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November 7, 2000

Ms. Pat Langley, Asst. Regional Director
U. S. Fish and Wildlife Service
Division of Federal Aid
P. O. Box 1306
Albuquerque, New Mexico 87103

Attn: Penny Bartnicki

Dear Ms. Langley:

Enclosed for your review and approval is the performance report for a Section 6 grant, E-22, Segment 8 (Status of Endemic New Mexico Salamanders). This report covers the period of August 1, 1999 through July 31, 2000.

Thank you for your continued assistance and cooperation. If you have any questions, please feel free to contact me at (505) 476-0286.

Sincerely,

Lisa B. Evans

Lisa B. Evans
Federal Aid Coordinator

LGB/MLM
Enc.

cc: Joy Nicholopoulos (Field Supervisor, Ecological Services, USFWS)
Tod Stevenson (Conservation Services Division Chief, NMGF)
Chuck Hayes (Conservation Services Division Assistant Chief, NMGF)
Mary Medina (Conservation Services Division Admin. Assistant, NMGF)
Charles Painter (Endangered Species Biologist, NMGF)

37055

PERFORMANCE REPORT

State: New Mexico Grant Number: E-22-8

Grant Title: Endangered Species

Project Title: Status of Endemic New Mexico Salamanders

Contract Period: August 1, 1999 To: July 31, 2000

Program Narrative Objective

To continue studies of the distribution, habitat requirements, and associated information on the Jemez Mountains salamander and the Sacramento mountain salamander. To investigate the effects of habitat alteration on existing populations of these salamanders.

Analysis of data presented in this Performance Report concludes the investigations of the Permanent Transects and Activity Plots in the Jemez Mountains. To address the question of population trends and persistence, further presence/absence searches at historic sites will continue. Research on the Sacramento mountain salamander, *Aneides hardii*, was not conducted during this segment because of the large amount of time required in the Jemez Mountains to complete the work reported herein, the extremely limited period of terrestrial activity of Jemez Mountains salamanders, the relatively secure nature of populations, and because of other commitments. However, there has been active communication regards the status of *A. hardii* with the United States Geological Survey (USGS), Biological Research Division biologists, who are conducting research on this species. Results of earlier research on the Sacramento mountain salamander were shared during numerous discussions with Ramotnik (1997) who prepared a conservation assessment of the Sacramento mountain salamander. This assessment will assist land managers in decision making regarding consequences of management actions affecting the Sacramento mountain salamander.

Completion of this project has required an enormous amount of fieldwork and administrative support. Scores of volunteers from Los Alamos National Laboratories, National Park Service (NPS), U.S. Forest Service (USFS), USGS, New Mexico Department of Game and Fish (NMDGF), University of New Mexico (UNM), NM Natural Heritage Program, U.S. Fish and Wildlife Service (USFWS), and the private sector have responded on very short notice and cheerfully helped with fieldwork. Rudy King, USDA Forest Service Rocky Mountain Experiment Station, Fort Collins, Colorado and Don Sias, Department of Biology, University of New Mexico, Albuquerque, New Mexico helped with data analysis. Current and past members of the New Mexico Endemic Salamander Team (TEAM) were important in discussions of this project and this

species. Marilyn Altenbach has been a faithful and committed consultant in all phases of this research. Her involvement in this project and commitment to this species has been invaluable and greatly appreciated.

Objectives/Procedures

Conduct field investigations in known and potential habitat of these two species to determine their distributional and numerical status and to gather associated information, using methodology developed and employed for this purpose in New Mexico since 1987.

LOCALITY DATA AND HIGH-GRADE SEARCHES

Specialized terminology used throughout this report (High-Grade search, Permanent Transect, Activity Plot, etc.) has been defined in previous segments and is not further defined herein. Appendix 1 is a complete listing and summary of all Jemez Mountains salamander localities, including all museum specimen records known and all High-Grade searches independently conducted by personnel from USFS, NMDGF, and NPS for which data were provided to NMDGF. These data are printed on paper and stored electronically in Microsoft Excel and in Microsoft Access. Included are data, when known, on museum, museum catalogue number, record source, total salamanders observed/collected, collector, date of collection, topographical map name, county, elevation, locality data, legal description with Township, Range, and Section, UTM coordinates, and notes. Each entry is assigned a map number that corresponds to a unique locality marked on a dedicated set of USGS topographical maps. These maps are updated annually as new locality information becomes available.

The listing includes data for 1167 searches. Of these, 681 (58%) searches failed to detect the presence of Jemez Mountains salamanders. There are 405 duplicates, i.e., searches completed at sites where High-Grade searches were conducted at an earlier date. For example, there are at least 52 collections that were made at the type locality since 1949. Searches were conducted at 762 unique sites. Observations of over 1100 individual Jemez Mountains salamanders were used in preparation of this report.

1. Permanently established transects (Permanent Transects) on pre/post logging plots will be investigated and data will be collected as called for in the Memorandum of Agreement (MOA) signed between the New Mexico Department of Game and Fish, the U.S. Fish and Wildlife Service, and the U.S. Forest Service. These transects are designed to investigate the effects of various silvicultural activities on salamander population density. Activity Plots of *Plethodon neomexicanus* will be monitored and data collected on population dynamics relevant to life history studies including growth, movement, and activity periods. Microhabitat characteristics will be recorded during searches where salamanders are and are not encountered.

PERMANENT TRANSECTS

Much of the data analysis from the Permanent Transects and the Activity Plots is graphically represented by boxplots or notched boxplots. Fig. 1 illustrates a summary of these graphics.

*	values more than 3 box lengths from boxplot
O	values more than 1.5 box lengths from boxplot
	Largest observed value that is not an outlier
	75th percentile
	Median (50% of the cases have values within the box)
	25th Percentile
	Smallest observed value that is not an outlier

Fig 1. Annotated sketch of a boxplot. The notched boxplot is similar except that the top and bottom of the "notch" illustrate the 95% confidence intervals around the median value. Thus, the notches provide an approximate 95% test of the null hypothesis that the true medians are equal. If these two notches overlap then the null hypothesis is not rejected with approximate 95% confidence (i.e., cannot say with 95% confidence that the median values are different). Alternatively, the difference between the medians could be described as statistically significant at the .05 level (Chambers et al. 1983) (i.e., if the notches do not overlap, the median values are different with 95% confidence level).

Salamanders are important ecological components of many forest ecosystems in North America. Despite their importance in forest systems, salamanders have often been neglected in forest management studies (Bury et al. 1980; Pough et al. 1987). Studies in the pacific Northwest indicate that many salamander species are adversely affected by logging (Bury and Corn 1988; Corn and Bury 1989; Welsh 1990). Relatively few studies have been conducted in the eastern United States, although collectively these studies suggest that timber harvesting is detrimental to salamanders in eastern forests also (Petranka et al. 1993 and references therein).

Permanent Transects (n=14) were established from 1987-1990 to study Jemez Mountains

salamander microhabitat requirements in conjunction with habitat manipulation. These transects were initiated in cooperation with the Santa Fe National Forest plan to log these units using cable or tractor logging. The research was designed to study the effects of logging on the relative abundance in relation to microhabitat components of designated plots. Other transects were established to collect ecological data (n=49), most at sites scheduled to be harvested by the USFS using various silvicultural treatments. Similar ecological transects were developed and used by USFWS to help assess microhabitat components of salamander populations (Ramotnik and Scott 1988). A full description of the Permanent Transects and the protocol used for routine monitoring is discussed as Appendix C in the Jemez Mountains Salamander management plan and in Ramotnik and Scott (1988). The location of these Permanent Transects is listed below.

Table 1. Transect number, date established, and locality data for Permanent Transects (PT) established on the Santa Fe National Forest from 1987-1990.

Transect Number	Date Established	Location
PT-1	7 July 1987	T19N R2E SE1/4 Sec 10
PT-2	28 Aug 1987	T19N R2E SW1/4 Sec 11
PT-3	29 Aug 1987	T19N R2E NW1/4 Sec 12
PT-4	29 Aug 1987	T19N R2E NE1/4 Sec 11
PT-5a	30 Aug 1987	T19N R2E SW1/4 Sec 1
PT-5b	14 July 1988	T19N R2E SW1/4 Sec 1
PT-6	== dropped ==	======
PT-7	26 Aug 1988	T19N R2E NW1/4 Sec 2
PT-8	26 Aug 1988	T19N R2E NW1/4 Sec 12
PT-9	30 Aug 1988	T19N R2E SE1/4 Sec 10
PT-10	26 July 1989	T20N R2E SE1/4 Sec 27
PT-11	3 Aug 1989	T18N R5E NW1/4 Sec 9
PT-12	3 Aug 1989	T18N R5E NW1/4 Sec 9
PT-13	18 Jul 1990	T18N R5E SE1/4 Sec 5
PT-14	1 Aug 1990	T18N R5E SE1/4 Sec 9

In spite of early agreements with the USFS, most of these plots were never logged so comparisons of pre/post Jemez Mountains salamander abundance on these plots could not be made. As of this writing only three of the plots (PT 3, PT 4, and PT 8) have been logged. Of these, only PT 4 was completely logged as planned. Logging on the other plots (PT 3 and PT 8) was incomplete and did not include the entire transect and surrounding area. Of these, PT 8 was dropped as a routine monitoring site due to the small numbers of Jemez Mountains salamanders encountered. PT 2 was not scheduled to be logged and served as a control for the other plots. Thus, only PT 2, PT 3, and PT 4 were regularly monitored. First and last monitoring dates for these transects are: PT 2 8/28/87 – 8/20/00; PT 3 8/25/87 – 8/20/00; PT 4 8/25/87 – 8/20/00; PT 8 8/25/87 – 8/10/98. In some cases, the High-Grade search associated with the PT was carried out while the ecological data associated with the PT were not collected.

For PT-2, PT-3, PT-4, and PT-8, variation in snout-vent length (SVL) was analyzed (Figs. 2-5;

Table 2) among years using Kruskal-Wallis rank test and Jonckheere-Terpstra trend test. Because of limited sample sizes in some years, Monte Carlo methods were used to estimate significance levels. The Kruskal-Wallis test has a null hypothesis that there is no difference in SVL among years, with no reference to the ordering in time of years. The Jonckheere-Terpstra trend test also has a null hypothesis that there is no difference in SVL among years but versus an alternative hypothesis of an increasing or decreasing trend among years.

For PT 2 (control) and PT 3 (partially logged), there was no indication of differences in SVL among years, $p > 0.397$ for both tests. For PT 8 (partially logged), there is a weak indication ($p = 0.092$) of differences among years according to the Kruskal-Wallis test, but no pairwise differences between years was apparent. There is no indication of trend among years for PT 8 ($p = 0.243$).

For PT 4 (completely logged), there is an indication of differences among years according to the Kurskal-Wallis test, but no pairwise differences between years was significant at $p = 0.1$. However, the Jonckheere-Terpstra trend test was quite significant ($p = 0.005$), indicating a significant increasing trend in SVL through time. This increase in mean SVL may indicate a stressed population as it implies a lack of recruitment of juveniles into the population.

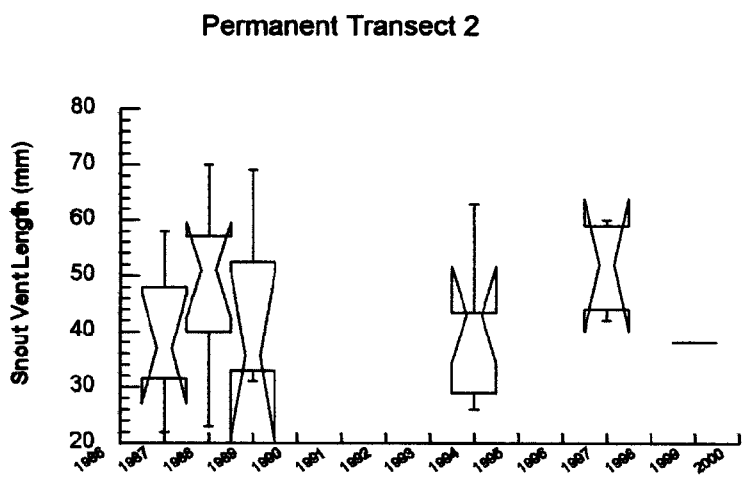


Fig. 2. Notched boxplots of SVL on PT 2 (control). The Permanent Transect was monitored only once during each year indicted. Sample sizes, which include Jemez Mountains salamanders found on the transect and on the associated High-Grade search, for individual years are as follows: 1987 n = 7; 1988 n = 10; 1989 n = 4; 1994 n = 7; 1997 n = 4; 1999 n = 1.

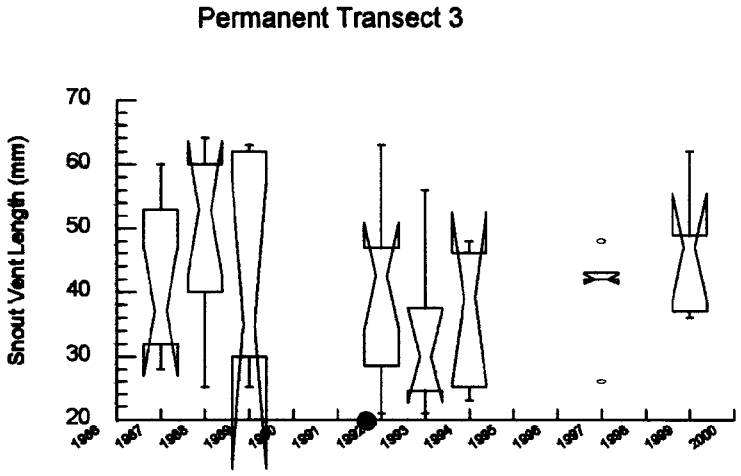


Fig. 3 Notched boxplots of SVL on PT 3 (partially logged). The Permanent Transect was monitored only once during each year indicted. Sample sizes, which include Jemez Mountains salamanders found on the transect and on the associated High-Grade search, for individual years are as follows: 1987 n = 11; 1988 n = 9; 1989 n =5; 1992 n = 12; 1993 n= 8; 1994 n = 6; 1997 n = 5; 1999 n = 5;2000 n = 0. ● = approximate date logged (winter 91-92).

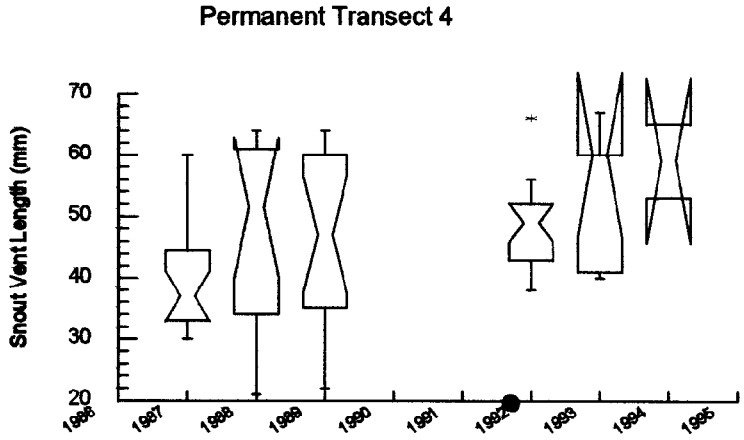


Fig. 4. Notched boxplots of SVL on PT 4 (completely logged). The Permanent Transect was monitored only once during each year indicted. Sample sizes, which include Jemez Mountains salamanders found on the transect and on the associated High-Grade search, for individual years are as follows: 1987 n = 19; 1988 n = 14; 1989 n = 17; 1992 n = 21; 1993 n = 5; 1994 n = 2; 1998 n = 0; 1999 n = 0; 2000 n = 0. ● = approximate date logged (winter 91-92).

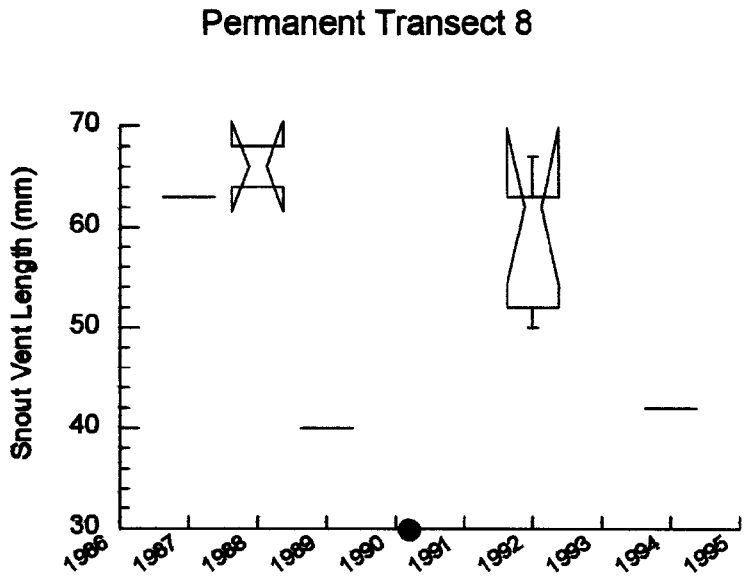


Fig. 5. Notched boxplots of SVL on PT 8 (partially logged). The Permanent Transect was monitored only once during each year indicted. Sample sizes, which include Jemez Mountains salamanders found on the transect and on the associated High-Grade search, for individual years are as follows: 1987 n = 1; 1988 n = 2; 1989 n = 1; 1992 n = 5; 1994 n = 1. ● = approximate date logged (March 1990).

Some of the figures above contain data that are not shown. i.e., when the number equals 0, the data are not illustrated. For example, in Fig. 4 during 1998, 1999, and 2000 there were no salamanders collected on Permanent Transect 4 or on the associated High-Grade search.

Logging and stand-replacing fires are probably the most pervasive anthropomorphic disturbances that occur in the forest during modern times. Most studies of terrestrial salamanders in disturbed areas have concentrated on the effects of these disturbances (Scott and Ramotnik 1992). Numerous studies have shown that many species of salamanders are sensitive to intensive forestry practices, such as clear-cutting, that greatly modify forest floor conditions. Clear-cutting degrades forest-floor microhabitats for salamanders by eliminating shading and leaf litter, increasing soil surface temperature, and reducing leaf litter moisture. This process creates conditions that physiologically stress salamanders that rely upon their moist skin as a respiratory organ. Numerous studies demonstrate that salamanders either decline following clear-cutting or are less abundant in young stands compared with mature stands. Some species are so sensitive to intensive forest management that they may be at risk of local or regional extinction (see Petranka 1998 and references therein).

For PT-4 there is an indication that the mean SVL of Jemez Mountains salamanders collected is increasing through time. It is unfortunate that no salamanders were found on this transect during surveys in 1998, 1999, and 2000 that could provide additional data to determine if this trend is continuing. Scott and Ramotnik (1992) found similar results studying *A. hardii* on pre/post

logging plots in the Sacramento Mountains and speculated there was reduced reproduction or survivorship among young salamanders on logged plots. Although the timber harvesting program on the Santa Fe National Forest has been greatly reduced during the last few years, Jemez Mountains salamander populations on previously logged areas may be undergoing the same incipient long-term population declines.

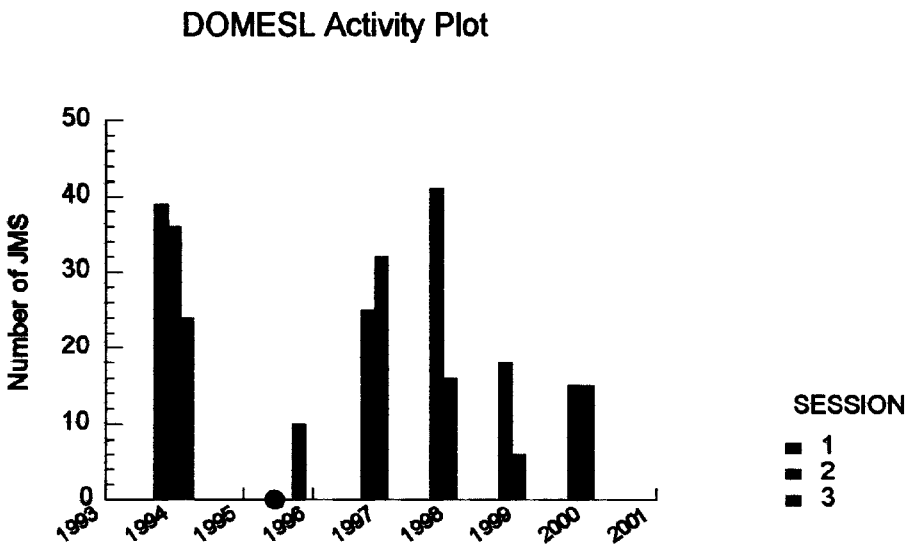
Table 2. Descriptive statistics for all Jemez Mountains salamanders collected on Permanent Transects and associated High-Grade searches from 28 Aug 1987 – 16 August 1999. Santa Fe National Forest, New Mexico. N = number of Jemez Mountains salamanders; SE = standard error; SVL = snout-vent length.

Permanent Transect No.	N	Mean SVL (mm)	SE	Min SVL (mm)	Max SVL (mm)
PT 2	33	44.06	2.38	22	70
PT 3	61	40.91	1.65	21	64
PT 4	78	46.6	1.33	21	67
PT 8	10	57.1	3.26	40	68

ACTIVITY PLOTS

Four Activity Plots were designed to investigate population size and structure, growth, movement, site fidelity, and habitat usage of Jemez Mountains salamanders. When environmental conditions were adequate for terrestrial activity, salamanders were captured, measured, uniquely marked, and released at the capture site. Select microhabitat characteristics, including type, size, and decay class of cover object and position of salamander relative to cover object were measured at each capture site. A full description of these plots and the protocol used for routine monitoring is discussed as Appendix D in the Jemez Mountains Salamander Management Plan and in Scott and Ramotnik (1989).

The four Activity Plots were designed as two sets. Each set was established so that one plot was on a slope and the other on an adjacent relatively flat area. Thus, two plots (DOMESL and POSOS) were on slopes generally >50%, and two plots (DOME and QUEMAZON) were on slopes < 5%. When climatic conditions were favorable, three survey sessions were conducted on each plot each year. Often, moisture conditions on the forest did not remain favorable for terrestrial activity for sufficient duration and only two sessions at each plot could be completed within the year. Figs. 6 and 7 shows the number of Jemez Mountains salamanders collected on the four Activity Plots by session by year.



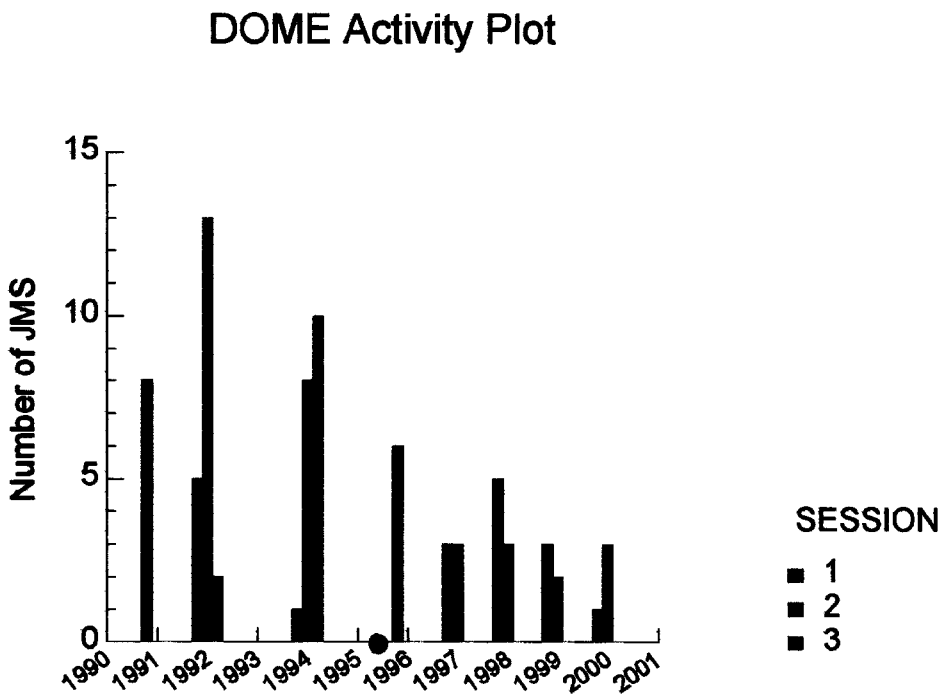
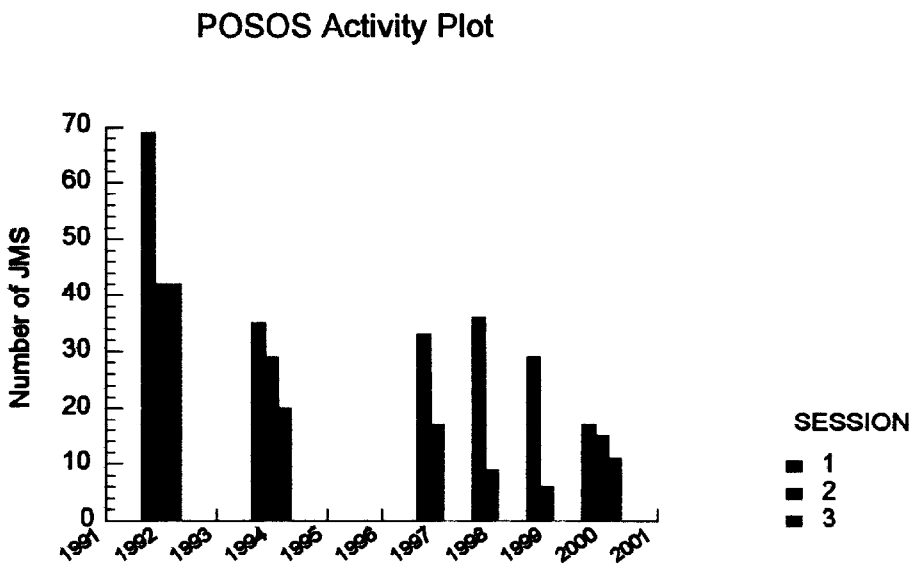


Fig. 6. Number of Jemez Mountains salamanders on DOMESL (slope) and DOME (flat) Activity Plots. ● = approximate date of Dome Fire.



