

**A SURVEY OF THE AVERY RANGER DISTRICT, PANHANDLE NATIONAL  
FOREST, FOR  
THE COEUR D'ALENE SALAMANDER (PLETHODON IDAHOENSIS).**

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## ABSTRACT

During June, July, and September of 1991, a field survey was conducted to document the distribution of the Coeur d'Alene Salamander (Plethodon idahoensis) on the Avery Ranger District of the Panhandle National Forest. Probably because of favorable weather, 61 new sites of occurrence were recorded on the St. Joe River between Marble Creek and Red Ives, and on tributaries of the St. Joe River including Slate Creek, Fishhook Creek, North Fork of the St. Joe River, Quartz Creek, and Bluff Creek. The elevation of the highest site was 3700 ft. Plethodon idahoensis was also found at historic localities on Bird Creek and 0.5 mile west of Avery, sites for which the status of the salamander has been previously unresolved. Twenty-eight percent of a subsample of known sites of occurrence dried completely during the summer, a factor that should be taken into account when planning future surveys for this species. This study confirms a suggestion that the salamander is more common on the Avery Ranger District than earlier surveys indicated, but the results are limited, given that searches were limited to seepages on roads, and that poor weather prevented extensive surveys at high elevations.

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## INTRODUCTION

The Coeur d'Alene Salamander (Plethodon idahoensis) is the only lungless salamander (Plethodontidae) known from the northern Rocky Mountains (Nussbaum et al. 1983). Part of a disjunct coastal biota that primarily occupies seasonally humid regions north of the Salmon River drainage (Daubenmire 1975, Nussbaum et al. 1983), the salamander occurs on either side of the Idaho-Montana border from just north of the Canadian boundary south through the Selway River drainage. It has been most readily encountered in the drainages of the St. Joe and North Fork of the Clearwater Rivers of Idaho, and in the Kootenai River drainage of Montana and British Columbia (Wilson et al., in review; Holmberg et al. 1984).

This unique, terrestrial amphibian is classified as a Species of Special Concern by the Idaho Department of Fish and Game, and as a Sensitive Species by both the Idaho office of the Bureau of Land Management and the U. S. Forest Service in Region 1 (Groves 1988). Because of state and federal interest in its distribution and status, P. idahoensis was the subject of broad field surveys in Idaho and Montana (Groves 1988, Wilson and Simon 1987) and later, regional surveys (Groves 1989, Groves and Cassirer 1989; Wilson 1990; Wilson and Simon 1988) that filled gaps between known localities, and revealed the possible western, eastern, and southern extent of the salamander in the U. S. The present study is a continuation of these efforts and has involved an intensive field survey for P. idahoensis in the heart of its range on the Avery Ranger District, Panhandle National Forest.

Plethodon idahoensis was first collected on the District by Ronald Nussbaum in the St. Joe River Valley, 0.5 mile west of Avery and along Bird Creek near its confluence with the St. Joe River (Groves 1988). Subsequent St. Joe localities on or adjacent to the District were established by Richard Wallace on the south bank of the St. Joe River; 1.5 miles west of Marble Creek, 1.5 miles east of Marble Creek, on Siwash Creek, and in the area across from Tin Can Flat Campground (Groves 1988).

During his 1987 surveys, Craig Groves (1988) discovered four additional localities along the upper St. Joe River; on the south bank 4.2 miles east of Marble Creek and 2.3 miles east of the Hoyt Bridge, and on the north side of the river 0.8 mile west of Malin Creek (Halfway Hill) and 1.5 miles upstream from Shady Creek. He also discovered four localities on tributaries of the upper St. Joe River; on the west side of Marble Creek 1.3 miles above Boulder Creek, on the

west side of Fishhook Creek 4.5 miles above the St. Joe River, and on the east side of the North Fork of the St. Joe River 1.6 and 4 miles upstream from the St. Joe River.

Groves (1988) was unable to find salamanders at the historic Bird Creek and Avery collection sites, and these two localities appeared disturbed by human activity. This led to concern that salamanders in them may somehow have been extirpated. The status of these two localities has been unclear, but a number of factors influence the surface appearance of *P. idahoensis*, making repeated visits to known sites of occurrence necessary to verify the salamander's presence (Wilson 1990).

The actual extent of *P. idahoensis* on the Avery Ranger District is unknown. Groves (1988) speculated that the salamander may be more common in the St. Joe drainage than time constraints permitted him to establish. Moreover, his surveys were conducted in the fall, after a relatively dry spring and summer, and he surmised that this may have impaired his ability to find salamanders in some places.

The purpose of the present study has been to document more fully the distribution and status of *P. idahoensis* on the District. To this end, I attempted to find the salamander at the Bird Creek and Avery localities, and tried to travel the District as widely as possible while searching for new sites of occurrence. A comparison of localities during early and late periods of the salamander's potential activity season also allowed me to examine the extent to which this species inhabits sites that become dry during the year. Such information may prove useful in future surveys. Finally, I recorded microhabitat data from new localities, which are intended for the Idaho Natural Heritage database. These may be used for future comparisons, should some type of monitoring program (see Groves 1989) be established for *P. idahoensis*.

## METHODS

Searches for *P. idahoensis* were conducted during, or within one week of rainfall; between 16 June and 2 July, on 14 July, on 17 September, and on 20 September. I intended to work more extensively in the fall, but arid weather, which inhibits surface activity of the salamander (Wilson and Larsen 1988), forced me to abandon this plan.

While the salamander inhabits various types of microhabitat, it is comparatively easy to find in seepages and on the margins of trickling stream headwaters (Groves 1988, 1989; Wilson and Simon 1987, 1988). I therefore confined my searches to these types of sites (except in the upper Slate Creek drainage where I also searched along streams) and surveyed as much of the Avery Ranger District as possible by road. By this method I was able to survey many of the low elevation drainages on the District in a relatively short time. During surveys, I attempted to examine every seepage I encountered. The only exceptions were on new sections of the St. Joe River Road along the north side of the river, between the new bridge west of Avery and the vicinity of the Siwash Creek footbridge. These areas were recently disturbed by roadwork.

*Plethodon idahoensis* is largely nocturnal (Wilson and Larsen 1988), so I first visited sites during the day to collect microhabitat data, and returned that night to look for salamanders by flashlight. I recorded the presence or absence of salamanders after a careful search of all surfaces dampened by emergent groundwater. To ensure that my efforts coincided with temperatures favorable to salamander activity (Wilson and Larsen 1988), I regularly recorded substrate temperatures during searches and planned to discontinue working if temperatures within the seepages dropped to 5°C. Such low temperatures did not occur during searches made on the dates above. On the upper reaches of Slate Creek, on Dunn Peak Road out of Avery, and on FR 320 above Red Ives, I searched during the day by digging, raking litter and bryophyte mat, displacing wood and rocky material, and prying fractured rock.

Microhabitat data collected at each site of occurrence are reported as follows: elevation in feet, measured with an altimeter; aspect in degrees, measured with a magnetic compass; slope in degrees, measured with a clinometer; and percent overhead cover, estimated with a spherical densiometer (Lemmon 1956). To find seepages at night I marked them with flagging and used an odometer to estimate, within 0.01 mile, their distances from road intersections. For sites inhabited by *P. idahoensis*, I am reporting these distance estimates to facilitate future visits, and

have marked the approximate position of each on U. S. G. S. topographic maps (Figures 1-16). During my last September trip to the District, I returned to seepages in which I had previously encountered salamanders and noted whether or not surface moisture was still present. I am reporting sites that dried completely as having intermittent moisture. I was not able to visit seepages on Slate Creek a second time.

Voucher specimens were collected from all sites and will be deposited in the Conner Museum, Washington State University, Pullman. In Appendix 2, I include a list of localities for other amphibians encountered during surveys.

## **RESULTS AND DISCUSSION**

Four historic localities were not visited during this study. These include the sites on the North Fork of the St. Joe River, on Siwash Creek, and on the St. Joe River across from Tin Can Flat Campground. I found *P. idahoensis* at one of these, Groves' (1988) North Fork of the St. Joe Site #1, in July 1990. Also during July 1990, I found the salamander on Bird Creek, but searched there unsuccessfully this year. The site I found in 1990 is 1.7 miles upstream from the confluence of Bird Creek and the St. Joe River; I did not find the salamander near the confluence.

I found *P. idahoensis* at eight historic localities during the present study, including the site 0.5 mile west of Avery, plus 61 additional sites on the Avery Ranger District and on the old St. Joe River Road between the District's boundary and Marble Creek. All were found in June. I am reporting the locations of each site in which I encountered the salamander without attempting to define the areal extent of individual salamander colonies or populations. Some of the sites I found are so close to one another that together they may be regarded as single localities. All but two of the new sites are fracture seepages, which have also been found in many of the previously encountered *P. idahoensis* localities (Groves 1988, Wilson and Simon 1987). The following is a list of all known sites of occurrence for *P. idahoensis* in the regions surveyed.

