U.S. Fish and Wildlife Service guidelines (USFWS 1992). The 6 survey areas and stations surveyed were originally selected by Watershed biologists in 2005, and were replicated in 2008. We did not survey the smallest block of old forest habitat (McClellan Butte) during our first visit, but initiated surveys at this block for all subsequent visits.

Spotted owls prefer territories with a large block of old forest surrounding a selected nest tree or trees (Ripple et al. 1991, Swindle et al. 1999, Dugger et al. 2005). All of the 6 survey areas in the Watershed contained historic spotted owl responses and/or known spotted owl territories. The theory behind the surveys is that if spotted owls were not detected in these patches, which represent the best available habitat, then they were unlikely to occur in other areas which were typified by second-growth conifer or mixed forest with few, if any, remaining old-growth patches or remnant old-growth trees.

The surveys were conducted at a series of pre-selected calling stations placed in and on the edge of spotted owl habitat stands, with the intent to attain complete coverage of suitable habitat (in this case, old forest patches; Figures 2 – 7). Road stations were surveyed during hours of darkness and hiking stations were surveyed during the day (typically in late afternoon, immediately prior to night surveys). Night surveys were initiated after civil twilight, generally when the forest became dark enough to ensure that potential diurnal spotted owl predators [primarily goshawks (*Accipiter gentilis*)and red-tailed hawks (*Buteo jamaicensis*)] were no longer active.

Surveys were completed within the recommended survey season of March 15th to August 31st (though this has been extended to September 15th in Washington), which corresponds to the typical breeding season for the species. Four surveys were completed at the McClellan Butte site, and 5 surveys were conducted at each of the remaining survey areas (Table 1). To the extent possible, survey visits were spaced throughout the season in order to detect any potential nesting birds early in the season, and later to detect owls that may have emigrated to the Watershed during the later portion of the breeding period. However, due to unusually heavy snow pack in the Watershed in spring 2008, survey initiation was delayed until July due to snow blockage on the road system.

Surveys were halted and rescheduled if rain was moderate or heavy, or if tree-drip or winds greater than 10 mph interfered with surveyor hearing. We did not initiate a night of surveys if weather conditions appeared to be severe enough to preclude an evening of survey work.

During a typical survey, personnel remained outside of their vehicles at each station for at least 10 minutes, alternately broadcasting spotted owl calls and listening for responses . Surveyors used their voices, “hoot-flutes,” and recordings of spotted owl calls to elicit responses. All owls heard during each 10-minute survey were noted. If a great horned

owl (*Bubo virginianus*; another potential predator) responded, the surveyor listened for the remainder of the 10-minute period but did not broadcast any additional spotted owl calls. If a barred owl (*Strix varia*) responded, surveyors listened until the owl stopped calling, then gave additional spotted owl calls following a 2-5 minute period of silence. Barred owls are not known to prey on spotted owls, but may attack spotted owls.

A typical evening survey, conducted under appropriate weather conditions, consisted of two or more observers driving to separate survey areas and conducting surveys as previously described. A survey route was predetermined for the evening. Observers drove between stations and covered each survey area in a "wave" from one end of the survey area to the other. We typically surveyed between 8 and 12 stations per evening, which required 3 to 6 hours per survey night per observer. All 6 survey areas were covered within a one-week period, which in total consists of a "visit".

3.0 RESULTS

3.1 Weather

Although the allowable survey period extends from mid-March through mid-September, we were forced to delay the start of surveys until early July 2008 due to the heavy snow pack. There were no survey days when precipitation was too heavy to conduct the survey visit. We encountered sporadic heavy rain showers on a few visits, but were able to wait until the weather improved. Over 75% of all surveys were conducted during clear or overcast days with no precipitation. High winds were generally not a problem in the Watershed in 2008.

3.2 Responses

We obtained 9 responses from large (spotted, barred, or great horned) owls at 4 stations during the surveys (Table 2, Figure 8).

We detected a single male spotted owl in 2008. During the first round of visits to the Findley Lake survey area on 8 July, a male spotted owl was heard by two observers who had met at a station. The owl was located and fed a mouse, but could not be captured for banding. The author and Watershed biologist Sally Nickelson returned to the site of the response for a follow-up visit on 9 July. The male spotted owl was located and captured.

This owl had been previously captured and banded as a juvenile near Snoqualmie Pass at a Cle Elum Demography Study Area site in 2006. At this natal site in 2006, a female spotted owl was initially found alone with two fledglings. During a second visit, during which this juvenile was banded, it was being fed by a male barred owl. A third visit in 2006 found the female spotted owl and the male barred owl both attending the two fledglings, but the second fledgling was never banded. Subsequent visits failed to find any member of the group and no spotted owls have been found at this site since the summer of 2006. Blood samples taken in 2006 indicated that the fledgling was a full-blooded spotted owl, and our observations in 2008 (voice and plumage) concur. Our recapture in 2008 confirms that the barred owl male successfully raised at least one spotted owl fledgling, which possibly represents a unique situation and should be documented in the scientific literature.