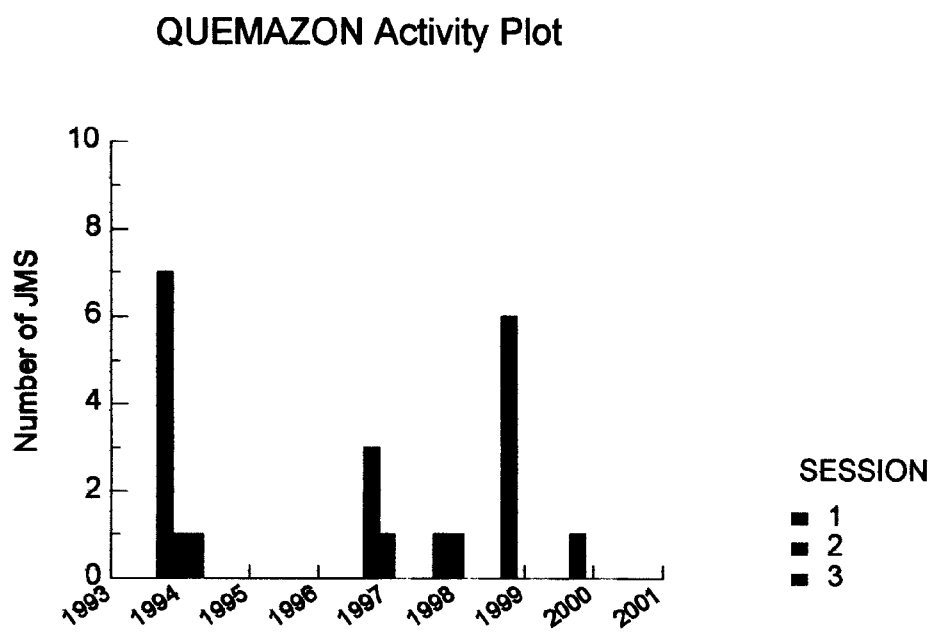


Fig. 7. Number of Jemez Mountains salamanders on POSOS (slope) and QUEMAZON (flat) Activity Plots.

In Fig. 6 and Fig. 7 the general trend is that more salamanders are encountered during the first collection of the season. This may be explained by a variety of unexplored reasons, including: 1) Jemez Mountains salamanders may be seasonal in their terrestrial activity, with the greatest activity occurring early in the season, 2) with the constant turning of cover objects, the moist microhabitat may dry out as the season progresses, or, 3) as a result of handling associated with data collection, there may be an unknown stress factor that causes most of the individuals marked earlier to remain below the surface.

Similar data (1991-1999) were presented in the Performance Report for E-23/7. Results of the Spearman Rank Correlation and Kendall Rank Correlation non-parametric tests of the numbers of Jemez Mountains salamanders collected on all Activity Plots (1991-1999) suggested that when considered together there was no decline of Jemez Mountains salamanders on the plots. However, when the data were analyzed independently, a decline was detected on the POSOS plot. Similar conclusions can be drawn from data analysis of Activity Plots from 1991-2000 as adding data from year 2000 does not make a difference in the results. Rainfall patterns and the continued microhabitat disturbance may actually account for the observed decline in the number salamander encountered on this plot. The data likely do not reflect an actual population decline in the surrounding, undisturbed areas.

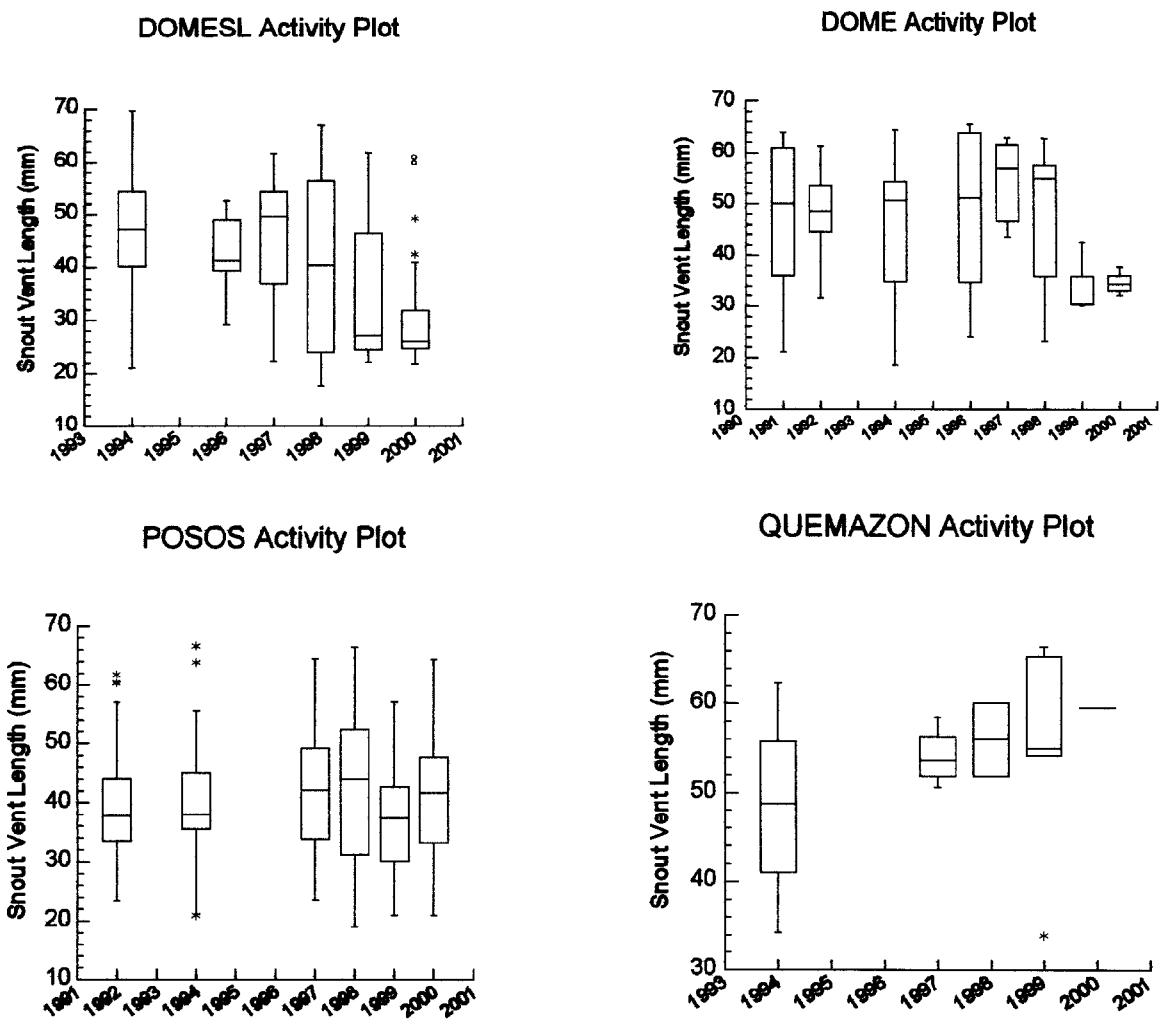


Fig. 8. Snout-vent lengths of Jemez Mountains salamanders taken on individual Activity Plots.

GROWTH

At least 29 species of *Plethodon* are recognized in North America (Petranka 1998). Growth data for these salamanders is scarce and has been reported for only 8 species. *Plethodon cinereus*, an abundant and widespread species in the northeastern United States, is perhaps the most well studied of all plethodontid salamanders (Petranka 1998) yet only two growth studies exists for that species. Sayler (1966), who studied growth rates only in immature individuals, reported hatchlings grew rapidly (ca. 15 mm SVL) during their first year. Nagel (1977) found juveniles grew an average of 15 mm SVL during the first year of life, but only 8 mm SVL during the second year. Other species with limited growth data include *P. dorsalis* (juveniles grow ca. 9.5 mm SVL per year, Petranka 1998), *P. hoffmani* (juveniles grow 10-12 mm SVL the first year after hatching, Petranka 1998), *P. jordani* (individuals increase an average of 12 mm SVL during the first year

and 9 mm SVL during the second year, Petranka 1998), *P. stormi* (juveniles grow 6.5-8 mm SVL per year, Nussbaum et al. 1983), *P. vehiculum* (individuals grow about 10 mm SVL annually during their first three years of life, Brodie 1970), *P. websteri* (growth rates during the active season average 1.3, 1.1, and 0.33 mm SVL/mo for 1-year, 2-year, and adult age classes. Growth rates during the first year average 10 mm SVL, Semlitsch and West 1983), and *P. wehrlei* (individuals grow about 20 mm SVL during the first year of life. During the second, third, and fourth years, males grow 11, 10, and 9 mm SVL, while females grow 9-10 mm SVL during their second year, Hall and Stafford 1972).

Growth rates of Jemez Mountains salamanders were determined from recaptures of 34 uniquely marked individuals from three Activity Plots. Only individuals > 25mm SVL (thought to be 1 year old, in second growing season), were uniquely marked for later recapture. No young-of-the-year were marked for use in these studies. Fig. 9 and Table 3 summarize these growth rates. It is unknown why the growth rates for Jemez Mountains salamanders are generally slower than other species in the genus. As most of the species discussed occur in the more mesic eastern forests, perhaps the higher and drier climate in New Mexico results in slower growth.

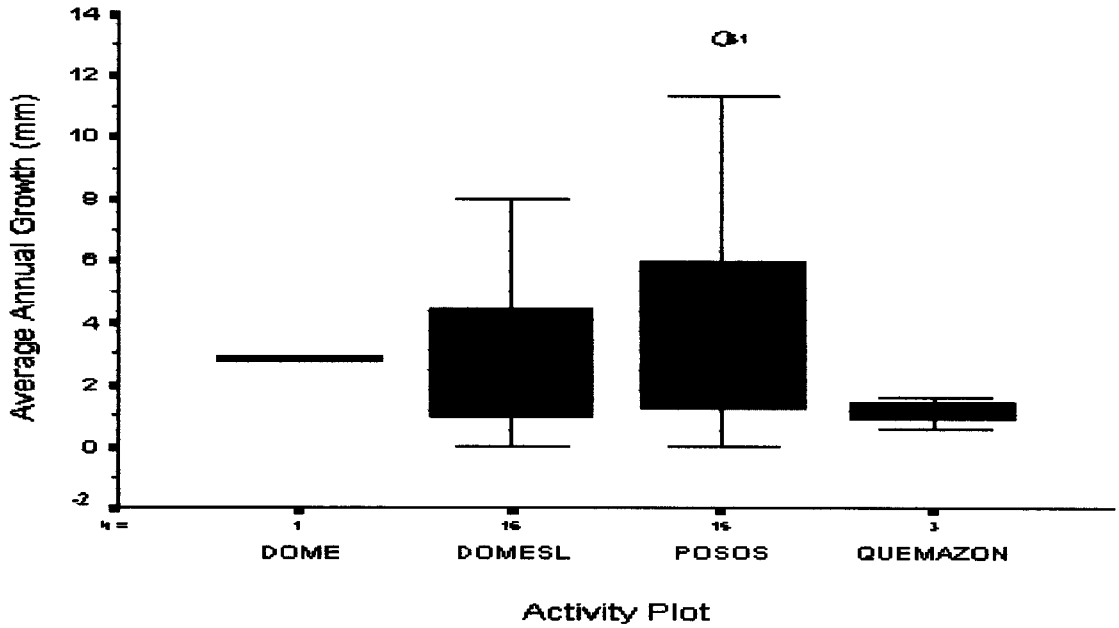


Fig. 9. Average annual growth (SVL) of Jemez Mountains salamanders (n = 35) on Activity Plots. Growth data are from mark/recapture of individual salamanders. Recapture rates on DOME (n = 1) were too low for analysis, and QUEMAZON was based on only 3 individuals.

Table 3. Average annual growth (SVL) statistics of Jemez Mountains salamanders on Activity Plots. Growth data are from mark/recapture of 34 individual salamanders. N = number of salamanders; SE = standard error; Min = minimum growth (mm) recorded; Max = maximum growth (mm) recorded.

Activity Plot	N	Mean Growth (mm)	SE	Mean 95% C.I.	Min (mm)	Max (mm)
DOMESL	16	3.13	0.63	1.79 – 4.47	0.0	8.01
POSOS	15	4.24	1.01	2.08 – 6.40	0.0	13.7
QUEMAZON	3	1.15	0.29	-0.13 – 2.43	0.59	1.6

MOVEMENT

Actual measurements of movements in small terrestrial salamanders are scarce. Stebbins and Cohen (1995) provide a review of the little data available. Average activity radius for eastern plethodontids was 3.9 m and the average home range was 20.5 m^2. Although Stebbins and Cohen (1995) do not discuss these traits in western plethodontid salamanders, it is likely smaller due to more xeric habitat conditions.

To determine the distance moved, an individual must be recognized and repeatedly relocated. For species too small for radio telemetry, this presents a unique problem. Passive Intergrated Transponders (PIT Tags) had limited applicability as only individuals > 55 mm SVL could be marked. Toe-clipping in plethodontid salamanders may affect the amount of movement and frequency of recapture in the marked animals, and the effects of handling are unknown. Additionally, small salamanders can regenerate toes quickly so that the reliability of accurately detecting a unique mark is decreased throughout time. However, many of the problems associated with marking small amphibians have recently been solved through the development of a fluorescent silicon pigment that can be injected subcutaneously. Since 1996, all Jemez Mountains salamanders (> ca. 25 mm SVL) detected on the Activity Plots during this study were uniquely marked with this injectable pigment using a scheme of different sites and colors on an individual. Although no specific tests were conducted on tag retention or survivorship, individuals relocated three years after marking appeared healthy, no infection or other sores were detected at the injection site on any salamanders.

Salamanders are known to move vertically and horizontally in their environment. Test and Bingham (1948), Taub (1961), and Fraser (1976) working with *P. cinereus*, suggested that most individual salamanders in a population are underground on any given day, although many individuals surface during and following rains to forage for prey. Soil moisture and temperature appear to be the primary factors affecting this vertical distribution of individuals (Taub 1961). When *P. cinereus* in field enclosures were provided underground passageways, many remained underground and never moved to the surface (Taub 1961). This is likely true for Jemez Mountains salamanders during drier years when the monsoon rains do not develop (C. Painter, M. Altenbach *pers. obs.*). Thus, surface counts taken during less than optimal weather are not likely useful in the

development of an index used to predict population trends or determining presence/absence. The extent to which these vertical patterns of movement vary geographically or seasonally is poorly understood.

Overland movements of Jemez Mountains salamanders are difficult to monitor because of the species' small size and secretive habits. Nocturnal surveys conducted with bright floodlights at sites with known dense populations of Jemez Mountains salamanders were unsuccessful at detecting surface-active salamanders. Plastic sheeting used as cover boards was also unsuccessfully used to monitor population levels. Ramotnik (1986) implanted 12 Jemez Mountains salamanders with radioactive Tantalum-182 wire in a study of movement and home range. Salamanders were tracked from two days to 6 weeks, with the longest movement reported being 13 m in 1.5 hr during a light drizzle. At least two females showed strong site fidelity, returning to the same site after repeated movements of up to 5 m. Results of the homing study indicate a lack of homing ability in Jemez Mountains salamanders displaced from the original capture site.

Analysis of mark/recapture data from the Activity Plots suggest these horizontal movements are small and average approximately 6 m when all movements recorded are considered together (Table 4)

Table 4. Overland movements of Jemez Mountains salamanders on Activity Plots on the Santa Fe National Forest. Calculations of movements are based on a straight line distance from capture site to capture site. SE = standard deviation; SE = standard error; N = sample size.

	All movements recorded considered separately (m)	**Max. Distance moved from original capture site (m)**	**Total movement (m)**
Mean	5.98	5.5	7.1
SE	1.1	1.2	1.8
SD	6.2	6	9.2
Min	0	0	0
Max	19.7	185 ~~19.7~~	35.2
N	32	25	25

Jemez Mountains salamanders are known to respond rapidly to drying surface conditions and disappear from the surface, presumably moving deep into the interstical spaces of the subterranean rock column (C. Painter, M. Altenbach *pers obs.*). Such vertical movement is necessary to maintain the correct humidity levels for cutaneous respiration.

SITE FIDELITY

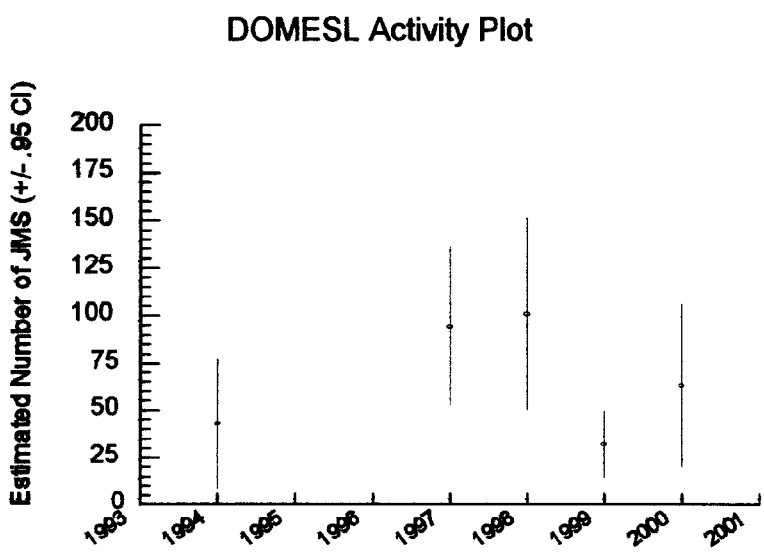
Many small, terrestrial salamanders probably spend their entire lives in and around a single protected site such as a rotting log, rock pile, or other shelter. Although certain plethodontids, such as *Desmognathus* and *Eurycea*, move seasonally to and from breeding sites, they are highly sedentary during most of the year (Petranka et al. 1993). Although not corroborated by Ramotnik (1986), some experimentally displaced species of *Plethodon* and *Desmognathus* readily home back to their place of capture and show no tendency to disperse away from home ranges when disturbed or handled (Duellman and Trueb 1986). An individual Jemez Mountains salamander was PIT-tagged on QUEMAZON Activity Plot on 3 Aug 1994 and was recaptured near the same log nearly 5 years (1,831 days) later on 10 Aug 1999; maximum distance recorded from the original capture was only 1.5 m. Of all movements recorded from recaptured individuals, 37% had moved less than 2 m and 36% had moved less than 2 m from the original capture site (Table 4). These data suggest that Jemez Mountains salamanders move very little and the maintenance of microsite characteristics is important. Individuals likely become familiar with particular microsite characteristics that facilitate foraging, retreat from desiccation, or other important aspects of their natural history requirements. When these microsite characteristics are altered on a landscape level, the entire population is likely stressed. For example, during a July 2000 High-Grade search of a historic site that was burned during the Cerro Grande Fire, 9 Jemez Mountains salamanders were found under one burned log approximately 35 cm in length, and 3 were found under the same rock. This unusual congregation of Jemez Mountains salamanders was unprecedented as less than 1% of the salamander observations reported herein are of 2 or more salamanders under a single cover object, and more than 3 salamanders within the same log has not been observed at any other time during this project. Since the Cerro Grande Fire greatly altered the microhabitat of these individuals, it was assumed the individuals were stressed and were seeking whatever surface cover was available at this site.

Petranka et al. (1993) found that clear-cutting depleted local populations of salamanders and reduced local species richness. Dispersal of plethodontid salamanders from plots following clear-cutting is unlikely because adults have small home ranges and are strongly philopatric. Although the fate of salamanders on clearcut areas is generally unknown, Petranka et al. (1993) suggested that most die following timber removal and that few disperse into the surrounding forests. Researchers have estimated that clear-cutting on U.S. Forest Service lands in western North Carolina has eliminated an average of 13.7 million salamanders annually in recent years. Although the absolute number of individuals being lost annually is substantial, it constitutes only about 0.34% of the estimated total number of salamanders found on National Forests lands in western North Carolina (Petranka et al. 1993).

POPULATION

The worldwide phenomenon of amphibian population declines is well known, although data available suggest that anurans are declining at much faster rates than salamanders. For example, Stebbins and Cohen (1995) listed case histories of 55 species of declining frogs and only 2 species of salamanders. However, the population trends of many narrowly endemic eastern plethodontid salamanders remain unstudied.

Collection of population data of Jemez Mountains salamanders is difficult for several reasons: 1) populations of Jemez Mountains salamanders that have sufficient individuals for a mark-recapture study are difficult to find, 2) individual Jemez Mountains salamanders are cryptic, secretive, and reclusive, and require microhabitat destruction to locate, 3) accurate marking and measuring is difficult due to the small size and fragility of individuals, 4) the sporadic occurrence of the wet and rainy conditions necessary for terrestrial activity of Jemez Mountains salamanders requires assembling a field crew on short notice, and 5) during the period data presented herein have been collected, there has been a general drying trend observed in the Jemez Mountains.Population estimates for DOMESL and POSOS Activity Plots (Fig. 10) were based on mark/recapture methods and analyzed using the Peterson Method (Seber 1982). The number of Jemez Mountains salamanders estimated to occur on the POSOS Activity Plot is declining. However, a decline at that individual site does not necessarily indicate a population decline throughout the forest but more likely a decline on the Activity Plot from repeated disturbance of the surface microhabitat. It is recommended that the design of future long-term research that affect the microhabitat be discussed with the TEAM.



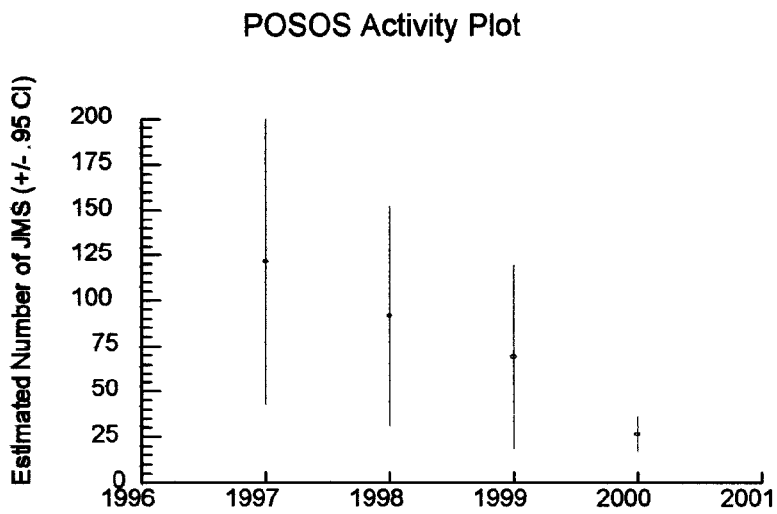


Fig. 10. Estimated population size for DOMESL and POSOS Activity Plots. The open circles indicate the actual estimated population size, the bars represent the upper and lower 95% confidence intervals

Table 4. Estimated population size and population statistics for Jemez Mountains salamanders on DOME SLOPE and POSOS Activity Plots during the years 1997-2000. Population size was estimated using the Peterson method (Seber 1982)*. Each Activity Plot is 2500 sq m or 1/4 hectare.

Activity Plot Year	Pop Estimate on AP	Pop estimate per hectare (per acre)	SE (Pop Est)	Lower 95% C.I.	Upper 95% C.I.
DOME SLOPE					
1997	94.3	377 (153)	20.8	52.8	135.9
1998	101	404 (164)	25.2	50.5	151.5
1999	32.3	129 (52)	8.6	15	49.5
2000	63	252 (102)	21.5	20.1	105.9
POSOS					
1997	121.4	486 (197)	39.2	43	199.8
1998	91.5	366 (148)	30.3	31	152
1999	69	267 (112)	25.1	18.8	119.2
2000	26.4	106 (43)	4.7	17	35.8

**NOTE*: *Activity Plots DOME and QUEMAZON did not have sufficient recapture data to compute population size.*

POPULATION MONITORING

Compared to other vertebrates, most herpetofauna are difficult to monitor because they are relatively small, cryptic, and secretive. Traditional censussing methods include overturning rocks and other cover objects, breaking apart logs and stumps, and excavating leaf litter and soil layers. Such practices can be highly destructive, destroying or degrading habitat that should be protected for species conservation. Other standard herpetological monitoring techniques (e.g., drift fences, pitfall traps, active search) can injure animals and the quality of the data are dependent upon the surveyor's experience level.

A technique that appears especially promising for sampling herpetofauna is the use of artificial cover objects (ACO). ACO requires little time and effort to deploy and monitor, can be checked repeatedly without disturbing animals, and are cost-effective (Droge et al. 1997; Fellers and Drost 1994). Several investigators have found ACO to be a useful monitoring method (DeGraaf and Yamasaki 1992; Zappalorti and Reinert 1994) and ACO have become the survey technique recommended by the Terrestrial Salamander Monitoring Program.

The simplest type of ACO is the coverboard. Coverboards are generally made of plywood or tin and are placed flat on the ground singly or in arrays along transects. Reptiles and amphibians can utilize coverboards as shelter, and animals can be censussed simply by checking the boards periodically. Coverboards are a non-destructive, non-intrusive sampling method appropriated to many terrestrial habitats. Furthermore, they pose a low risk of injury to animals and are easy to maintain and use. Plastic sheeting designed as cover boards was unsuccessfully used for monitoring Jemez Mountains salamanders on two Activity Plots. Additional research on the response of Jemez Mountains salamanders to a variety of coverboards needs to be conducted.