### St. Joe River between Marbled Creek and Avery

1. Seepage on S. side of FH 50, 5.55 mi W. of Hoyt Bridge.
2. Seepage on S. side of FH, 5.45 mi W. of Hoyt Bridge. T45N, R4E, S18. No figure.  
Elevation 2350, Aspect 02, Slope 52, Cover 81.
3. Seepage on S. side of FH 50, 4.44 mi W. of Hoyt Bridge. T45N, R4E, S17. Figure 1A.  
Elevation 2360, Aspect 307, Slope 60, Cover 33. Intermittent moisture.
4. Seepage on S. side of FH 50, 3.60 mi W. of Hoyt Bridge. T45N, R4E, S17. Figure 1B.  
Elevation 2360, Aspect 54, Slope 65, Cover 46.
5. Seepage on S. side of FH 50, 3.52 mi W. of Hoyt Bridge. T45N, R4E, S17. Figure 1C.  
Elevation 2360, Aspect 59, Slope 39, Cover 48.
6. Seepage on S. side of FH 50, 3.45 mi W. of Hoyt Bridge. T45N, R4E, S17. Figure 1D.  
Elevation 2360, Aspect 31, Slope 72, Cover 50.
7. Seepage on S. side of FH 50, 2.99 mi W. of Hoyt Bridge. T45N, R4E, S16. Figure 1E.  
Elevation 2360, Aspect 347, Slope 49, Cover 78.
8. Seepage on S. side of FH 50, 2.85 mi W. of Hoyt Bridge. T45N, R4E, S16. Figure 1F.  
Groves (1988) St. Joe #2 locality.
9. Seepage on S. side of FH 50, 2.75 mi W. of Hoyt Bridge. T45N, R4E, S16. Figure 1G.  
Elevation 2360, Aspect 05, Slope 60, Cover 80.
10. Seepage on S. side of FH 50, 0.85 mi W. of Hoyt Bridge. T45N, R4E, S10. Figure 2A.  
Elevation 2400, Aspect 62, Slope 70, Cover 66.
11. Seepage on S. side of FH 50, 0.55 mi E. of Hoyt Bridge. T45N, R4E, S11. Figure 2B.  
Figure 2B. Elevation 2430, Aspect 10, Slope 90, Cover 75.
12. Seepage on S. side of FH 50, 1.01 mi E. of Hoyt Bridge. T45N, R4E, S12. Figure 2C.  
Elevation 2500, Aspect 06, Slope 62, Cover 74.
13. Seepage on S. side of FH 50, 1.50 mi E. of Hoyt Bridge. T45N, R4E, S13. Figure 2D.  
Elevation 2500, Aspect 04, Slope 70, Cover 78.
14. Seepage on S. side of FH 50, 1.95 mi E. of Hoyt Bridge. T45N, R5E, S18. Figure 2E.  
Elevation 2500, Aspect 22, Slope 90, Cover 60.

15. Seepage on S. side of FH 50, 2.02 mi E. of Hoyt Bridge. T45N, R5E, S18. Figure 2F. Elevation 2500, Aspect 10, Slope 62, Cover 73.
16. Seepage on S. side of FH 50, 2.10 mi E. of Hoyt Bridge. T45N, R5E, S18. Figure 2G. Groves (1988) St. Joe #4 locality.
17. Seepage on S. side of FH 50, 3.5 mi E. of Hoyt Bridge. T45N, R5E, S17. Figure 4A. Elevation 2500, Aspect 27, Slope 60, Cover 62.
18. Seepage on S. side of FH 50, 0.98 mi E. of Fishhook Creek Bridge. T45N, R5E, S16. Figure 4B. Groves (1988) Avery locality.

#### Fishhook and Lick Creeks

19. Seepage on E. side of FR 301, 1.82 mi S. of FH 50. T45N, R5E, S20. Figure 4C. Elevation 2620, Aspect 310, Slope 75, Cover 77.
20. Seepage on E. side of FR 301, 2.77 mi S. of FH 50. T45N, R5E, S29. Figure 5A. Elevation 2800, Aspect 207, Slope 75, Cover 74.
21. Seepage on E. side of FR 301, 2.81 mi S. of FH 50. T45N, R5E, S28. Figure 5B. Elevation 2800, Aspect 210, Slope 50, Cover 70.
22. Seepage on E. side of FR 301, 3.37 mi S. of FH 50. T45N, R5E, S32. Figure 5K. Elevation 2820, Aspect 270, Slope 90, Cover 56.
23. Seepage on E. side of FR 301, 3.48 mi S. of FH 50. T45N, R5E, S32. Figure 5C. Elevation 2820, Aspect 330, Slope 52, Cover 78.
24. Seepage on W. side of FR 301, 1.82 mi S. of the S. end of the Fishhook Creek Tunnel. Figure 5D. T44N, R5E, S4. Groves (1988) Fishhook Creek locality.
25. Seepage on W. side of FR 301, 1.1 mi S of the S. end of the Fishhook Creek Tunnel. T44N, R5E, S4. Figure 5E. Elevation 2900, Aspect 111, Slope 72, Cover 42.
26. Seepage on W. side of FR 301, 1.64 mi S. of the S. end of the Fishhook Creek Tunnel. T44N, R5E, S5. Figure 5G. Elevation 3000, Aspect 55, Slope 78, Cover 48. Intermittent moisture.
27. Seepage on the W. side of FR 301, 1.95 mi S. of the S. end of the Fishhook Creek Tunnel. T44N, R5E, S9. Figure 5H. Elevation 3050, Aspect 140, Slope 85, Cover 50.
28. Seepage on W. side of FR 301, 2.02 mi S. of the S. end of the Fishhook Creek Tunnel. T44N, R5E, S8. Figure 5I. Elevation 3050, Aspect 99, Slope 45, Cover 37. Intermittent moisture.

29. Seepage on the W. side of FR 301, 2.14 mi S. of the S. end of the Fishhook Creek Tunnel. T44N, R5E, S8. Figure 5J. Elevation 3050, Aspect 85, Slope 70, Cover 40. Intermittent moisture.
30. Seepage on E. side of FR 301, 3.99 mi S. of FH 50. T44N, R5E, S17. Figure 6B. Elevation 3520, Aspect 76, Slope 37, Cover 43.
31. Seepage on E. side of FR 301, 4.42 mi S. of FH 50. T44N, R5E, S20. Figure 6A. Elevation 3550, Aspect 161, Slope 70, Cover 42.
32. Seepage on N. side of FR 753, 0.08 mi W. of FR 301. T44N, R5E, S5. Figure 5F. Elevation 2<sup>2</sup>-9980, Aspect 140, Slope 90, Cover 80. Intermittent moisture.

#### Slate Creek

33. Seepage on E. side of FR 225, 1.7 mi N. of the transmission line crossing. T45N, R4E, S3. Figure 3A. Elevation 3040, Aspect 317, Slope 40, Cover 84. No second visit.
34. Seepage on E. side of FR 225, 3.15 mi N. of the transmission line crossing. T46N, R4E, S27. Figure 3B. Elevation 2750, Aspect 285, Slope 25, Cover 31. No second visit.
35. Seepage on E. side of FR 225, 3.22 mi N. of the transmission line crossing. T46N, R4E, S27. Figure 3C. Elevation 2750, Aspect 292, Slope 90, Cover 60. No second visit.
36. Seepage on E. side of FR 225, 3.86 mi N. of the transmission line crossing. T46N, R4E, S27. Figure 3D. Elevation 2800, Aspect 269, Slope 45, Cover 21. No second visit.
37. Seepage on E. side of FR 225, 3.97 mi N. of the transmission line crossing. T46N, R4E, S27. Figure 3E. Elevation 2800, Aspect 251, Slope 90, Cover 90. No second visit.
38. Seepage on E. side of FR 225, 4.07 mi N. of the transmission line crossing. T46N, R4E, S27. Figure 3F. Elevation 2800, Aspect 321, Slope 80, Cover 56. No second visit.
39. Seepage on E. side of FR 225, 4.74 mi N. of the transmission line crossing. T46N, R4E, S23. Figure 3G. Elevation 2900, Aspect 339, Slope 75, Cover 88. No second visit.
40. Seepage on E. side of FR 225, 5.17 mi N. of the transmission line crossing. T46N, R4E, S22. Figure 3H. Elevation 2930, Aspect 243, Slope 52, Cover 77. No second visit.
41. Seepage on E. side of FR 225, 5.61 mi N. of the transmission line crossing. T46N, R4E, S23. Figure 3I. Elevation 3000, Aspect 308, Slope 40, Cover 78. No second visit.

#### North Fork St. Joe River

42. Seepage on E. side old FR 456. Figure 7D. Groves 1988) North Fork St. Joe #1 locality. Not visited. I found a salamander here in July 1990.