The single male spotted owl that we detected in the Cedar River Watershed (the territory has been named “Seattle Creek”) was heard in the same area during the second and third 2008 survey visits (which included one follow-up). Because the 3 responses were over a week apart and in the same general area, the site will now be considered a resident single spotted owl site (Status 3) and will be recognized as a regulated spotted owl territory by the Washington Department of Fish and Wildlife.

We obtained only 3 barred owl responses in 2008, two of which were probably from the same male on two different nights. A female was heard not too far from this male, which indicates that a pair is probably present in the Tinkham/Abiel/Baldy survey area. Barred owls were present near these response locations in 2005 as well, which probably indicates the presence of a stable barred owl territory in this area. It is surprising that we did not detect additional barred owls during our visits. Although initiation of surveys was delayed in 2008, many of our barred owl detections did not occur until the month of August in 2005, so we were expecting more detections than we received in 2008.

In addition to spotted and barred owl responses, a great horned owl male was heard on one night in 2008. As was apparent from the 2005 surveys, this species appears to be uncommon in the upper Watershed and/or does not appear to regularly respond during spotted owl surveys.

Among small owls, only northern pygmy owls (*Glaucidium gnoma*) were detected, probably due to the late season timing of the surveys. This species is known to become active and call frequently in late summer/early fall. Four different pygmy owls were heard from mid-August to mid-September in the Goat Mountain, Tinkham/Abiel/Baldy, and Findley Lake survey patches (see notes on data forms in Appendix A). Had we been able to survey in April and May, it is likely that we would have detected northern saw-whet owls (*Aegolius acadicus*) which should be common in the area.

Other wildlife heard at night during the surveys included common nighthawks (*Chordeiles minor*), elk (*Cervus elaphus*), and coyotes (*Canis latrans*). Nighthawks could become a species of concern in western Washington due to their disappearance from urban nesting areas, which is attributed to gull and crow predation. However, nighthawks appear to remain in viable numbers in the upper Cedar River Watershed, as they do in the upper Green River Watershed to the south.

4.0 DISCUSSION

4.1 Survey Results

The year of 2008 was a relatively good reproductive year for spotted owls in the western Cascade Mountain range of Washington (D. Herter, pers. obs.). On the surrounding Rainier Demography Study Area (DSA; Figure 9), which includes that portion of the Cascade Range west of the crest from I-90 south through and including Mt. Rainier National Park, 42% of active territories supported nesting spotted owls. Spotted owls tend to respond to surveyors (fly-in or vocalize) better in breeding years than in non-breeding years (Anthony et al. 2004).

4.2 Recommendations for Future Studies

Because a resident single spotted owl is present in the Cedar River Watershed, monitoring of the site annually is recommended to track occupancy of the site and confirm the presence of a pair, should one be present in the future. Spotted owl numbers are now so low in western Washington that monitoring is recommended for all active sites, particularly in areas where active timber management occurs (J. Buchanan, WDFW, pers. comm.).

Because potential spotted owl nesting habitat is still present in the watershed, and barred owls do not appear to have established territories over all portions of this habitat, surveys for spotted owls should probably be repeated periodically to monitor occupancy status. Surveys in the watershed for spotted owls should aim to provide the highest likelihood of detecting a resident spotted owl. As used in this study, surveys surrounding old forest habitat should provide the highest likelihood of locating spotted owls (Ripple *et al.* 1991, Swindle *et al.* 1999, Dugger *et al.* 2005).

5.0 LITERATURE CITED

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FIGURES AND TABLES

Figure 1.

Map of the Cedar River Municipal Watershed: showing the six patches of old forest where spotted owl surveys were conducted in summer 2008.