Jemez Mountains salamanders may be abundant at select sites. For instance, at least 308 individuals were collected during 52 collections made at the Type Locality from 1949-1986, a period of 37 years. Of 65 historically occupied sites that were revisited (Appendix 1), Jemez Mountains salamanders were detected on 60 (92.3%). At the other 5 sites, Jemez Mountains salamanders could have been overlooked because of the difficulty of detection and the exacting climatic conditions required for terrestrial activity. This trend suggests that populations of Jemez Mountains salamanders are persisting at sites that are unaltered by anthropomorphic events, e.g., the Cerro Grande Fire. Additional data need to be collected to corroborate these findings and determine the persistence of other populations.

Recently there has been a rapidly growing interest in monitoring populations of plethodontid salamanders that stems from three related areas of research. First, worldwide decline and extinction of anurans (Vial and Saylor 1993) raise the possibility that other amphibian taxa may also be at risk now or in the future. It has been predicted that growing human impact on ecosystems may induce even higher rates of decline in native amphibian and reptile populations in the future (Beebee 1996; Pechmann et al. 1991; Seigel and Simons 1995). Second, the pronounced sensitivity of amphibians to environmental changes makes them particularly valuable as indicator

species, even for species not facing any risk of immediate extinction. For example, studies have shown that survival of many amphibian species are strongly dependent upon factors that can be influenced by human activities, including habitat fragmentation and edge effects (deMaynadier and Hunter 1998), UV radiation levels (Blaustein and Wake 1995; Blaustein et al. 1994), soil and water pH (Frisbie and Wyman 1991; Sugalski and Claussen 1977), and percent organic matter and percent soil moisture (Grant et al. 1992; Sugalski and Claussen 1997). Finally, because of their abundance, total biomass, and role in food chains, amphibians are ecologically significant members of their communities (Griffiths 1996). For instance, within parts of its range the redback salamander (*Plethodon cinereus*) accounts for more biomass than any other vertebrate group (Burton and Likens 1975) and is one of the most important mid-level predators in eastern North American forest ecosystems (Carfioli et al. 2000). Although Jemez Mountains salamander populations are known to be dense in some areas, (estimated at 487 or ca. 500/hectare - Table 4) they are not known to reach the eastern levels. In recognition of the environmental sensitivity and ecological importance of the plethodontid salamanders, the Terrestrial Salamander Monitoring Program (http://www.im.nbs.gov/sally), a subdivision of the North American Amphibian Monitoring Program of the U.S. Geological Survey, was established in 1997.

The status of the Sacramento mountain salamander, *Aneides hardii*, is described in Ramotnik (1997) (Appendix 2). Limited field surveys indicate no major changes in status since that time.

FOOD HABITS

The Jemez Mountains salamander, *Plethodon neomexicanus*, occurs only in north-central New Mexico where it is confined to montane forests surrounding the Valles Caldera in Los Alamos, Sandoval, and Rio Arriba counties. The Jemez Mountains salamander is limited by habitat type and is found from approximately 7200 – 9515 feet (Degenhardt et al. 1996). Their limited distribution, exacting microhabitat requirements, and threats from silvicultural activities prompted the New Mexico State Game Commission to classify them as "Threatened" on 24 Jan 1975 (NMDGF 1999).

Jemez Mountains salamanders are associated with two basic types of habitat throughout its range – rocky slopes and downed logs (Ramotnik and Scott 1988). The downed log habitat used by Jemez Mountains salamanders is primarily Douglas-fir, *Pseudotsuga menziesii*, in varying later stages of decomposition.

Since salamanders are often numerically the most abundant vertebrate in many forest ecosystems (Heatwole 1962; Jaeger 1980), their annual biomass production can play an important role in the forest food chain. Since the body mass of adult Jemez Mountains salamanders average approximately 1.2 grams, their typical prey falls below the size range of the prey of most birds and mammals. Because the metabolic rates of salamanders appear to be among the lowest of vertebrates (Feder 1983), conversion efficiencies (ratio of energy into biomass synthesized) are high, roughly 40-80% of energy ingested can be converted to new biomass (Fitzpartick 1973; Burton and Likens 1975). Therefore, salamanders comprise a quantitatively and qualitatively

important component of the energy flow in may forest ecosystems (Burton and Likens 1975; Bury 1983).

In general, salamanders tend to be rather unselective feeders. A wide variety of invertebrate prey is consumed and other than items that are too large, too small, too fast, or too distasteful, prey seems to be taken largely in proportion to its abundance in the field (Griffiths 1996; Petranka 1998). There have been few food habits studies of the Jemez Mountains salamander. Regan (1972) examined the stomachs and intestines of 39 adults and reported the following distribution of food items by percent occurrence: ants 77%; lepidopteran larvae 18%, beetle larvae 13%, mycetophilid flies 10%, staphylinid beetles 8%, pseudoscorpions, tenebrionid beetles, tipulid flies, and termites 5% each, and annelid worms, mites, carabid beetles, and snails 3% each.

The salamanders used in the food habits study reported herein were collected between 12 June – 27 August 1992 by tearing apart rotted trees and turning rocks following protocol established in the Jemez Mountains salamander management plan. Specimens were placed individually in small plastic bags and were immediately placed on ice to retard further digestion of prey items. Salamanders were then transported to the laboratory within 6 hours. They were killed in chlorotone, fixed in 10% formalin, and stored in 40% ISOH. Snout-vent length (SVL) was measured from the tip of the snout to the anterior edge of the cloaca. Stomachs were removed, placed in water, and opened. Stomach contents were separated into individual food items, examined with the aid of a dissecting microscope, measured with an ocular micrometer, and counted. Prey items were identified to the most useful, lowest taxonomic unit. Specimens and stomach contents were curated as scientific museum specimens at the University of New Mexico Museum of Southwest Biology, Division of Herpetology and are available for reexamination by qualified researchers.

Stomachs of 79 Jemez Mountains salamanders (mean 50.4 mm SVL, range 31.7-69.2; SD 8.7) contained 1396 food items (Table 5). Jemez Mountains salamanders ingested diverse food types (Table 7) and their diet appeared similar to that of other terrestrial salamanders that are described as eating a general sampling of the small invertebrates that exist in their habitat (Petranka 1998). Hymenoptera, mainly ants (family Formicidae), were important prey and accounted for 51.6% of the total number of prey items and were encountered in 90% of the stomachs examined. Mites (19.6% of the total number of prey items and encountered in 68% of the stomachs examined) were also important prey items.

Table 5. Stomach contents of *Plethodon neomexicanus* (n = 79) collected June – August 1992, Jemez Mountains, Sandoval County, New Mexico. No: number of prey items encountered (n = 1396); % No: proportion of specific prey type in total prey encountered; Vol: total volume (mm^3) of specific prey type; % Vol: proportion of prey type in total volume of prey items; Freq: number of stomachs with specific prey item; % Freq: proportion of prey type in total number of samples.

Prey Type	No.	% No.	Vol.	% Vol.	Freq.	% Freq.
Hymenoptera (Formicidae)	721	51.65	937.32	41.33	71	90
Acari	274	19.63	77.9	3.44	54	68
Coleoptera	113	8.09	359.86	15.87	42	53
Diptera	59	4.23	88.91	3.92	30	38
Collembola	53	3.8	14.67	0.65	29	37
Hymenoptera (non-ant)	43	3.08	232.09	10.23	24	30
Araneae	39	2.79	95.37	4.21	23	29
Gastropoda	38	2.72	66.33	2.93	18	23
Chilopoda	18	1.29	61.33	2.7	14	18
Hemiptera	18	1.29	116.87	5.15	10	13
Lepidoptera	4	0.29	67.74	2.99	4	5
Neuroptera	4	0.29	4.87	0.21	3	3.8
Unidentified arthropods	4	0.29	0.39	0.02	4	5
Diplopoda	2	0.14	6.48	0.29	2	2.5
Orthoptera	2	0.14	110.54	4.87	2	2.5
Isoptera	1	0.07	0.84	0.04	1	1.3
Oligochaeta	1	0.07	1.07	0.05	1	1.3
Opiliones	1	0.07	23.4	1.03	1	1.3
Plant material	1	0.07	1.74	0.08	1	1.3
Total	1396	100	2267.63	100		

Table 6. Summary statistics of individual prey volumes. These data are from prey taken from Jemez Mountains salamanders collected from June – August 1992, Jemez Mountains, Sandoval County, New Mexico.

VARIABLE	N	MEAN	SE	MIN	MAX
Length (mm)	1396	2.3	0.05	0.4	26.8
Width (mm)	1396	0.86	0.01	0.1	4.9
Volume (mm^3)	1396	1.62	0.17	0	138.54

Table 7. Taxonomic listing of the prey items identified from Jemez Mountains salamander, *Plethodon neomexicanus*, collected June – August 1992, Sandoval County, New Mexico.

ANNELIDA
Class Oligochaeta
  Order Haplotaxida
    Family Lumbricidae – earthworms
ARTHROPODA
Class Arachnida
  Order Araneae – spiders
  Order Opiliones – harvestmen
  Order Acari – mites
Class Diplopoda – millipedes
Class Chilopoda – centipedes
Class Insecta – insects
  Order Collembola – springtails
    Family Entombryidae – springtails
  Order Orthoptera – crickets, grasshoppers, etc
    Family Gyrillidae – crickets
  Order Isoptera – termites
  Order Hemiptera – true bugs
    Family Chrysopidae – lacewings
  Order Coleoptera – beetles
    Family Carabicae – ground beetles
    Family Staphylinidae – rove beetles
    Family Ptilidae – feather-winged beetles
    Family Scaphidiidae – shining fungus beetles
    Family Scarabaeidae – scarab beetles
    Family Elateridae – click beetles
    Family Nitidulidae – sap beetles
    Family Mordellidae – tumbling flower beetles
    Family Chrysomelidae – leaf beetles
    Family Curculionidae – snout beetles
  Order Lepidoptera – moths and butterflies
  Order Diptera – true flies
    Family Tipulidae – crane flies
    Family Culicidae – mosquitoes
    Family Ceratopogonidae – biting midges
    Family Chironomidae – midges
    Family Cecidomyiidae – gall midges
  Order Hymenoptera – ants, wasps, etc.
    Family Formicidae – ants
MOLLUSCA
Class Gastropoda
  Order Basommatophora
    Family unknown – (small discoid terrestrial snail)

2. Additional areas of potential habitat will be investigated using standardized protocol and the presence or absence of salamanders will be noted. Locality data will be added to a dedicated set of topographic maps.

All Jemez Mountains salamander localities have been entered onto dedicated topographic maps that are available for examination at the NMDGF Endangered Species Program offices in Santa Fe. In addition, summary data, including locality data, from all High-Grade searches reported as of 23 August 2000 are available in Appendix 1 of this report.

3. All data collected during this study will be recorded on standardized data forms and will be shared between the three signatory agencies to the MOA.

All data collected to date from the standardized High-Grade searches, Activity Plots, and all transects were recorded on standardized data forms. Original copies of these forms are archived in the office files of the Endangered Species Program, New Mexico Department of Game and Fish, Santa Fe and are available for inspection to qualified members of the signatory agencies. Additional copies of all forms are maintained by Marilyn Altenbach, consultant to the TEAM.

4. Coordination with the New Mexico Endemic Salamander Team to produce a management plan for *Plethodon neomexicanus* will continue.

The New Mexico Endemic Salamander Team (TEAM) was formerly established by the May 1991 signing of the *Memorandum of Agreement for the Conservation of the Jemez Mountains Salamander*, with signatories from the New Mexico Department of Game and Fish, the USDA Forest Service, and the U.S. Fish and Wildlife Service. This memorandum of agreement also called for the development of a cooperative management plan to guide the conservation of the Jemez Mountains salamander and its habitat on lands administered by the USFS. Final approval and the 6 January 2000 signing of the *Conservation Agreement for the Jemez Mountains Salamander between and Among New Mexico Department of Game and Fish, USDA Forest Service, and U.S. Fish and Wildlife Service* represented an agreement by the signatory agencies to reduce threats and ensure the conservation of the Jemez Mountains salamander. The conservation agreement incorporated the management direction and commitments contained in the *Cooperative Management Plan for the Jemez Mountains Salamander (Plethodon neomexicanus) on Lands Administered by the Forest Service*. The TEAM was aided by various agency personnel and consultants during the completion of these documents.

5 All microhabitat and morphometric data collected during this and prior segments of this project will be computerized, analyzed, and submitted for publication.

A. All data from the standardized data sheets will be entered into the appropriate computer program and then analyzed for life history traits, including, but not limited to population age structure, distribution, microhabitat requirements, and size class of specimens encountered.

POPULATION AGE STRUCTURE

Table 8. Summary statistics for Jemez Mountains salamanders collected 1991-1999. (SVL = snout-vent length; HG = high-grade search; AP = activity plot).

	TOTAL LENGTH (mm)	SVL BY HG (mm)	SVL BY AP (mm)	TAIL LENGTH (mm)	HEAD WIDTH (mm)	MASS (g)
MEAN	79.2	44.5	42.4	37	5.9	1.17
STD ERR	1.29	0.35	0.43	0.74	0.04	0.03
STD DEV	25.16	11.7	11.4	14.41	1.15	0.78
RANGE	30.9-135.7	17.7-74	17.7-69.7	7.47-70.68	1.26-9.06	0.02-5.7
N	375	509	689	375	677	674

The smallest Jemez Mountains salamander encountered was 17.7 mm SVL, 30.9 mm total length. Individuals approximately 18-20 mm SVL encountered during mid-late July are expected to be hatchlings, however individuals positively known to be immediate post-hatching have not been discovered during field surveys. The largest individuals in this table are 74 mm SVL, 135.7 mm total length, although individuals as large as 84 mm SVL are known (USFS data sheets). Total length is measured only in those individuals with undamaged tails. Brodie and Altig (1967) determined that sexual maturity is reached at approximately 50 mm SVL.

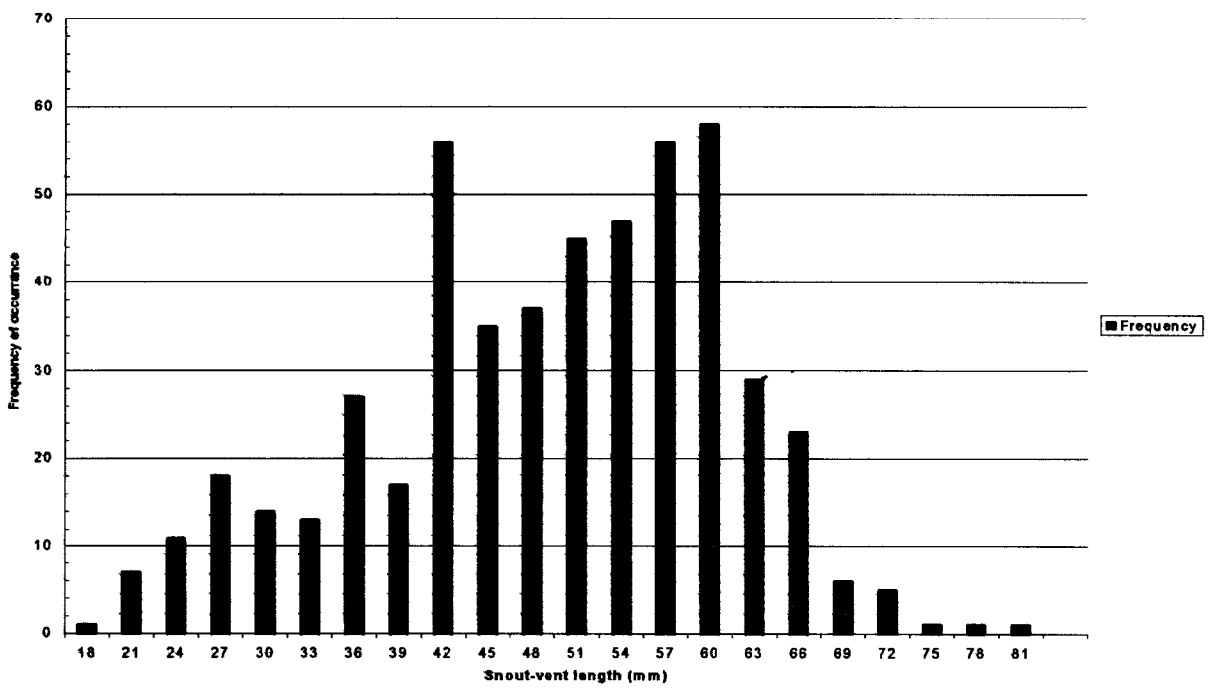


Fig. 10. Histogram of snout-vent length (SVL) of Jemez Mountains salamanders. N = 509

MICROHABITAT

Jemez Mountains salamanders are lungless salamanders of the family Plethodontidae. This is the largest family of salamanders, with 60% of the known living species – approximately 240 species in 30 genera. In all members of this family, including the Jemez Mountains salamander, respiration is through the mucous membranes in the mouth and throat and through the skin. Thus to keep their skin moist and able to absorb oxygen, these salamanders require more moist microhabitat conditions than most salamanders with lungs. Most species occur in rocky habitat that provides subterranean refugia from the drier forest habitat. Numerous studies of the eastern group of plethodontid salamanders indicate that most of the population remains underground at any given time. Most do not tolerate heat or desiccation.

Many of the early reports (Williams 1972; 1973; Ramotnik 1986) on the habitat requirements of Jemez Mountains salamanders were biased due to the limited number of occupied sites known to early researchers. In this earlier literature, aspect and canopy cover were considered especially important for the presence of Jemez Mountains salamander populations. Known occupied habitat was generally confined to "...steep, north-facing slopes with dense canopy cover." While steep slopes were found to be important, analysis of data collected on the 63 Ecological Transects did not detect differences on occupied or unoccupied sites in aspect or canopy cover at 95% C.I. However these data are likely biased, as areas chosen for transects were based on habitat-scale visual inspection and were expected to have Jemez Mountains salamanders present. Habitat features consciously selected for when establishing these transects included downed logs and canopy cover, therefore an analysis of these important factors is not presented. Data analysis of the remaining habitat characteristics is thought to be less biased. While these data do show a difference in means, they are not statistically significant at the 95% C.I. Although this represents a flaw in the data created by a design problem that cannot be alleviated in the analysis provided herein, there may be other ways of analyzing these data that would eliminate some of the built-in biases. Much has been learned about Jemez Mountains salamander habitat requirements since 1987 when these transects were selected, and other factors would be considered if the same decisions were made today. Randomly chosen sites were not appropriate as the highly fragmented nature of Jemez Mountains salamander populations would likely result in the selection of no sites with salamanders present. While aspect at occupied sites was known to vary considerably, canopy cover was thought to be an important component in predicting the presence of Jemez Mountains salamander. The fact that canopy cover is similar on sites with and without Jemez Mountains salamanders may actually show similarities in the sites selected rather than actual differences where Jemez Mountains salamander do and do not occur. A few salamanders have been located on sites with no canopy cover, although these sites are normally immediately adjacent to dense forest or have abundant surface and subsurface rock present.

Based on data analysis, percent slope was selected as a good predictor of the presence of Jemez Mountains salamander populations. Analysis of the microhabitat data collected on the 63 Ecological Transects did not detect similarities on occupied versus unoccupied sites in the percent slope at 95% C.I. However, this interpretation must also be carefully evaluated as there are sites occupied by Jemez Mountains salamanders that have 0% slope. These sites are usually along a

ridge top with salamanders known to occupy the adjacent slopes. The Activity Plots, DOME versus DOMESL is good example.

Although difficult to measure or detect, subsurface rock structure is a critically important and essential component of Jemez Mountains salamander habitat. Analysis of the microhabitat data collected on the 63 Ecological Transects did not detect similarities on occupied versus unoccupied sites in the percent cover (m^2) of rocks < 10 cm or in the percent cover (m^2) of rocks > 10 cm at 95% C.I. If a reliable method to predict subsurface geology could be deployed, it may provide a management tool to predict Jemez Mountains salamander occupancy without surface disturbance or actual field surveys. Such methods could also eliminate the necessity of conducting these field surveys only possible during the brief climatic conditions optimal for terrestrial activity.

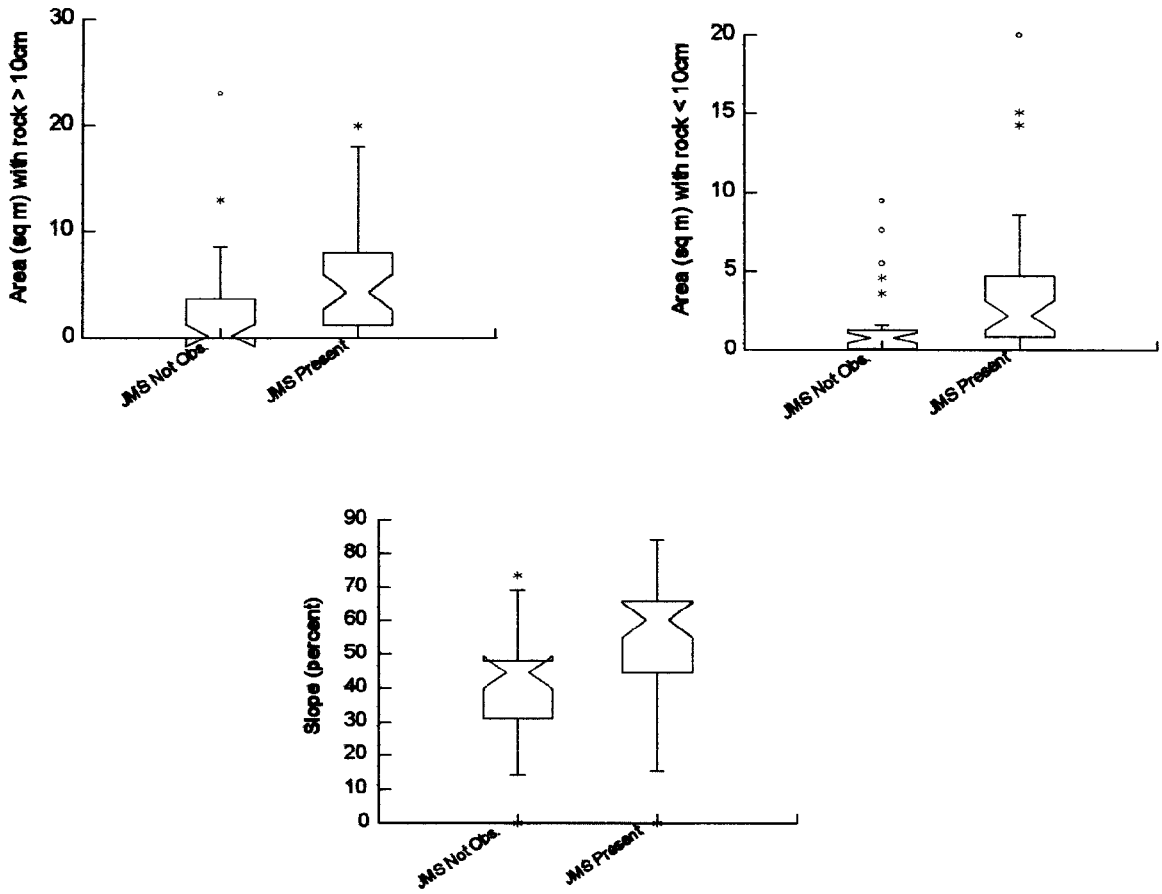


Fig. 11. These three factors were important predictive habitat measurements. Analysis of the data collected on the 63 Ecological Transects did not detect similarities at 95% C.I. in the percent slope, the percent cover (m^2) of rocks < 10 cm, and the percent cover (m^2) of rocks > 10 cm on sites occupied or unoccupied by Jemez Mountains salamanders.

The number of logged stumps in an area provides some information on the recent logging history. This was thought to be important in the persistence of Jemez Mountains salamander populations, although analysis of the microhabitat data collected on the 63 Ecological Transects did not detect differences on occupied versus unoccupied sites in the number of logged stumps at 95% C.I. However, numerous factors, including density of pre-logging salamander populations, logging methods used, season of event, extent of area logged, etc, must be considered before conclusions can be drawn from these data. This information was unknown and was not factored into the analysis reported herein.

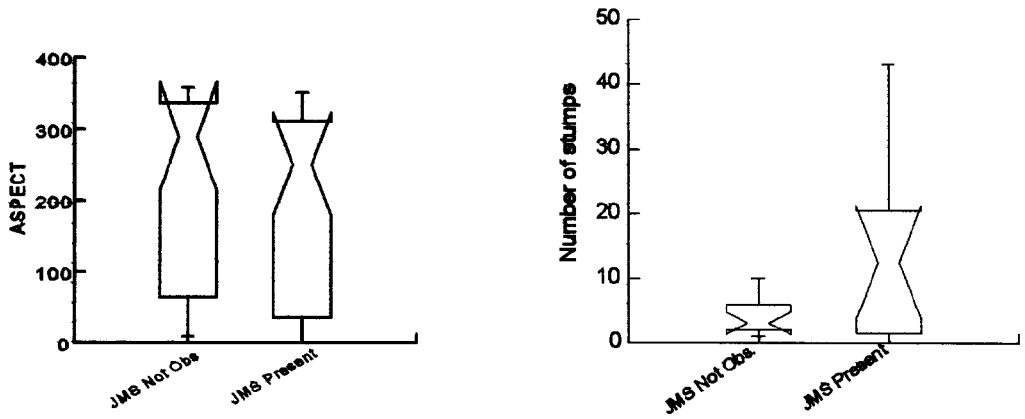


Fig. 12. Based on the early literature these two factors were thought to be important predictive habitat measurements. Analysis of the data collected on the 63 Ecological Transects did not detect differences at 95% C.I. in the slope aspect or the number of logged stumps on sites occupied or unoccupied by Jemez Mountains salamanders. Interpretation of these data must be carefully considered (see above discussion) in the management of the Jemez Mountains salamander.

