

STATUS AND DISTRIBUTION OF THE COEUR D'ALENE SALAMANDER
(PLETHODON VANDYKEI IDAHOENSIS) IN IDAHO

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Nongame Report
February 1988

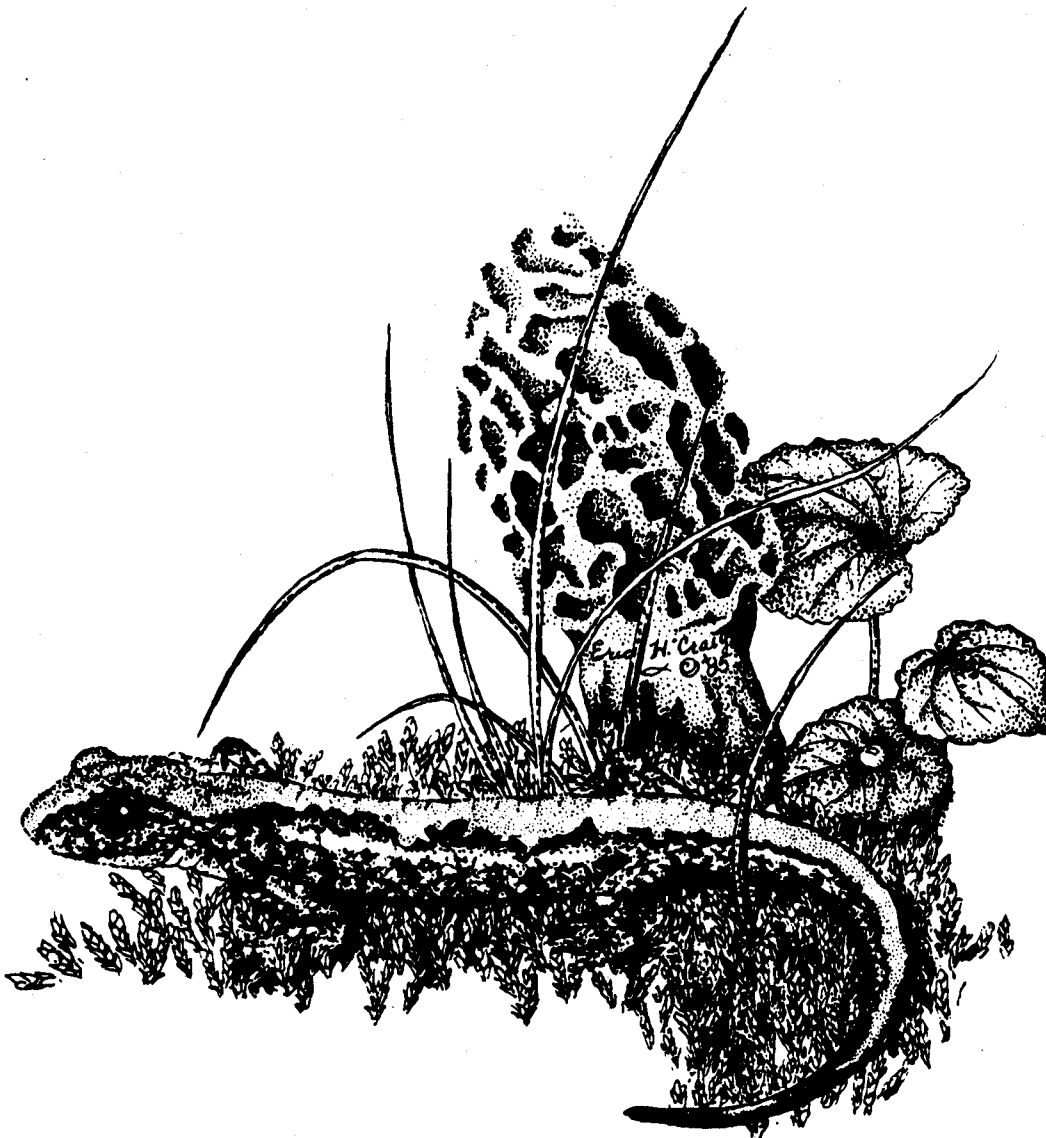


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ABSTRACT

Prior to this status survey, the Coeur d'Alene salamander had been collected at 29 sites in northern Idaho. At least eight of these sites had already been eliminated and the status of eight other sites had not been determined for 8-10 years. During May and September 1987, portions of the Lochsa, North Fork Clearwater, St. Joe, Coeur d'Alene, Pend Oreille, Kootenai, and Moyie drainages were surveyed in order to gain a better understanding of the Coeur d'Alene salamander's population status, distribution, and habitat requirements. Thirty new populations were discovered during the status survey. Over half of these populations are on the Clearwater National Forest. Twenty-three of the 29 previously known populations were visited and 12 were found to be extant. Four other populations are thought to be extant bringing the total of present-day Idaho populations to 46. Coeur d'Alene salamanders occur in three types of habitat in Idaho: spring seepages, spray zones of waterfalls, and edges of streams. The majority of Idaho sites are spring seepages associated with road cuts. The species occurs in Idaho from 1800 ft in elevation on the lower Selway River to 3500 ft at Copper Falls near the Canadian border. Aspect and overstory cover do not appear to be important environmental factors in explaining the species' distribution. The presence of fractured bedrock as well as relatively high substrate moisture, high relative humidity, and moderate air temperatures appear to be the most important factors in explaining the distribution of the Coeur d'Alene salamander.

STATEMENT OF PROBLEM

Plethodon vandykei is a small, plethodontid salamander that occurs in two disjunct areas, western Washington and northern Idaho/western Montana. The subspecies in western Washington is P. vandykei vandykei (Van Dyke's salamander); the northern Idaho/western Montana subspecies is P. vandykei idahoensis (Coeur d'Alene salamander). Prior to this status survey the species had been collected at 29 sites in northern Idaho of which at least 8 sites had been eliminated; the status of 8 other sites had not been determined in 8-10 years. Because of its apparent rarity as well as some opinions that the northern Idaho/western Montana subspecies should be afforded full species status, the Coeur d'Alene salamander has been classified as a candidate for listing as Threatened or Endangered by the U.S. Fish and Wildlife Service, a Species of Special Concern by the Idaho Department of Fish and Game, and a Sensitive Species by the Idaho office of the Bureau of Land Management and the U.S. Forest Service in Region 1. Partially funded by a Challenge Grant from the U.S. Forest Service, the Idaho Natural Heritage Program conducted a status survey of the Coeur d'Alene salamander in 1987 to gain a better understanding of the salamander's population status, distribution, and habitat requirements. The purpose of this report is to detail the findings of the 1987 field inventory.

BACKGROUND

The Coeur d'Alene salamander is a relatively short (max SVL (snout-vent length): 62 mm), long-legged species with a green, orange, yellow, or red dorsal stripe (Nussbaum et al. 1983). The stripes are usually invaded with melanophores and usually do not reach the tip of the tail. The limb bases are dark with light flecks.

Mating generally occurs from August through October although some breeding may also take place in April and May (Lynch 1984). Females have a biennial reproductive cycle and lay eggs in dry nest sites during April and May. Hatching and emergence of neonates from nests occurs in September and October. Coeur d'Alene salamanders generally hibernate from November through March, although these dates may vary with elevation (Nussbaum et al. 1983).

In northern Idaho, Coeur d'Alene salamanders have been collected in three different types of habitat: 1) edges of streams, 2) talus in spray zones of waterfalls, and 3) spring seepages associated with road cuts. Most species of Plethodon occupy a more terrestrial habitat than P. vandykei, which has been referred to as the most aquatic Plethodon (Brodie and Storm 1971). The Coeur d'Alene salamander forages primarily on aquatic insects (Wilson and Larsen, in press).

The taxonomic status of Plethodon vandykei has long been debated and is still in question. On one side of the issue are the views of Highton and Larson (1979) and Wallace (1986) who, based on biochemical evidence, suggest that the western Montana/northern Idaho subspecies should be a full species, Plethodon idahoensis. In contrast are the views of Brodie (1970) and Nussbaum et al. (1983) who hold that the biochemical evidence is weak and that morphological variation between the subspecies is not sufficient to elevate the Coeur d'Alene salamander to a full species. Here I use the nomenclature of Stebbins (1985) out of convention (i.e., Coeur d'Alene salamander = P. vandykei idahoensis).

Lynch (unpublished data) and Diller and Wallace (1985) have previously searched for additional populations of the Coeur d'Alene salamander. In 1985, Diller, Wallace, Groves, and several Nez Perce National Forest personnel searched unsuccessfully for the salamander in the Selway-Bitterroot Wilderness from the Paradise Guard Station to Selway Falls. The majority of this wilderness area is likely too dry to support any substantial populations of the species. Lynch has searched numerous locales in Idaho for the Coeur d'Alene salamander. Those areas where he located typical habitat but did not find salamanders are summarized in Table 1. Prior to this status survey, the Coeur d'Alene salamander was known from 29 sites in northern Idaho (of which only 13 were known to be extant) extending from the lower Selway River north to the Canadian border (Figure 1).