43. Seepage on E. side old FR 456. Figure 7A. Groves (1988) North Fork St. Joe ##2 locality. Not visited.
44. Seepage on W. side of new Road 456, 2.58 mi N. of FH 50. T45N, R5E, S1. Figure 7B. Elevation 2700, Aspect 178, 1 Slope 71, Cover 16. Intermittent moisture.
45. Seepage on W. side of new Road 456, 2.88 mi N. of FH 50. T45N, R5E, S1. Figure 7C. Elevation 2700, Aspect 50, Slope 51, Cover 61. Intermittent moisture.
46. Seepage on E. side of old FR 456, 0.13 mi S. of bridge over North Fork St. Joe River. T46N, R5E, S25. Figure 8A. Elevation 2750, Aspect 302, Slope 70, Cover 70. Intermittent moisture.
47. Seepage on W. side of old FR 456, 0.15 mi N. of intersection of new Road 456 and old FR 456 (W. end of trestle). T46N, R5E, S25. Figure 8B. Elevation 2750, Aspect 98, Slope 83, Cover 60.
48. Seepage on W. side of old FR 456, 2.43 mi N. of intersection of new Road 456 and old FR 456 (W. end of trestle). T46N, R5E, S24. Figure 8G. Elevation 2920, Aspect 131, Slope 66, Cover 81.
49. Seepage on W. side of old FR 456, 3.08 mi N. of intersection of new Road 456 and old FR 456 (W. end of trestle). T46N, R5E, S13. Figure 8H. Elevation 2950, Aspect 16, Slope 70, Cover 48.
50. Seepage on W. side of old FR 456, 3.85 mi N. of intersection of new Road 456 and old FR 456 (W. end of trestle). T46N, R6E, S18. Figure 8I. Elevation 2950, Aspect 64, Slope 75, Cover 58. Intermittent moisture.
51. Seepage on W. side of old FR 456, 4.05 mi N. of intersection of new Road 456 and old FR 456 (W. end of trestle). T46N, R6E, S7. Figure 9A. Elevation 3000, Aspect 85, Slope 75, Cover 51. Intermittent moisture.
52. Seepage on E. side of new Road 456, 0.69 mi N. of intersection of new Road 456 and old FR 456(W. end of trestle). T46N, R5E, S25. Figure 8C. Elevation 2850, Aspect 270, Slope 42, Cover 96.

53. Seepage on E. side of new Road 456, 0.84 mi N. of intersection of new Road 456 and old FR 456 (W. end of trestle). T46N, R5E, S25. Figure 8D. Elevation 2850, Aspect 236, Slope 72, Cover 17.
54. Seepage on E. side of new Road 456, 1.29 mi N. of intersection of new Road 456 and old FR 456 (W. end of trestle). T46N, R5E, S24. Figure 8E. Elevation 2950, Aspect 283, Slope 80, Cover 61. Intermittent moisture.
55. Seepage on E. side of new Road 456, 1.49 mi N. of intersection of new Road 456 and old FR 456 (W. end of trestle). T46N, R5E, S24. Figure 8F. Elevation 2950, Aspect 330, Slope 42, Cover 70.
56. Seepage on E. side of new Road 456, 3.25 mi N. of intersection of new Road 456 and old FR 456 (W. end of trestle). T46N, R6E, S18. Figure 9B. Elevation 30-8"0, Aspect 258, Slope 70, Cover 50. Intermittent moisture.

#### St. Joe River between Avery and Bird Creek

57. Groves (1988) Siwash Creek locality. Figure 10A. Not visited.
58. Seepage on N. side of FH 50, 3.71 mi W. of Bird Creek. FR 338. T45N, R6E, S22. Figure 10B. Elevation 2660, Aspect 146, Slope 62, Cover 68.
59. Seepage on N. side of FH 50, 2.3 mi W. of Bird Creek FR 338. T45N, R6E, S14. Figure 10C. Elevation 2750, Aspect 157, Slope 80, Cover 48.

#### Bird Creek

60. Seepage on E. side of FR 338, 1.7 mi N. of PH 50. T45N, R6E, S7. Figure 11. Elevation 2960, Aspect 306, Slope 60, Cover 59. Groves (1988) locality. I found P. idahoensis here in July 1990, but not during my 1991 visits.

#### St. Joe River between Bird Creek and Quartz Creek

61. Talus field on S. side of St. Joe River. Groves (1988) locality. Figure 12A. Not visited.
62. Seepage on N. side of PH 50, 3.64 mi W. of Eagle Creek q j JR 1214. Figure 12B. Groves (1988) Malin Creek locality.

#### Quartz Creek

63. Seepage on W. side of FR 339, 0.15 mi N. of FH50. T45N, R7E, S36. Figure 13A. Elevation 2950, Aspect 117, Slope 62, Cover 54. Intermittent moisture.
64. Seepage on W. side of FR 339, 0.42 mi N. of FHSO. T45N, 616 R7E, S36. Figure 13B. Elevation 3000, Aspect 140, Slope 70, Cover 63. Intermittent moisture.

65. Seepage on W. side of FR 339, 0.56 mi N. of FHSO. T45N, R7E, S36. Figure 13C. Elevation 3050, Aspect 150, Slope 90, Cover 64. Intermittent moisture.

#### Bluff Creek

66. Seepage on W. side of FR 509, 0.09 mi S. of PH 50. T44N, R8E, S5. Figure 14D. Elevation 3070, Aspect 156, Slope 90, Cover 95.
67. Seepage on W. side of FR 509, 0.24 mi S. of FH 50. T44N, R8E, S5. Figure 14E. Elevation 3070, Aspect 140, Slope 90, Cover 95.
68. Seepage on W. side of FR 509, 1.04 mi S. of FH 50. T44N, R8E, S7. Figure 14F. Elevation 3170, Aspect 168, Slope 71, Cover 54.

#### St. Joe River between Quartz Creek and Red Ives

69. Seepage on N. side of FH 50, 0.1 mi. W. of Bluff Creek Bridge. T44N, R8E, S5. Figure 14A. Elevation 3060, Aspect 232, Slope 90, Cover 34. Intermittent moisture.
70. Seepage on N. side of FH 50, 4.38 mi W. of Bruin Creek. FR 1223. T44N, R8E, S9. Figure 14B. Groves (1988) Shady Creek locality.
71. Seepage on E. side of FH 218, 0.70 mi S. of the I intersection of FH 218 and FH 50. T44N, R8E, S24. Figure 14C. Elevation 3450, Aspect 284, Slope 80, Cover 51.
72. Seepage on E. side of FH 218, 3.74 mi S. of the intersection of FH 218 and FH 50. T44N, R9E, S31. Figure 15A. Elevation 3500, Aspect 255, Slope 70, Cover 45.
73. Seepage on E. side of FH 218, 3.84 mi S. of the intersection of FH 218 and FH 50. T44n, R9E, S31. Figure 15B. Elevation 3500, Aspect 190, Slope 75, Cover 75.
74. Seepage on E. side of FH 218, 0.46 mi N. of Red Ives Station driveway. T43N, R9E, S20. Figure 16. Elevation 3700, Aspect 268, Slope 70, Cover 35.

The greatly increased number of *P. idahoensis* localities established during this study supports Groves' (1988) suggestion that the salamander is more widespread in the St. Joe River drainage than assumed previously. The present study likely benefited from heavy precipitation and relatively warm nights during the June surveys: success in finding plethodons is influenced by their opportunistic appearance above ground during such favorable climatic conditions (Feder 1983, Ovaska and Gregory 1989, Wilson and Larsen 1988).

Although heavy June precipitation resulted in very good search conditions at low elevations, it also resulted in road closures that prevented me from adequately exploring at high

elevations. Perhaps for this reason, the highest site of occurrence found during this study was at 3700 ft (site 74), well below the maximum known for *P. idahoensis* (Wilson and Simon 1987). Clearly, more high elevation surveys are needed on the District.

The present study may provide a somewhat improved understanding of the salamander's distribution on the Avery Ranger District, but the results are limited, given the comparatively vast area of the District not surveyed. In the interest of covering as much ground as possible, I limited searches to seepages along roadways, although the salamander is known to occur in a variety of microhabitat types (Groves 1988, 1989; Wilson and Simon 1987, 1988), and is conceivably more common in less disturbed settings. Many of the roads I surveyed are along streams, and I saw examples of undisturbed, potential *P. idahoensis* microhabitat on the opposite banks of all. Except to quickly establish the general distributional pattern of the salamander in a given region (e.g. the high elevation areas not covered in this study), future surveys should probably be conducted away from roads.

Of the 61 inhabited sites (historic and new) I visited a second time in September 17 (28%) had dried completely during the summer. This is a substantial proportion, and it is possible that dry conditions have impeded previous searches for the salamander on the Avery Ranger District (Groves 1988). It is unknown whether salamanders in seasonally dry sites travel to permanently moist sites where they can be surface-active through our region's late summer drought, or whether they track the water table underground as it rises and falls with local precipitation (Groves 1988, Wilson 1990). In any case, the fact that *P. idahoensis* occupies such places is a potentially important factor that should be considered in the planning of future surveys. Ideally, surveys should incorporate fieldwork during both spring and fall, so as to minimize the possibility of missing intermittently moist sites inhabited by the salamander.