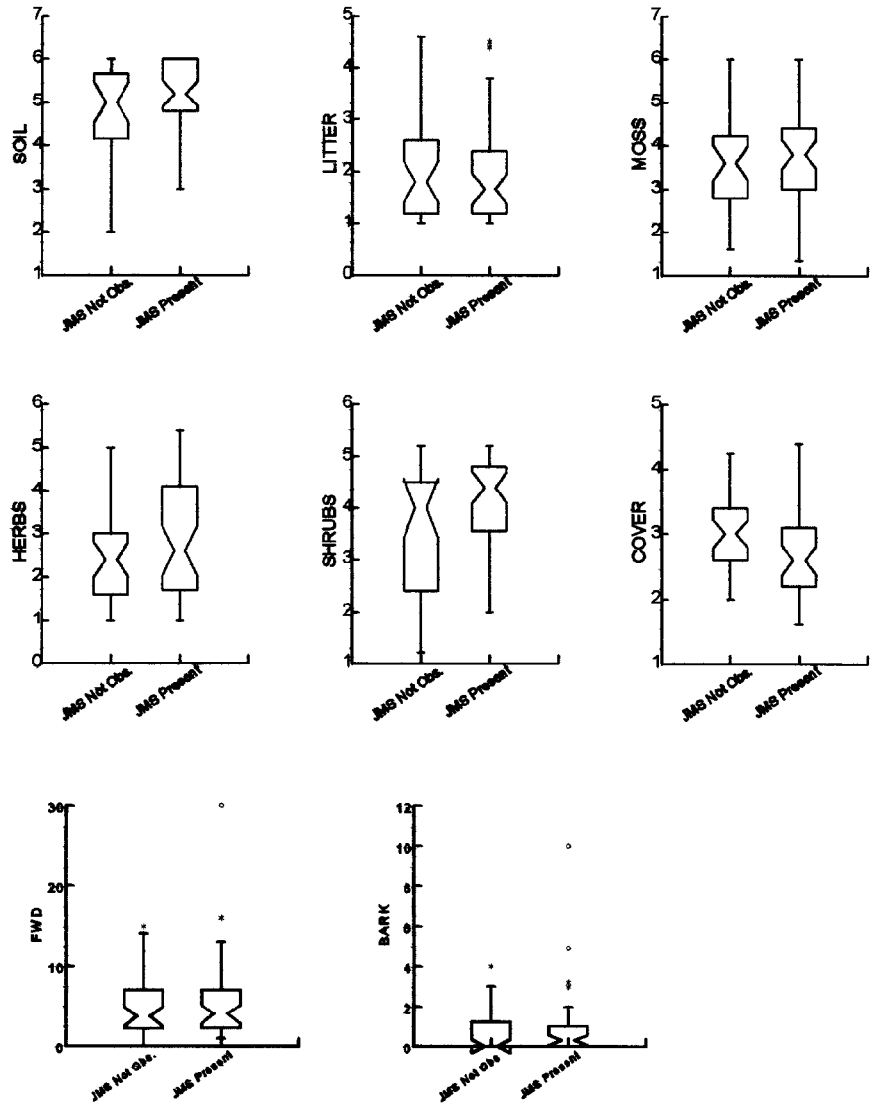


Fig. 13. Microhabitat characteristics measured on ecological transects (n = 63) on the Santa Fe National Forest between 1987-1990. No differences were detected at 95% C.I in these characteristics between sites occupied or unoccupied by Jemez Mountains salamanders. FWD = fine woody debris.

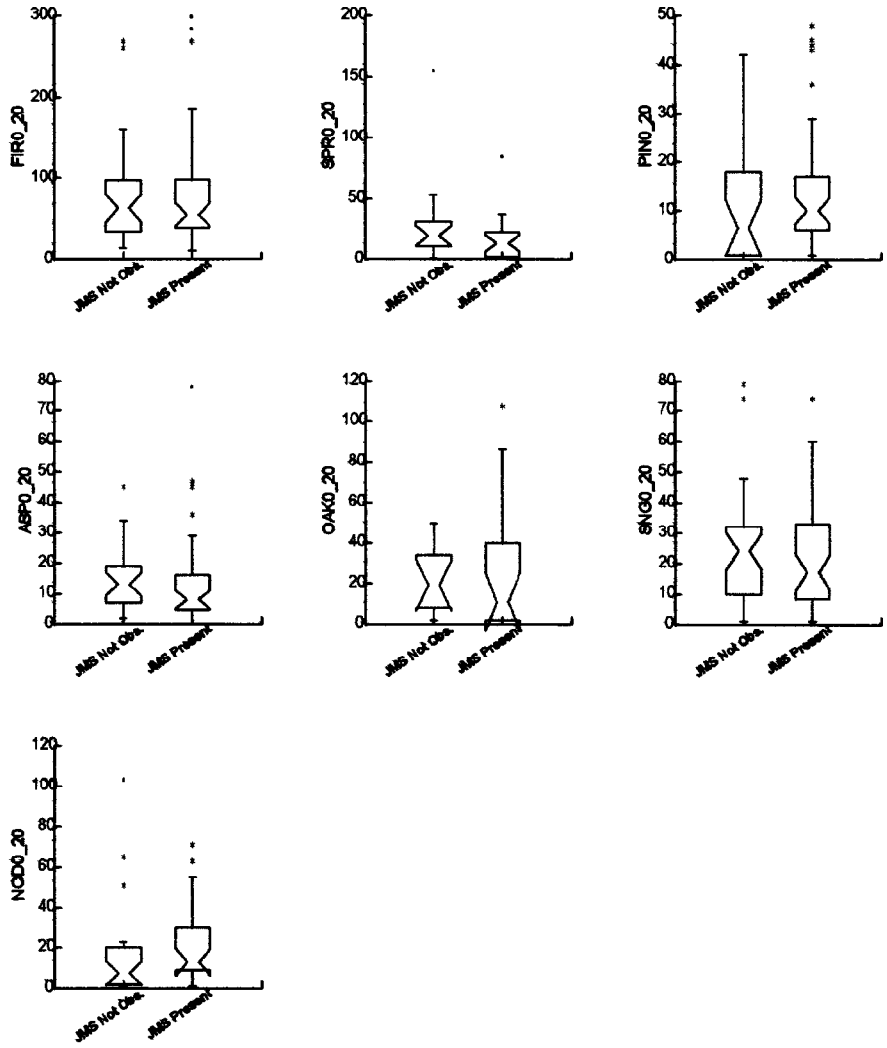


Fig. 14. Microhabitat characteristics measured on ecological transects (n = 63) on the Santa Fe National Forest between 1987-1990. No differences were detected at 95% C.I in these characteristics (No. trees 0-20 cm dbh) between sites occupied or unoccupied by Jemez Mountains salamanders.

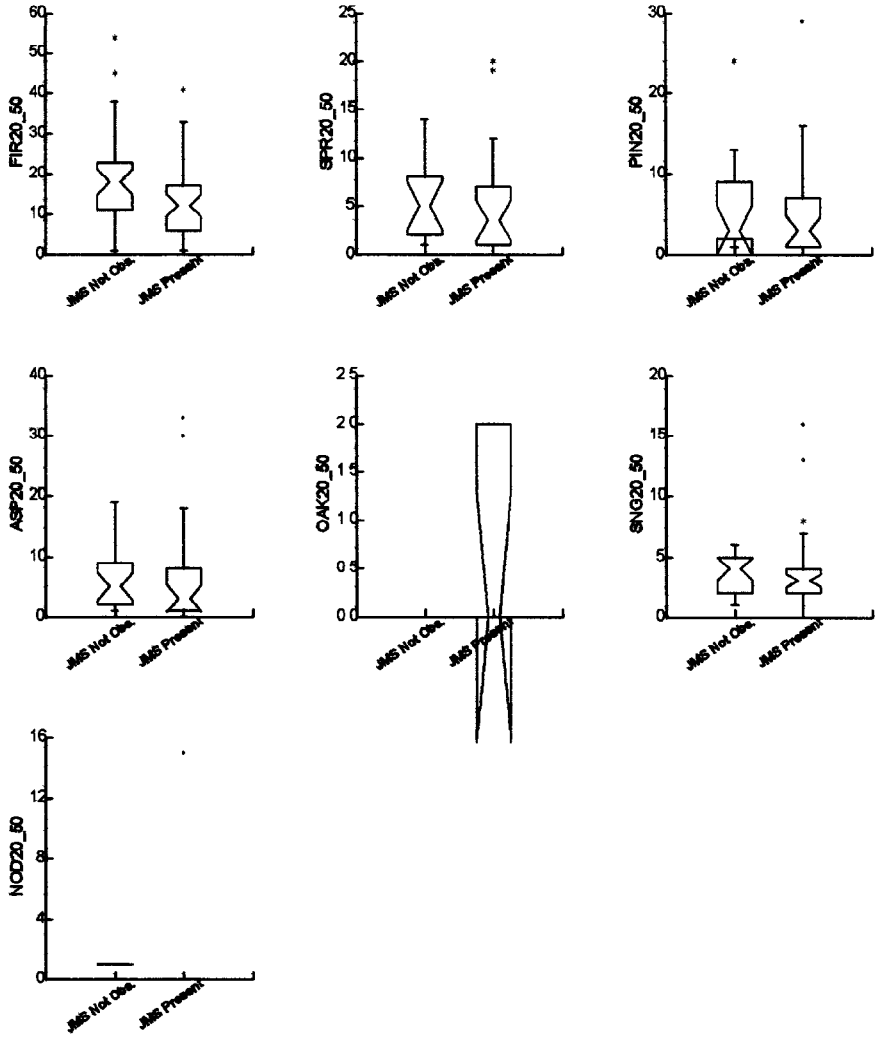


Fig. 15. Microhabitat characteristics measured on ecological transects (n = 63) on the Santa Fe National Forest between 1987-1990. No differences were detected at 95% C.I in these characteristics (No. trees 20-50 cm dbh) between sites occupied or unoccupied by Jemez Mountains salamanders.

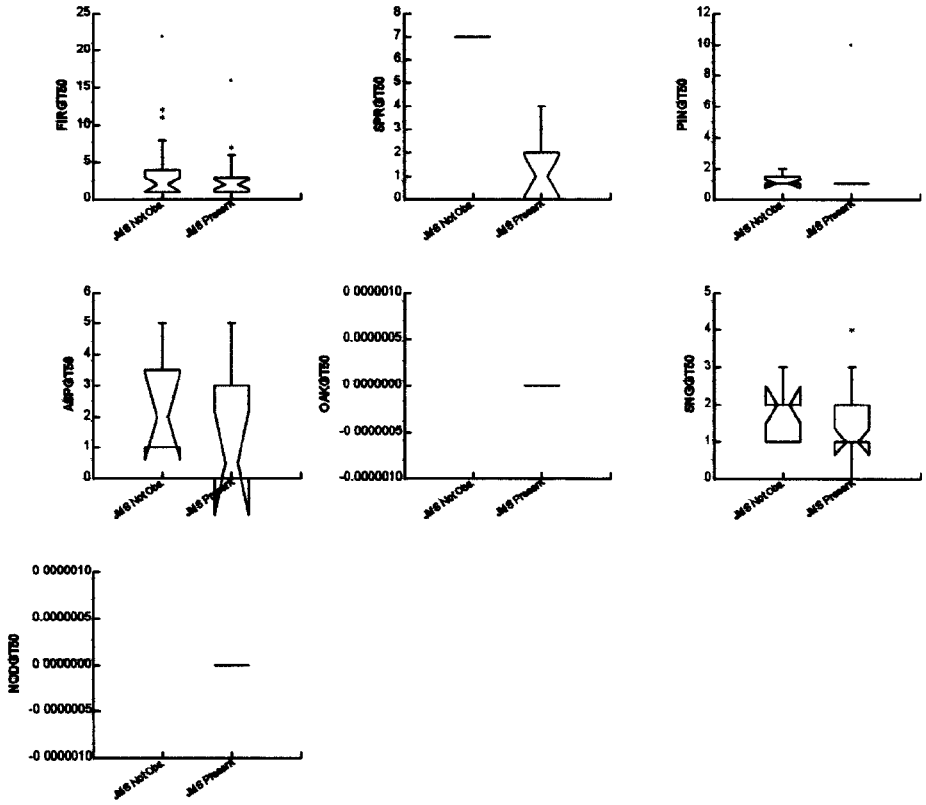


Fig. 16. Microhabitat characteristics measured on ecological transects (n = 63) on the Santa Fe National Forest between 1987-1990. With the possible exception of the number of snags > 50 cm dbh, no differences were detected at 95% C.I in these characteristics (No. trees > 50 cm dbh) between sites occupied or unoccupied by Jemez Mountains salamanders. Oak > 50 cm dbh and NOD > 50 cm dbh do not exist on transects investigated.

RECOMMENDATIONS

The Jemez Mountains salamander is narrowly endemic in a specific habitat type and highly fragmented by subsurface geology in the Jemez Mountains. Threats to the species are believed to include activities that may impact individuals or populations and/or alter habitat conditions in the following manner: 1) ground disturbance such as excavation, churning, compaction, or any activity that reduces interspaces and subsurface channels; 2) vegetation modification to the extent that ground surface microclimate is made drier or otherwise altered through increased exposure to sun and wind; and 3) suppression of prey species (especially ants and other surface-dwelling invertebrates) to the extent that Jemez Mountains salamanders obtain less energy or increase energy expenditures while foraging. These threats may include but are not limited to the following: unnatural, stand-replacing wildfire, fire suppression activities (possibly including the use of fire retardant), removal of surface ground cover, e.g., downed logs, silviculture, mining, roads, other developments, research, livestock grazing, and disease (Jemez Mountains Salamander Cooperative Management Plan 2000).

When active on the surface, most Jemez Mountains salamanders are found within or under rotted logs or under rocks. Successfully and reliably censussing these microhabitats requires destruction of the habitat, especially rotted logs which must be torn apart to locate salamanders. The disruption of the moist microhabitat under rocks that are repeatedly turned to locate salamanders may cause desiccation of the microhabitat and thus destroy its suitability for Jemez Mountains salamanders. Consideration of this should be given to research design at long-term mark/recapture sites that require repeated censusing of the same habitat. Future research should be designed so that long-term repeated habitat destruction is avoided.

Historically, the major threat to the Jemez Mountains salamander was thought to be habitat destruction through various silvicultural activities. However, since implementation of the Cooperative Agreement and the Management Plan, which restricted these activities, the greatest threat is thought to be from large, unnatural, stand-replacing fires. This type of fire has been recurring during the past 25 years and include the Cerro Grande, Dome, La Mesa, and Oso fires (Jemez Mountains Salamander Cooperative Management Plan 2000).

The legal status and the level of protection currently afforded the Jemez Mountains salamander needs to be re-assessed for the following reasons:

- The underlying assumption of the Jemez Mountains salamander inter-agency agreements and management plan (Memorandum of Agreement for the Conservation of the Jemez Mountains Salamander; Signed May 1991; Conservation Agreement for the Jemez Mountains Salamander Between and Among New Mexico Department of Game and Fish, USDA Forest Service, and U.S. Fish and Wildlife Service, signed January 2000, and the Cooperative Management Plan for the Jemez Mountains Salamander on Lands Administered by the Forest Service, signed January 2000) was that protection of the species on Forest Service lands would insure survival of the species. This assumption may no longer be valid.

- The Cerro Grande Fire that occurred in the Jemez Mountains near Los Alamos during May 2000, burned 14% of the total Jemez Mountains salamander Essential Zone (28% of the Essential Zone within the fire perimeter) with moderate to severe intensity. [The Essential Zone is the area most crucial for long term maintenance of viable salamander populations.] Nearly all of the forest canopy and downed log cover, both thought to be critical for this species, was eliminated from the area. There is a continued threat of significant losses or declines of Jemez Mountains salamander populations from post-fire rehabilitation efforts or from additional unnatural stand-replacing fires in remaining habitat.

- The federal government failed to implement or fund mitigation measures recommended by the TEAM to the Burned Area Emergency Rehabilitation (BAER) Team, although the BAER Team did carry the recommendations forward to the decision makers. The TEAM was not formally notified of the failure to implement these recommendations.

- During the Cerro Grande Fire, fire retardant was broadcast over large areas within the Essential Zone as a means of fire control. Fire retardant contains cyanide to help prevent the retardant from hardening and to protect the tanks in the air tankers from corroding. Recent tests of runoff water taken during Summer 2000 found levels of cyanide that were 5 times higher than the New Mexico state standard for fishing waters (New Mexican 2000). Fire retardant chemicals are known to be toxic to aquatic algae and invertebrates at concentrations that are possible in aquatic systems accidentally sprayed during fire-fighting (NBS 1995). A study released 20 March 2000 by the U.S. Geological Survey, Columbia Environmental Research Center ("The effects of UVB Radiation on the toxicity of fire-fighting chemicals") revealed that specific mixtures of a retardant product produce trace amounts of cyanide that is hazardous to fish, frogs, and other aquatic organisms. The NM State Environment Department found macro-invertebrate and fish kills in Cow Creek and the Pecos River that were thought to be related to increased levels of cyanide (119 ppb) as a result of fire retardant used on the Viveash Fire in the Santa Fe Mountains near Pecos during June 2000. There is little doubt that chemical contamination of habitats has played a significant role in amphibian population decline and extinction on local levels (Diana and Beasley 1998; Monds1998), however the risks to Jemez Mountains salamander populations as a result of elevated levels of cyanide resulting from the use of fire retardant are unstudied and unknown.

- Los Alamos National Laboratory recently constructed a large flood control dam in Pajarito Canyon (where Jemez Mountains salamanders potentially occur). Prior to construction of this dam, neither the TEAM nor the Department of Game and Fish were contacted regards potential impacts to Jemez Mountains salamander populations.

- The U.S. Department of Transportation, Federal Highway Administration is in the planning stages for the realignment of NM Forest Highway 126. This realignment has the potential to negatively affect Jemez Mountains salamander populations on the extreme western periphery of their known range. Specifically, the 7-Springs bypass is a Category 1 Management Action (Cooperative Management Plan for the Jemez Mountains Salamander on Lands Administered by the Forest Service, signed January 2000), i.e., one that will "...alter

important components of salamander habitat and may affect the persistence of salamanders (individuals and/or populations.)" This proposed project has been reviewed by and coordinated with the TEAM regarding the impacts of this action.

- The State Hardrock Mining Commission approved a mine extension over a mile from the original mine in the Jemez Mountains (El Cajete Mine) without any assessment or consideration of Jemez Mountains salamander populations.

- The State of New Mexico does not provide protection for this species or it's habitat. The species is state-listed as Threatened although the legislature removed protection for that category, and state-listing provides no protection for habitat. The Santa Fe National Forest is currently providing protection from take of the Jemez Mountains salamander within the Jemez, Cuba, Coyote, and Espanola Ranger Districts under Order No. 10-230 "Animal Possession Restriction" signed November 1999. This order specifically prohibits capture, collection, killing, possession, storage, or transportation of any life stages or parts thereof of the Jemez Mountains salamander without a permit. The following persons are exempt from this Order: any Federal, State, or local officer, or New Mexico Game and Fish employees or contractors, or members of an organized rescue or fire fighting force in the performance of official duty.

- During the 2000 field season, 21 High-Grade searches of sites historically occupied by Jemez Mountains salamander were conducted on the area burned by the Cerro Grande Fire. Of these, salamanders were detected at only 6 or ca. 28% of the sites (M. Cummer *pers. comm.*; C. Painter *unpubl. data*). This figure is much lower than the 92% persistence at undisturbed, historically occupied sites that were revisited (see above) and Jemez Mountains salamanders were detected. While at least some Jemez Mountains salamanders persist within the burned area 2-3 months post fire, it appears that the population is stressed and it is unknown if the species will survive on the severely burned areas. Further research designed to investigate Jemez Mountains salamander population persistence should be planned on the area burned by the Cerro Grande Fire.

SUMMARY

1) There was a decline of Jemez Mountains salamanders on the Activity Plots. This decline is most likely a result of surface disturbance and not an overall decline of Jemez Mountains salamander populations within the forest. This suggests that surface disturbing activities may be detrimental to populations of this species.

2) There was a significant increase in the SVL of Jemez Mountains salamanders collected on a Permanent Transect after logging. This decreased recruitment of young suggests reproductive stress. This, along with the observation of declining numbers on logged transects, suggests that opening of the forest canopy causes an actual decrease in Jemez Mountains salamanders or a decrease in the ability to detect these salamanders.

3) Movement data suggests the Jemez Mountains salamander moves very little from the original capture site. Thus, large-scale forest management activities that remove or destroy cover objects or fragment the habitat are likely detrimental to Jemez Mountains salamander populations.

4) The species depends to a large degree upon ants as a primary food source. Any forest management activities that significantly reduces ant populations may be detrimental to Jemez Mountains salamander.

5) During the May 2000 Cerro Grande Fire, at least 14% of the total known Jemez Mountains salamander Essential Zone was severely impacted. The species persisted in the severely burned area, however preliminary data suggests the population is stressed and may of experienced significant declines at some historically occupied sites.

6) The threat of additional unnatural, stand-replacing wildfires continues in the Jemez Mountains. This poses a serious threat to the continued persistence of the Jemez Mountains salamander over a significant portion of its range

Based on the above, prospects for the survival and recruitment of the Jemez Mountains salamander may be in jeopardy within the foreseeable future throughout all or a significant portion of its range. Conservation and recovery efforts should focus on actions that provide protection against the threats listed above.

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Prepared By: Charles W. Painter for
Charles W. Painter
Project Leader

Approved By:
Chuck L. Hayes
Assistant. Chief,
Conservation. Services. Div.

Approved By: Tod W. Stevenson
Tod W. Stevenson
Chief,
Conservation. Services. Div.

Approved By: Lisa B. Evans
Lisa Evans
Federal Aid Coordinator

Appendix 1. Complete listing and summary of all Jemez Mountains salamander localities, including all museum specimen records known and all High-Grade searches independently conducted by personnel from USFS, NMDGF, and NPS for which data were provided to NMDGF.