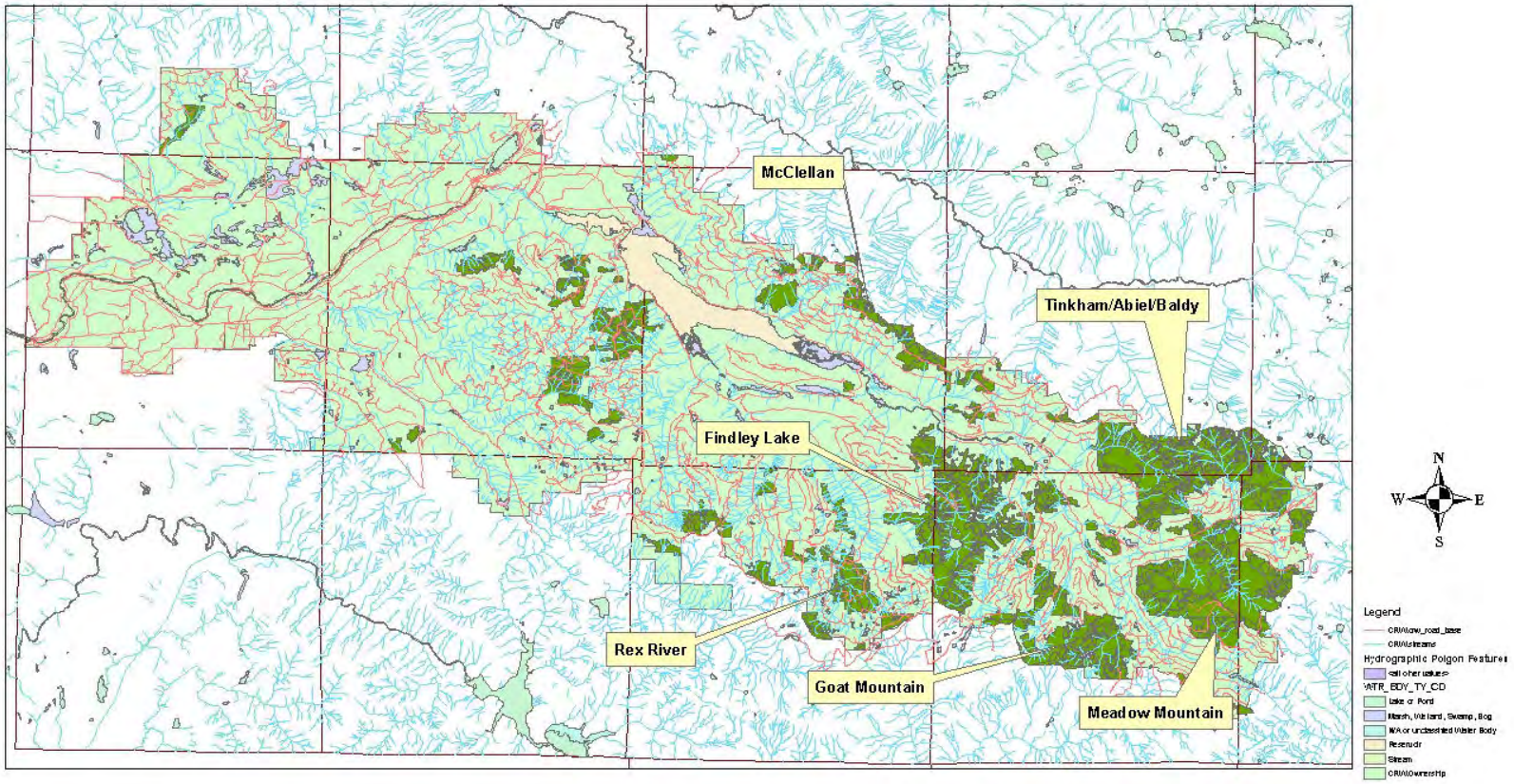


Figure 2.
SPOW Survey Locations, Patch #5: (Findley Lake)