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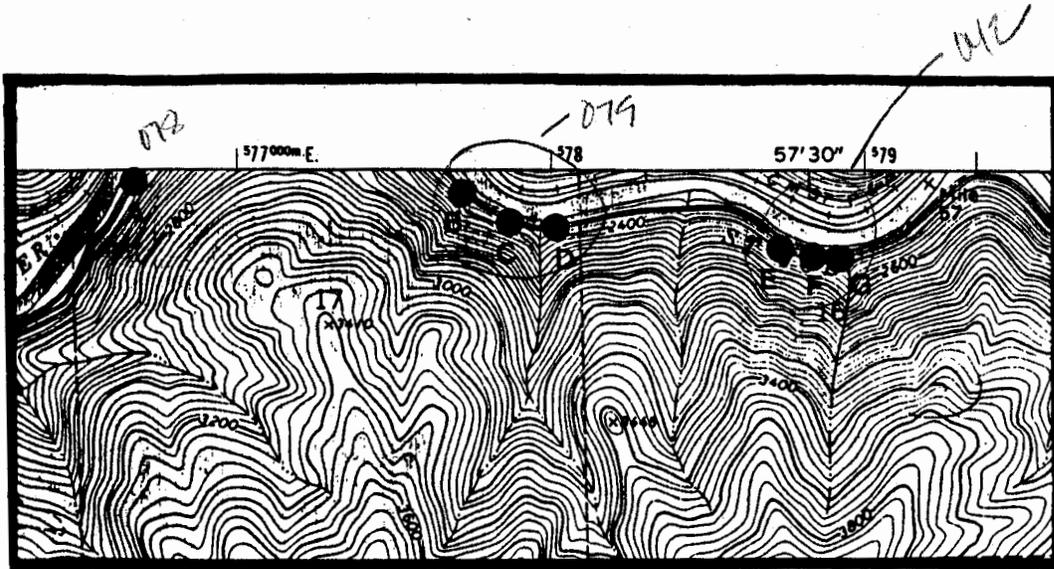


Figure 1. Hoyt Mtn. 7.5' topo.

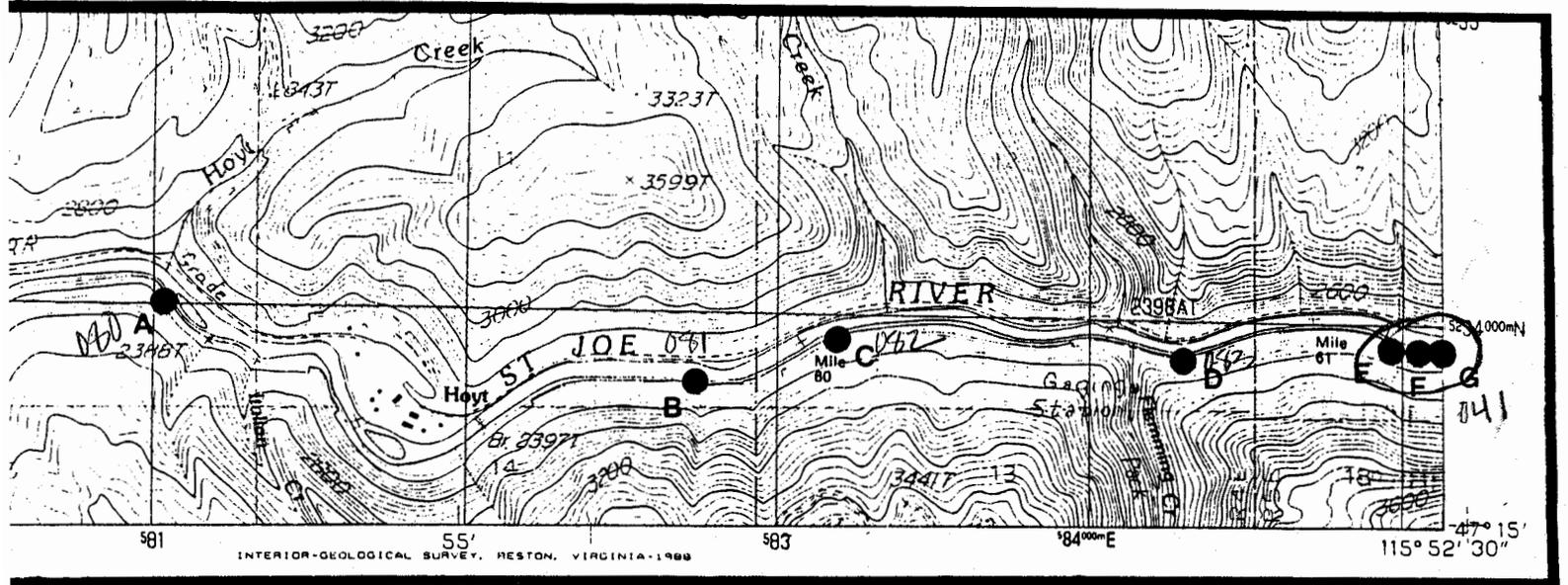


Figure 2. Mastodon Mtn. 7.5' topo.

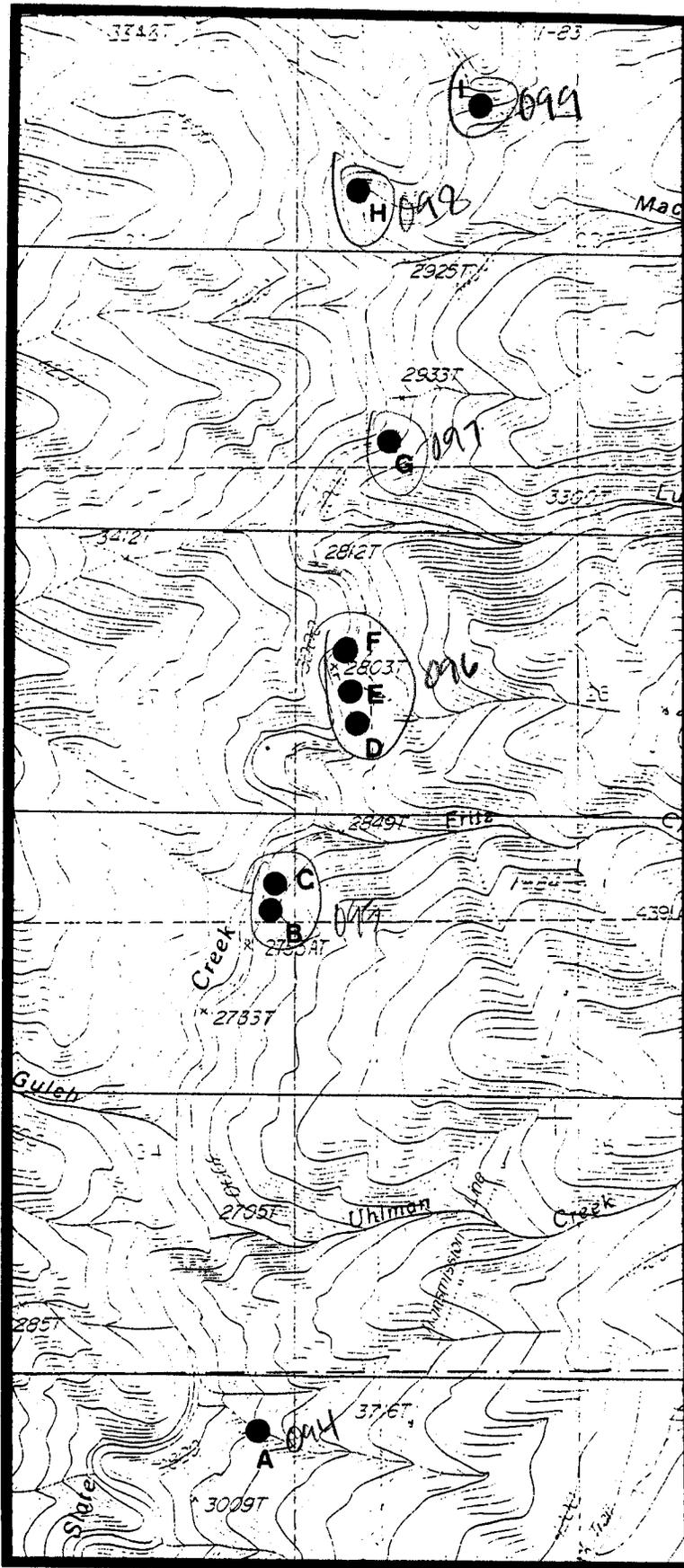


Figure 3. Mastodon Mtn. 7.5' topo.