METHODS

I searched for new populations of the Coeur d'Alene salamander along the South Fork of the Clearwater River and on the Clearwater, St. Joe, Coeur d'Alene, and Kaniksu National Forests during May and September 1987 (Table 2). These months were chosen for the survey because the Coeur d'Alene salamander is largely inactive and remains underground from June 15 to July 30 (Lynch, pers. comm.). In addition, I attempted to survey as many as possible of the previously known collection sites for the species to determine the habitat and status of the population at these sites. During May, I searched for salamanders in the spray zones of waterfalls and in spring seepages on rock exposures next to roads. In August, the type of habitat searched was expanded to include edges of streams which could not be searched during spring runoff in May.

Surveys were conducted systematically along forest roads adjacent to streams. Unless streams could be safely forded, only springs and tributaries along the roaded side of a creek or river were surveyed. A list of waterfalls in Idaho was obtained from the U.S. Geological Survey and from Plumb (1983). I searched most of the undeveloped waterfalls in northern Idaho for new salamander populations.

When salamanders were located, I recorded data on location, canopy cover, slope, aspect, type of habitat (stream, waterfall, spring), size of available habitat, and number of salamanders observed. Slope was estimated in degrees with a clinometer. Aspect was measured with a compass and is reported as degrees in the direction that the site faced. Percent canopy cover was measured with a spherical densiometer and is reported as an average of four readings taken from one spot in the four cardinal directions. Size of available habitat was estimated to the closest rectangle or square with a measuring tape. A photograph was taken at each site where salamanders were observed.

When time allowed, the total number of salamanders at spring seepage populations was counted at night. For logistical reasons, not all spring seepage populations were counted at night. For safety reasons, population counts could not be conducted at night at the waterfall sites. In addition, it was not feasible to count salamanders along streams at night. Population sizes were classified into three categories: 1) small (S) - less than 5 salamanders observed, 2) medium (M) - 5 to 15 salamanders observed, and 3) large (L) - >15 salamanders observed.

On June 9, R. Wallace, L. Diller, and I attempted to mark and recapture salamanders at the Lochsa River population in order to get a better estimate of their densities. We toe clipped animals on the left front leg and released them at the site of capture.

Because no toe clipped animals were captured the following evening, no further attempts were made to mark/recapture salamanders at other sites.

I collected Coeur d'Alene salamanders at several sites. These salamanders were preserved in a 10% formalin solution and deposited in the amphibian and reptile collection at the Department of Biological Sciences, University of Idaho.

RESULTS

Thirty new sites inhabited by Coeur d'Alene salamanders were discovered during the 1987 status survey (Table 3). Sixteen of these sites were on the Clearwater National Forest, one was on the Coeur d'Alene District of the Bureau of Land Management, eight were on the St. Joe National Forest, four were on the Coeur d'Alene National Forest, and one was on private land (Potlatch Corporation).

Twenty-three of the 29 previously known sites were visited, and 12 of these were found to definitely be extant (Table 3). Thus, there are now at least 42 sites for the Coeur d'Alene salamander in northern Idaho that were known to be extant in 1987. Based on recent observations, another four sites (Glover Creek, Cascade Creek, Big Creek, Kelly Creek Falls) are also thought to be extant bringing the estimated total number of present-day Coeur d'Alene salamander populations in Idaho to 46. Nine sites are definitely thought to no longer contain salamanders, whereas the status of four sites (Benton Butte, Benton Creek, Wolf Lodge Bay, Beauty Creek) remains unknown (Table 3). Of the forty-six extant populations, three are in the Selway/Lochsa drainage, 24 are in the North Fork Clearwater drainage, 13 are in the St. Joe drainage, five are in the Coeur d'Alene drainage, and one is in the Moyie drainage (Figure 1). Details on the exact location and population status of all 59 Coeur d'Alene salamander populations are provided in Appendix A.

I did not find salamanders at several locales where I searched for them (Table 2). These areas were primarily waterfalls in the Selkirk Mountains on the Kaniksu National Forest and Wellington Creek Falls in the Lightning Creek drainage. In addition, the majority of streams I searched in the Coeur d'Alene drainage did not appear to contain salamanders.

Twenty-five of the newly discovered populations were spring seepages over rock faces along roadsides, and five were along the edges of streams (Table 4). When considering both contemporary and historic salamander populations in Idaho (i.e., 59 sites), three are waterfalls (Copper, Elk Creek, Kelly Creek), one is a combination of springs and streams (Montana/Steep Creeks), 17 are streams, 35 are springs, and three (historic) are unknown (Canyon, Avery, Chatcolet). Among the 44 sites at which I measured aspect, there was a fairly equal distribution between north-facing and south-facing (25 versus 19) sites (Table 5). The slope of spring populations averaged 54.9 degrees \pm 14.9 (SD) (n = 31) and ranged from 35 - 90 degrees; slope of stream populations had a mean of 25.0 degrees \pm 16.6 (SD) (n = 5) and ranged from 10 - 45 degrees (Table 4). Percent canopy cover above salamander populations varied widely between 0 and 96 % (\bar{x} = 59.1 % \pm 29.2, n = 37).

Twenty-three of 34 populations were classified as small (< 5 salamanders) populations, five as medium-sized populations, and six as large (> 15 salamanders) (Table 4). I observed the greatest number of salamanders at the Elk Creek Falls, Quartz Creek, and Lochsa River populations. Elk Creek Falls was the only site where I observed salamanders above ground and active during the day.

The elevation of Coeur d'Alene salamander populations in Idaho ranges from 1800 ft at the Glover Creek site on the Selway River to 3500 ft at the Copper Falls site on the Canadian border (Appendix A). Although the S. Fork Wellington Creek population is listed as occurring at 4200 ft, the exact location of this historic population is unknown and the elevation is therefore only approximate. For all 59 historic and current sites for the salamander, the mean elevation is 2648 ± 552 ft (SD).

DISCUSSION

Most of the known populations of Coeur d'Alene salamanders in Idaho occur at spring seepages next to roads. Although this may be an indication that the species prefers this habitat over streamside habitat or that seepage habitat is more available than streamside, it is more likely to be a reflection of bias in sampling. Spring seepages next to roads are not only more accessible than streamside habitat, but they are also easier to search for salamanders than the habitat along streams. Although I usually had no difficulties in finding salamanders at spring seepages (< 5 minutes search time), I sometimes spent up to 30-45 minutes searching for salamanders along streams before finding one individual. Thus, both in this status survey and in previous attempts to locate Coeur d'Alene salamander populations, there has probably been a bias towards searching spring seepages along roads as opposed to streamside habitat.

In streamside habitats, salamanders were located on the edge of streams beneath moist rocks. Usually these rocks were next to a small cascade or bedrock of the stream where water flowed over the rock in thin sheets. Salamanders were never observed in the stream itself and were rarely found immediately adjacent to flowing water. There was usually a canopy cover of greater than 70% in these streamside habitats.

Neither aspect nor canopy cover appeared to be important factors in the distribution of spring seepages. Nearly as many sites faced to the south as the north and canopy cover varied widely. For example, the Pie Creek populations #1 and 2 (Table 4) faced to the south and had very little canopy cover. Apparently the most important elements of these seepages are the hydric and thermal stability they afford to the salamanders (Wilson and Larsen, in press), thereby insulating them from climatic extremes. These seepages provide a constant emergence of spring water with a constant low water temperature.

In these spring seepages, I observed salamanders at night in three areas: the vertical rock face over which spring water flowed, rubble at the base of the rock face, and on various vascular plants or bryophytes (moss) growing on the rockface or at its base. On several occasions, salamanders exhibited a negative phototaxic response to the beam of the flashlights used to locate them. During the day, salamanders were never observed on rock faces and could only be found by turning over rocks or removing the bryophyte cover from rock faces. Elk Creek Falls was the single exception; salamanders were active here during the day on the surface of talus within the spray zone of the falls.

Estimating the size of individual Coeur d'Alene salamander populations was difficult for several reasons. First, assessing salamander numbers along streams during the day is nearly impossible because most individuals are beneath rocks. Second,

logistics forced me to survey some parts of the state during May and other parts during September. Wilson and Larsen (in press) have shown that for a spring seepage in western Montana, the number of salamanders observed on a given night is positively correlated with decreasing substrate temperature and negatively correlated with the number of days since the last rain. Therefore, counts during May and September may not be comparable. Third, for at least some sites, not all salamanders are above ground at a given point in time on a given night. At the Quartz Creek springs (site name # 23 - Table 3) I observed salamanders at night deep in rock fractures and not on the surface feeding. This factor may then also confound estimating salamander numbers.

In summary, the data on population size in Table 4 should be viewed with skepticism. Why similar sites in size and habitat appeared to contain considerably different population sizes is not clear. Wilson and Simon (1987) suggested that differences among sites in the amount of area underground which salamanders retreat to during the day could account, in part, for such discrepancies.