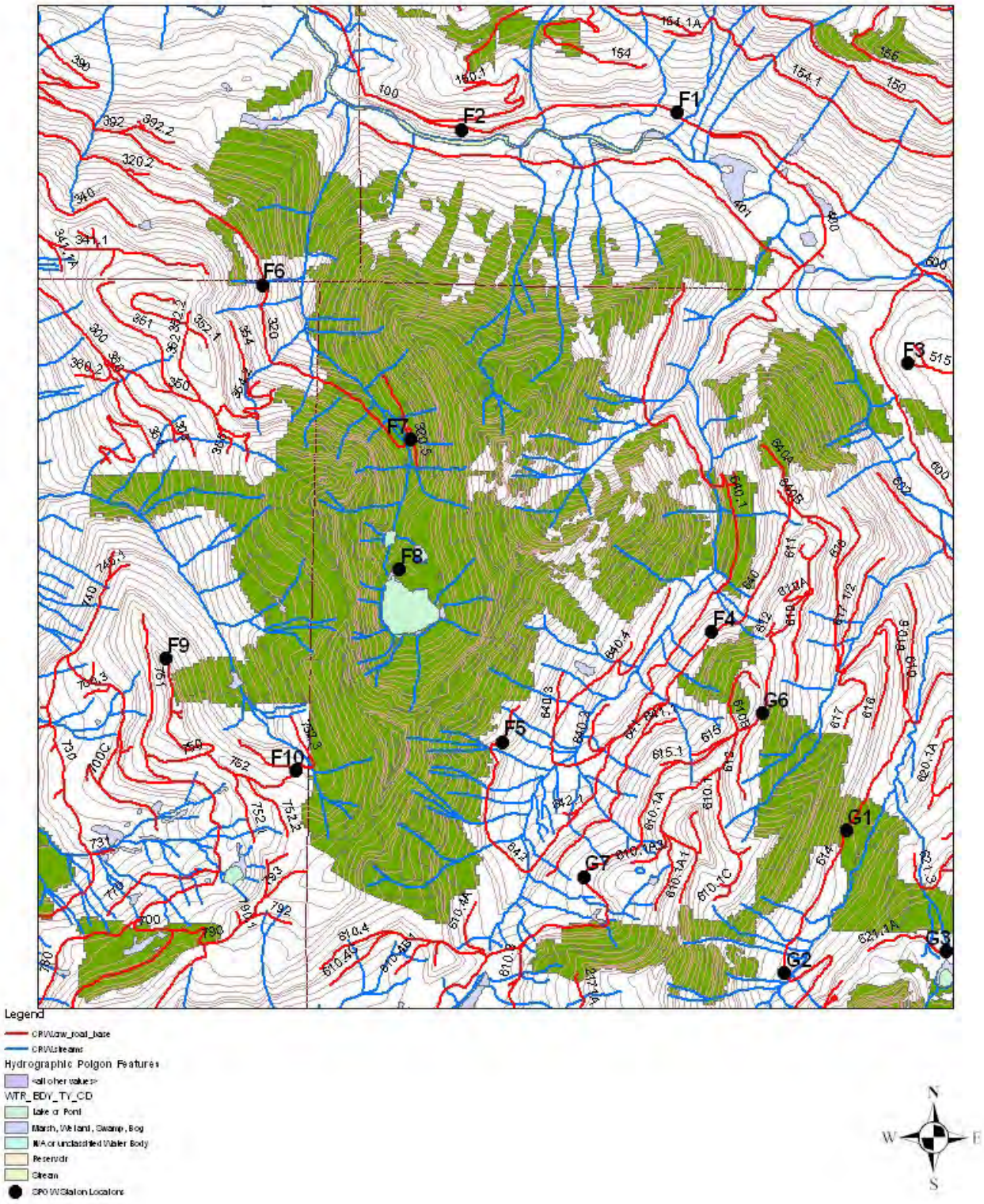


Figure 3.
SPOW Survey Locations, Patch #2: (Goat Mountain)