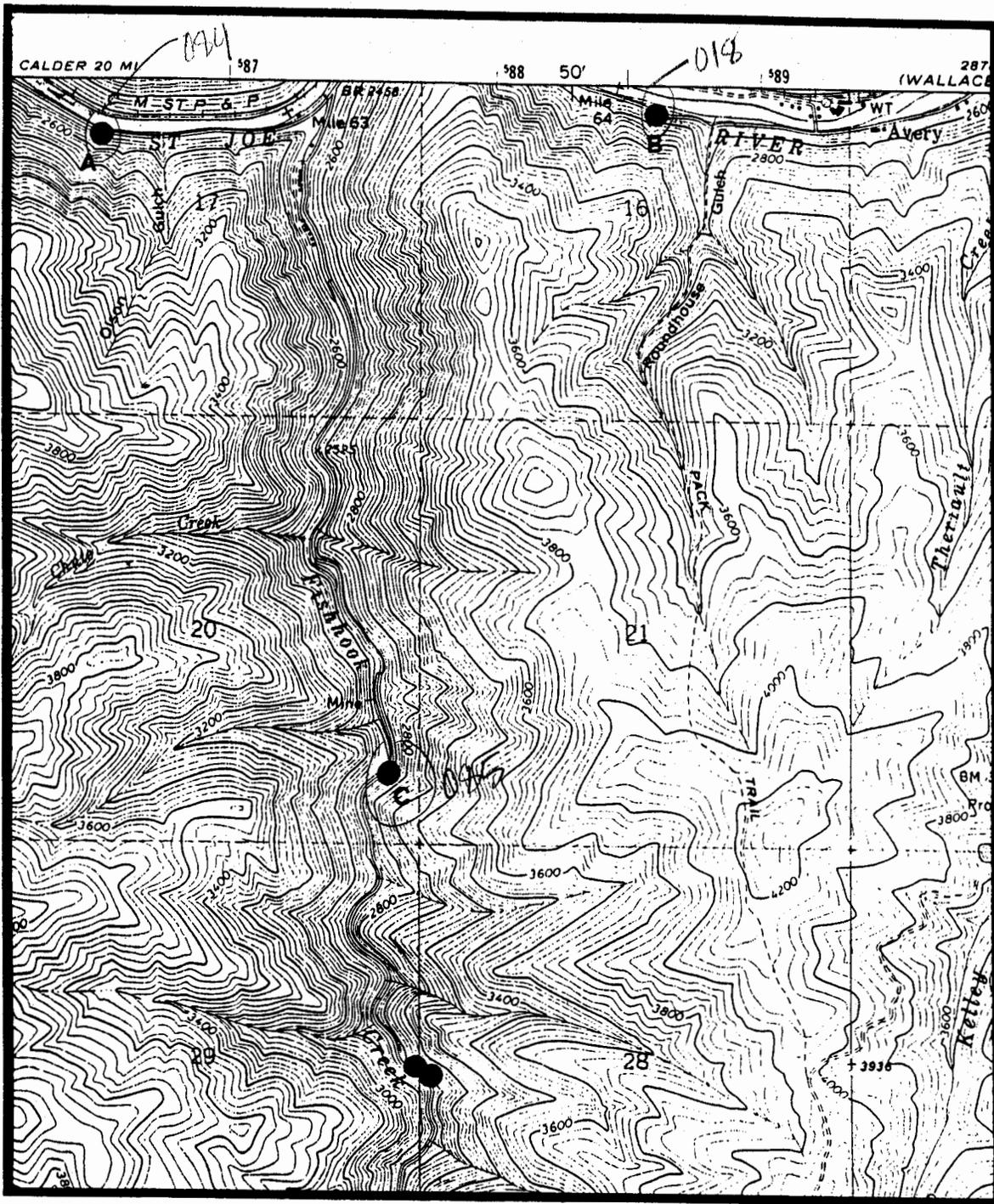


Figure 4. Fishhook Crk. 7.5' topo.

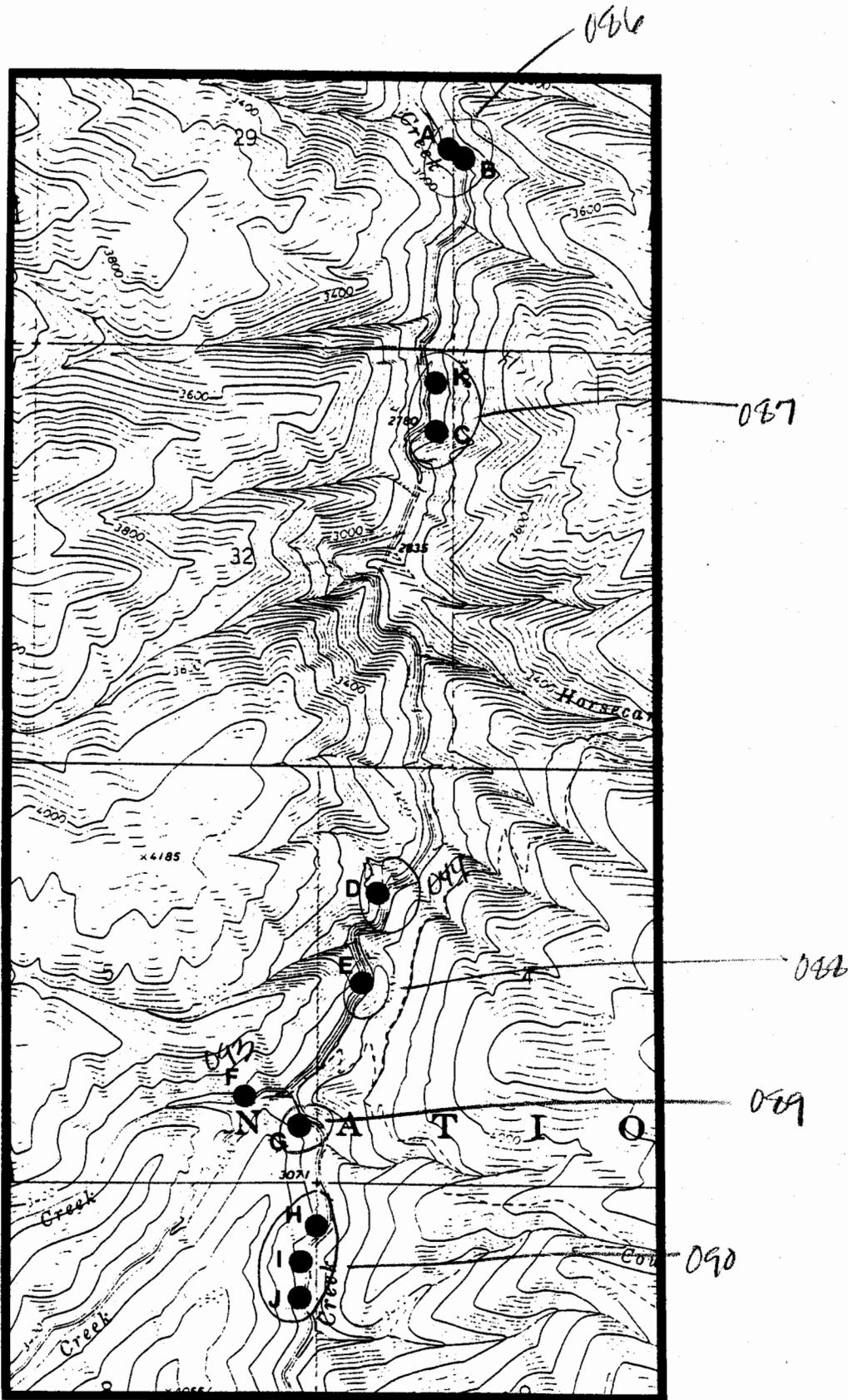


Figure 5. Fishhook Crk. 7.5' topo.

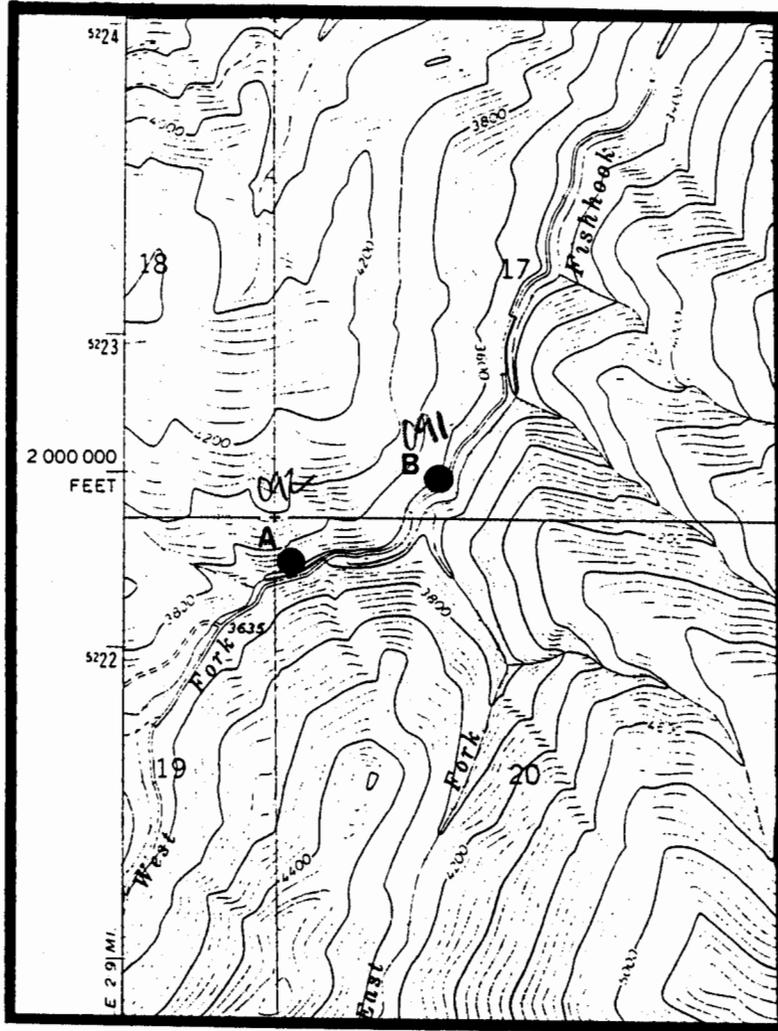


Figure 6. Fishhook Crk. 7.5' topo.