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
1	1	S	AMNH	55952		1	1
2		M	AMNH	88619-25		7	7
3	29	M	ASU-NC	11394-98		5	5
4		G	BWMC	578		1	1
5	112	M	BYU	38752		1	1
6	112	M	BYU	40892		1	1
7	112	M	BYU	40895		1	1
8	1	S	CAS	12764-65		2	2
9		M	CM	48086-87		2	2
10	1	S	CM	62571		1	1
11	11	M	CM	62572-73		2	2
12	1	M	CM	72385-87		3	3
13		M	CM	72477-78		2	2
14		S	CM	72479		1	1
15		M	CM	86027-28		2	2
16	1	M	CM	86029-30		2	2
17	1	M	CM	86031-50		20	20
18	1	M	CM	86051		1	1
19	1	M	CM	86052		1	1
20	1	M	CM	86053-69		17	17
21	1	M	CM	86070-71		2	2
22	1	M	CM	86072-73		2	2
25		S	CU	A 10224-26		3	3
26		M	FMNH	191786-87		2	2
27	283	M	KU	179051-52		2	2
28	1	M	KU	45405-06		2	2
29	29	S	KU	45407-10		4	4
30		S	KU	78021-22		2	2
31	112	M	LACM	105516-17		2	2
32	133	M	LACM	31102-18		17	17
33		M	LACM	75853-80		28	28
34	112	M	MHP	110-11		2	2
35	1	S	MHP	1-109		110	110
36	1	S	MHP	429-431		3	3
37	249	M	MHP	4724-28		5	5
38		M	MSB	13501-03		3	3
39	39	S	MSB	15903-04		2	2
40		M	MSB	15905-19		15	15

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
41		M	MSB	15920-43		24	24
42	39	S	MSB	16084		1	1
43	43	M	MSB	16285-97		13	13
44	43	M	MSB	16298-305		8	8
45		M	MSB	16306		1	1
46	249	M	MSB	16307		1	1
47	47	M	MSB	16308-09		2	2
48	39	S	MSB	16310-13		4	4
49	49	S	MSB	16314-15		2	2
50		G	MSB	16316-19		4	4
51	49	S	MSB	16320-31		12	12
52	49	S	MSB	16332-42		11	11
53	53	G	MSB	16343-45		3	3
54	54	M	MSB	16348		1	1
55	39	S	MSB	16349-50		2	2
56	43	M	MSB	16351		1	1
57		S	MSB	16352		1	1
58	249	M	MSB	16353-54		2	2
59	47	M	MSB	16355-58		4	4
60	39	S	MSB	16359		1	1
61		S	MSB	16360		1	1
62	49	S	MSB	16361-65		5	5
63	49	S	MSB	16366-69		4	4
64	49	S	MSB	16370-78		9	9
65	49	S	MSB	16379-97		19	19
66	112	M	MSB	2641-2662		22	22
67	112	M	MSB	2663-2667		5	5
68	112	M	MSB	2668-97		29	29
69	69	S	MSB	30646-47		2	2
70		S	MSB	36356-61		6	6
71		M	MSB	36362-63		2	2
72	39	M	MSB	38817		1	1
73	73	M	MSB	40115		1	1
74		M	MSB	40531-36		6	6
75		M	MSB	41077-78		2	2
76	76	M	MSB	41216-17		2	2
77		M	MSB	41321		1	1
78		S	MSB	47092-93		2	2

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
79		S	MSB	47343		2	1
80	80	S	MSB	47381		1	1
81	1	S	MSB	48488-90		3	3
82	82	S	MSB	49057-61		25	5
83		S	MSB	49062-66		6	5
84	84	S	MSB	49067-69		3	3
85		S	MSB	49070-72		3	3
86		S	MSB	49073-76		7	4
87		S	MSB	49077-79		5	3
88		S	MSB	49080-81		2	2
89		S	MSB	49163		1	1
90	90	S	MSB	49164-67		10	4
91	91	S	MSB	49168		1	1
92		S	MSB	49169-72		4	4
93		S	MSB	49173-74		2	2
94	94	S	MSB	49175		4	1
95	95	S	MSB	49176-78		7	3
96		S	MSB	49179-80		2	2
97	97	S	MSB	49181		2	1
98	98	S	MSB	49182-84		3	3
99		S	MSB	49185-86		2	2
100		S	MSB	49188		1	1
101	1	S	MSB	49802-04		3	3
102		S	MSB	50610		1	1
103	103	S	MSB	50611-12		15	2
104	104	S	MSB	50613		1	1
105		S	MSB	50614		17	1
106	106	S	MSB	50615		10	1
107	107	S	MSB	50777		1	1
108		M	MSB	50869		1	1
109		M	MSB	50870		1	1
110	110	M	MSB	50871		1	1
111		S	MSB	52099		1	1
112	112	S	MSB	5540-43		4	4
113	1	M	MVZ	184462		1	1
114	1	M	MVZ	184463		1	1
115	1	S	MVZ	201311		1	1
116	1	S	MVZ	49018-26		9	9

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
117	1	S	MVZ	49027-35		9	9
118		S	MVZ	57614		1	1
119	119	S	MVZ	57615-17		3	3
120	119	S	MVZ	57618		1	1
121	283	M	MVZ	67540-42		3	3
122	1	M	MVZ	91318-21		4	4
123		U	MVZ	91322		1	1
124		U	MVZ	91323-25		3	3
125	112	M	MVZ	91326-27		2	2
126		S	MVZ	98833-43		11	11
127	127	S	NMSU	2782-802		21	21
128	283	M	NMSU	337-39		3	3
129	283	M	NMSU	340		1	1
130		M	NMSU	6111-41		31	31
131		U	OSMNH	31specimens		31	31
132	112	G	SAM	1190		1	1
133	133	S	SIUC	H-3004		1	1
134	1	S	TNHC	19306		1	1
135	144	G	TU	18729-36		8	8
136		U	UCM	43798-830		33	33
137	127	G	UCM	43831-34		4	4
138		U	UCM	505		1	1
139	139	S	UIMNH	61405-08		4	4
140	139	S	UIMNH	61589		4	4
141	1	S	UF	8240		1	1
142	1	S	UF	8676		11	11
143	1	S	UMMZ	109902		1	1
144	144	M	UMMZ	121884		6	6
145	73	G	UMMZ	122937		20	20
146		M	UMMZ	130587		1	1
147	11	M	UMMZ	130588-89		1	2
148	1	S	UMMZ	133124		5	5
149	39	M	UMMZ	135586		2	2
150	112	M	UMMZ	135748		3	3
151	1	S	UMMZ	136164		1	1
152	54	M	UMMZ	136165		5	5
153		M	UMMZ	136424		11	11
154	133	S	UMMZ	136425		16	16

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
155	54	M	UMMZ	136426		5	5
156	39	M	UMMZ	146862-67		6	6
157		U	UMOC	751C-57C		7	7
158		G	UMOC	760C-62C		3	3
159	1	S	USNM	129378		1	1
160		U	USNM	42921-22		2	2
161		S			Reagan,1967		
162		G			Reagan,1967		
163	163	S			Williams1974		
164	164	S			Williams1974		
165		S			Williams1974		
166	80	S			Williams1974		
167		S			Williams1974		
168	168	S			Williams1974		
169		S	MSB	41358		1	1
170		S			Williams1976	1	
171		M			Whitford1977		
172		M			Whitford1977		
173		M			Whitford1977		
174		S			Guthrie1979	1	
175		S			USFWS1986	1	
176		S			USFWS1986	1	
177	177	S			USFWS1986	1	
178	178	S	MSB	47341-42		4	2
179	178	S			USFWS1986	1	
180		S			USFWS1986	5	
181		S			USFWS1986	7	
182		S			USFWS1986	2	
183	183	S			USFWS1986	4	
184	184	S			USFWS1986	6	
185	185	S			USFWS1986	5	
186		S			USFWS1986	2	
187	168	S			USFWS1986	4	
188	80	S			USFWS1986	50	
189	49	S			USFWS1986	6	
190	82	S			Scott1987	6	
191	183	S			Scott1987	2	
192	177	S			Scott1987	1	

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MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
193	168	S			Scott1987	8	
194	90	S			Scott1987	1	
195	98	S			Scott1987	16	
196	184	S			Scott1987	3	
197	184	S			Scott1987	5	
198	184	S			Scott1987	5	
199	184	S			Scott1987	1	
200		S			NMGF1988	4	
201		S			NMGF1988	3	
202		S			NMGF1988	2	
203	107	S			NMGF1988	1	
204	80	S	MSB	47382		1	1
205		S	MSB	47383		4	1
206	80	S	MSB	47384		1	1
207	80	S	MSB	47385		1	1
208	80	S	MSB	47386		1	1
209		M	MSB	47387		1	1
210	184	S	MSB	47388		1	1
211		M	MSB	47389		1	1
212	80	S	MSB	47390		1	1
213	80	S	MSB	47391		1	1
214		S	MSB	51685		12	1
215	185	S			NMGF1988	5	
216	95	S			NMGF1988	10	
217	90	S			NMGF1988	4	
218	90	S			NMGF1988	5	
219	98	S			NMGF1988	14	
220		S			NMGF1988	2	
221		S			NMGF1988	6	
222	94	S			NMGF1988	3	
223	91	S			NMGF1988	2	
224	97	S			NMGF1988	1	
225	225	M			Pilz,PNM1988	2	
226	110	M			Pilz,PNM1988	1	
227	225	M			Pilz,PNM1988	1	
228	110	M			Pilz,PNM1988	4	
229	110	M			Pilz,PNM1988	1	
231	90	S			Painter1989	5	

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
232	98	S			Painter1989	17	
233	95	S			Painter1989	4	
234	185	S			Painter1989	3	
235	94	S			Painter1989	2	
236	106	S			Painter1989	11	
237	91	S			Painter1989	1	
238		S			Painter1989	1	
239	103	S			Painter1989	1	
240		S			Painter1989	1	
241		S			Painter1989	4	
242		S			Painter1991	13	
243		S			Painter1991	4	
244		S			Painter1991	3	
245	245	S			Painter1991	5	
246		S			Painter1991	6	
247	69	S			Painter1991	2	
248	248	S			Painter1991	9	
249	249	S			Painter1991	1	
250		S			Painter1991	12	
251		S			Painter1991	9	
252		S	ESP	1418	Painter1991	4	1
253		S			Painter1991	1	
254		S			Painter1991	1	
255		S			Painter1991	3	
256	256	S			Painter1991	14	
257		S			Painter1991	3	
258	258	S			Painter1991	1	
259	69	S			Painter1991	16	
260	69	S			Ramotnik1988	3	
261	261	S			Ramotnik1988	1	
262	164	S			Ramotnik1988	2	
263	80	S			Ramotnik1988	3	
264		M			Ramotnik1988	3	
265		S			Ramotnik1988	2	
266		M			Ramotnik1988	3	
267	267	M			Ramotnik1988	10	
268	267	M			Ramotnik1988	10	
269	76	M			Ramotnik1988	1	

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
270		S			Ramotnik1988	3	
271		M			Ramotnik1988	1	
272	69	S			Ramotnik1988	5	
273	69	S			Ramotnik1988	20	
274	69	S			Ramotnik1988	10	
275	69	S			Ramotnik1988	10	
276	163	S			Ramotnik1988	2	
277		S			Ramotnik1988	8	
278		S			Ramotnik1988	9	
279		M			Ramotnik1988	2	
280		S			Guthrie1979	2	
281	281	S			Guthrie1979	1	
282		S			Guthrie1979	1	
283	283	S			Guthrie1979	1	
284	284	S			Guthrie1979	1	
285		S			Guthrie1979	5	
286		M			Ramotnik1988		
287		M			Ramotnik1988		
288		M			Ramotnik1988		
289		S			USFS Memo,Esp	1	
290		S			USFS Memo,Esp	1	
291		S			USFS Memo,Esp	1	
292		S			USFS Memo,Esp	1	
293		S			USFS Memo,Esp	4	
294		S			USFS Memo,Esp	1	
295		S			USFS Memo,Esp	1	
296		M			USFS,misc.map	2	
297		S			NPSdatasheets	2	
298		S			NPSdatasheets	4	
299		S			NPSdatasheets	3	
300		S			NPSdatasheets	1	
301		S			NPSdatasheets	5	
302		S			NPSdatasheets	3	
303		S			USFSdatasheet	1	
304		S			USFSdatasheet	1	
305		S			USFSdatasheet	1	
306		S			USFSdatasheet	1	
307		S			USFSdatasheet	1	

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
308		S			USFSdatasheet	1	
309		S			USFSdatasheet	1	
310		S			USFSdatasheet	1	
311		S			USFSdatasheet	3	
312		U	MCZ	101087-88		2	2
313	53	G	MSB	16346-47		2	2
314		S			MJAfieldnotes	1	
315	315	S			MJAfieldnotes	2	
316	315	S			MJAfieldnotes	1	
317		S			MJAfieldnotes	4	
318		S			USFSdatasheet	1	
319	184	S			USFSdatasheet	9	
320	184	S			USFSdatasheet	5	
321	1	M	CM	72427-37		11	11
322	1	M	CM	72421-25		5	5
323	1	M	CM	72409-18		10	10
324	1	M	CM	72405-08		4	4
325	1	M	CM	72401		1	1
326	1	M	CM	72402		1	1
327	1	M	CM	72400		1	1
328	1	M	CM	72426		1	1
329	1	M	CM	72449-52		4	4
330	1	M	CM	72463-68		6	6
331	1	M	CM	72475-76		2	2
332	1	M	CM	72453-58		6	6
333	1	M	CM	72403		1	1
334	1	M	CM	72394		1	1
335	1	M	CM	72404		1	1
336	1	M	CM	72396-99		4	4
337	1	M	CM	72445-48		4	4
338	1	M	CM	72459-62		4	4
339	1	M	CM	72438-44		7	7
340	1	M	CM	72395		1	1
341	1	M	CM	72388-93		6	6
342	1	M	CM	72469-74		6	6
343	1	M	CM	72419-20		2	2
344	344	S			Painter1993	9	
345	344	S			Painter1993	5	

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MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
346	344	S			Painter1993	13	
347	344	S			Painter1993	2	
348	82	S			Painter1993	34	
349	82	S			Painter1993	35	
350	82	S			Painter1993	42	
351	82	S			Painter1993	31	
352	82	S			Painter1993	12	
353	168	S			Painter1993	2	
354	69	S			Painter1993	2	
355	69	S			Painter1993	10	
356		S			Painter1993	3	
357		S			Painter1993	1	
358		S			Painter1993	1	
359	69	S			Painter1993	4	
360	90	S			Painter1993	13	
361	98	S			Painter1993	22	
362	91	S			Painter1993	5	
363		S			Painter1993	4	
364	80	S	MSB(ESP)	2272		1	1
365	80	S	MSB(MSBF)	3601-12		12	12
366	366	S	MSB(MSBF)	3613-15		3	3
367	103	S	MSB(MSBF)	3616-22		7	7
368	368	S	MSB(MSBF)	3623-37		15	15
369	369	S	MSB(MSBF)	3676-90		15	15
370	366	S	MSB(MSBF)	3638-48		11	11
371	371	S	MSB(MSBF)	3649,50,57-		11	11
372		S	MSB(ESP)	4232-41		10	10
373		S			Painter1993	4	
374	371	S			Painter1993	2	
375		S			Painter1993	1	
376	90	S			Data 1993	8	
377	98	S			Data 1993	5	
378		S			NPSdatasheets	2	
379		S			USFWS 1986	0	
380		S			USFWS 1986	0	
381		S			USFWS 1986	0	
382		S			USFWS 1986	0	
383	383	S			USFWS 1986	0	

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
384	384	S			USFWS 1986	0	
385	385	S			USFWS 1986	0	
386	386	S			USFWS 1986	0	
387		S			USFWS 1986	0	
388		S			USFWS 1986	0	
389		S			USFWS 1986	0	
390		M			USFWS 1986	0	
391		M			USFWS 1986	0	
392		S			USFWS 1986	0	
393		S			USFWS 1986	0	
394	394	S			Scott 1987	0	
395	394	S			Scott 1987	0	
396	384	S			Scott 1987	0	
397	383	S			Scott 1987	0	
398		S			Scott 1987	0	
399		S			Scott 1987	0	
400		S			Scott 1987	0	
401		S			Scott 1987	0	
402		S			Scott 1987	0	
403	185	S			Scott 1987	0	
404		S			Scott 1987	0	
405	385	S			Scott 1987	0	
406	386	S			Scott 1987	0	
407		S			Scott 1987	0	
408		S			Scott 1987	0	
409		S			Scott 1987	0	
410		S			Scott 1987	0	
411		S			Scott 1987	0	
412		S			Scott 1987	0	
413		S			Scott 1987	0	
414		S			Scott 1987	0	
415		S			Scott 1987	0	
416		S			Scott 1987	0	
417		S			Scott 1987	0	
418		S			Scott 1987	0	
419		S			Scott 1987	0	
420		S			Scott 1987	0	
421	421	S			Scott 1987	0	

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
422		S			Scott 1987	0	
423		S			Scott 1987	0	
424		S			Scott 1987	0	
425		S			Scott 1987	0	
426	185	S			Scott 1987	0	
427		S			Scott 1987	0	
428		S			Scott 1987	0	
429		S			Scott 1987	0	
430		S			Scott 1987	0	
431		S			Scott 1987	0	
432		S			Scott 1987	0	
433		S			Scott 1987	0	
434		S			Scott 1987	0	
435		S			Scott 1987	0	
436		S			Scott 1987	0	
437	437	S			Scott 1987	0	
438	438	S			Scott 1987	0	
439		S			Scott 1987	0	
440	440	S			Scott 1987	0	
441		S			NMDGF 1988	0	
442	442	S			NMDGF 1988	0	
443		S			NMDGF 1988	0	
444		S			NMDGF 1988	0	
445		S			NMDGF 1988	0	
446		S			NMDGF 1988	0	
447		S			NMDGF 1988	0	
448	437	S			NMDGF 1988	0	
449	440	S			NMDGF 1988	0	
450	438	S			NMDGF 1988	0	
451		S			NMDGF 1988	0	
452		S			NMDGF 1988	0	
453	453	S			NMDGF 1988	0	
454		S			NMDGF 1988	0	
455		S			NMDGF 1988	0	
456		S			NMDGF 1988	0	
457		S			NMDGF 1988	0	
458		S			NMDGF 1988	0	
459		S			NMDGF 1988	0	

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
460		S			NMDGF 1988	0	
461		S			NMDGF 1988	0	
462		S			NMDGF 1988	0	
463	184	S			Painter 1989	0	
464	97	S			Painter 1989	0	
465		S			Painter 1989	0	
466		S			Painter 1989	0	
467		S			Painter 1989	0	
468		S			Painter 1989	0	
469		S			Painter 1989	0	
470	107	S			Painter 1989	0	
471		S			Painter 1989	0	
472		S			Painter 1989	0	
473		S			Painter 1989	0	
474		S			Painter 1989	0	
475		S			Painter 1989	0	
476		S			Painter 1989	0	
477		S			Painter 1989	0	
478		S			Painter 1989	0	
479		S			Painter 1989	0	
480		S			Painter 1989	0	
481		S			Painter 1989	0	
482		S			Painter 1989	0	
483		S			Painter 1989	0	
484		S			Painter 1989	0	
485		S			Painter 1989	0	
486		S			Painter 1989	0	
487		S			Painter 1989	0	
488		S			Painter 1989	0	
489		S			Painter 1989	0	
490		S			Painter 1989	0	
491	103	S			Painter 1989	0	
492		S			CWPfieldnotes	0	
493		S			Painter 1989	0	
494		S			Painter 1989	0	
495		S			Painter 1989	0	
496		S			Painter 1989	0	
497		S			Painter 1989	0	

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
498		S			Painter 1989	0	
499		S			Painter 1989	0	
500		S			Painter 1989	0	
501		S			Painter 1989	0	
502		S			Painter 1989	0	
503		M			Painter 1989	0	
504		S			Painter 1989	0	
505		S			Painter 1989	0	
506		S			Painter 1989	0	
507		S			Painter 1989	0	
508		S			Painter 1989	0	
509		S			Painter 1989	0	
510		S			Painter 1989	0	
511		S			Painter 1989	0	
512		S			Painter 1991	0	
513	513	S			Painter 1991	0	
514		S			Painter 1991	0	
515		S			Painter 1991	0	
516		S			Painter 1991	0	
517		S			Painter 1991	0	
518	103	S			Painter 1991	0	
519		S			Painter 1991	0	
520		S			Painter 1991	0	
521		S			Painter 1991	0	
522		S			Painter 1991	0	
523	453	S			Painter 1991	0	
524		S			Painter 1991	0	
525		S			Painter 1991	0	
526		S			Painter 1991	0	
527		S			Painter 1991	0	
528		S			Painter 1991	0	
529		S			Painter 1991	0	
530		S			Painter 1991	0	
531		S			Painter 1991	0	
532		S			Painter 1991	0	
533		S			Painter 1991	0	
534	442	S			Painter 1991	0	
535		S			Painter 1991	0	

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
536		S			Painter 1991	0	
537		S			Painter 1991	0	
538		S			Painter 1991	0	
539		S			Painter 1991	0	
540		S			Painter 1991	0	
541		S			Painter 1991	0	
542	91	S			Painter 1991	0	
543		M			USFSdatasheet	0	
544		S			USFSdatasheet	0	
545		S			USFSdatasheet	0	
546		S			USFSdatasheet	0	
547		S			USFSdatasheet	0	
548		S			USFSdatasheet	0	
549		S			USFSdatasheet	0	
550		M			USFSdatasheet	0	
551		M			USFSdatasheet	0	
552		S			USFSdatasheet	0	
553		S			USFSdatasheet	0	
554		M			USFSdatasheet	0	
555		S			USFSdatasheet	0	
556		M			USFSdatasheet	0	
557		S			USFSdatasheet	0	
558		M			USFSdatasheet	0	
559		S			USFSdatasheet	0	
560		M			USFSdatasheet	0	
561		S			USFSdatasheet	0	
562		S			USFSdatasheet	0	
563		M			USFSdatasheet	0	
564		S			USFSdatasheet	0	
565		M			USFSdatasheet	0	
566		S			USFSdatasheet	0	
567		M			USFSdatasheet	0	
568		M			USFSdatasheet	0	
569		S			USFSdatasheet	0	
570		S			USFSdatasheet	0	
571		S			USFSdatasheet	0	
572		M			USFSdatasheet	0	
573		S			USFSdatasheet	0	

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
574		S			USFSdatasheet	0	
575		S			USFSdatasheet	0	
576		M			USFSdatasheet	0	
577		S			USFSdatasheet	0	
578		M			USFSdatasheet	0	
579		S			USFSdatasheet	0	
580		M			USFSdatasheet	0	
581		M			USFSdatasheet	0	
582		M			USFSdatasheet	0	
583		M			USFSdatasheet	0	
584		M			USFSdatasheet	0	
585		M			USFSdatasheet	0	
586		M			USFSdatasheet	0	
587		M			USFSdatasheet	0	
588		S			USFSdatasheet	0	
589		M			USFSdatasheet	0	
590		M			USFSdatasheet	0	
591		M			USFSdatasheet	0	
592		S			USFSdatasheet	0	
593		S			USFSdatasheet	0	
594		S			USFSdatasheet	0	
595		S			USFSdatasheet	0	
596		M			USFSdatasheet	0	
597		S			USFSdatasheet	0	
598		M			USFSdatasheet	0	
599		M			USFSdatasheet	0	
600		M			USFSdatasheet	0	
601		M			USFSdatasheet	0	
602		S			USFSdatasheet	0	
603		M			USFSdatasheet	0	
604		M			USFSdatasheet	0	
605		S			USFSdatasheet	0	
606		S			USFSdatasheet	0	
607		M			USFSdatasheet	0	
608		M			USFSdatasheet	0	
609		M			USFSdatasheet	0	
610		M			USFSdatasheet	0	
611		M			USFSdatasheet	0	

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MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
612		M			USFSdatasheet	0	
613		M			USFSdatasheet	0	
614		M			USFSdatasheet	0	
615		M			USFSdatasheet	0	
616		M			USFSdatasheet	0	
617		S			USFSdatasheet	0	
618		S			USFSdatasheet	0	
619		S			USFSdatasheet	0	
620		S			USFSdatasheet	0	
628		M			USFSdatasheet	0	
622		M			USFSdatasheet	0	
623		S			USFSdatasheet	0	
624		S			USFSdatasheet	0	
625		M			USFSdatasheet	0	
626		M			USFSdatasheet	0	
627		M			USFSdatasheet	0	
628		M			USFSdatasheet	0	
629		S			USFSdatasheet	0	
630		M			USFSdatasheet	0	
631		M			USFSdatasheet	0	
632		M			USFSdatasheet	0	
633		S			USFSdatasheet	0	
634		S			USFSdatasheet	0	
635		S			USFSdatasheet	0	
636		M			USFSdatasheet	0	
637		M			USFSdatasheet	0	
638		S			USFSdatasheet	0	
640		S			USFSdatasheet	0	
641		S			USFSdatasheet	0	
642		S			USFSdatasheet	0	
643		M			USFSdatasheet	0	
644		S			USFSdatasheet	0	
645		M			USFSdatasheet	0	
646		M			USFSdatasheet	0	
647		M			USFSdatasheet	0	
648		S			USFSdatasheet	0	
649		S			USFSdatasheet	0	
650		S			USFSdatasheet	0	

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MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
651		S			USFSdatasheet	0	
652		S			USFSdatasheet	0	
653		S			USFSdatasheet	0	
654		S			USFSdatasheet	0	
655		S			USFSdatasheet	0	
656		M			USFSdatasheet	0	
657		S			USFSdatasheet	0	
658		S			USFSdatasheet	0	
659		M			USFSdatasheet	0	
660		S			USFSdatasheet	0	
661		S			USFSdatasheet	0	
662		M			USFSdatasheet	0	
663		M			USFSdatasheet	0	
664		S			USFSdatasheet	0	
665		M			USFSdatasheet	0	
666		S			USFSdatasheet	0	
667		M			USFSdatasheet	0	
668		M			USFSdatasheet	0	
669		S			USFSdatasheet	0	
670		S			USFSdatasheet	0	
671		S			USFSdatasheet	0	
672		M			USFSdatasheet	0	
673		S			USFSdatasheet	0	
674		M			USFSdatasheet	0	
675		S			USFSdatasheet	0	
676		M			USFSdatasheet	0	
677		S			USFSdatasheet	0	
678		S			USFSdatasheet	0	
679		S			USFSdatasheet	0	
680		M			USFSdatasheet	0	
681		M			USFSdatasheet	0	
682		M			USFSdatasheet	0	
683		S			USFSdatasheet	0	
684		M			USFSdatasheet	0	
685		S			USFSdatasheet	0	
686		M			USFSdatasheet	0	
687		S			USFSdatasheet	0	
688		S			USFSdatasheet	0	

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
689		M			USFSdatasheet	0	
690		M			USFSdatasheet	0	
691		M			USFSdatasheet	0	
692		M			USFSdatasheet	0	
693		M			USFSdatasheet	0	
694		M			USFSdatasheet	0	
695		M			USFSdatasheet	0	
696		M			USFSdatasheet	0	
697		S			USFSdatasheet	0	
698		M			USFSdatasheet	0	
699		S			USFSdatasheet	0	
700		S			USFSdatasheet	0	
701		S			USFSdatasheet	0	
702		S			USFSdatasheet	0	
703		M			USFSdatasheet	0	
704		S			USFSdatasheet	0	
705		M			USFSdatasheet	0	
706		M			USFSdatasheet	0	
707		S			USFSdatasheet	0	
708		M			USFSdatasheet	0	
709		S			USFSdatasheet	0	
710		S			USFSdatasheet	0	
711		S			USFSdatasheet	0	
712		S			USFSdatasheet	0	
713		S			USFSdatasheet	0	
714		S			USFSdatasheet	0	
715		S			USFSdatasheet	0	
716		S			USFSdatasheet	0	
717		S			USFSdatasheet	0	
718		M			USFSdatasheet	0	
719		M			USFSdatasheet	0	
720		M			USFSdatasheet	0	
721		S			USFSdatasheet	0	
722		S			USFSdatasheet	0	
723		S			USFSdatasheet	0	
724		S			USFSdatasheet	0	
725		M			USFSdatasheet	0	
726		S			USFSdatasheet	0	

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MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
727		S			USFSdatasheet	0	
728		S			USFSdatasheet	0	
729		S			USFSdatasheet	0	
730		M			USFSdatasheet	0	
731		S			USFSdatasheet	0	
732		S			USFSdatasheet	0	
733		S			USFSdatasheet	0	
734		M			USFSdatasheet	0	
735		M			USFSdatasheet	0	
736		S			USFSdatasheet	0	
737		M			USFSdatasheet	0	
738		S			USFSdatasheet	0	
739		S			USFSdatasheet	0	
740		M			USFSdatasheet	0	
741		S			USFSdatasheet	0	
742		M			USFSdatasheet	0	
743		S			USFSdatasheet	0	
744		M			USFSdatasheet	0	
745		M			USFSdatasheet	0	
746		M			USFSdatasheet	0	
747		M			USFSdatasheet	0	
748		S			USFSdatasheet	0	
749		S			USFSdatasheet	0	
750		M			USFSdatasheet	0	
751		M			USFSdatasheet	0	
752		S			USFSdatasheet	0	
753		M			USFSdatasheet	0	
754		S			USFSdatasheet	0	
755		S			USFSdatasheet	0	
756		S			USFSdatasheet	0	
757		M			USFSdatasheet	0	
758	758	M			USFSdatasheet	0	
759		M			USFSdatasheet	0	
760		S			USFSdatasheet	0	
761		S			USFSdatasheet	0	
762	762	M			USFSdatasheet	0	
763	763	M			USFSdatasheet	0	
764		S			USFSdatasheet	0	