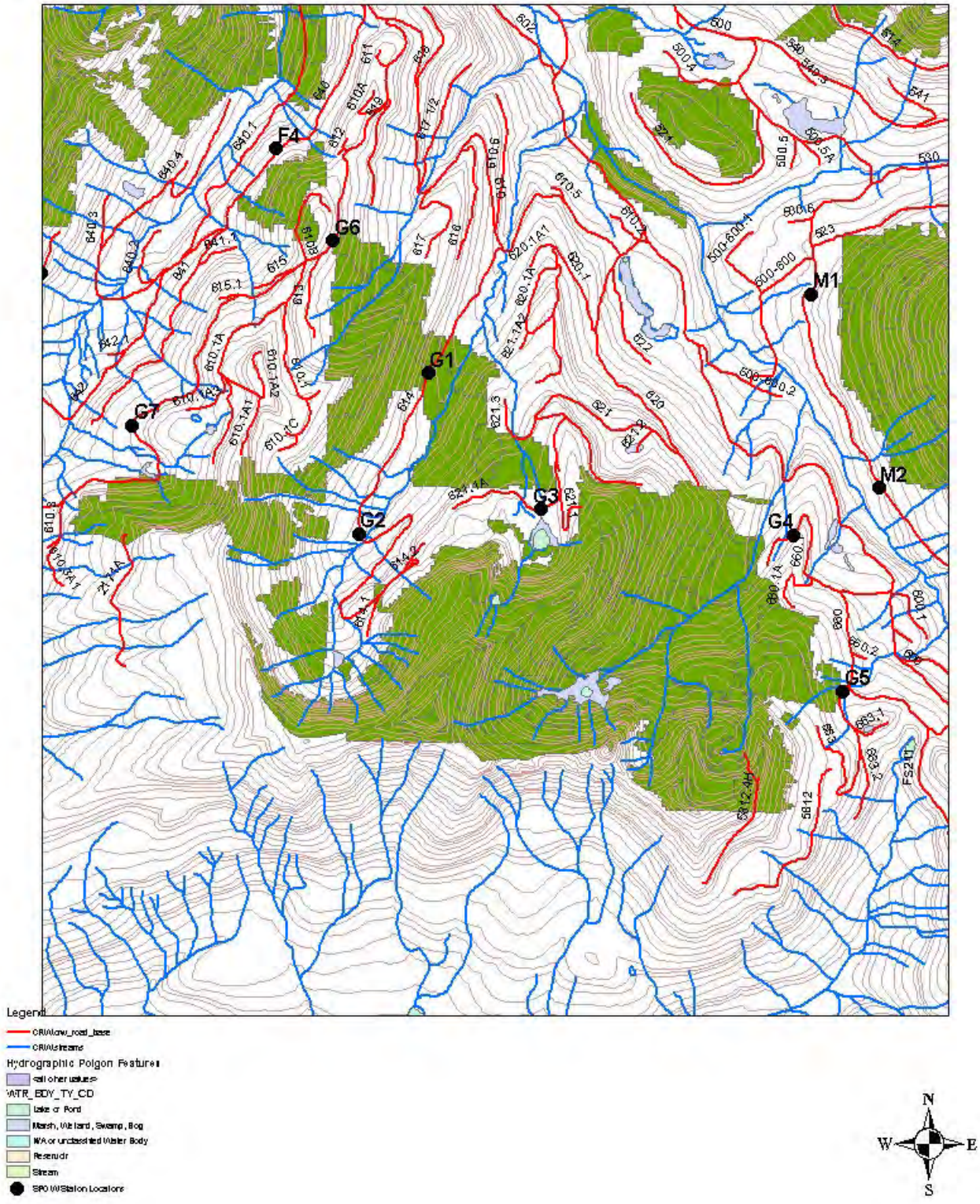


Figure 4.
SPOW Survey Locations, Patch #6: (McClellan)

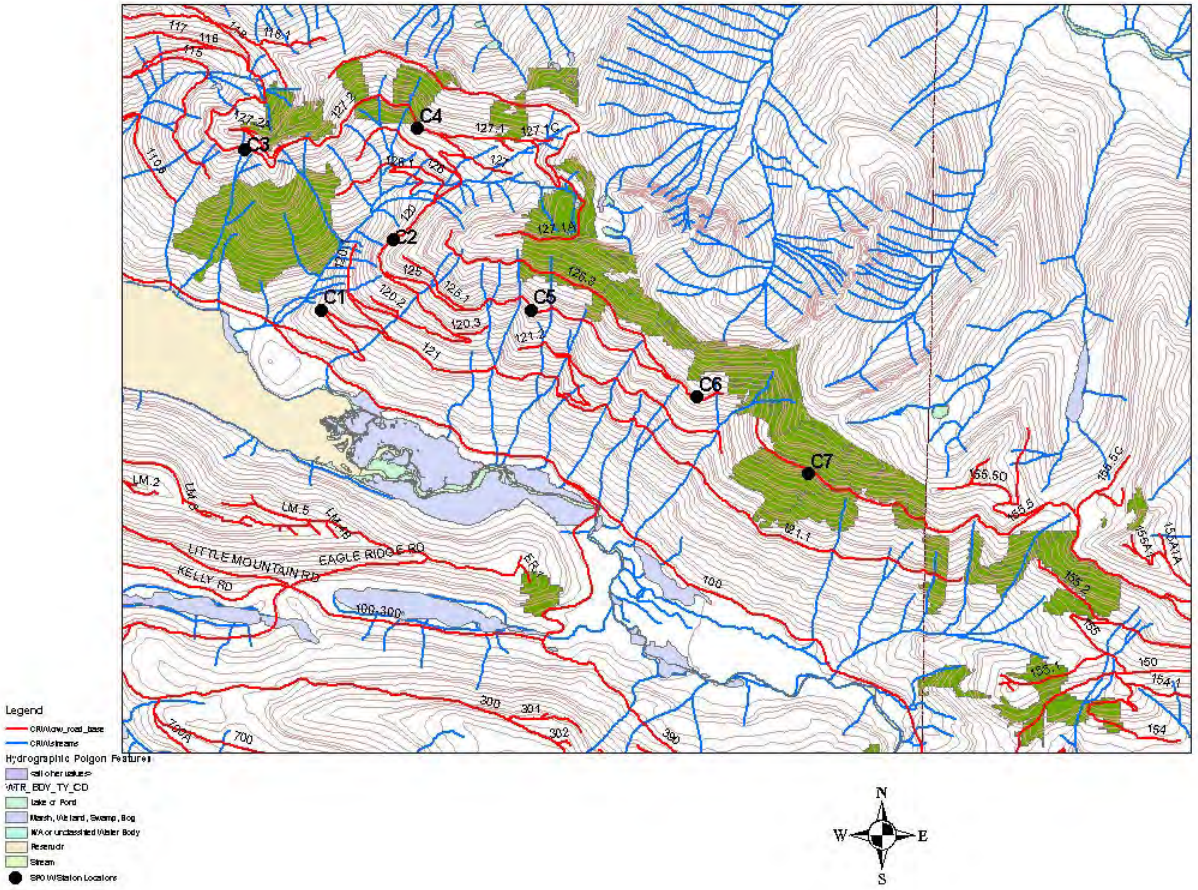


Figure 5.