Precipitation in northern Idaho was far below normal during the spring, summer, and autumn of 1987. This drought period may have had an adverse effect on my abilities to detect salamanders at certain sites. For example, I was unable to locate salamanders at Beauty Creek or in talus on the south shore of Wolf Lodge Bay

(site # 51 and 52 - Table 3). Both of these sites were extremely dry when I visited them. It is plausible that salamanders either dispersed from these sites to moister ones or had retreated underground to avoid dessication.

Some Coeur d'Alene salamander populations in Idaho appear to tolerate disturbed conditions. For example, most of the spring seepage populations located along the North Fork Clearwater Rd. and the St. Joe River Rd. are subject to constant disturbance and dust from logging trucks. Additionally, some of these populations are on southern exposures with little canopy cover. At least one population, West Fork Benton Creek (site # 19 - Table 3), was discovered in an area that was actively being logged. Conversely, heavy logging in a drainage and the resulting stream sedimentation and loss of canopy cover may have eliminated some populations such as Emida (#33) and Bird Creek (#44).

Results of the 1987 survey indicate that the North Fork Clearwater and St. Joe River drainages form the core of the Coeur d'Alene salamander's distribution in Idaho. I am confident that only time prevented me from finding additional populations in these drainages. It is not unreasonable to suspect that Coeur d'Alene salamanders could be found somewhere along nearly every major tributary to these rivers. On the other hand, the species appears to be much less abundant in the Coeur d'Alene drainage and in streams of the Purcell and Selkirk Mountains.

The absence of salamanders at waterfalls in the Selkirks is most likely related to the lack of fractured rock into which salamanders can retreat in winter to avoid freezing. The species' apparent rarity in the Coeur d'Alene, Pend Oreille, and Moyie drainages may be related to the heavy logging that has historically occurred there. However, an alternative explanation is that glaciation in Idaho from the Coeur d'Alene drainage north during the Pleistocene (Ross and Savage 1967) may have eliminated populations of the Coeur d'Alene salamander and the species has been slow to recolonize after recession of the glaciers.

In summary, the known distribution of the Coeur d'Alene salamander in Idaho is from the Lochsa and lower Selway River north to the Canadian border (Figure 1). The western border of the species' distribution can be approximated by a line running from the confluence of the Selway and Lochsa Rivers to Elk River, a second line from Elk River to Wolf Lodge Bay on Coeur d'Alene Lake, and a third line from Wolf Lodge Bay to Copper Falls. The Idaho/Montana boundary forms the eastern border of the distribution in Idaho, although many localities exist in Montana (Wilson and Simon 1987). Warmer average temperatures and lower amounts of precipitation probably limit the distribution of the Coeur d'Alene salamander in the south, whereas human related disturbances and/or the impacts of Pleistocene glaciation limit the species to the north.

MANAGEMENT RECOMMENDATIONS

1. The Coeur d'Alene salamander should remain as a Forest Service Sensitive Species. Although it appears to be abundant within its range, its distribution in Idaho is quite restricted as is the type of microhabitat the species requires. In addition, taxonomic work may eventually indicate that the northern Idaho/western Montana populations represent a distinct species.

2. Road widening projects along the Lochsa, North Fork Clearwater, and St. Joe River roads as well as proposed hydroelectric projects represent the greatest threats to the species. The majority of Idaho populations occur in these areas. Whenever possible, road improvement projects should be designed so as to avoid negatively impacting these populations. Clearcuts to stream edges in the North Fork Clearwater and St. Joe Rivers drainages should be avoided because these actions will likely result in elimination of some populations.

3. At least four areas in Idaho need further inventory for Coeur d'Alene salamanders. The first area is streams along the Montana border between Clark Fork and Copper Falls. The second is tributaries of the upper Coeur d'Alene River north of Prichard. Third, some additional searches of tributaries to Coeur d'Alene Lake could result in the discovery of new populations. Lastly, searches around Hayden, Spirit, and Twin Lakes may be worthy.

4. A better understanding is needed of the microhabitat requirements of this species. A study focusing on activity as well as habitat and environmental variables at several widely dispersed populations could help provide this needed management information.

ACKNOWLEDGMENTS

Forest Service biologists Dan Davis, Steve Anderson, Paul Harrington, and Linda Saunders - Ogg were very helpful in logistical aspects of the survey. Rick Wallen and Nancy Tyler assisted in field work. Dick Wallace and Lowell Diller took the lead in the mark/recapture process. I wish to especially thank Dick Wallace for the time he took to provide me with background on all his and others' previous efforts to collect Coeur d'Alene salamanders in Idaho. His data, as well as those of Jim Lynch and Al Wilson, were critical to the completeness of this survey.

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Figure 1. Distribution of Coeur d'Alene salamander populations in northern Idaho. Numbers refer to populations of salamanders identified in Tables 3 and 4 (see text).

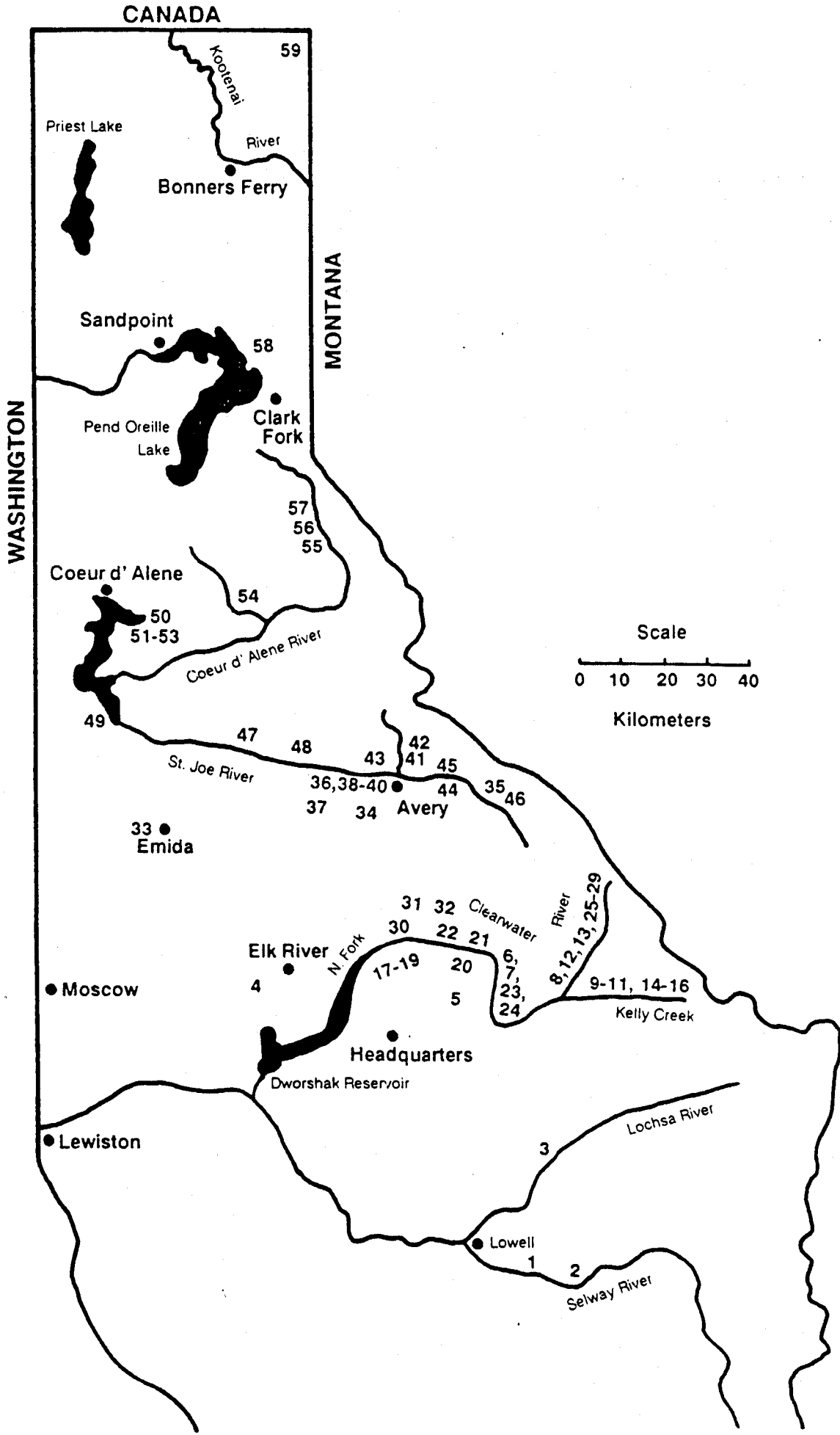


Table 1. Summary of sites that J. Lynch searched unsuccessfully for the Coeur d'Alene salamander (1980 - 1986).