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
765		S			USFSdatasheet	0	
766	766	M			USFSdatasheet	0	
767		M			USFSdatasheet	0	
768		M			USFSdatasheet	0	
769	769	M			USFSdatasheet	0	
770		S			USFSdatasheet	0	
771		S			USFSdatasheet	0	
772		M			USFSdatasheet	0	
773		S			USFSdatasheet	0	
774		M			USFSdatasheet	0	
775		S			USFSdatasheet	0	
776		S			USFSdatasheet	0	
777		S			USFSdatasheet	0	
778		M			USFSdatasheet	0	
779		S			USFSdatasheet	0	
780		M			USFSdatasheet	0	
781		M			USFSdatasheet	0	
782		S			USFSdatasheet	0	
783		M			USFSdatasheet	0	
784		S			USFSdatasheet	0	
785		M			USFSdatasheet	0	
786		S			USFSdatasheet	0	
787		S			USFSdatasheet	0	
788		M			USFSdatasheet	0	
789	789	M			USFSdatasheet	0	
790	790	M			USFSdatasheet	0	
791		M			USFSdatasheet	0	
792		S			USFSdatasheet	0	
793		S			USFSdatasheet	0	
794		S			USFSdatasheet	0	
795		M			USFSdatasheet	0	
796		S			USFSdatasheet	0	
797	766	M			USFSdatasheet	0	
798	769	M			USFSdatasheet	0	
799		M			USFSdatasheet	0	
800	758	M			USFSdatasheet	0	
801		M			USFSdatasheet	0	
802	762	S			USFSdatasheet	0	

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MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
803		M			USFSdatasheet	0	
804	763	M			USFSdatasheet	0	
805		M			USFSdatasheet	0	
806		M			USFSdatasheet	0	
807		M			USFSdatasheet	0	
808		M			USFSdatasheet	0	
809		M			USFSdatasheet	0	
810		S			USFSdatasheet	0	
811		M			USFSdatasheet	0	
812		S			USFSdatasheet	0	
813	789	M			USFSdatasheet	0	
814	790	M			USFSdatasheet	0	
815		S			USFSdatasheet	0	
816		S			USFSdatasheet	0	
817		S			USFSdatasheet	0	
818		S			USFSdatasheet	0	
819		S			USFSdatasheet	0	
820		M			USFSdatasheet	0	
821		S			USFSdatasheet	0	
822		S			USFSdatasheet	0	
823		S			USFSdatasheet	0	
824		M			USFSdatasheet	0	
825		S			USFSdatasheet	0	
826		S			USFSdatasheet	0	
827		M			USFSdatasheet	0	
828		M			USFSdatasheet	0	
829		S			USFSdatasheet	0	
830		M			USFSdatasheet	0	
831		M			USFSdatasheet	0	
832		S			USFSdatasheet	0	
833		M			USFSdatasheet	0	
834		S			USFSdatasheet	0	
835		S			USFSdatasheet	0	
836		M			USFSdatasheet	0	
837		S			USFSdatasheet	0	
838		M			USFSdatasheet	0	
839		M			USFSdatasheet	0	
840		M			USFSdatasheet	0	

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MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
841		S			USFSdatasheet	0	
842		M			USFSdatasheet	0	
843		S			USFSdatasheet	0	
844		S			USFSdatasheet	0	
845		M			USFSdatasheet	0	
846		M			USFSdatasheet	0	
847		M			USFSdatasheet	0	
848		M			USFSdatasheet	0	
849		S			USFSdatasheet	0	
850		M			USFSdatasheet	0	
851		S			USFSdatasheet	0	
852		M			USFSdatasheet	0	
853		M			USFSdatasheet	0	
854		M			USFSdatasheet	0	
855		S			USFSdatasheet	0	
856		S			USFSdatasheet	0	
857		S			USFSdatasheet	0	
858		M			USFSdatasheet	0	
859		M			USFSdatasheet	0	
860		M			USFSdatasheet	0	
861		M			USFSdatasheet	0	
862		M			USFSdatasheet	0	
863		S			USFSdatasheet	0	
864		M			USFSdatasheet	0	
865		M			USFSdatasheet	0	
866		M			USFSdatasheet	0	
867		M			USFSdatasheet	0	
868		S			USFSdatasheet	0	
869		S			USFSdatasheet	0	
870		M			USFSdatasheet	0	
871		S			USFSdatasheet	0	
872		M			USFSdatasheet	0	
873		S			NPSdatasheet	0	
874	874	S			NPSdatasheet	0	
875		S			NPSdatasheet	0	
876		S			NPSdatasheet	0	
877		S			NPSdatasheet	0	
878		S			NPSdatasheet	0	

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MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
879	879	S			NPSdatasheet	0	
880		S			NPSdatasheet	0	
881		S			NPSdatasheet	0	
882		S			NPSdatasheet	0	
883		S			Painter 1993	0	
884	97	S			Painter 1993	0	
885		S			Painter 1993	0	
886	886	M			MJAfieldnotes	0	
887		S			Painter 1993	0	
888		S			Painter 1993	0	
889		S			Painter 1993	0	
890		S			Painter 1993	0	
891	891	S			Painter 1993	0	
892	891	S			Painter 1993	0	
893		S			Painter 1993	0	
894		S			USFSdatasheet	0	
895		S			USFSdatasheet	0	
896		S			USFSdatasheet	0	
897		S			USFSdatasheet	0	
898		S			USFSdatasheet	0	
899	97	S			NMDGFdatashee	0	
900		M			Ramotnik 1988	0	
901		M			Ramotnik 1988	0	
902		M			Ramotnik 1988	0	
903		M			Ramotnik 1988	0	
904		S			Ramotnik 1988	0	
905		M			Ramotnik 1988	0	
906		M			Ramotnik 1988	0	
907		M			Ramotnik 1988	0	
908		M			Ramotnik 1988	0	
909		M			Ramotnik 1988	0	
910		M			Ramotnik 1988	0	
911		M			Ramotnik 1988	0	
912		M			Ramotnik 1988	0	
913		M			Ramotnik 1988	0	
914		M			Ramotnik 1985	0	
915	267	M			Ramotnik 1988	0	
916		M			Ramotnik 1988	0	

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MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
917		M			Ramotnik 1988	0	
918		M			Ramotnik 1988	0	
919		M			Ramotnik 1988	0	
920		M			Ramotnik 1988	0	
921	886	M			Ramotnik 1988	0	
922	922	M			Ramotnik 1988	0	
923	922	M			Ramotnik 1988	0	
924	922	M			Ramotnik 1988	0	
925		M			Ramotnik 1988	0	
926		M			Ramotnik 1988	0	
927		M			Ramotnik 1988	0	
928		M			Ramotnik 1988	0	
929		M			Ramotnik 1988	0	
930		M			Ramotnik 1988	0	
931		M			Ramotnik 1988	0	
932		M			Ramotnik 1988	0	
933		M			Ramotnik 1988	0	
934	934	M			Ramotnik 1988	0	
935	934	M			Ramotnik 1988	0	
936	936	M			Ramotnik 1988	0	
937	936	M			Ramotnik 1988	0	
938	936	M			Ramotnik 1988	0	
939		M			Ramotnik 1988	0	
940	940	M			Ramotnik 1988	0	
941	940	M			Ramotnik 1988	0	
942		M			Ramotnik 1988	0	
943		M			Ramotnik 1988	0	
944		M			Ramotnik 1988	0	
945	69	S			Ramotnik 1988	0	
946		M			Ramotnik 1988	0	
947		M			Ramotnik 1988	0	
948		M			Ramotnik 1988	0	
949		M			Ramotnik 1988	0	
950		M			Ramotnik 1988	0	
951		M			Ramotnik 1988	0	
952		M			Ramotnik 1988	0	
953		M			Ramotnik 1988	0	
954		M			Ramotnik 1985	0	

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MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
955		S			MJAfieldnotes	0	
956		S			MJAfieldnotes	0	
957		S			MJAfieldnotes	0	
958		S			MJAfieldnotes	0	
959		S			MJAfieldnotes	0	
960		S			MJAfieldnotes	0	
961		S			MJAfieldnotes	0	
962		S			MJAfieldnotes	0	
963		S			USFWSdata	0	
964		S			USFWSdata	0	
965		S			NPSdatasheet	0	
966		S			NPSdatasheet	1	
967		S			NPSdatasheet	0	
968	371	S			NMDGFdatashee	7	
969	371	S			NMDGFdatashee	1	
970	371	S			NMDGFdatashee	1	
971	82	S			NMDGFdatashee	35	
972	82	S			NMDGFdatashee	29	
973	82	S			NMDGFdatashee	20	
974	344	S			NMDGFdatashee	1	
975	344	S	MSB(ESP)	4663	NMDGFdatashee	8	1
976	344	S			NMDGFdatashee	10	
977	977	S	MSB(ESP)	4662	NMDGFdatashee	39	1
978	977	S			NMDGFdatashee	36	
979	977	S			NMDGFdatashee	3	
980	977	S			NMDGFdatashee	21	
981		S			NMDGFdatashee	10	
982	196	S			NMDGFdatashee	7	
983	98	S			NMDGFdatashee	2	
984	95	S			NMDGFdatashee	7	
985	90	S			NMDGFdatashee	6	
986	91	S			NMDGFdatashee	1	
987		M			CWPfieldnotes	0	
988		M			CWPfieldnotes	0	
989		M			CWPfieldnotes	0	
990	248	S			Wiltenmuth summary	1	
991	261	S			Wiltenmuth summary	0	
992	248	S			Wiltenmuth summary	4	

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MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
993	248	S			Wiltenmuth summary	0	
994	248	S			Wiltenmuth summary	0	
995	258	S			Wiltenmuth summary	0	
996	258	S			Wiltenmuth summary	0	
997		S			Wiltenmuth summary	0	
998	998	M			Wiltenmuth summary	2	
999	998	M			Wiltenmuth summary	7	
1000	998	M			Wiltenmuth summary	5	
1001	998	M			Wiltenmuth summary	6	
1002	256	S			Wiltenmuth summary	0	
1003	245	S			Wiltenmuth summary	0	
1004		S			Wiltenmuth summary	0	
1005		S			Wiltenmuth summary	2	
1006	1006	S			Wiltenmuth summary	1	
1007	1005	S			Wiltenmuth summary	1	
1008	1006	S			Wiltenmuth summary	5	
1009	1009	S			Wiltenmuth summary	1	
1010	1009	S			Wiltenmuth summary	3	
1011	184	S			Wiltenmuth summary	9	
1012		S			USFSdatasheets	0	
1013		S			USFSdatasheets	0	
1014		S			USFSdatasheets	0	
1015	513	S			USFSdatasheets	0	
1016	368	S			USFSdatasheets	2	
1017		S			USFSdatasheets	0	
1018		S			USFSdatasheets	0	
1019	513	S			USFSdatasheets	0	
1020		S			USFSdatasheets	0	
1021		S			USFSdatasheets	0	
1022		S			USFSdatasheets	0	
1023		S			USFSdatasheets	0	
1024		S			USFSdatasheets	0	
1025		S			USFSdatasheets	0	
1026		S			USFSdatasheets	0	
1027		S			USFSdatasheets	1	
1028		S			USFSdatasheets	0	
1029		S			USFSdatasheets	0	
1030		S			USFSdatasheets	0	

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MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
1031		S			USFSdatasheets	2	
1032		S			USFSdatasheets	0	
1033		S			USFSdatasheets	0	
1034		S			USFSdatasheets	0	
1035		S			USFSdatasheets	0	
1036		S			USFSdatasheets	0	
1037		S			USFSdatasheets	0	
1038		S			USFSdatasheets	0	
1039		S			USFSdatasheets	0	
1040		S			USFSdatasheets	0	
1041		S			USFSdatasheets	0	
1042		S			USFSdatasheets	0	
1043		S			USFSdatasheets	0	
1044	196	S			CWPfieldnotes	5	
1045	258	S			MJAfieldnotes	6	
1046		S			USFSdatasheets	1	
1047		S			USFSdatasheets	2	
1048		S			USFSdatasheets	16	
1049		S			USFSdatasheets	0	
1050		S			USFSdatasheets	0	
1051		S			USFSdatasheets	0	
1052		S			USFSdatasheets	0	
1053		S			USFSdatasheets	2	
1054		S			USFSdatasheets	3	
1055		S			USFSdatasheets	3	
1056	256	S			USFSdatasheets	8	
1057		S			USFSdatasheets	0	
1058		S			USFSdatasheets	0	
1059		S			USFSdatasheets	0	
1060		S			USFSdatasheets	0	
1061		S			USFSdatasheets	0	
1062		S			USFSdatasheets	10	
1063		S	MSB	55408	MJA fieldnotes	1	1
1064	69	S			MJAdatasheets	7	
1065	412	S			MJAdatasheets	0	
1066	95	S			MJAdatasheets	4	
1067	90	S			MJAdatasheets	5	
1068		S			MJAdatasheets	2	

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MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
1069	379	S			MJAdatasheets	0	
1070	513	S			MJAdatasheets	0	
1071	421	S			MJAdatasheets	0	
1072	977	S			MJAdatasheets	10	
1073	84	S			MJAdatasheets	1	
1084	8	S			NMDGFdatasheets	0	
1074		S			NMDGFdatasheets	0	
1075		S	MSB	ESP 5566	NMDGFdatasheets	1	1
1076		S	MSB	ESP 5567	NMDGFdatasheets	1	1
1077		S			NMDGFdatasheets	0	
1078		S	MSB	ESP 5568	NMDGFdatasheets	1	1
1079		S			NMDGFdatasheets	0	
1080		S			NMDGFdatasheets	0	
1081		S	MSB	ESP5569	NMDGFdatasheets	1	1
1082		S			NMDGFdatasheets	0	
1083	47	S			NMDGFdatasheets	0	
1085	344	S			NMDGFdatasheets	3	
1086	344	S			NMDGFdatasheets	3	
1087	980	S			NMDGFdatasheets	10	
1088	980	S			NMDGFdatasheets	25	
1089	980	S			NMDGFdatasheets	32	
1090	82	S			NMDGFdatasheets	33	
1091	82	S			NMDGFdatasheets	17	
1092	371	S			NMDGFdatasheets	1	
1093	371	S			NMDGFdatasheets	3	
1094	49	M	PSU	3069-73	CWP from PSU	4	4
1095		S			CWP field notes 98	1	
1096		S	MSB	ESP5748	CWP field notes 98	1	1
1097		S			USFSdatasheets	0	
1098		S			USFSdatasheets	0	
1099	103	S			USFSdatasheets	1	
1100		S			USFSdatasheets	3	
1101		S			USFSdatasheets	0	
1102		S			USFSdatasheets	0	
1103		S			USFSdatasheets	0	
1104		S			USFSdatasheets	0	
1105		S			USFSdatasheets	0	
1106		S			USFSdatasheets	0	

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
1107		S			USFSdatasheets	0	
1108		S			USFSdatasheets	0	
1109		S			USFSdatasheets	0	
1110		S			USFSdatasheets	0	
1111		S			USFSdatasheets	0	
1112		S			USFSdatasheets	0	
1113		S			USFSdatasheets	0	
1114		S			USFSdatasheets	0	
1115		S			USFSdatasheets	0	
1116		S			USFSdatasheets	1	
1117		S			USFSdatasheets	0	
1118		S			USFSdatasheets	1	
1119		S			USFSdatasheets	1	
1120		S			USFSdatasheets	0	
1121		S			USFSdatasheets	0	
1122		S			USFSdatasheets	0	
1123		S			CWP field notes 98	0	
1124	980	S			NMDGFdatasheets	18	
1125	980	S			NMDGFdatasheets	6	
1126	82	S			NMDGFdatasheets	29	
1127	82	S			NMDGFdatasheets	6	
1128	371	S			NMDGFdatasheets	6	
1129	371	S			NMDGFdatasheets	0	
1130	344	S			NMDGFdatasheets	3	
1131	344	S			NMDGFdatasheets	2	
1132	95	S			NMDGFdatashee	1	
1133	90	S			NMDGFdatashee	5	
1134	98	S			NMDGFdatashee	0	
1135		S			NMDGFdatashee	1	
1136		S			NMDGFdatashee	0	
1137		S			NMDGFdatashee	0	
1138		S			NMDGFdatashee	1	
1139		S			NMDGFdatashee	1	
1140	980	S			NMDGFdatashee	41	
1141	980	S			NMDGFdatashee	16	
1142	344	S			NMDGFdatasheets	5	
1143	344	S			NMDGFdatasheets	3	
1144	82	S			NMDGFdatasheets	36	

MAP NO	Same As No	MAPPING PRECISION	MUSEUM	CATALOGUE NUMBER	SOURCE	TOTAL JMS	NO JMS COLLECTED
1145	82	S			NMDGFdatasheets	9	1
1146	371	S			NMDGFdatasheets	1	
1147	371	S			NMDGFdatasheets	1	
1148	1148	S			USFS datasheets	1	0
1149	1149	S			USFS datasheet	1	0
1150	977	S			NMDGF datasheets	1	0
1151	175	S			NMDGF datasheets	1	0
1152	252	S			NMDGF datasheets	4	0
1153	248	S			NMDGF datasheets	2	0
1154	980	S	ESP	7601	NMDGF datasheets	15	1
1155	344	S			NMDGF datasheets	1	0
1156	82	S			NMDGF datasheets	17	0
1157	371	S			NMDGF datasheets	0	0
1158	1158	S			NMDGF datasheets	10	0
1159	1158	S			NMDGF datasheets	12	0
1160		S			NMDGF datasheets	2	0
1161	1161	S			NMDGF datasheets	0	0
1162	980	S			NMDGF datasheets	15	0
1163	344	S			NMDGF datasheets	3	0
1164	82	S			NMDGF datasheets	15	0
1165	371	S			NMDGF datasheets	1	0
1166	98	S			NMDGFdatashee	0	
1167	90	S			NMDGFdatashee	0	
1168	95	S			NMDGFdatashee	0	
1169	82	S			NMDGF datasheets	11	0
1170	371	S			NMDGF datasheets	0	0
1171	91	S			NMGF1988	0	

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
1	1	UNK	1952-08-18	Bland	Sandoval	8750
2		UNK	1971-07-05	Bland	Sandoval	ca8500
3	29	Timothy H. Keitt	1985-06-17	Bland	Sandoval	8900-9100
4		A. Prieto	1966-08	Valle Toledo	Sandoval	ca 8800
5	112	RD Porter	1965-08-14	Bland	Sandoval	ca 8750
6	112	RD Porter & WG Degenhardt	1965-08-14	Bland	Sandoval	ca 8750
7	112	RD Porter & WG Degenhardt	1965-08-14	Bland	Sandoval	ca 8750
8	1	RC Stebbins	1949-08-14	Bland	Sandoval	8750
9		TP Maslin	1968-07-27	Bland	Sandoval	ca 8700
10	1	DE Hahn	1962-08-12	Bland	Sandoval	8750
11	11	SR Williams	1971-08	Bland	Sandoval	ca8800
12	1	SR Williams	1970-06-16	Bland	Sandoval	ca 8700
13		JL Jones	1972-09-04	Bland	Sandoval	ca 7600
14		M Moore	1970-09-03	Guaje Mountain	Los Alamos	ca 7200
15		SR Williams	1970-06-04	Redondo Peak	Sandoval	ca 8750
16	1	SR Williams	1970-10-04	Bland	Sandoval	8700
17	1	SR Williams	?	Bland	Sandoval	8700
18	1	SR Williams	1972-06-04	Bland	Sandoval	8700
19	1	SR Williams	1972-08-20	Bland	Sandoval	8700
20	1	SR Williams	?	Bland	Sandoval	8700
21	1	SR Williams	1972-06-04	Bland	Sandoval	8700
22	1	SR Williams	?	Bland	Sandoval	8700
25		KE & GE Ball	1959-06-21	Bland	Sandoval	ca 8700
26		EH Taylor	1971-09	Bland	Sandoval	ca 9050
27	283	UNK	UNK	Bland	Sandoval	ca 8920
28	1	GA Schad	1957-08-23	Bland	Sandoval	ca 8750
29	29	GA Schad	1957-08-25	Bland	Sandoval	8950
30		RD Barkett	1963-07-11	Bland	Sandoval	?
31	112	CJ Jones	1960-07-09	Bland	Sandoval	8750
32	133	AH Brame	1964-09-27	Bland	Sandoval	ca 9200
33		JW Wright	1960-06-12	Bland	Sandoval	ca 8800
34	112	CL Jones	1960-07-09	Bland	Sandoval	8750
35	1	CA Ely & ED Fleharty	1962-08-07	Bland	Sandoval	8750
36	1	ED Fleharty	N/A	Bland	Sandoval	8750
37	249	DR Ittner	1967-06-05	Redondo Peak	Sandoval	ca 9200
38		T. Brown	1959-06-23	Bland	Sandoval	ca 7900
39	39	J.L.Christiansen	1966-07-10	Redondo Peak	Sandoval	8760
40		J.L.Christiansen	1966-08-28	Redondo Peak	Sandoval	ca 9200

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
41		J.L.Christiansen	1966-07-10	Redondo Peak	Sandoval	8800-9200
42	39	J.L.Christiansen	1966-07	Redondo Peak	Sandoval	8760
43	43	D.P. Reagan	1966-08-12	Bland	Sandoval	ca 8800
44	43	D.P. Reagan	1966-06-30	Bland	Sandoval	8750-9000
45		D.P. Reagan	1966-06-30	Bland	Sandoval	ca 9000
46	249	D.P. Reagan	1966-07-02	Redondo Peak	Sandoval	9200
47	47	D.P. Reagan	1967-07-03	Seven Springs	Sandoval	ca 8100
48	39	D.P. Reagan	1966-07-02	Redondo Peak	Sandoval	8760
49	49	D.P. Reagan	1966-07-10	Redondo Peak	Sandoval	ca 8900
50		D.P. Reagan	1966-07-10	Bland	Sandoval	ca 7600
51	49	D.P. Reagan	1966-07-31	Redondo Peak	Sandoval	ca 8900
52	49	D.P. Reagan	1966-07-23	Redondo Peak	Sandoval	ca 8900
53	53	D.P. Reagan	1965-09-19	Redondo Peak	Sandoval	?
54	54	D P. Reagan	1965-09-19	Bland	Sandoval	ca 8900
55	39	D.P. Reagan	1966-07-01	Redondo Peak	Sandoval	8760
56	43	D.P. Reagan	1966-06-30	Bland	Sandoval	ca 8800
57		D.P. Reagan	1966-07-01	Redondo Peak	Sandoval	ca 8800
58	249	D.P. Reagan	1966-07-02	Redondo Peak	Sandoval	9200
59	47	D.P Reagan	1966-07-03	Seven Springs	Sandoval	ca 8100
60	39	D.P. Reagan	1966-07-02	Redondo Peak	Sandoval	8760
61		D.P. Reagan	1966-07-14	Redondo Peak	Sandoval	8840
62	49	D.P. Reagan	1966-07-14	Redondo Peak	Sandoval	ca 8900
63	49	D.P. Reagan	1967-07-15	Redondo Peak	Sandoval	ca 8900
64	49	D.P. Reagan	1966-08-06	Redondo Peak	Sandoval	ca 8900
65	49	D.P. Reagan	1966-08-17	Redondo Peak	Sandoval	ca 8900
66	112	C.J. Jones	1960-07-09	Bland	Sandoval	ca 8750
67	112	C.J. Jones	1961-08-13	Bland	Sandoval	ca 8750
68	112	A.L. Gennaro	1960-07-09	Bland	Sandoval	ca 8750
69	69	S.R. Williams	1974-07-12	Seven Springs	Sandoval	8200
70		C.M. Bogert etal.	1979-06-10	Valle Toledo	Los Alamos	9100
71		C.M. Bogert etal.	1979-06-24	Guaje Mountain	Los Alamos	ca 7600
72	39	J.L. Christiansen	1966-07-10	Redondo Peak	Sandoval	ca 8760
73	73	W.G. Degenhardt	1967-06-13	Bland	Sandoval	ca 8150
74		A.E. Dunham, J.D. Garcia	1969-06-20	Jemez Springs	Sandoval	ca 7720
75		S.R. Williams	1974-08-15	Frijoles	Los Alamos	ca 8100
76	76	S.R. Williams	1974-08-15	Valle Toledo	Los Alamos	ca 9000
77		S.R. Williams	1974-08-15	Frijoles	Los Alamos	ca 8400
78		S.R. Williams	1974-07-22	Seven Springs	Sandoval	ca 8500