SPOW Survey Locations, Patch #1: (Meadow Mountain)

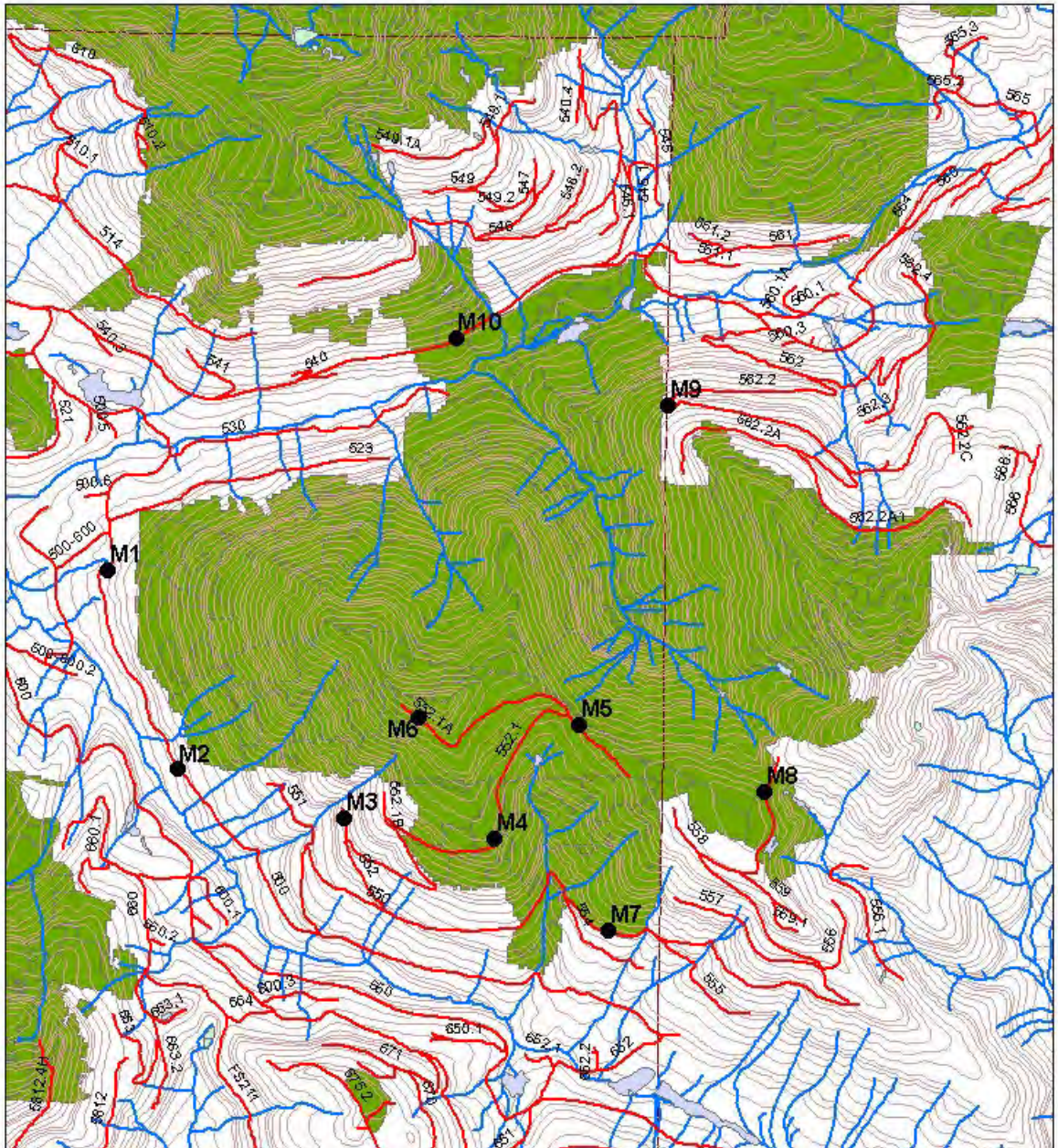


Figure 6.