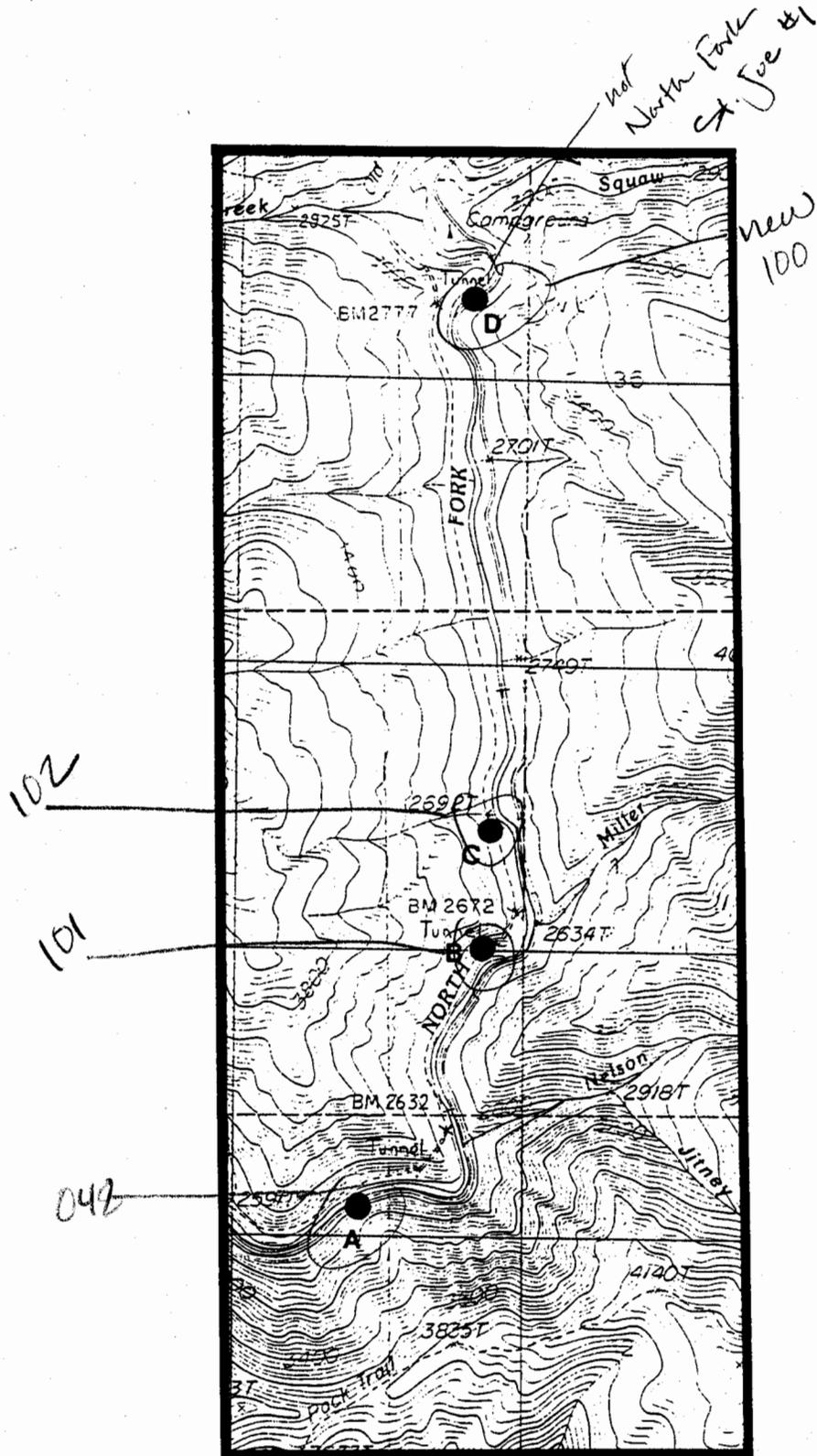


Figure 7. Avery 7.5' topo.

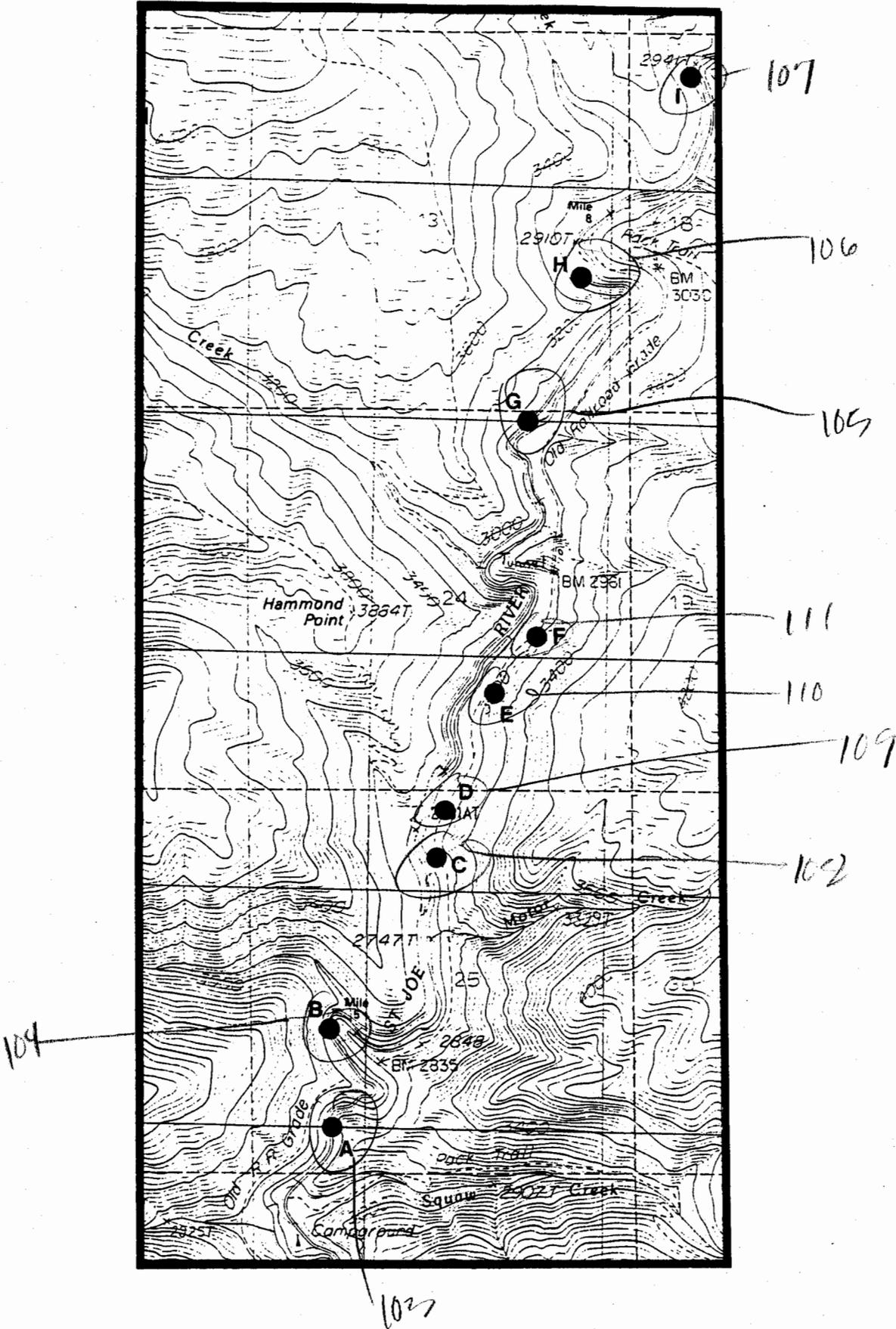


Figure 8. Avery 7.5' topo.