1. Tributaries of the Salmon River from Shoup to Riggins.
2. Lochsa River from Crooked Fork confluence to Hungry Creek.
3. Clearwater River from Lowell to Lewiston.
4. Tributaries of the Selway River (N side) from Moose Creek confluence to Three Links Confluence.
5. Tributaries of Lawyers Creek from Craigmont to Ferdinand.
6. Breakfast Creek from Dworshak Reservoir upstream 5 mi.
7. Potlatch River from Kendrick to Corral Creek.
8. Tributaries of the Potlatch River from Deary to Bovill.
9. Tributaries of the E. Fork Potlatch River from Bovill upstream 8 mi.
10. Tributaries of Bull Run Creek from 10 mi E. of Elk River to Elk River.
11. Tributaries of Lapwai Creek from Culdesac to Winchester.
12. Tributaries of Santa Creek from Benewah Co. line to Santa.
13. Tributaries of the St. Maries River from Clarkia to John Creek.
14. Chatcolet Lake
15. Conkling Park
16. Hayden, Spirit, and Twin Lakes
17. Lightning Creek from mouth upstream for 9 mi.

Table 1 (continued)

18. Tributaries of Lake Pend Oreille from Trestle Creek to Clark Fork.
 19. Tributaries of the Clark Fork River (N side) from Clark Fork to Noxon.
 20. Tributaries of the Kootenai River from Troy to Mission Creek.
 20. Priest Lake
 21. Tributaries of the Moyie River along Hwy. 95 from Mission Creek divide to Moyie, Canada.
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Table 2. Areas searched for Coeur d'Alene salamanders during the 1987 status survey.

Clearwater National Forest (and adjacent state/private lands):

1. Springs along and selected tributaries to Beaver Creek from headwaters to mouth.
2. Springs along Silver Creek Rd from Beaver Creek to Dworshak Reservoir.
3. W. Fork of Benton Creek
4. Springs and creeks along the N. Fork Clearwater River from Marquette Creek upstream to the Hidden Creek campground.
5. Fern Creek and Dog Creek in the Isabella Creek drainage.
6. Springs along Quartz Creek (N. Fork Clearwater drainage).
7. Cave Creek Falls (N. Fork Clearwater drainage).
8. Springs and tributaries to Kelly Creek from Kelly Forks upstream to Hansen Meadows.
9. Cayuse Creek from Cayuse Landing upstream approx. 2 mi.
10. Springs along Lochsa River Rd.

St. Joe National Forest (and adjacent state/private lands):

1. Creeks along the Rochat Creek Divide Rd from the St. Joe River Rd to Crystal Lake.
2. Springs along and selected tributaries to the St. Joe River from Calder upstream to Red Ives.
3. Big Creek
4. Springs along Marble Creek.

Table 2 (continued)

5. Springs along Fishhook Creek.
6. Springs and tributaries to the N. Fork St. Joe River from its headwaters to its mouth.

Coeur d'Alene National Forest (and adjacent state/private lands):

1. Beauty Creek from its mouth upstream 2 mi.
2. Unnamed creek flowing into Beauty Bay (Coeur d'Alene Lake).
3. Talus along the S shore of Wolf Lodge Bay (Coeur d'Alene L.).
4. Springs along and selected tributaries to the N. Fork Coeur d'Alene River from Bumblebee Meadow to Honey Mtn.
5. Springs along Leiberg Creek from mouth to Leiberg Saddle.
6. Springs along Elk Creek from Gene Creek confluence downstream to Magee.
7. Springs along Tepee Creek from Magee to its mouth.
8. Springs along Coeur d'Alene River from Tepee Creek confluence downstream to Prichard.

Kaniksu National Forest (and adjacent state/private lands):

1. Wellington Creek Falls (Lightning Creek drainage)
2. Jeru Falls (Selkirks)
3. Smith Creek Falls (Selkirks)
4. Myrtle Creek Falls (Selkirks)
5. Lower Priest Falls or American Falls (Selkirks)
6. Copper Falls (Purcells)

Table 3. Summary of location, land ownership, observation dates, and status of historic and present-day populations of the Coeur d'Alene salamander (Plethodon vandykei idahoensis) in Idaho, 1955-1987. Site names appear in order by township, range, and section.

Site Name	Location (T, R, S, and County)	Land Ownership	First Observation Date and Observer's Name		Last Observation Date and Observer's Name		Population Status
			Date	Observer's Name	Date	Observer's Name	
1. Glover Creek, Selway River	T32N, R9E, S32, Idaho	Mez Perce National Forest	1979, Lynch		1986, Wallace		Extant
2. Cascade Creek, Selway River	T32N, R11E, S30, Idaho	Mez Perce National Forest	1986, Lynch		1986, Lynch		Extant
3. Lochsa River	T34N, R8E, S24, Idaho	Clearwater National Forest	1965, Teberg		1987, Groves		Extant
4. Elk Creek Falls	T39N, R2E, S11, Clearwater	St. Joe National Forest	1977, Diller		1987, Groves		Extant
5. Beaver Creek, NF Clearwater River	T39N, R6E, S5, Clearwater	Clearwater National Forest	1980, Lynch and Wallace		1987, Groves		Extant
6. Flat Creek No. 1, NF Clearwater River	T39N, R7E, S1, Clearwater	Clearwater National Forest	1987, Groves		1987, Groves		Extant
7. Flat Creek No. 2, NF Clearwater River	T39N, R7E, S11, Clearwater	Clearwater National Forest	1985, Wallace		1987, Groves		Extinct, rock slide
8. Black Canyon No. 3, NF Clearwater River	T39N, R10E, S7, Clearwater	Clearwater National Forest	1987, Groves		1987, Groves		Extant
9. Clayton Creek, Kelly Creek drainage	T39, R10E, S15, Clearwater	Clearwater National Forest	1987, Groves		1987, Groves		Extant
10. Pie Creek No. 1, Kelly Creek drainage	T39N, R10E, S16, Clearwater	Clearwater National Forest	1987, Groves		1987, Groves		Extant

Table 3 (continued).

Site Name	Location (T, R, S, and County)	Land Ownership	Last Observation		
			First Observation Date and Observer's Name	Date and Observer's Name	
				Population Status	
11. Pie Creek No. 2	T39N, R10E, S17, Clearwater	Clearwater National Forest	1987, Groves	1987, Groves	Extant
12. Black Canyon No. 1, NF Clearwater River	T39N, R10E, S18, Clearwater	Clearwater National Forest	1987, Groves	1987, Groves	Extant
13. Black Canyon No. 2	T39N, R10E, S18, Clearwater	Clearwater National Forest	1987, Groves	1987, Groves	Extant
14. Kelly Creek Falls	T39N, R10E, S22, Clearwater	Clearwater National Forest	1985, Diller	1985, Diller	Extant
15. Clayton Creek No. 2, Kelly Creek drainage	T39N, R11E, S17, Clearwater	Clearwater National Forest	1987, Groves	1987, Groves	Extant
16. Clayton Creek No. 3	T39N, R11E, S20 Clearwater	Clearwater National Forest	1987, Groves	1987, Groves	Extant
17. Benton Butte	T40N, R5E, S2 Clearwater	State	1978, Diller	1979, Diller	?
18. Benton Creek	T40N, R5E, S8, Clearwater	U. S. Army Corps	1976, Orme	1976, Orme	?
19. West Fork Benton Creek	T40N, R5E, S18, Clearwater	Potlatch	1987, Groves	1987, Groves	Extant
20. Montana and Steep Creeks, ¹ Beaver Creek drainage	T40N, R6E, S12, Clearwater	Clearwater National Forest	1980, Lynch; 1987, Groves	1987, Groves	Extant
21. Canyon Ranger Station	T40N, R7E, S4, Clearwater	Clearwater National Forest	1959, Melson	1987, Groves	Extinct

Table 3 (continued).

Site Name	Location (T, R, S, and County)	Land Ownership	Last Observation	
			First Observation Date and Observer's Name	Date and Observer's Name
22. Aquarius Campground Clearwater	T41N, R7E, S32, National Forest	Clearwater National Forest	1980, Lynch	1987, Groves
23. Quartz Creek, NF Clearwater River	T40N, R8E, S21, Clearwater	Clearwater National Forest	1980, Lynch	1987, Groves
24. Rock Creek, NF Clearwater River	T40N, R8E, S32, Clearwater	Clearwater National Forest	1986, Wallace	1987, Groves
25. Fix Creek, NF Clearwater River	T40N, R10E, S9 Clearwater	Clearwater National Forest	1985, Diller	1987, Groves
26. Elizabeth Creek No. 1, NF Clearwater River	T40N, R10E, S20, Clearwater	Clearwater National Forest	1985, Diller	1987, Groves
27. Elizabeth Creek No. 2	T40N, R10E, S21, Clearwater	Clearwater National Forest	1987, Groves	1987, Groves
28. Pete Ott Creek No. 1, NF Clearwater River	T40N, R10E, S29, Clearwater	Clearwater National Forest	1987, Groves	1987, Groves
29. Pete Ott Creek No. 2	T40N, R10E, S32, Clearwater	Clearwater National Forest	1987, Groves	1987, Groves
30. Marquette Creek, NF Clearwater River	T41N, R6E, S25, Clearwater	Clearwater National Forest	1987, Groves	1987, Groves
31. Dog Creek, Isabella Creek drainage	T41N, R7E, S30, Clearwater	Clearwater National Forest	1987, Groves	1987, Groves
32. Fern Creek, NF Clearwater River	T41N, R7E, S30, Clearwater	Clearwater National Forest	1987, Groves	1987, Groves

Table 3 (continued).