SPOW Survey Locations, Patch #4: (Rex River)

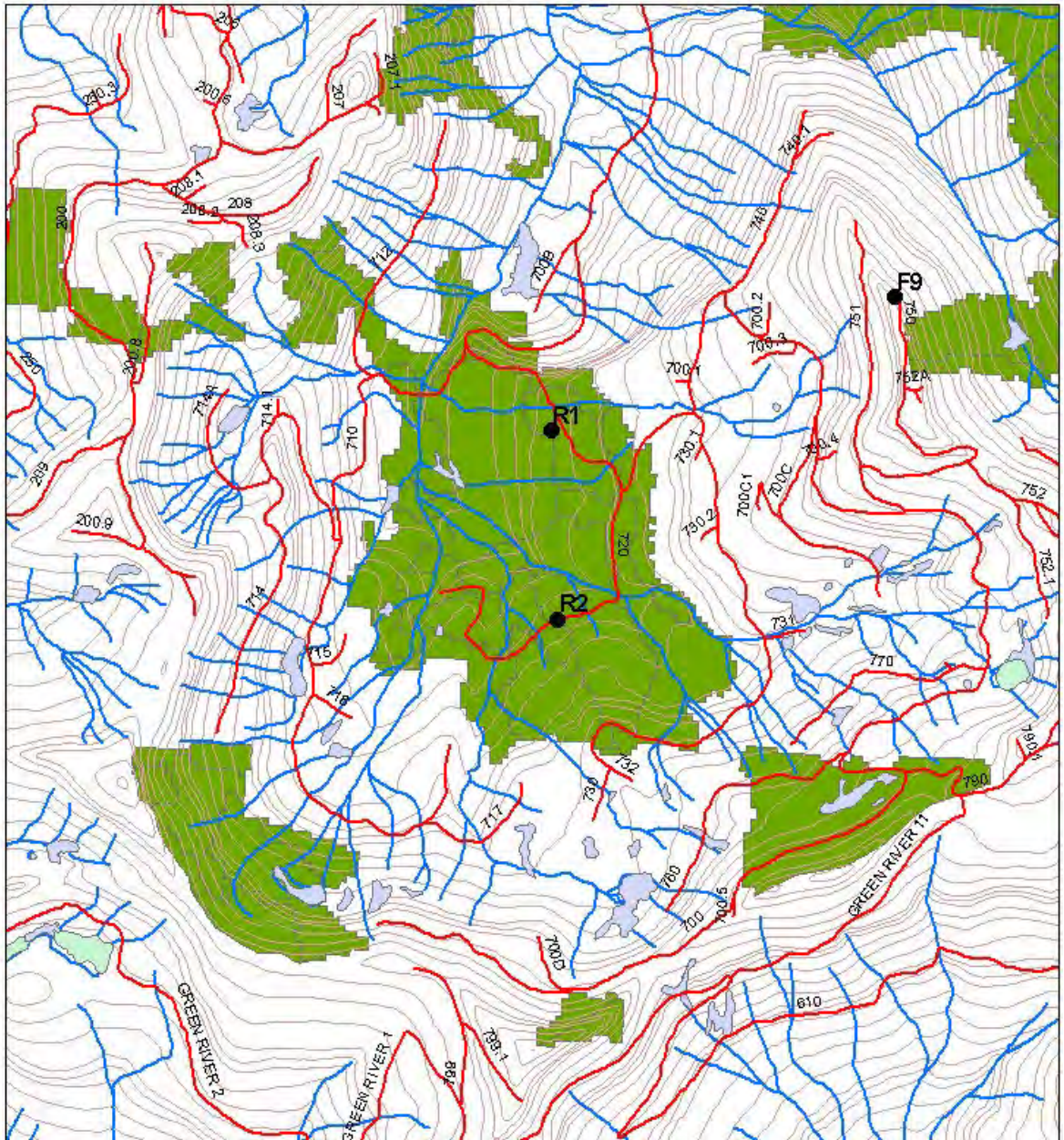
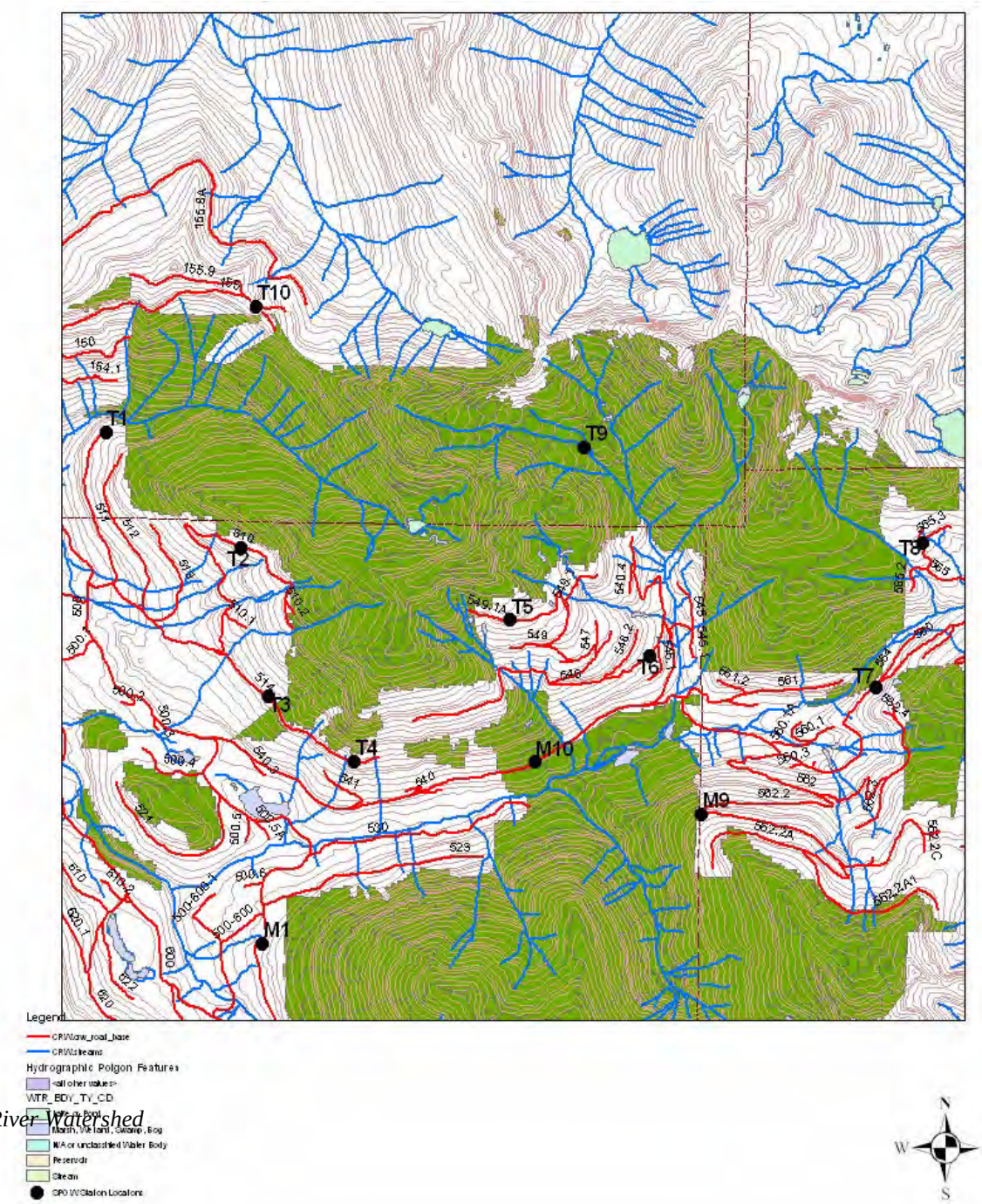