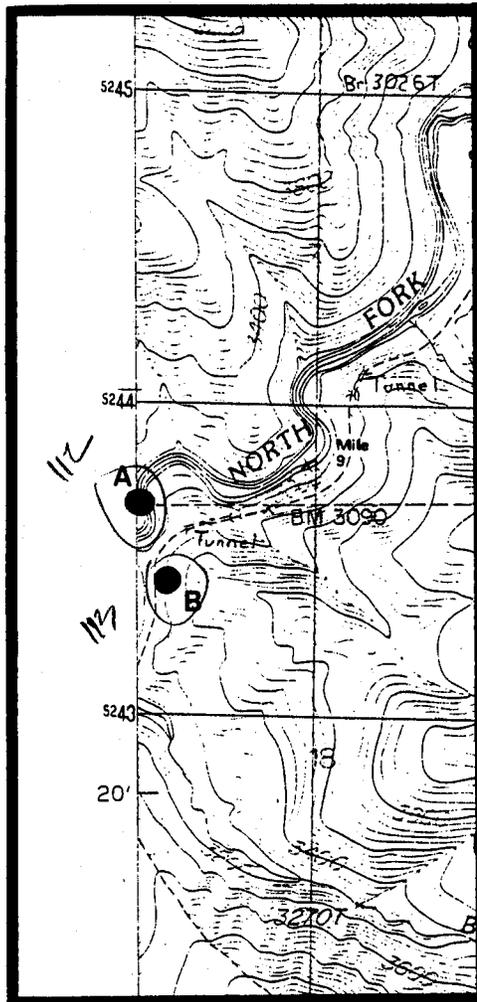


Figure 9. Shefoot Mtn. 7.5' topo.



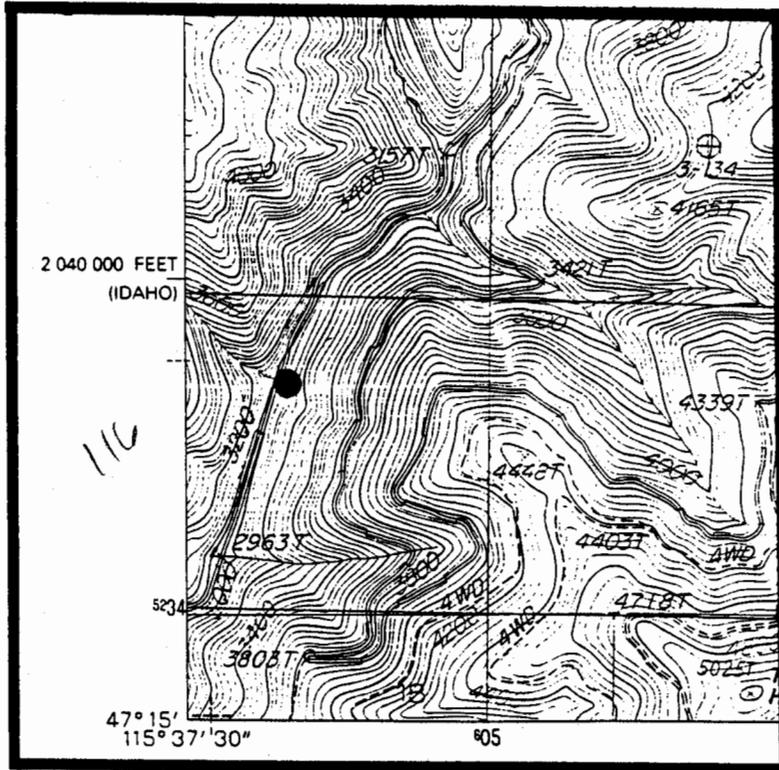


Figure 11. Adair 7.5' topo.





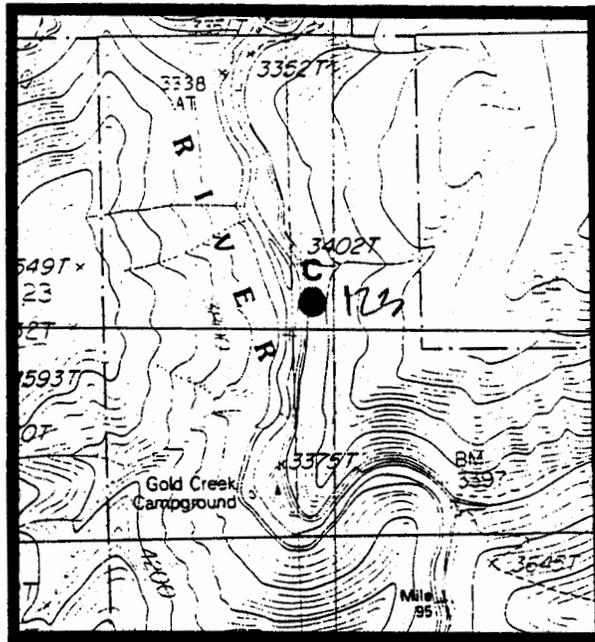
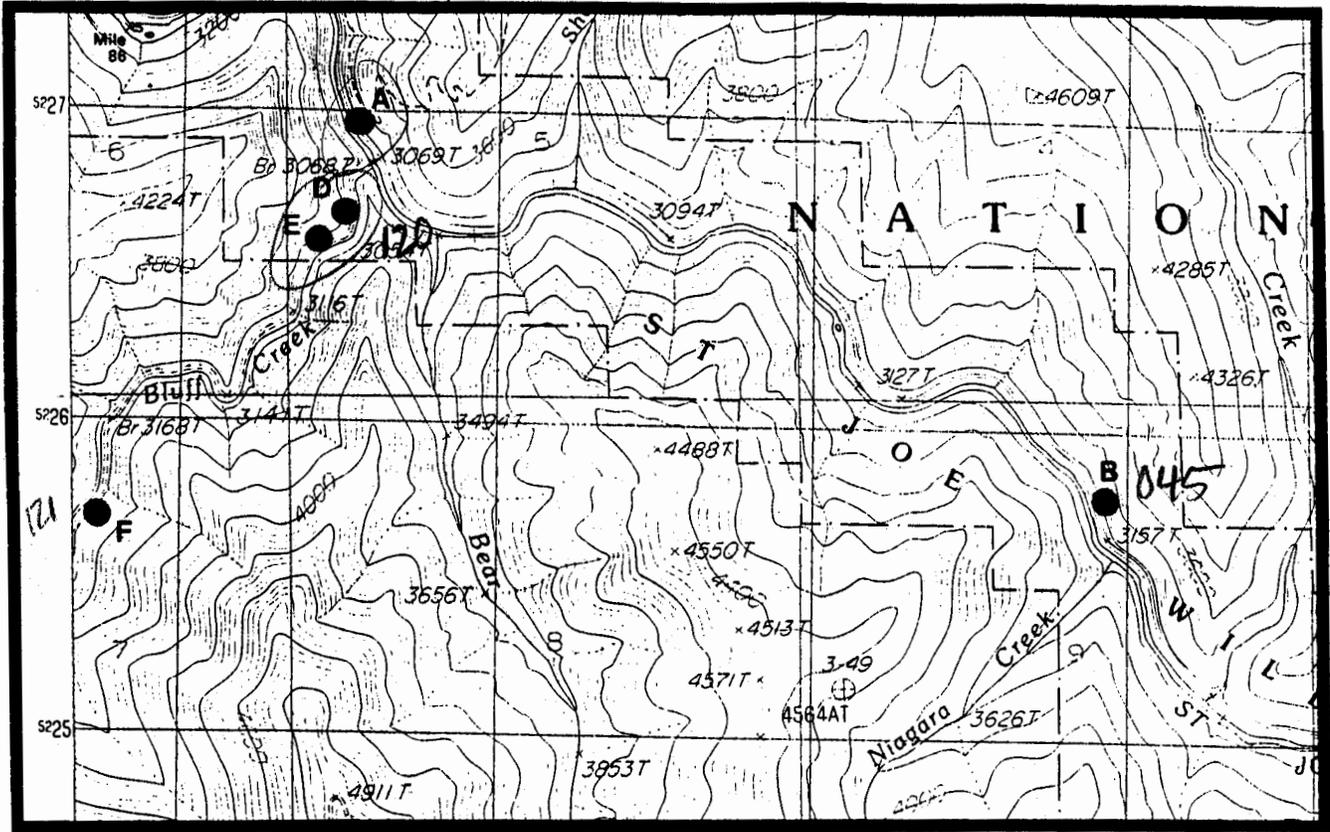


Figure 14. Conrad Peak 7.5' topo.