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MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
79		Altenbach, Fritts	1986-08-13	Cerro del Grant	Rio Arriba	9070
80	80	CA Ramotnik	1985-06-03	Seven Springs	Sandoval	ca 8300
81	1	Painter, Scott, Fritts, Degenhardt	1986-07-16	Bland	Sandoval	8750
82	82	N.J. Scott, et al.	1987-07-01	Valle Toledo	Los Alamos	9470
83		N.J. Scott, et al.	1987-07-01	Valle Toledo	Los Alamos	9540
84	84	N.J. Scott, et al.	1987-07-01	Guaje Mountain	Los Alamos	9550
85		Altenbach, Campbell	1987-07-06	Seven Springs	Sandoval	8060
86		C.A. Ramotnik	1987-07-08	Valle Toledo	Los Alamos	9400
87		C.A. Ramotnik, B.E.Smith	1987-07-08	Valle Toledo	Los Alamos	9200
88		C.A. Ramotnik	1987-07-08	Valle Toledo	Los Alamos	9000
89		M.J. Altenbach, Ramotnik	1987-08-24	Seven Springs	Sandoval	8400
90	90	C.A. Ramotnik	1987-08-25	Seven Springs	Sandoval	8600
91	91	B.E. Smith	1987-08-25	Seven Springs	Sandoval	8340
92		Altenbach, Stefferud, Scott, Smith	1987-08-26	Polvadera Peak	Rio Arriba	9700
93		M.J. Altenbach	1987-08-26	Polvadera Peak	Rio Arriba	9700
94	94	R. Alvarado	1987-08-27	Seven Springs	Sandoval	8600
95	95	N.J. Scott, M.J Altenbach	1987-08-28	Seven Springs	Sandoval	8400
96		Ramotnik, N.J. Scott	1987-08-28	Seven Springs	Sandoval	8200
97	97	C.A. Ramotnik	1987-08-28	Seven Springs	Sandoval	8550
98	98	M.J. Altenbach	1987-08-29	Seven Springs	Sandoval	8480
99		M.J. Altenbach, B.E. Smith	1987-08-30	Bland	Sandoval	8800
100		N.J. Scott	1987-09-02	Polvadera Peak	Rio Arriba	9500
101	1	M. Conway, H. Campbell	1976-07-21	Bland	Sandoval	8750
102		A.S. Bridegam	1989-07-26	Seven Springs	Sandoval	8200
103	103	A.S. Bridegam	1989-07-26	Seven Springs	Sandoval	8200
104	104	A.S. Bridegam	1989-07-27	Rancho del Chaparral	Sandoval	8300
105		A.S. Bridegam	1989-08-02	Bland	Sandoval	8500
106	106	A.S. Bridegam	1989-08-02	Bland	Sandoval	8200
107	107	C.W.Painter, etal.	1988-08-24	Seven Springs	Sandoval	8600
108		C.W. Painter, W. Pilz, B. Powell	1987-08-18	Valle Toledo	Sandoval	9800
109		C.W. Painter, W. Pilz, B. Powell	1987-08-18	Valle Toledo	Sandoval	10,060
110	110	C.W. Painter, W. Pilz, B. Powell	1987-08-20	Valle Toledo	Los Alamos	9200
111		GL Burton	1990-09-25	Bland	Sandoval	7600
112	112	J.S. Findley	1960-06-12	Bland	Sandoval	8750
113	1	UNK	UNK	Bland	Sandoval	ca 8750
114	1	DB Wake	1965-06-15	Bland	Sandoval	ca 8750
115	1	DB Wake	N/A	Bland	Sandoval	8750
116	1	W Riemer	1949-08-14	Bland	Sandoval	8750

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
117	1	RC Stebbins	1949-08-14	Bland	Sandoval	8750
118		WC Russell	1952-08-26	Redondo Peak	Sandoval	8500
119	119	WC Russell	1952-08-27	Redondo Peak	Sandoval	8500
120	119	RI Bowman	1952-08-27	Redondo Peak	Sandoval	8500
121	283	RJ Raitt, GA Schad	1958-07-13	Bland	Sandoval	8920
122	1	DB Wake	1965-06-15	Bland	Sandoval	ca 8750
123		DB Wake	?	?	Sandoval	?
124		DB Wake	?	?	Sandoval	?
125	112	CJ Jones (Wake)	1960-07-09	Bland	Sandoval	8750
126		SB Ruth	1971-08-13	Bland	Sandoval	ca 9050
127	127	J LaPointe	1970-06-19	Bland	Sandoval	ca 8600
128	283	GA Schad	1958-07-13	Bland	Sandoval	ca 8920
129	283	RJ Raitt	1959-08-17	Bland	Sandoval	ca 8920
130		W Whitford	1978-07	Valle San Antonio	Sandoval	ca 10,000
131		?	?	?	?	?
132	112	M & S Minton	1971-08-17	Bland	Sandoval	8700
133	133	E Brodie	1966-08	Bland	Sandoval	ca 9200
134	1	AP Blair	1952-09-18	Bland	Sandoval	8750
135	144	?	?	Bland	Sandoval	8800
136		TP Maslin	1968-07-27	?	Sandoval	?
137	127	TP Maslin, B Baum	1969-07-24	Bland	Sandoval	ca 8600
138		? could be J Henderson	1910-08-20	?	Sandoval	?
139	139	A Brame et al	1965-06-15	Bland	Sandoval	ca 8860
140	139	A Brame et.al.	1965-06-15	Bland	Sandoval	ca 8860
141	1	?	?	Bland	Sandoval	8750
142	1	?	?	Bland	Sandoval	8750
143	1	R Stebbins	1949-08-14	Bland	Sandoval	8750
144	144	FR Gehlbach	1959-08-25	Bland	Sandoval	ca 8800
145	73	FR Gehlbach	1961-08-27	Bland	Sandoval	ca 8200
146		C Gans	1971-08-23	Redondo Peak	Sandoval	ca 8600
147	11	C Gans	1971-08-23	Bland	Sandoval	ca 8800
148	1	J Kezer	1972-07-17	Bland	Sandoval	8750
149	39	SR Williams	1972, summer	Redondo Peak	Sandoval	ca 8760
150	112	WG Degenhardt	1965-08-14	Bland	Sandoval	ca 8700
151	1	ED Brodie	1966-08-10	Bland	Sandoval	8750
152	54	ED Brodie	1966-08-10	Bland	Sandoval	ca 8900
153		ED Brodie	1966-08-10	Bland	Sandoval	ca 8550
154	133	ED Brodie	1966-08-10	Bland	Sandoval	ca 9200

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
155	54	ED Brodie	1966-08-10	Bland	Sandoval	ca 8900
156	39	SR Williams	1972	Redondo Peak	Sandoval	ca 8760
157		?	1971-08-10	?	Sandoval	?
158		?	1966-08	Valle Toledo	Sandoval	ca 8800
159	1	RC Stebbins	1949-08-14	Bland	Sandoval	8750
160		Junius Henderson	1910	?	Sandoval	9000
161		DP Reagan	1966	Bland	Sandoval	8300-8500
162		JL Christiansen	1966	Redondo Peak	Sandoval	8500-9200
163	163	SR Williams	?	Seven Springs	Sandoval	8100
164	164	SR Williams	?	Seven Springs	Sandoval	8200
165		SR Williams	?	Seven Springs	Sandoval	8300
166	80	SR Williams	?	Seven Springs	Sandoval	8300
167		SR Williams	?	Seven Springs	Sandoval	8400
168	168	SR Williams	?	Seven Springs	Sandoval	8600
169		S.R. Williams	1974-07-26	Jarosa	Rio Arriba	ca 8900
170		SR Williams	1975-09-06	Bland	Sandoval	8100
171		W Whitford	?	Valle San Antonio	Sandoval	ca 9200
172		W Whitford	?	Valle San Antonio	Sandoval	ca 9500
173		W Whitford	?	Valle San Antonio	Sandoval	ca10,400
174		DA Guthrie	1979-08-21	Bland	Sandoval	8700
175		MJ Altenbach, TH Fritts, RR Beatson	1986-07-28	Bland	Sandoval	9170
176		MJ Altenbach, TH Fritts, RR Beatson	1986-07-28	Bland	Sandoval	8450
177	177	MJ Altenbach, TH Fritts, RR Beatson	1986-07-29	Bland	Sandoval	8260
178	178	MJ Altenbach, TH Fritts, RR Beatson	1986-07-28	Bland	Sandoval	7740
179	178	MJ Altenbach, RR Beatson, CA Ramotnik	1986-08-04	Bland	Sandoval	7740
180		MJ Altenbach, RR Beatson, CA Ramotnik	1986-08-04	Bland	Sandoval	7800
181		MJ Altenbach, RR Beatson, CA Ramotnik	1986-08-04	Bland	Sandoval	7760
182		MJ Altenbach, RR Beatson, CA Ramotnik	1986-08-06	Redondo Peak	Sandoval	8630
183	183	MJ Altenbach, RR Beatson, CA Ramotnik	1986-08-01	Seven Springs	Sandoval	8580
184	184	MJ Altenbach, RR Beatson, CA Ramotnik	1986-08-01	Seven Springs	Sandoval	8320
185	185	MJ Altenbach, RR Beatson, CA Ramotnik	1986-08-03	Seven Springs	Sandoval	8360
186		MJ Altenbach, RR Beatson, CA Ramotnik	1986-08-03	Seven Springs	Sandoval	8200
187	168	MJ Altenbach, RR Beatson, CA Ramotnik	1986-08-03	Seven Springs	Sandoval	8600
188	80	MJ Altenbach, RR Beatson, CA Ramotnik, RB Bury, PS Corn	1986-07-18	Seven Springs	Sandoval	8300
189	49	MJ Altenbach, RR Beatson, CA Ramotnik, RB Bury, PS Corn	1986-07-19	Redondo Peak	Sandoval	ca 8900
190	82	MJ Altenbach, CA Ramotnik, BE Smith, CJ Campbell	1987-07-08	Valle Toledo	Los Alamos	9470
191	183	MJ Altenbach, CA Ramotnik, BE Smith, CJ Campbell	1987-07-06	Seven Springs	Sandoval	8580
192	177	MJ Altenbach, CA Ramotnik, BE Smith, CJ Campbell	1987-07-09	Bland	Sandoval	8260

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
193	168	MJ Altenbach, CA Ramotnik, BE Smith, CJ Campbell	1987-07-10	Seven Springs	Sandoval	8600
194	90	MJ Altenbach, CA Ramotnik, BE Smith	1987-08-29	Seven Springs	Sandoval	8600
195	98	MJ Altenbach, CA Ramotnik, BE Smith	1987-08-25	Seven Springs	Sandoval	8340
196	184	MJ Altenbach, CA Ramotnik, BE Smith	1987-06-30	Seven Springs	Sandoval	8240
197	184	MJ Altenbach, CA Ramotnik, BE Smith	1987-07-11	Seven Springs	Sandoval	8240
198	184	MJ Altenbach, CA Ramotnik, BE Smith	1987-08-24	Seven Springs	Sandoval	8240
199	184	MJ Altenbach, CA Ramotnik, BE Smith	1987-08-31	Seven Springs	Sandoval	8240
200		MA Ramsey, RL Gallegos, R Jennings, CW Painter	1988-07-21	Redondo Peak	Sandoval	8520
201		MA Ramsey, RL Gallegos, CW Painter	1988-07-21	Redondo Peak	Sandoval	9250
202		MA Ramsey, RL Gallegos, CW Painter	1988-07-19	Redondo Peak	Sandoval	9200
203	107	MA Ramsey, RL Gallegos, CW Painter	1988-08-24	Seven Springs	Sandoval	8600
204	80	CA Ramotnik	1984-08-07	Seven Springs	Sandoval	8480
205		C.A. Ramotnik	1986-08-07	Bland	Sandoval	7650
206	80	CA Ramotnik	1985-06-03	Seven Springs	Sandoval	ca 8300
207	80	CA Ramotnik	1985-06-03	Seven Springs	Sandoval	8480
208	80	CA Ramotnik	1985-06-03	Seven Springs	Sandoval	ca 8300
209		CA Ramotnik	1985-06-03	Guaje Mountain	Los Alamos	7000
210	184	CA Ramotnik	1984-08-15	Seven Springs	Sandoval	8280
211		CA Ramotnik	1984-08-21	Seven Springs	Sandoval	8520
212	80	CA Ramotnik	1984-08-15	Seven Springs	Sandoval	8480
213	80	CA Ramotnik	1984-08-04	Seven Springs	Sandoval	8480
214		C.W. Painter, M J. Altenbach	1990-08-01	Valle Toledo	Los Alamos	9470
215	185	MA Ramsey, RL Gallegos, CW Painter	1988-06-29	Seven Springs	Sandoval	8350
216	95	MA Ramsey, RL Gallegos, CW Painter	1988-06-29	Seven Springs	Sandoval	8560
217	90	MA Ramsey, RL Gallegos, CW Painter	1988-06-30	Seven Springs	Sandoval	8560
218	90	MA Ramsey, RL Gallegos, CW Painter	1988-07-01	Seven Springs	Sandoval	8560
219	98	MA Ramsey, RL Gallegos, CW Painter	1988-06-28	Seven Springs	Sandoval	8550
220		MA Ramsey, RL Gallegos, CW Painter	1988-07-14	Seven Springs	Sandoval	8520
221		MA Ramsey, RL Gallegos, CW Painter	1988-06-30	Seven Springs	Sandoval	8480
222	94	MA Ramsey, RL Gallegos, CW Painter	1988-07-15	Seven Springs	Sandoval	8400
223	91	MA Ramsey, RL Gallegos, CW Painter	1988-07-13	Seven Springs	Sandoval	8480
224	97	MA Ramsey, RL Gallegos, CW Painter	1988-07-13	Seven Springs	Sandoval	8560
225	225	WR Pilz	1985-06-19	Valle Toledo	Los Alamos	9200
226	110	WR Pilz	1985-06-26	Valle Toledo	Los Alamos	9200
227	225	WR Pilz	1985-06-27	Valle Toledo	Los Alamos	9200
228	110	WR Pilz	1985-08-07	Valle Toledo	Los Alamos	9200
229	110	WR Pilz	1987-07-27	Valle Toledo	Los Alamos	9200
231	90	Painter, Altenbach, et al.	1989-07-25	Seven Springs	Sandoval	8600

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
232	98	Painter, Altenbach, et al.	1989-07-25	Seven Springs	Sandoval	8550
233	95	Painter, Altenbach, et al.	1989-07-25	Seven Springs	Sandoval	8400
234	185	Painter, Altenbach, et al.	1989-07-25	Seven Springs	Sandoval	8360
235	94	Painter, Altenbach, et al.	1989-07-26	Seven Springs	Sandoval	8600
236	106	Painter, Altenbach, et al.	1989-08-17	Bland	Sandoval	8200
237	91	Painter, Altenbach, et al.	1989-08-10	Seven Springs	Sandoval	8480
238		Painter, Altenbach, et al.	1989-08-17	Bland	Sandoval	8100
239	103	Painter, Altenbach, et al.	1989-08-03	Seven Springs	Sandoval	8200
240		Painter, Altenbach, et al.	1989-08-03	Bland	Sandoval	8100
241		Painter, Altenbach, et al.	1989-08-03	Bland	Sandoval	8100
242		Painter, Altenbach, et al.	1990-07-16	Bland	Sandoval	8750
243		Painter, Altenbach, et al.	1990-07-16	Bland	Sandoval	8750
244		Painter, Altenbach, et al.	1990-07-16	Bland	Sandoval	8788
245	245	Painter, Altenbach, et al.	1990-07-18	Bland	Sandoval	8540
246		Painter, Altenbach, et al	1990-07-30	Seven Springs	Sandoval	8500
247	69	Painter, Altenbach, et al.	1990-07-31	Seven Springs	Sandoval	8240
248	248	Painter, Altenbach, et al.	1990-08-01	Redondo Peak	Sandoval	9120
249	249	Painter, Altenbach, et al.	1990-08-01	Redondo Peak	Sandoval	9200
250		Painter, Altenbach, et al.	1990-08-02	Redondo Peak	Sandoval	9460
251		Painter, Altenbach, et al.	1990-08-02	Redondo Peak	Sandoval	9420
252		Painter, Altenbach, et al.	1990-08-02	Redondo Peak	Sandoval	9400
253		Painter, Altenbach, et al	1990-08-09	Redondo Peak	Sandoval	9200
254		Painter, Altenbach, et al.	1990-08-13	Redondo Peak	Sandoval	9200
255		Painter, Altenbach, et al.	1990-08-15	Bland	Sandoval	8400
256	256	Painter, Altenbach, et al.	1990-08-15	Bland	Sandoval	8500
257		Painter, Altenbach, et al.	1990-08-15	Seven Springs	Sandoval	8700
258	258	Painter, Altenbach, et al.	1990-07-18	Bland	Sandoval	8750
259	69	Painter, Altenbach, et al.	1990-07-31	Seven Springs	Sandoval	8240
260	69	CA Ramotnik	1984-06-03	Seven Springs	Sandoval	8240
261	261	CA Ramotnik	1984-06-03	Redondo Peak	Sandoval	9000
262	164	CA Ramotnik	1984-06-07	Seven Springs	Sandoval	8200
263	80	CA Ramotnik	1984-06-12	Seven Springs	Sandoval	8300
264		CA Ramotnik	1984-06-12	Seven Springs	Sandoval	8720
265		CA Ramotnik	1984-06-23	Seven Springs	Sandoval	8200
266		CA Ramotnik	1984-06-26	Seven Springs	Sandoval	ca 8600
267	267	CA Ramotnik	1985-06-03	Seven Springs	Sandoval	8480
268	267	CA Ramotnik	1985-07-26	Seven Springs	Sandoval	8480
269	76	CA Ramotnik	1985-05-20	Valle Toledo	Los Alamos	9100

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
270		CA Ramotnik	1985-05-23	Guaje Mountain	Los Alamos	ca 7200
271		CA Ramotnik	1985-05-25	Guaje Mountain	Los Alamos	2133m
272	69	CA Ramotnik	1985-06-24	Seven Springs	Sandoval	8240
273	69	CA Ramotnik	1985-07-13	Seven Springs	Sandoval	8240
274	69	CA Ramotnik	1985-08-01	Seven Springs	Sandoval	8240
275	69	CA Ramotnik	1985-08-15	Seven Springs	Sandoval	8240
276	163	CA Ramotnik	1985-06-24	Seven Springs	Sandoval	8100
277		CA Ramotnik	1985-06-28	Frijoles	Los Alamos	2495-2600m
278		CA Ramotnik	1985-06-29, 07-06	Seven Springs	Sandoval	2555-2645m
279		CA Ramotnik	1985-07-14	Seven Springs	Sandoval	2575-2665m
280		DA Guthrie	1977-07-27	Bland	Sandoval	8600
281	281	DA Guthrie	1977-08-06	Bland	Sandoval	8850
282		DA Guthrie	1977-08-22	Bland	Sandoval	8600
283	283	DA Guthrie	1978-07-04	Bland	Sandoval	8850
284	284	DA Guthrie	1978-08-06	Bland	Sandoval	8850
285		DA Guthrie	1979-08-19	Bland	Sandoval	8100
286		WR Pilz	?	Valle San Antonio	Sandoval	ca 9600
287		WR Pilz	?	Valle San Antonio	Sandoval	ca 9600
288		WR Pilz	?	Valle San Antonio	Sandoval	ca 9400
289		CA Bogert, J Conner, et al.	1979-07-11	Valle Toledo	Los Alamos	9100
290		CA Bogert, J Conner, et al.	1979-07-11	Valle Toledo	Los Alamos	9200
291		CA Bogert, J Conner, et al	1979-07-11	Valle Toledo	Los Alamos	9150
292		CA Bogert, J Conner, et al.	1979-07-11	Valle Toledo	Los Alamos	9300
293		CA Bogert, J Conner, et al.	1979-07-11	Valle Toledo	Los Alamos	9350
294		CA Bogert, J Conner, et al	1979-07-11	Valle Toledo	Los Alamos	9350
295		CA Bogert, J Conner, et al.	1979-07-11	Valle Toledo	Los Alamos	9400
296		D Trujillo	1986-08-08	Cerro del Grant	Rio Arriba	ca8900
297		CD Allen, JR McGraff, DC Oney	1991-08-07	Bland	Sandoval	8890
298		CD Allen, JR McGraff, DC Oney	1991-08-08	Bland	Sandoval	8000
299		JR McGraff, DC Oney	1991-08-09	Bland	Sandoval	8400
300		JR McGraff, DC Oney	1991-08-12	Bland	Sandoval	7350
301		JR McGraff, DC Oney	1991-08-14	Bland	Sandoval	8600
302		JR McGraff, DC Oney	1991-08-14	Bland	Sandoval	8600
303		BE Smith, et al.	1991-07-18	Frijoles	Los Alamos	7800
304		M Gachupin, SWIFF	1991-08-01	Cerro del Grant	Rio Arriba	10,200
305		J Gachupin, Jemez Eagles	1991-08-15	Frijoles	Los Alamos	8150
306		USFS field crew	1991-08-08	Seven Springs	Sandoval	8500
307		USFS field crew	1991-08-09	Seven Springs	Sandoval	8800

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MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
308		USFS field crew	1991-08-14	Valle San Antonio	Sandoval	8800
309		USFS field crew	1991-08-14	Valle San Antonio	Sandoval	8800
310		USFS field crew	1991-08-14	Valle San Antonio	Sandoval	8800
311		USFS field crew	1991-08-14	Seven Springs	Sandoval	8700
312		Ely, Fleharty	1962-08-07	?	Sandoval	?
313	53	D.P. Reagan	1965-09-29	Redondo Peak	Sandoval	?
314		JL Burton, M Gorresen	1991-08-12	Valle Toledo	Sandoval	8800
315	315	JL Burton, M Gorresen	1991-08-12	Valle Toledo	Sandoval	8900
316	315	M Gorresen, MJ Altenbach, W Baker, D Tedrick	1991-08-13	Valle Toledo	Sandoval	8900
317		M Gorresen, MJ Altenbach, W Baker, D Tedrick	1991-08-13	Guaje Mountain	Sandoval	7950
318		USFS field crew	1991-08-12	Valle San Antonio	Sandoval	9000
319	184	USFS field crew	1991-07-15	Seven Springs	Sandoval	8400
320	184	USFS field crew	1991-09-09	Seven Springs	Sandoval	8400
321	1	SR Williams	1971-07-27	Bland	Sandoval	ca 8700
322	1	SR Williams	1970-08-23	Bland	Sandoval	ca 8700
323	1	SR Williams	1970-08-19	Bland	Sandoval	ca 8700
324	1	SR Williams	1970-08-18	Bland	Sandoval	ca 8700
325	1	SR Williams	1970-07-22	Bland	Sandoval	ca 8700
326	1	SR Williams	1970-07-27	Bland	Sandoval	ca 8700
327	1	SR Williams	1970-07-21	Bland	Sandoval	ca 8700
328	1	SR Williams	1970-08-24	Bland	Sandoval	ca 8700
329	1	SR Williams	1972-06-18	Bland	Sandoval	ca 8700
330	1	SR Williams	1972-08-07	Bland	Sandoval	ca 8700
331	1	SR Williams	1972-11-12	Bland	Sandoval	ca 8700
332	1	SR Williams	1972-06-04	Bland	Sandoval	ca 8700
333	1	SR Williams	1970-07-29	Bland	Sandoval	ca 8700
334	1	SR Williams	1970-07-10	Bland	Sandoval	ca 8700
335	1	SR Williams	1970-07-30	Bland	Sandoval	ca 8700
336	1	SR Williams	1970-07-20	Bland	Sandoval	ca 8700
337	1	SR Williams	1972-06-17	Bland	Sandoval	ca 8700
338	1	SR Williams	1972-07-17	Bland	Sandoval	ca 8700
339	1	SR Williams	1971-09-12	Bland	Sandoval	ca 8700
340	1	SR Williams	1970-07-11	Bland	Sandoval	ca 8700
341	1	SR Williams	1970-07-07	Bland	Sandoval	ca 8700
342	1	SR Williams	1972-08-20	Bland	Sandoval	ca 8700
343	1	SR Williams	1970-08-20	Bland	Sandoval	ca 8700
344	344	Painter, Altenbach	1991-08-02	Bland	Sandoval	8750
345	344	Altenbach,R Larranaga,RS Bristol	1992-08-06	Bland	Sandoval	8750