Site Name	Location (T, R, S, and County)	Land Ownership	First Observation Date and Observer's Name		Last Observation Date and Observer's Name		Population Status
			Date	Observer's Name	Date	Observer's Name	
33. Emida	T43N, R3W, S13, Benewah	St. Joe National Forest	1955	Dumas	1987	Groves	Extinct
34. Fishhook Creek, St. Joe River	T44N, R5E, S4, Shoshone	St. Joe National Forest	1987	Groves	1987	Groves	Extant
35. Shady Creek, St. Joe River	T44N, R8E, S9, Shoshone	St. Joe National Forest	1987	Groves	1987	Groves	Extant
36. St. Joe River No. 1	T45N, R3E, S14, Shoshone	BLM	1985	Wallace	1987	Groves	Extant
37. Marble Creek, St. Joe River	T45N, R3E, S25, Shoshone	St. Joe National Forest	1987	Groves	1987	Groves	Extant
38. St. Joe River No. 2	T45N, R4E, S16, Shoshone	St. Joe National Forest	1987	Groves	1987	Groves	Extant
39. St. Joe River No. 3	T45N, R4E, S18, Shoshone	BLM	1985	Wallace	1987	Groves	Extant
40. St. Joe River No. 4	T45N, R5E, S7, Shoshone	St. Joe National Forest	1987	Groves	1987	Groves	Extant
41. North Fork St. Joe River No. 1	T45N, R5E, S11, Shoshone	St. Joe National Forest	1987	Groves	1987	Groves	Extant
42. North Fork St. Joe River No. 2	T45N, R5E, S12, Shoshone	St. Joe National Forest	1987	Groves	1987	Groves	Extant
43. Avery	T45N, R5E, S16, Shoshone	Private	1973	Mussbaum	1987	Groves	Extinct

Table 3 (continued).

Site Name	Location (T, R, S, and County)	Land Ownership	First Observation Date and Observer's Name	Last Observation Date and Observer's Name	Population Status
44. Bird Creek, St. Joe River	T45N, R6E, S13, Shoshone	St. Joe National Forest	1965, Mussbaum	1987, Groves	Extinct
45. Siwash Creek, St. Joe River	T45N, R6E, S19, Shoshone	St. Joe National Forest	1978, Wallace	1987, Groves	Extant
46. Malin Creek, St. Joe River	T45N, R7E, S21, Shoshone	St. Joe National Forest	1987, Groves	1987, Groves	Extant
47. Ahrs Gulch, St. Joe River	T46N, R1E, S7, Benewah	BLM	1987, Groves	1987, Groves	Extant
48. Big Creek, St. Joe River	T46N, R3E, S7, Shoshone	St. Joe National Forest	1985, Wilson	1986, Wallace	Extant
49. Chatcolet Lake	T46N, R4W, S12, Benewah	State	1957, Dumas	1983, Lynch and Wallace	Extinct
50. Fourth of July Creek	T49N, R1W, S17, Kootenai	Coeur d'Alene National Forest	1955, Dumas	1980, Lynch	Extinct
51. Wolf Lodge Bay, Coeur d'Alene Lake	T49N, R3W, S1, Kootenai	BLM	1955, Dumas	1980, Lynch and Wallace; 1987, Groves	?
52. Beauty Creek, Coeur d'Alene Lake	T49N, R3W, S11, Kootenai	Coeur d'Alene National Forest	1968, Brodie	1978, Wallace and Howard; 1987, Groves	?
53. Unnamed Creek, Beauty Bay	T49N, R3W, S11, Kootenai	Coeur d'Alene National Forest	1968, Brodie	1985, Wallace;	Extant

Table 3 (continued).

Site Name	Location (T, R, S, and County)	Land Ownership	First Observation Date and Observer's Name		Last Observation Date and Observer's Name		Population Status
			Date	Observer's Name	Date	Observer's Name	
54. North Fork Coeur d'Alene River	T50N, R1E, S7, Shoshone	Coeur d'Alene National Forest	1987, Groves		1987, Groves		Extant
55. Coeur d'Alene River No. 1	T51N, R3E, S23, Shoshone	Coeur d'Alene National Forest	1987, Groves		1987, Groves		Extant
56. Coeur d'Alene River No. 2	T51N, R3E, S23, Shoshone	Coeur d'Alene National Forest	1987, Groves		1987, Groves		Extant
57. Cardinal Creek, Coeur d'Alene River	T52N, R3E, S28, Shoshone	Coeur d'Alene National Forest	1987, Groves		1987, Groves		Extant
58. South Fork Wellington Creek	T57M, R2E, S21, Banner	Kaniksu, National Forest	1965, Teberg		1981, Lynch and Wallace; 1987, Groves		Extinct
59. Copper Creek Falls	T65N, R2E, S24, Boundary	Kaniksu National Forest	1986, Wilson		1987, Groves		Extant

1 One spring site and four stream sites grouped into one population due to proximity of sites.

Table 4. Summary of habitat variables for Coeur d'Alene salamander populations in northern Idaho. Under population size, S, M, and L refer to Small, Medium, and Large sizes of populations. Pluses (+) appearing in habitat variable columns indicate that the site was not surveyed or that salamanders could not be found at the site. Minuses (-) indicate that the site was surveyed, but no data were collected on that particular variable. See text for complete explanation of habitat variables.

Site Name	Type of Habitat	Aspect (°)	Slope (°)	Cover (%)	Available habitat (m ²)	Population Size
1. Glover Creek	Spring	220	35	65	-	-
2. Cascade Creek	Stream	+	+	+	+	+
3. Lochsa River	Spring	80	45-75	0-47	-	L
4. Elk Creek Falls	Waterfall	210	-	-	-	L
5. Beaver Creek	Stream	+	+	+	+	+
6. Flat Creek No. 1	Spring	292	43	81	14.4	S
7. Flat Creek No. 2	Spring	+	+	+	+	+
8. Black Canyon No. 3	Spring	84	60	15	24	S
9. Clayton Creek No. 1	Spring	142	35	88	41	M
10. Pie Creek No. 1	Spring	210	70	14	28	S
11. Pie Creek No. 2	Spring	160	48	8	21	M
12. Black Canyon No. 1	Spring	56	60	69	12	S
13. Black Canyon No. 2	Spring	170	60	26	19	L
14. Kelly Creek Falls	Waterfall	+	+	+	+	+
15. Clayton Creek No. 2	Spring	208	39	-	35	S

Table 4 (continued).

Site Name	Type of Habitat	Aspect (°)	Slope (°)	Cover (%)	Available habitat (m ²)	Population Size
16. Clayton Creek No. 3	Spring	254	48	49	174	M
17. Benton Butte	Spring	+	+	+	+	+
18. Benton Creek	Stream	+	+	+	+	+
19. West Fork Benton Creek	Stream	360	40	42	-	-
20. Montana and Steep Creeks ¹	Streams and spring	120	27	91	-	L
21. Canyon Ranger Station	?	+	+	+	+	+
22. Aquarius Campground	Stream	+	+	+	+	+
23. Quartz Creek	Spring	266-286	35-90	-	100	L
24. Rock Creek	Spring	330	47	93	62	M
25. Fix Creek	Spring	58	70	40	1	S
26. Elizabeth Creek No. 1	Spring	20	50	7	17	L
27. Elizabeth Creek No. 2	Spring	85	42	33	6	-
28. Pete Ott Creek No. 1	Spring	44	55	91	5	S
29. Pete Ott Creek No. 2	Spring	20	70	26	18	S
30. Marquette Creek	Stream	170	45	69	-	-
31. Dog Creek	Stream	134	20	94	-	-
32. Fern Creek	Stream	210	10	96	-	-

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Table 4 (continued).

Site Name	Type of Habitat	Aspect (°)	Slope (°)	Cover (%)	Available habitat (m ²)	Population Size
33. Emida	Stream	+	+	+	+	+
34. Fishhook Creek	Spring	130	65	32	40	S
35. Shady Creek	Spring	240	55	16	19	S
36. St. Joe River No. 1	Spring	352	90	65	7	S
37. Marble Creek	Spring	179	70	81	8	S
38. St. Joe River No. 2	Spring	360	40	69	8	S
39. St. Joe River No. 3	Spring	310	55	86	4	-
40. St. Joe River No. 4	Spring	350	50	70	11	S
41. NF St. Joe River No. 1	Spring	298	50	67	1	S
42. NF St. Joe River No. 2	Spring	330	80	45	28	S
43. Avery	?	+	+	+	+	+
44. Bird Creek	Stream	+	+	+	+	+
45. Siwash Creek	Stream	60	-	93	-	S
46. Malin Creek	Spring	170	70	60	7	M
47. Ahrs Gulch	Stream	150	10	96	-	S
48. Big Creek	Stream	+	+	+	+	+
49. Chatcolet Lake	?	+	+	+	+	+

Table 4 (continued).