Figure 7.
SPOW Survey Locations, Patch #3: (Tinkham/Abiel/Baldy)



Cedar River Watershed

Raedeke Associates, Inc.
October 30, 2008

Figure 8. (For internal use only).

Table 1. Timing of visits to spotted owl survey areas, Cedar River Watershed, 2008.

Visit #	Start Date	End Date	Observers
1	8 July	9 July	Herter, Holloway, Merriman, Richardson
2	28 July	31 July	Merriman, Richardson
3	13 August	18 August	Herter, Holloway, Merriman, Richardson
4	25 August	26 August	Merriman, Richardson
5	8 September	9 September	Holloway, Merriman, Richardson

Table 2. Summary of responses from all owl species detected in the Cedar River Watershed, 2008.

Response:					
No.	**Species**	**Age/Sex**	**Date**	**Time**	**Survey Area**
1	Spotted Owl	male	8 July	22:20	Findley Lake
2	Spotted Owl	subadult male	9 July	13:10	Findley Lake
3	Barred Owl	unknown	9 July	20:42	Tinkham/Abiel/Baldy
4	Spotted Owl	male	29 July	22:48	Findley Lake
5	Spotted Owl	subadult male	30 July	16:50	Findley Lake
6	Barred Owl	male	31 July	22:46	Tinkham/Abiel/Baldy
7	Great Horned Owl	male	13 August	20:40	Tinkham/Abiel/Baldy
8	Spotted Owl	male	14 August	21:15	Findley Lake
9	Barred Owl	female	8 September	21:13	Tinkham/Abiel/Baldy

APPENDIX A

Data forms for all spotted owl survey visits to the Cedar River Watershed - 2008.

VISIT 1

VISIT 2

VISIT 3

VISIT 4

VISIT 5