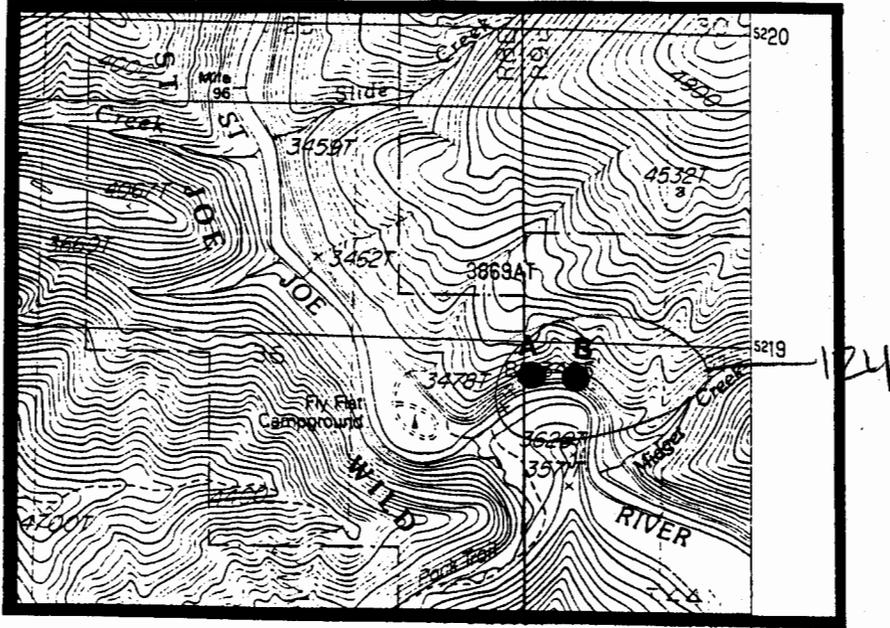


Figure 15. Peggy Peak 7.5' topo.

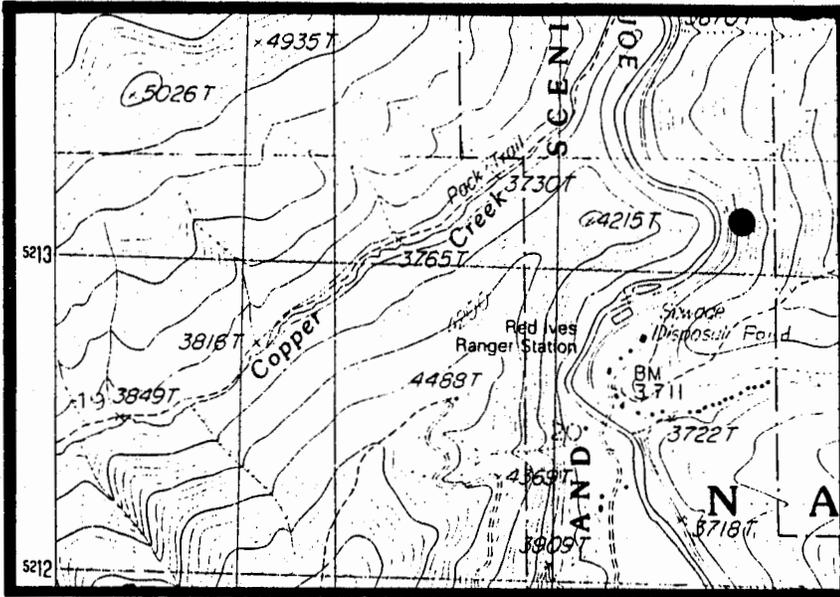


Figure 16. Red Ives Peak 7.5' topo.

Appendix 1. Areas searched unsuccessfully. All sites were searched at night unless noted otherwise.

1. St. Joe River FH 50; 16 seepages between Marble Creek and Hoyt Bridge.
2. St. Joe River FH 50; 11 seepages between Hoyt Bridge and Avery.
3. New St. Joe River Road (N. side of river); 9 seepages between Hoyt and the intersection of the new St. Joe River Road and old FH 50 (recent roadcuts).
4. Fishhook Creek FR 301; 7 seepages between FH 50 and the Fishhook Creek Tunnel.
5. Fishhook Creek FR 301; 12 seepages from the Fishhook Creek Tunnel S. to 4.99 mi.
6. Lick Creek FR 753; 3 seepages from FR 301 to 1.95 mi.
7. FR 301; 3 seepages from the Little North Fork Clearwater Bridge S. to 3.10 mi.
8. FR 1268; seven seepages from the Little North Fork Clearwater Bridge S. to 7.84 mi.
9. Cairn Creek on Slate Creek FR 225 (day).
10. Binney Creek on Slate Creek FR 225 (day).
11. Cedar Creek on Slate Creek FR 225 (day).
12. Horn Creek on Slate Creek FR 225 (day).
13. Slate Creek FR 225; 6 Seepages and 3 unnamed creeks between FR 3745 and Horn Creek (day).
14. Slate Creek FR 225; 2 unnamed creeks between the transmission line crossing and Uhlman Creek (day).
15. Slate Creek FR 225; 8 seepages between the transmission line crossing and Horn Creek.
16. FR 1934 (Slate Creek drainage); 22 seepages and headwater streams between Binney Creek and Slate Creek FR 225.
17. Dunn Peak FR 1934; 5 seepages from Old Avery Ranger Station to 1.18 mi (day).
18. New North Fork St. Joe Road 456; 12 seepages between Avery and the intersection of new Road 456 and old FR 456 (W. end of trestle).
19. Old North Fork St. Joe FR 456; 19 seepages from the intersection of new Road 456 and old FR 456 (W. end of trestle) N. to 3.95 mi.

20. North Fork St. Joe Road 456; 6 seepages between the intersection of new Road 456 and old FR 456 (W. end of trestle) to Loop Creek FR 326.
21. Loop Creek FR 326; 2 seepages from Road 456 to 0.50 mi.
22. North Fork St. Joe Road 456; 17 seepages between Loop Creek FR 326 and Moon Pass Summit.
23. Bouillon Creek FR 507; 3 seepages from North Fork St. Joe Road 456 to 6.00 mi.
24. St Joe River FH 50; 5 seepages between Avery and Bird Creek FR 338.
25. Bird Creek FR 338; 4 seepages from FH 50 to 1.95 mi.
26. St Joe River FH 50; 3 seepages between Bird Creek FR 338 and Prospector Creek FR 752.
27. Prospector Creek FR 752; 2 seepages from FH 50 to 1.50 mi.
28. St Joe River FH 509; seepages between Prospector Creek FR 752 and Eagle Creek FR 1214
29. Eagle Creek FR 12145; seepages from FH 50 to 2.83 mi.
30. St Joe River FH 50; 4 seepages between Eagle Creek FR 1214 and Quartz Creek FR 339.
31. Quartz Creek FR 339; 6 seepages from FH 50 to 4.94 mi.
32. St Joe River FH 50 8; seepages between Quartz Creek FR 339 and Bruin Creek FR 1223.
33. Bruin Creek FR 1223; 3 seepages from FH 50 to 3.6 mi.
34. Bluff Creek FR 5099; seepages from FH 50 to 5.24 mi.
35. FR 201; 1 Seepage 5.40 mi W. of FR 509.
36. Gold Creek FH 50; 7 seepages between its intersection with St. Joe River FR 218 and Gold Summit.
37. St. Joe River FR 218; 8 seepages between its intersection with Gold Creek FH 50 and Red Ives.
38. Beaver Creek FR 303; 2 seepages from FR 218 to 7.64 mi.
39. FR 320; 4 seepages between Red Ives and State Line (day).

Appendix 2. Other amphibians encountered during searches. All were found at night unless noted otherwise.

Ambystoma macrodactylum

1. North Fork St. Joe Road 456; seepage 2.35 mi W. of Loop Creek FR 336.
2. St. Joe River FR 218; on easement 0.35 mi N. of Red Ives Station driveway.
3. Pond on Slate Creek FR 225 S. of Cedar Creek (day).

Dicamptodon ensatus (aterrimus)

1. FR 218; on easement 1 mi S. of Beaver Creek FR 303.
2. St. Joe River FR 218; on easement 0.5 mi S. of Gold Creek FH 50.
3. Quartz Creek FR 339; on easement 0.1 mi from FH 50.
4. Old St. Joe River FH 50; seepage 3.39 mi W. of Hoyt Bridge.
5. Old North Fork St. Joe FR 456; on easement 2.43 mi N. of intersection of new Road 456 and old FR 456.

Ascaphus truei

1. Quartz Creek FR 339; seepages 0.42, 0.83, and 2.2 mi from FH 50.
2. St. Joe River FR 218; seepage 0.46 mi N. of Red Ives Station driveway.
3. Bluff Creek FR 509; seepages 1.94 and 2.89 mi from FH 50.
4. Bird Creek FR 338; seepages 0.44 and 1.16 mi from FH 50.

Bufo boreas

1. Bird Creek FR 338; on easement 1 mi from FH 50.

Rana pretiosa

1. North Fork St. Joe Road 456; seepage 2.35 mi W. of Loop Creek FR 336.
2. St. Joe River FR 218; on easement near intersection with Beaver Creek FR 303.
3. Pond on Slate Creek FR 225 S. of Cedar Creek (day).

Hyla (Pseudacris) regilla

1. Fishhook Creek FR 301; seepage 1.15 mi from FH 50.
2. Pond on Slate Creek FR 225 S. of Cedar Creek (day).