Site Name	Type of Habitat	Aspect (°)	Slope (°)	Cover (%)	Available habitat (m ²)	Population Size
50. Fourth of July Creek	Stream?	+	+	+	+	+
51. Wolf Lodge Bay	Spring	+	+	+	+	+
52. Beauty Creek	Stream	+	+	+	+	+
53. Unnamed Creek-Beauty Bay	Stream	330	-	-	-	-
54. MF Coeur d'Alene River	Spring	240	70	33	8	S
55. Coeur d'Alene River No. 1 Spring	Spring	40	60	85	9	S
56. Coeur d'Alene River No. 2 Spring	Spring	80	70	77	6	S
57. Cardinal Creek	Spring	350	55	89	1	S
58. SF Wellington Creek	Stream	+	+	+	+	+
59. Copper Creek Falls	Waterfall	280	-	25	-	S

1 One spring site and four stream sites grouped into one population due to proximity of sites.

Table 5. Distribution of Coeur d'Alene salamander populations by facing aspect.

<u>Degrees</u>	<u>Number of populations</u>
0-45 (NNE)	4
46-90 (ENE)	8
91-135 (ESE)	3
136-180 (SSE)	7
181-225 (SSW)	5
226-270 (SWS)	4
271-315 (WNW)	4
316-360 (NNW)	<u>9</u>
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APPENDIX A - DETAILED INFORMATION ON THE LOCATION AND STATUS OF
59 COEUR D' ALENE SALAMANDER POPULATIONS IN IDAHO FROM THE DATA
BASE OF THE IDAHO NATURAL HERITAGE PROGRAM.

SITE NAME: GLOVER CREEK
 TOPO QUAD: SELWAY FALLS STILLMAN POINT
 ELEVATION: 1800 LATITUDE: 460420 LONGITUDE: 1152150
 GEN. DESCRIPTION: salamander populations located on N side of Selway R. Rd. near Glover CK in talus: 1) 1 mi below Glover CK, 2) 1.5 mi below Glover CK, and 3) 3.5 mi below Glover CK.

POPULATION DATA: Small population first discovered by Lynch. Wallace collected specimens here in 1986. Groves checked sites in 1987 but found no animals probably due to dry weather.

LAND OWNERSHIP: IDFFSNFNEZP1

SITE NAME: CASCADE CREEK
 TOPO QUAD: FOG MOUNTAIN
 ELEVATION: 1870 LATITUDE: 462505 LONGITUDE: 1152325
 GEN. DESCRIPTION: Cascade Creek on Selway River

POPULATION DATA: Lynch reported a small population for this site but did not collect any specimens.

LAND OWNERSHIP: IDFFSWISELW1 IDFFSNFNEZP1

SITE NAME: LOCHSA RIVER
 TOPO QUAD: MCLENNON BUTTE COOLWATER MTN HUCKLEBERRY
 ELEVATION: 2000 LATITUDE: 461550 LONGITUDE: 1152340
 GEN. DESCRIPTION: salamanders found on rock face with seeps along N side of Lochsa River between Mp 111 and 117 (Split Creek - Snowshoe Creek)

POPULATION DATA: Large population first discovered by Teberg. Wallace has made numerous collections here; Groves surveyed it with Wallace and Diller in 1987 and attempted to mark/recapture salamanders here.

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: ELK CREEK FALLS
TOPO QUAD: ELK CREEK FALLS
ELEVATION: 2800 LATITUDE: 464415 LONGITUDE: 1161020
GEN. DESCRIPTION: salamanders found in talus below lower Elk Creek Falls

POPULATION DATA: Large population that was site of Lynch's master's thesis. Only population known where salamanders are active during the day. Diller first discovered site; Groves surveyed it in 1987.

LAND OWNERSHIP: IDFFSNFSTJ01

SITE NAME: BEAVER CREEK
TOPO QUAD: THOMPSON POINT
ELEVATION: 3100 LATITUDE: 464500 LONGITUDE: 1154330
GEN. DESCRIPTION: Salamanders located beneath rocks along Beaver Creek between Falls Creek and Elmer Creek confluences

POPULATION DATA: Lynch and Wallace first discovered this site; Groves surveyed the site in 1987 and found it to be extant.

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: FLAT CREEK #1
TOPO QUAD: CLARKE MT
ELEVATION: 2100 LATITUDE: 464350 LONGITUDE: 1153150
GEN. DESCRIPTION: salamander population located 1 mi above Flat Creek mouth on N. Fork Clearwater River Rd.

POPULATION DATA: Groves collected 1 adult, 3 juveniles in seep on N side of road

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: FLAT CREEK #2
TOPO QUAD: CLARKE MT
ELEVATION: 2100 LATITUDE: 464320 LONGITUDE: 1153225
GEN. DESCRIPTION: salamanders were located 2 mi above Flat Creek confluence
with N. Fork Clearwater R. on seep on N side of road

POPULATION DATA: Population discovered by Dick Wallace in 1986; small
population that Groves noted was destroyed by a land slide
in his 1987 survey

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: BLACK CANYON #3
TOPO QUAD: SCURVY MTN
ELEVATION: 2900 LATITUDE: 464400 LONGITUDE: 1151445
GEN. DESCRIPTION: small waterfall over rock face with little moss 1.2 mi from
Kelly Forks on W side of Black Canyon Rd.

POPULATION DATA: 2 adults counted at night by Groves, no animals collected.

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: CLAYTON CREEK #1
TOPO QUAD: SCURVY MT.
ELEVATION: 3000 LATITUDE: 464300 LONGITUDE: 1150830
GEN. DESCRIPTION: salamanders found at 2 springs on N side of Kelly CK Rd. -1
is 3 mi below Clayton CK confluence and the other is 3.2 mi

POPULATION DATA: Groves discovered site and noted 2 adults, 1 juvenile in
extensive seeps at uppermost site; lower site had 2 adults,
1 juvenile in single seep

LAND OWNERSHIP: IDFFSNFCLEA1

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SITE NAME: PIE CREEK #1
TOPO QUAD: SCURVY MT.
ELEVATION: 2800 LATITUDE: 464305 LONGITUDE: 1151200
GEN. DESCRIPTION: salamanders found in small seep on N side of Kelly Creek Rd
.6 mi above Pie Creek confluence

POPULATION DATA: Groves discovered site and saw 1 juvenile in seep

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: PIE CREEK #2
TOPO QUAD: SCURVY MT
ELEVATION: 2800 LATITUDE: 464330 LONGITUDE: 1151320
GEN. DESCRIPTION: salamanders collected in small seep on N side of Kelly Creek
Rd. .3 mi below Pie Creek

POPULATION DATA: Groves discovered site in 1987 and saw 2 adults, 4 juveniles

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: BLACK CANYON #1
TOPO QUAD: JUNCTION MTN
ELEVATION: 2800 LATITUDE: 464330 LONGITUDE: 1151525
GEN. DESCRIPTION: small seep over mossy rocks on W side of road in Black
Canyon .3 mi upstream from Kelly Forks

POPULATION DATA: Groves discovered site in 1987 and counted 3 animals

LAND OWNERSHIP: IDFFSNFCLEA1

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SITE NAME: BLACK CANYON #2
TOPO QUAD: JUNCTION MTN; SCURVY MT
ELEVATION: 2800 LATITUDE: 464335 LONGITUDE: 1151500
GEN. DESCRIPTION: salamanders found at 2 seeps over rocks on W side of Black Canyon Rd. .6 mi and .8 mi upstream from Kelly Forks

POPULATION DATA: Groves discovered site and counted 17 adults at night

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: KELLY CREEK FALLS
TOPO QUAD: SCURVY MTN.
ELEVATION: 3300 LATITUDE: 464230 LONGITUDE: 1151245
GEN. DESCRIPTION: salamanders located at base of waterfall on S side of Kelly Creek

POPULATION DATA: Diller discovered this site and collected 5 juveniles

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: CLAYTON CREEK #2
TOPO QUAD: GORMAN HILL
ELEVATION: 3000 LATITUDE: 464250 LONGITUDE: 1150630
GEN. DESCRIPTION: salamanders located in seep on N side of Kelly Creek Rd. 1.4 mi below Clayton Creek confluence

POPULATION DATA: Groves discovered site and saw 1 adult in 1987

LAND OWNERSHIP: IDFFSNFCLEA1

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SITE NAME: CLAYTON CREEK #3

TOPO QUAD: GORMAN HILL

ELEVATION: 3000

LATITUDE: 464230

LONGITUDE: 1152550

GEN. DESCRIPTION: salamanders located in several small seeps on N side of Kelly Creek Rd. .5 mi below Clayton Creek confluence

POPULATION DATA: Groves discovered site and saw 3 adults and 3 juveniles

LAND OWNERSHIP: IDFFSNPCLEA1

SITE NAME: BENTON BUTTE

TOPO QUAD: BERTHA HILL

ELEVATION: 3500

LATITUDE: 465045

LONGITUDE: 1154605

GEN. DESCRIPTION: salamanders located in seep several hundred feet below butte in seep in heavy timber

POPULATION DATA: Diller discovered this small population; Groves did not survey in 1987 although he did find salamanders in W. Fork Benton Creek; heavy logging in area of this EO in 1987

LAND OWNERSHIP: IDSSLDLCLER1

SITE NAME: BENTON CREEK

TOPO QUAD: BERTHA HILL

ELEVATION: 1800

LATITUDE: 464940

LONGITUDE: 1155150

GEN. DESCRIPTION: salamanders located at Benton Creek near its mouth at Dworshak Reservoir

POPULATION DATA: Mark Orme discovered this population. Although Groves did not survey this site in 1987 he did locate salamanders in the W. Fork Benton Creek despite heavy logging

LAND OWNERSHIP: IDFDACECORP1

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SITE NAME: W FORK BENTON CREEK

TOPO QUAD: BERTHA HILL

ELEVATION: 2800

LATITUDE: 464850

LONGITUDE: 1155210

GEN. DESCRIPTION: salamander found on W Fork of Benton Creek beneath mossy covered rock

POPULATION DATA: Groves discovered this site on 1987, but did not collect any animals

LAND OWNERSHIP:

SITE NAME: BEAVER CREEK-STEEP CK-MONTANA CK

TOPO QUAD: THOMPSON POINT

ELEVATION: 2000

LATITUDE: 464930

LONGITUDE: 1153820

GEN. DESCRIPTION: 100y up Steep Ck in sm cascade; beneath rxs @ confl of Steep & Beaver Ck; .25mi N of Steep Ck confl on Beaver Ck (mossy seep on E side of rd); unnamed Ck across from Steep Ck;

POPULATION DATA: also found at 100y up Montana Ck in small cascade. Lynch first discovered salamanders in Steep and Montana Creeks, Groves surveyed the area extensively in 1987.

LAND OWNERSHIP: IDFFSNFCLEA1

IDSLSLCL1

SITE NAME: AQUARIUS CAMPGROUND

TOPO QUAD: SHEEP MT

ELEVATION: 1800

LATITUDE: 465130

LONGITUDE: 1153700

GEN. DESCRIPTION: Aquarius Campground, N. Fork Clearwater River

POPULATION DATA: Lynch found salamanders in gravel: Groves surveyed area in 1987 and did not find any animals

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: CANYON RANGER STATION
TOPO QUAD: SHEEP MTN.
ELEVATION: 1800 LATITUDE: 465015 LONGITUDE: 1153500
GEN. DESCRIPTION: salamanders located at Canyon Work Center, N. Fork Clear-
water River

POPULATION DATA: Groves surveyed this site extensively in 1987 and could not
find any animals.

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: QUARTZ CREEK
TOPO QUAD: THE NUB
ELEVATION: 1900 LATITUDE: 464740 LONGITUDE: 1152730
GEN. DESCRIPTION: salamanders located in several seeps just above Quartz Ck,
North Fork Clearwater River on N side of road

POPULATION DATA: Lynch first discovered these 8 seeps from .3 mi to 1 mi
above Quartz Creek. Wallace collected 25 animals here in
1986. Groves surveyed the site in 1987.

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: ROCK CREEK
TOPO QUAD: THE NUB
ELEVATION: 1900 LATITUDE: 464610 LONGITUDE: 1152900
GEN. DESCRIPTION: salamanders located in 2 small seeps (.25 mi apart), 1.3-1.6
mi above Rock Creek confluence on N side of N.Fork Clear-
water River Rd.

POPULATION DATA: Wallace discovered this site and collected 35 animals in
1986, Groves surveyed site in 1987

LAND OWNERSHIP: IDFFSNFCLEA1

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SITE NAME: FIX CREEK

TOPO QUAD: MOOSE MTN

ELEVATION: 3400

LATITUDE: 464905

LONGITUDE: 1151200

GEN. DESCRIPTION: population located at roadside seep just N of Fix Ck on east exposure in burned area (50-75 yr) with rocky exposures

POPULATION DATA: 5 subadults collected by Diller who discovered the site; Groves noted in 1987 that population was still extant

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: ELIZABETH CREEK

TOPO QUAD: MOOSE MTN

ELEVATION: 3400

LATITUDE: 464715

LONGITUDE: 1151305

GEN. DESCRIPTION: population located at roadside seep 100 m S of Elizabeth Ck east exposure of river canyon that has burned with exposed rock faces (Black Canyon)

POPULATION DATA: 3 adults and 1 juvenile collected by Diller who discovered the site, Groves saw several individuals at this site in 1987 but did not collect any

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: ELIZABETH CREEK #2

TOPO QUAD: MOOSE MTN (15')

ELEVATION: 3300

LATITUDE: 464805

LONGITUDE: 1151300

GEN. DESCRIPTION: 2 tiny seeps over rock face .8 mi and 1.0 mi upstream of Elizabeth Creek on W side of Black Canyon Rd

POPULATION DATA: Groves collected 1 juvenile when he discovered the site in 1987

LAND OWNERSHIP: IDFFSNFCLEA1

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SITE NAME: PETE OTT CREEK #1
TOPO QUAD: MOOSE MTN (15')
ELEVATION: 3100 LATITUDE: 464630 LONGITUDE: 1151340
GEN. DESCRIPTION: Small mossy covered seep over rock face 2.2 mi above Pete
Ott Ck on N. Fork Clearwater River

POPULATION DATA: Groves discovered this site and saw 5 animals at night but
did not collect any animals

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: PETE OTT CREEK #2
TOPO QUAD: MOOSE MTN (15')
ELEVATION: 3020 LATITUDE: 464600 LONGITUDE: 1151345
GEN. DESCRIPTION: 2 small seeps 1.4 mi above Pete Ott Creek on W side of Black
Canyon Rd.

POPULATION DATA: Groves discovered this site and saw 2 animals at night but
did not collect any

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: MARQUETTE CREEK
TOPO QUAD: THOMPSON POINT
ELEVATION: 2200 LATITUDE: 465200 LONGITUDE: 1153840
GEN. DESCRIPTION: Salamanders found beneath mossy rocks on unnamed creek 1
drainage east of Marquette Creek

POPULATION DATA: Groves collected 3 adults and 1 juvenile in 1987, and
discovered the site

LAND OWNERSHIP: IDFFSRNAQUA1 IDFFSNFCLEA1

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SITE NAME: DOG CREEK
TOPO QUAD: THOMPSON POINT
ELEVATION: 2100 LATITUDE: 465230 LONGITUDE: 1153730
GEN. DESCRIPTION: mossy covered rocks 100 yd up Dog Creek from logging road

POPULATION DATA: Groves discovered the site in 1987 and collected 1 animal

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: FERN CREEK
TOPO QUAD: SHEEP MTN
ELEVATION: 2000 LATITUDE: 465140 LONGITUDE: 1153710
GEN. DESCRIPTION: salamanders found beneath moss covered rocks on side of Fern Creek

POPULATION DATA: Groves discovered site in 1987, but did not collect any animals

LAND OWNERSHIP: IDFFSNFCLEA1

SITE NAME: EMIDA
TOPO QUAD: WEST DENNIS
ELEVATION: 3200 LATITUDE: 470442 LONGITUDE: 1163942
GEN. DESCRIPTION: salamander population located at creek 1 mi S. of crest of hill on US 95A 5.5 mi SW of Emida

POPULATION DATA: Dumas discovered this site. Wallace, Lynch, and Groves have searched the site but found no animals.

LAND OWNERSHIP: IDFFSNFSTJ01

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SITE NAME: MARBLE CREEK
TOPO QUAD: MARBLE MTN
ELEVATION: 2600 LATITUDE: 471310 LONGITUDE: 1160135
GEN. DESCRIPTION: seep beneath a tree over rock face on Marble Creek 1.3mi
above Boulder Creek confluence

POPULATION DATA: Groves discovered the site and collected 1 juvenile

LAND OWNERSHIP:

SITE NAME: ST JOE RIVER #2
TOPO QUAD: HOYT MOUNTAIN
ELEVATION: 2400 LATITUDE: 471450 LONGITUDE: 1155730
GEN. DESCRIPTION: small seep over mossy rocks 4.2 mi above Marble Ck.
confluence on S side of St. Joe River Rd

POPULATION DATA: Groves discovered the site and collected 3 animals in 1987

LAND OWNERSHIP: IDFFSNFSTJ01

SITE NAME: ST JOE RIVER #3
TOPO QUAD: HOYT MOUNTAIN
ELEVATION: 2800 LATITUDE: 471445 LONGITUDE: 1155935
GEN. DESCRIPTION: small seep over rock face on S side of St. Joe River Rd 1.5
mi upstream from confluence with Marble Creek

POPULATION DATA: Population discovered by Wallace in 1985; Groves surveyed in
1987 but did not count animals

LAND OWNERSHIP: IDFBLEMCOEU1

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SITE NAME: ST JOE RIVER #4
TOPO QUAD: WALLACE (15')
ELEVATION: 2500 LATITUDE: 471505 LONGITUDE: 1155205
GEN. DESCRIPTION: Seep over mossy rocks on S side of St. Joe River Rd. 2.3 mi
above Avery Ranger Station.

POPULATION DATA: Groves discovered this site and collected 1 animal

LAND OWNERSHIP: IDFFSNFSTJ01

SITE NAME: N FORK ST JOE RIVER #1
TOPO QUAD: WALLACE (15')
ELEVATION: 3100 LATITUDE: 471530 LONGITUDE: 1154730
GEN. DESCRIPTION: small seep over mossy rocks on E side N. Fork St. Joe River
4 mi from mouth

POPULATION DATA: Groves discovered this site and collected 3 animals in 1987

LAND OWNERSHIP: IDFFSNFSTJ01

SITE NAME: N FORK ST. JOE RIVER #2
TOPO QUAD: WALLACE (15')
ELEVATION: 3100 LATITUDE: 471600 LONGITUDE: 1154610
GEN. DESCRIPTION: salamanders located at large seep over mossy rocks on E side
of N. Fork St. Joe River Rd. 1.6 mi from mouth

POPULATION DATA: Groves discovered the site and collected 3 animals in 1987

LAND OWNERSHIP: IDFFSNFSTJ01

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SITE NAME: AVERY
TOPO QUAD: FISHHOOK CREEK
ELEVATION: 2600 LATITUDE: 471455 LONGITUDE: 1154950
GEN. DESCRIPTION: population located .5 mi W of Avery along St. Joe River

POPULATION DATA: Nussbaum discovered site, Groves surveyed this area in 1987 and found no sites with salamanders; population probably eliminated

LAND OWNERSHIP:

SITE NAME: BIRD CREEK
TOPO QUAD: THOR MOUNTAIN
ELEVATION: 2600 LATITUDE: 471335 LONGITUDE: 1153630
GEN. DESCRIPTION: salamanders located at St. Joe River-Bird Creek confluence

POPULATION DATA: Nussbaum discovered a sparse population at Bird Creek; Wallace found animals in 1978 1 mi upstream from Bird Ck on S side St. Joe River in talus field; Groves surveyed along Bird Creek in 1987 but found no animals - heavy logging

LAND OWNERSHIP: IDFFSNFSTJ01

SITE NAME: SIWASH CREEK
TOPO QUAD: THREE SISTERS
ELEVATION: 2600 LATITUDE: 471350 LONGITUDE: 1154645
GEN. DESCRIPTION: salamanders found 200 yd up Siwash Creek in talus SE of Creek; Groves surveyed in 1987 and found no animals in talus due to dry conditions?, 1 animal found along creek

POPULATION DATA: Wallace discovered this site

LAND OWNERSHIP: IDFFSNFSTJ01

SITE NAME: MALIN CREEK
 TOPO QUAD: THOR MOUNTAIN
 ELEVATION: 3100 LATITUDE: 471345 LONGITUDE: 1153500
 GEN. DESCRIPTION: large seep over mossy rock face .8 mi downstream from Malin
 Creek on N side of St. Joe River Rd

POPULATION DATA: Groves discovered site and collected 5 animals at night in
 1987

LAND OWNERSHIP: IDFFSNFSTJ01

SITE NAME: AHRG GULCH
 TOPO QUAD: ST JOE BALDY
 ELEVATION: 3200 LATITUDE: 472050 LONGITUDE: 1162245
 GEN. DESCRIPTION: unnamed creek flowing into St. Joe River adjacent to Ahrs
 Gulch

POPULATION DATA: Groves discovered site and collected 1 juvenile on side of
 stream under large rocks

LAND OWNERSHIP: IDFFSNFCOEU1

SITE NAME: BIG CREEK
 TOPO QUAD: CALDER 15'
 ELEVATION: 2820 LATITUDE: 472045 LONGITUDE: 1160730
 GEN. DESCRIPTION: salamanders found along Big Creek above the campground

POPULATION DATA: population discovered by Al Wilson in 1985; Wallace
 collected there in 1986; Groves surveyed in 1987, but could
 find no animals under very dry conditions

LAND OWNERSHIP: IDFFSNFSTJ01

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SITE NAME: CHATCOLET LAKE
TOPO QUAD: CHATCOLET
ELEVATION: 2200 LATITUDE: 472052 LONGITUDE: 1164608
GEN. DESCRIPTION: Chatcolet Lake

POPULATION DATA: Dumas discovered this population but his precise locality records are lacking. Wallace has searched this area for specimens but found no animals.

LAND OWNERSHIP: IDSPRSPHEYB1

SITE NAME: FOURTH OF JULY CREEK
TOPO QUAD: ROSE LAKE
ELEVATION: 2400 LATITUDE: 473525 LONGITUDE: 1162912
GEN. DESCRIPTION: Fourth of July Canyon

POPULATION DATA: Population discovered by Dumas; but Lynch could not find any animals in 1979-1980. Huge road improvement project in 1987 has probably eliminated any salamanders.

LAND OWNERSHIP: IDFFSNFCOEU1

SITE NAME: WOLF LODGE BAY
TOPO QUAD: MT. COEUR D'ALENE
ELEVATION: 2200 LATITUDE: 473710 LONGITUDE: 1164000
GEN. DESCRIPTION: salamanders found on S shore of Wolf Lodge Bay

POPULATION DATA: small population in talus along roadcut, not much habitat available according to Wallace in 1980, Groves could find no animals in dry talus in 1987.

LAND OWNERSHIP: IDFBLCOCOEU1

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SITE NAME: BEAUTY CREEK
TOPO QUAD: MT. COEUR D' ALENE
ELEVATION: 2000 LATITUDE: 473648 LONGITUDE: 1164045
GEN. DESCRIPTION: salamanders located along Beauty Creek

POPULATION DATA: population first discovered 2.2 mi from highway on Beauty Creek by Brodie; Wallace found animals on S side of road along Beauty Bay; Groves could find no animals along Beauty Creek in 1987 - very dewatered and polluted.

LAND OWNERSHIP: IDFFSNFCOEU1

SITE NAME: UNNAMED CREEK-BEAUTY BAY
TOPO QUAD: MT. COEUR D' ALENE
ELEVATION: 2000 LATITUDE: 473635 LONGITUDE: 1164112
GEN. DESCRIPTION: salamanders located along an unnamed creek flowing into Beauty Bay

POPULATION DATA: Brodie first discovered this site which has a sparse population. Groves found 1 animal at this site in 1987 under dry conditions.

LAND OWNERSHIP: IDFFSNFCOEU1

SITE NAME: N FORK COEUR D' ALENE RIVER
TOPO QUAD: POND PEAK
ELEVATION: 2500 LATITUDE: 474200 LONGITUDE: 1162230
GEN. DESCRIPTION: N. Fork Coeur d'Alene River, .6 mi downstream of Laverne Ck. confluence, seep over rock face on E side of road

POPULATION DATA: population discovered by Groves and 1 animal collected in 1987

LAND OWNERSHIP: IDFFSNFCOEU1

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SITE NAME: COEUR D'ALENE RIVER #1

TOPO QUAD: POND PEAK

ELEVATION: 2600

LATITUDE: 474530

LONGITUDE: 1160200

GEN. DESCRIPTION: seep over mossy rocks on W side of Coeur d' Alene River; 2.6 mi above Kit Price Campground

POPULATION DATA: Groves discovered this site; salamanders found beneath rock and leaves at base of seep, 5 animals collected

LAND OWNERSHIP: IDFFSNFCOEU1

SITE NAME: COEUR D'ALENE RIVER #2

TOPO QUAD: POND PEAK

ELEVATION: 2600

LATITUDE: 474450

LONGITUDE: 1160150

GEN. DESCRIPTION: small seep over mossy rock face on W side of Coeur d' Alene River; 1.6 mi above Kit Price Campground; another seep with salamanders .2 mi downstream.

POPULATION DATA: Groves discovered this site in 1987; saw 1 animal

LAND OWNERSHIP: IDFFSNFCOEU1

SITE NAME: CARDINAL CREEK

TOPO QUAD: POND PEAK

ELEVATION: 2600

LATITUDE: 474920

LONGITUDE: 1160530

GEN. DESCRIPTION: .3 mi above Cardinal Creek confluence with Coeur d' Alene River; small seep over mossy rocks on SW side of road.

POPULATION DATA: Groves discovered this site in 1987 and collected 2 animals

LAND OWNERSHIP: IDFFSNFCOEU1

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SITE NAME: S FORK WELLINGTON CREEK
TOPO QUAD: MT. PEND OREILLE 15' QUAD MAP
ELEVATION: 4200 LATITUDE: 481625 LONGITUDE: 1161240
GEN. DESCRIPTION: salamanders located on tributary of S Fork Wellington Creek

POPULATION DATA: Teberg discovered this site. Lynch and Wallace searched for animals here from 1979-1981 and found none. Groves searched Wellington Creek falls in 1987 and found none. Logging probably eliminated population.

LAND OWNERSHIP: IDFFSCGKANI1 IDFFSNFKANI1

SITE NAME: COPPER FALLS
TOPO QUAD: EASTPORT
ELEVATION: 3500 LATITUDE: 485815 LONGITUDE: 1160830
GEN. DESCRIPTION: Copper Falls

POPULATION DATA: Salamanders found in spray zone of falls, population discovered by A. Wilson and surveyed by Groves in 1987

LAND OWNERSHIP: IDFFSNFKANI1

Submitted by:

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