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
346	344	Altenbach,R Larranaga,RS Bristol,MW Doles	1992-08-12	Bland	Sandoval	8750
347	344	Painter, Altenbach, MW Doles	1992-08-20	Bland	Sandoval	8750
348	82	Altenbach,R Larranaga,RS Bristol	1992-08-04	Valle Toledo	Los Alamos	9470
349	82	Altenbach,R Larranaga,RS Bristol	1992-08-05	Valle Toledo	Los Alamos	9470
350	82	Altenbach,R Larranaga,RS Bristol, et al.	1992-08-11	Valle Toledo	Los Alamos	9470
351	82	Painter, Altenbach, MW Doles	1992-08-18	Valle Toledo	Los Alamos	9470
352	82	Painter, Altenbach, MW Doles	1992-08-19	Valle Toledo	Los Alamos	9470
353	168	Altenbach,R Larranaga,RS Bristol,MW Doles	1992-08-12	Seven Springs	Sandoval	8600
354	69	Altenbach	1992-05-29	Seven Springs	Sandoval	8400
355	69	Painter, MW Doles	1992-07-14	Seven Springs	Sandoval	8400
356		Painter, Altenbach, MW Doles	1992-07-21	Bland	Sandoval	8860
357		Altenbach,R Larranaga,MW Doles	1992-07-28	Bland	Sandoval	8300
358		Altenbach,R Larranaga,MW Doles	1992-07-28	Bland	Sandoval	8200
359	69	Altenbach,R Larranaga,RS Bristol, et al.	1992-08-10	Seven Springs	Sandoval	8400
360	90	Altenbach,R Larranaga,CW Bailey	1992-07-29	Seven Springs	Sandoval	8600
361	98	Painter, MW Doles, JT Klingel	1992-07-29	Seven Springs	Sandoval	8550
362	91	Altenbach,R Larranaga,MW Doles	1992-07-30	Seven Springs	Sandoval	8480
363		Painter, Altenbach, MW Doles	1992-08-13	Seven Springs	Sandoval	8600
364	80	Painter, Altenbach	1992-06-15	Seven Springs	Sandoval	8440
365	80	Painter, Altenbach, MW Doles	1992-07-15	Seven Springs	Sandoval	8440
366	366	Painter, Altenbach, MW Doles	1992-07-23	Seven Springs	Sandoval	8660
367	103	Painter, Altenbach, MW Doles	1992-07-23	Seven Springs	Sandoval	8200
368	368	Painter, Altenbach, MW Doles	1992-07-24	Bland	Sandoval	8750
369	369	Painter, Altenbach, MW Doles, et al.	1992-07-31	Bland	Sandoval	8500
370	366	Painter, MW Doles	1992-08-13	Seven Springs	Sandoval	8660
371	371	Painter, Altenbach, MW Doles	1992-08-19	Valle Toledo	Los Alamos	9470
372		Painter, C Garrett	1992-08-27	Bland	Sandoval	8680
373		Painter, C Garrett	1992-08-27	Guaje Mountain	Los Alamos	8640
374	371	Altenbach	1992-09-15	Valle Toledo	Los Alamos	9470
375		J Gachupin	1992-08-27	Redondo Peak	Sandoval	9120
376	90	Painter, Altenbach, C Tyrpak	1993-08-31	Seven Springs	Sandoval	8600
377	98	Painter, Altenbach, C Tyrpak	1993-08-31	Seven Springs	Sandoval	8550
378		CD Allen, JR McGraff, DC Oney	1991-08-08	Bland	Sandoval	8000
379		Ramotnik, Altenbach, Beatson	1986-08-02	Seven Springs	Sandoval	8720
380		Ramotnik, Altenbach, Beatson	1986-08-02	Seven Springs	Sandoval	8180
381		Ramotnik, Altenbach, Beatson	1986-08-02	Seven Springs	Sandoval	8360
382		Ramotnik, Altenbach, Beatson	1986-08-03	Seven Springs	Sandoval	8560
383	383	Ramotnik, Altenbach, Beatson	1986-08-06	Redondo Peak	Sandoval	9320

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MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
384	384	Ramotnik, Altenbach, Beatson	1986-08-06	Redondo Peak	Sandoval	8880
385	385	Ramotnik, Altenbach, Beatson	1986-08-07	Bland	Sandoval	8120
386	386	Ramotnik, Altenbach, Beatson	1986-07-29	Bland	Sandoval	8400
387		Ramotnik, Altenbach, Beatson	1986-08-08	Redondo Peak	Sandoval	8630
388		Altenbach, Beatson	1986-08-12	Bland	Sandoval	7500
389		Altenbach, Beatson	1986-08-12	Bland	Sandoval	7380
390		Altenbach, Beatson	1986-08-12	Bland	Sandoval	ca7800
391		Altenbach, Beatson	1986-08-13	Cerro del Grant	Rio Arriba	ca8900
392		Altenbach, Beatson	1986-08-14	Guaje Mountain	Los Alamos	7940
393		Altenbach, Beatson	1986-08-14	Guaje Mountain	Los Alamos	7800
394	394	Altenbach, Painter, BE Smith, J Stewart	1987-07-02	Redondo Peak	Sandoval	8630
395	394	Altenbach, Ramotnik, BE Smith	1987-08-30	Redondo Peak	Sandoval	8630
396	384	Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-05	Redondo Peak	Sandoval	8880
397	383	Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-05	Redondo Peak	Sandoval	9320
398		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-05	Redondo Peak	Sandoval	9250
399		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-05	Bland	Sandoval	8850
400		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-02	Redondo Peak	Sandoval	8440
401		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-06	Seven Springs	Sandoval	8660
402		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-06	Seven Springs	Sandoval	8360
403	185	Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-07	Seven Springs	Sandoval	8200
404		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-07	Seven Springs	Sandoval	8360
405	385	Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-09	Bland	Sandoval	8120
406	386	Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-09	Bland	Sandoval	8400
407		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-10	Jarosa	Rio Arriba	8800
408		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-10	Jarosa	Rio Arriba	8960
409		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-10	Jarosa	Rio Arriba	9200
410		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-10	Jarosa	Rio Arriba	8960
411		Altenbach, Ramotnik, BE Smith, NJ Scott,Jr, A Bridegam	1987-08-27	Seven Springs	Sandoval	8480
412		Altenbach, Ramotnik, BE Smith, SE Stefferud	1987-08-29	Seven Springs	Sandoval	8680
413		Altenbach, Ramotnik, BE Smith, SE Stefferud	1987-08-29	Seven Springs	Sandoval	8260
414		Altenbach, Ramotnik, BE Smith	1987-08-30	Redondo Peak	Sandoval	9160
415		Altenbach, Ramotnik, BE Smith, NJ Scott,Jr	1987-08-28	Seven Springs	Sandoval	8660
416		Altenbach, Ramotnik, BE Smith	1987-08-29	Seven Springs	Sandoval	8300
417		Altenbach, Ramotnik, BE Smith, NJ Scott, CJC, CWP	1987-06-30	Cerro del Grant	Rio Arriba	9620
418		Altenbach, Ramotnik, BE Smith, NJ Scott, CJC, CWP	1987-06-30	Cerro del Grant	Rio Arriba	9480
419		Altenbach, Ramotnik, BE Smith, NJ Scott, CJC, CWP	1987-06-30	Cerro del Grant	Rio Arriba	9220
420		Altenbach, Ramotnik, BE Smith, NJ Scott, CJC, CWP	1987-06-30	Cerro del Grant	Rio Arriba	9740
421	421	Altenbach, Ramotnik, BE Smith, NJ Scott, CJC, CWP	1987-07-01	Guaje Mountain	Los Alamos	8850

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422		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-02	Bland	Sandoval	8750
423		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-03	Jarosa	Rio Arriba	9070
424		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-07	Seven Springs	Sandoval	8400
425		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-07	Seven Springs	Sandoval	8400
426	185	Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-07	Seven Springs	Sandoval	8520
427		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-09	Bland	Sandoval	8350
428		Altenbach, Ramotnik, BE Smith, CJ Campbell	1987-07-09	Bland	Sandoval	8350
429		Altenbach, Ramotnik, BE Smith, NJ Scott,Jr, SE Stefferu	1987-08-26	Vallecitos	Rio Arriba	10060
430		Altenbach, Ramotnik, BE Smith, NJ Scott,Jr, SE Stefferu	1987-08-26	Polvadera Peak	Rio Arriba	10540
431		Altenbach, Ramotnik, BE Smith, NJ Scott,Jr, SE Stefferu	1987-08-26	Polvadera Peak	Rio Arriba	9550
432		Altenbach, Ramotnik, BE Smith, NJ Scott,Jr, SE Stefferu	1987-08-27	Seven Springs	Sandoval	8650
433		Altenbach, Ramotnik, BE Smith, NJ Scott,Jr, SE Stefferu	1987-08-27	Seven Springs	Sandoval	8600
434		Altenbach, Ramotnik, BE Smith	1987-08-31	Seven Springs	Sandoval	8700
435		Altenbach, Ramotnik, BE Smith	1987-08-31	Seven Springs	Sandoval	8800
436		Altenbach, Ramotnik, BE Smith	1987-08-31	Redondo Peak	Sandoval	8560
437	437	Altenbach, Ramotnik, BE Smith, NJ Scott,Jr, D DeLorenzo	1987-09-02	Polvadera Peak	Rio Arriba	9750
438	438	Altenbach, Ramotnik, BE Smith, NJ Scott,Jr, D DeLorenzo	1987-09-02	Polvadera Peak	Rio Arriba	9600
439		Altenbach, Ramotnik, BE Smith, NJ Scott,Jr, D DeLorenzo	1987-09-02	Polvadera Peak	Rio Arriba	9450
440	440	Altenbach, Ramotnik, BE Smith, NJ Scott,Jr, D DeLorenzo	1987-09-02	Polvadera Peak	Rio Arriba	9900
441		MA Ramsey, RL Gallegos	1988-07-05	Redondo Peak	Sandoval	8520
442	442	MA Ramsey, RL Gallegos	1988-07-05	Redondo Peak	Sandoval	8520
443		MA Ramsey, RL Gallegos	1988-07-05	Redondo Peak	Sandoval	8520
444		MA Ramsey, RL Gallegos	1988-07-20	Redondo Peak	Sandoval	8520
445		MA Ramsey, B Crostic, D Trujillo, Liestman	1988-08-04	Redondo Peak	Sandoval	8520
446		MA Ramsey, RL Gallegos	1988-08-01	Regina	Sandoval	9400+
447		MA Ramsey, RL Gallegos	1988-08-01	Rancho del Chaparral	Sandoval	ca 8300
448	437	MA Ramsey, RL Gallegos, CW Painter	1988-08-16	Polvadera Peak	Rio Arriba	9700
449	440	MA Ramsey, RL Gallegos, CW Painter	1988-08-16	Polvadera Peak	Rio Arriba	9900
450	438	MA Ramsey, RL Gallegos, CW Painter	1988-08-16	Polvadera Peak	Rio Arriba	9650
451		MA Ramsey, RL Gallegos, CW Painter	1988-08-17	Cerro del Grant	Rio Arriba	9250
452		MA Ramsey, RL Gallegos, CW Painter	1988-08-15	Polvadera Peak	Rio Arriba	9700
453	453	MA Ramsey, CW Painter	1988-08-18	Redondo Peak	Sandoval	9300
454		MA Ramsey, CW Painter	1988-08-18	Redondo Peak	Sandoval	9300
455		MA Ramsey, CW Painter	1988-08-19	Redondo Peak	Sandoval	9250
456		MA Ramsey, R Alvarado	1988-08-30	Redondo Peak	Sandoval	9200
457		MA Ramsey, RL Gallegos, CW Painter	1988-08-23	Seven Springs	Sandoval	8820
458		MA Ramsey, RL Gallegos, CW Painter	1988-08-23	Seven Springs	Sandoval	8960
459		MA Ramsey, RL Gallegos, CW Painter	1988-08-24	Seven Springs	Sandoval	8720

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MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
460		MA Ramsey, RL Gallegos, CW Painter	1988-08-24	Seven Springs	Sandoval	8640
461		MA Ramsey, RL Gallegos, CW Painter	1988-08-24	Seven Springs	Sandoval	8760
462		MA Ramsey, RL Gallegos, CW Painter	1988-08-25	Seven Springs	Sandoval	8760
463	184	Painter, Altenbach, Bridegam, Campbell, Orr, Fisher,etc	1989-07-10	Seven Springs	Sandoval	8240
464	97	Painter, Altenbach, Bridegam, A Abeyta, N Espinoza	1989-07-25	Seven Springs	Sandoval	8560
465		Altenbach, Bridegam, JA Jackson	1989-07-26	Seven Springs	Sandoval	8520
466		Altenbach, Bridegam, JA Jackson, CJ Campbell	1989-07-26	Seven Springs	Sandoval	8600
467		Altenbach, Bridegam, JA Jackson, CJ Campbell	1989-07-26	Seven Springs	Sandoval	8200
468		Painter, N Espinoza, A Abeyta, R Humphrey	1989-07-26	Seven Springs	Sandoval	9000
469		Painter, N Espinoza, A Abeyta, R Humphrey	1989-07-26	Seven Springs	Sandoval	8880
470	107	Painter, N Espinoza, A Abeyta, R Humphrey	1989-07-26	Seven Springs	Sandoval	8600
471		Painter, Campbell, Jackson, Bridegam	1989-07-27	Seven Springs	Sandoval	8800
472		Painter, Campbell, Jackson, Bridegam	1989-07-27	Seven Springs	Sandoval	8400
473		Painter, Campbell, Jackson, Bridegam	1989-07-27	Jemez Springs	Sandoval	8000
474		Painter, Campbell, Jackson, Bridegam	1989-07-27	Jemez Springs	Sandoval	8200
475		Altenbach, N Espinoza, A Abeyta, R Humphrey	1989-07-27	Rancho del Chaparral	Sandoval	8300
476		Altenbach, N Espinoza, A Abeyta, R Humphrey	1989-07-27	Seven Springs	Sandoval	8600
477		Altenbach, N Espinoza, A Abeyta, R Humphrey	1989-07-27	Rancho del Chaparral	Sandoval	8300
478		Painter, Bridegam, Humphrey	1989-07-28	Redondo Peak	Sandoval	8650
479		Campbell, Abeyta, Espinoza	1989-07-28	Bear Springs Peak	Sandoval	8200
480		Campbell, Abeyta, Espinoza	1989-07-28	Bear Springs Peak	Sandoval	8150
481		Abeyta, Humphrey, Jackson	1989-07-31	Polvadera Peak	Rio Arriba	ca 8800
482		Painter, Gallegos, Espinoza	1989-07-31	Polvadera Peak	Rio Arriba	9000
483		Altenbach, Bridegam, Campbell	1989-07-31	Polvadera Peak	Rio Arriba	8940
484		Altenbach, Espinoza, Campbell	1989-08-01	Polvadera Peak	Rio Arriba	9000
485		Altenbach, Espinoza, Campbell	1989-08-01	Polvadera Peak	Rio Arriba	8900
486		Bridegam, Abeyta, Jackson	1989-08-01	Cerro del Grant	Rio Arriba	9300
487		Bridegam, Abeyta, Jackson	1989-08-01	Cerro del Grant	Rio Arriba	10020
488		Painter, Campbell, Bridegam	1989-08-02	Bland	Sandoval	8100
489		Painter, Campbell, Bridegam	1989-08-02	Bland	Sandoval	7800
490		Humphrey, Gallegos, Abeyta	1989-08-02	Bland	Sandoval	7900
491	103	Painter, Bridegam	1989-08-03	Seven Springs	Sandoval	8200
492		Painter, Bridegam	1989-08-03	Seven Springs	Sandoval	8200
493		Altenbach, Espinoza, Jackson	1989-08-03	Bland	Sandoval	7900
494		Altenbach, Espinoza, Jackson	1989-08-03	Bland	Sandoval	7900
495		Painter, G Stryker	1989-08-17	Bland	Sandoval	8200
496		Altenbach, Campbell	1989-08-07	Rancho del Chaparral	Sandoval	8600
497		Altenbach, Campbell	1989-08-07	Rancho del Chaparral	Sandoval	8800

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
498		Bridegam, Abeyta, Jackson	1989-08-07	Rancho del Chaparral	Sandoval	8300
499		Bridegam, Abeyta, Jackson	1989-08-07	Rancho del Chaparral	Sandoval	8300
500		Bridegam, Abeyta, Jackson	1989-08-07	Rancho del Chaparral	Sandoval	8200
501		Painter, Gallegos, Espinoza	1989-08-07	Seven Springs	Sandoval	8600
502		Painter, Gallegos, Espinoza	1989-08-07	Seven Springs	Sandoval	8600
503		Painter, Gallegos, Espinoza	1989-08-07	Seven Springs	Sandoval	8480
504		Painter, Campbell, Jackson	1989-08-08	Rancho del Chaparral	Sandoval	8300
505		Painter, Campbell, Jackson	1989-08-08	Seven Springs	Sandoval	8200
506		Abeyta, Bridegam, Gallegos	1989-08-08	San Miguel Mountain	Sandoval	9000
507		Abeyta, Bridegam, Gallegos	1989-08-08	San Miguel Mountain	Sandoval	8600
508		Painter, Altenbach, Bridegam	1989-08-09	Polvadera Peak	Rio Arriba	10300
509		Painter, Altenbach, Bridegam	1989-08-09	Vallecitos	Rio Arriba	ca 8550
510		Painter,Altenbach,Bridegam,Jackson,Stryker,C Allen,Espi	1989-08-17	Bland	Sandoval	7900
511		Painter,Altenbach,Bridegam,Jackson,Stryker,C Allen,Espi	1989-08-17	Bland	Sandoval	7700
512		Altenbach, JC Casey	1990-07-17	Jemez Springs	Sandoval	7800
513	513	LL West, BD Cunningham	1990-07-17	Bland	Sandoval	8788
514		Altenbach, Casey, Abeyta, West, Cunningham	1990-07-18	Bland	Sandoval	8500
515		Painter, Altenbach, GL Burton	1990-07-30	Rancho del Chaparral	Sandoval	8600
516		Painter, Altenbach, GL Burton	1990-07-30	Rancho del Chaparral	Sandoval	7900
517		Painter, Altenbach, GL Burton	1990-07-30	Rancho del Chaparral	Sandoval	8100
518	103	Painter, Altenbach, GL Burton	1990-07-30	Seven Springs	Sandoval	8200
519		Altenbach, Burton, Cunningham, West	1990-08-02	Redondo Peak	Sandoval	8920
520		Altenbach, Burton, Cunningham, West	1990-08-02	Redondo Peak	Sandoval	9200
521		Painter, Gallegos, Abeyta	1990-08-02	Redondo Peak	Sandoval	9400
522		Painter, Altenbach, GL Burton, West	1990-08-03	Seven Springs	Sandoval	8460
523	453	Altenbach, Painter, Cunningham, Abeyta	1990-08-06	Redondo Peak	Sandoval	9140
524		Altenbach, Gallegos	1990-08-07	Polvadera Peak	Rio Arriba	9350
525		Painter, West	1990-08-07	Polvadera Peak	Rio Arriba	9550
526		Painter, West, Altenbach, Gallegos, Abeyta, Cunningham	1990-08-08	Polvadera Peak	Rio Arriba	9850
527		Painter, West, Altenbach, Gallegos, Abeyta, Cunningham	1990-08-08	Polvadera Peak	Rio Arriba	10460
528		Painter, West, Altenbach, Gallegos, Abeyta, Cunningham	1990-08-08	Vallecitos	Rio Arriba	10450
529		Altenbach, Abeyta, Cunningham, West	1990-08-09	Redondo Peak	Sandoval	8900
530		Altenbach, Abeyta, Cunningham, West	1990-08-09	Redondo Peak	Sandoval	8940
531		Altenbach, Abeyta, Stryker	1990-08-13	Redondo Peak	Sandoval	8480
532		Altenbach, Painter, WJ McKinney	1990-08-16	Redondo Peak	Sandoval	8600
533		Altenbach, Painter, WJ McKinney	1990-08-16	Redondo Peak	Sandoval	8640
534	442	Altenbach, Painter, WJ McKinney	1990-08-16	Redondo Peak	Sandoval	8640
535		Altenbach, Painter, L Stell	1990-08-17	Bland	Sandoval	8380

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MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
536		West, Gallegos, Abeyta	1990-08-16	Redondo Peak	Sandoval	ca8700
537		West, Gallegos, Abeyta	1990-08-16	Redondo Peak	Sandoval	9000
538		Altenbach, Abeyta	1990-08-21	Redondo Peak	Sandoval	8440
539		Altenbach, Abeyta	1990-08-21	Redondo Peak	Sandoval	8400
540		Altenbach, Abeyta	1990-08-21	Redondo Peak	Sandoval	8200
541		Abeyta, West	1990-08-22	Redondo Peak	Sandoval	8460
542	91	Altenbach, Abeyta, Cunningham, West	1990-07-25	Seven Springs	Sandoval	8480
543		M Gachupin, Eagles	1991-08-15	Bland	Sandoval	8800
544		M Gachupin, J Gachupin, A Trujillo	1991-09-11	Guaje Mountain	Los Alamos	7600
545		M Gachupin, J Gachupin, A Trujillo	1991-09-11	Guaje Mountain	Los Alamos	6700
546		M Gachupin, J Gachupin, A Trujillo	1991-09-11	Guaje Mountain	Los Alamos	7600
547		M Gachupin, J Gachupin, A Trujillo	1991-09-11	Guaje Mountain	Los Alamos	7400
548		M Gachupin, Eagles	1991-08-15	Bland	Sandoval	8600
549		M Gachupin, L West, BE Smith, A Trujillo, P Frank	1991-07-15	Redondo Peak	Sandoval	8600
550		M Gachupin, L West, BE Smith, A Trujillo, P Frank	1991-07-15	Redondo Peak	Sandoval	8600
551		J Gachupin, Smith, Trujillo, M Gachupin, Frank, West	1991-07-16	Redondo Peak	Sandoval	9000
552		J Gachupin, Smith, Trujillo, M Gachupin, Frank, West	1991-07-16	Redondo Peak	Sandoval	8740
553		J Gachupin, Smith, Trujillo, M Gachupin, Frank, West	1991-07-16	Redondo Peak	Sandoval	8600
554		J Gachupin, Smith, Trujillo, M Gachupin, Frank, West	1991-07-16	Redondo Peak	Sandoval	9300
555		J Gachupin, Smith, Trujillo, M Gachupin, Frank, West	1991-07-16	Redondo Peak	Sandoval	9800
556		J Gachupin, Smith, Trujillo, M Gachupin, Frank, West	1991-07-16	Redondo Peak	Sandoval	ca8700
557		J Gachupin, Smith, M Gachupin	1991-07-17	Redondo Peak	Sandoval	9800
558		J Gachupin, Smith, M Gachupin	1991-07-17	Redondo Peak	Sandoval	9700
559		J Gachupin, Smith, M Gachupin	1991-07-17	Redondo Peak	Sandoval	9200
560		J Gachupin, Smith, M Gachupin	1991-07-17	Redondo Peak	Sandoval	ca9800
561		J Gachupin, Smith, M Gachupin	1991-07-17	Redondo Peak	Sandoval	9800
562		Frank, Trujillo, West, T West	1991-07-17	Redondo Peak	Sandoval	9600
563		Frank, Trujillo, West, T West	1991-07-17	Redondo Peak	Sandoval	9200
564		Frank, Trujillo, West, T West	1991-07-17	Redondo Peak	Sandoval	9000
565		Frank, Trujillo, West, T West	1991-07-17	Redondo Peak	Sandoval	9050
566		Frank, Trujillo, West, T West	1991-07-17	Redondo Peak	Sandoval	9300
567		Frank, Trujillo, West, T West	1991-07-17	Redondo Peak	Sandoval	8700
568		Frank, Trujillo, West, J Gachupin, M Gachupin	1991-07-18	Redondo Peak	Sandoval	9600
569		Frank, Trujillo, West, J Gachupin, M Gachupin	1991-07-18	Redondo Peak	Sandoval	9300
570		Frank, Trujillo, West, J Gachupin, M Gachupin	1991-07-18	Redondo Peak	Sandoval	9200
571		Frank, Trujillo, West, J Gachupin, M Gachupin	1991-07-18	Redondo Peak	Sandoval	9000
572		Frank, Trujillo, West, J Gachupin, M Gachupin	1991-07-18	Redondo Peak	Sandoval	9000?
573		Frank, Trujillo, West, J Gachupin, M Gachupin	1991-07-18	Redondo Peak	Sandoval	9000

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
574		Frank, Trujillo, West, T West	1991-07-19	Redondo Peak	Sandoval	9000
575		Frank, Trujillo, West, T West	1991-07-19	Redondo Peak	Sandoval	9000
576		Frank, Trujillo, West, T West	1991-07-19	Redondo Peak	Sandoval	9000
577		Frank, Trujillo, West, T West	1991-07-19	Redondo Peak	Sandoval	9800
578		McKinney, West, 11 people	1991-07-22	Jarosa	Rio Arriba	8900
579		McKinney, West, 11 people	1991-07-22	Jarosa	Rio Arriba	8900
580		McKinney, West, 11 people	1991-07-22	Jarosa	Rio Arriba	8900
581		McKinney, West, 11 people	1991-07-22	Jarosa	Rio Arriba	8900
582		McKinney, West, 11 people	1991-07-22	Jarosa	Rio Arriba	8900
583		McKinney, West, 11 people	1991-07-22	Jarosa	Rio Arriba	8900
584		McKinney, West, 11 people	1991-07-22	Jarosa	Rio Arriba	8900
585		McKinney, West, 11 people	1991-07-22	Jarosa	Rio Arriba	8950
586		West + 11 people	1991-07-23	Jarosa	Rio Arriba	8800
587		West, 10 person crew	1991-07-23	Jarosa	Rio Arriba	8900
588		West, 10 person crew	1991-07-23	Jarosa	Rio Arriba	8800
589		West, 10 person crew	1991-07-23	Jarosa	Rio Arriba	8700
590		West, 10 person crew	1991-07-23	Jarosa	Rio Arriba	8750
591		West, 10 person crew	1991-07-23	Jarosa	Rio Arriba	8700
592		West, 10 person crew	1991-07-23	Jarosa	Rio Arriba	8700
593		West, 10 person crew	1991-07-23	Jarosa	Rio Arriba	8700
594		West, 10 person crew	1991-07-23	Jarosa	Rio Arriba	8600
595		West, 10 person crew	1991-07-23	Jarosa	Rio Arriba	8700
596		West, 10 person crew	1991-07-23	Jarosa	Rio Arriba	8700
597		West, 12 person crew	1991-07-24	Jarosa	Rio Arriba	8500
598		West, 12 person crew	1991-07-24	Jarosa	Rio Arriba	8600
599		West, 12 person crew	1991-07-24	Jarosa	Rio Arriba	8600
600		West, 12 person crew	1991-07-24	Jarosa	Rio Arriba	8600
601		West, 12 person crew	1991-07-24	Jarosa	Rio Arriba	8600
602		West, 12 person crew	1991-07-24	Jarosa	Rio Arriba	8550
603		West, 12 person crew	1991-07-24	Jarosa	Rio Arriba	8450
604		M Gachupin, 6 crew	1991-07-24	Jarosa	Rio Arriba	8450
605		West, 6 person crew	1991-07-24	Jarosa	Rio Arriba	8600
606		M Gachupin, 6 crew	1991-07-24	Jarosa	Rio Arriba	8600
607		J Gachupin, wildlife crew + fire crew	1991-07-25	Jarosa	Rio Arriba	8600
608		J Gachupin, wildlife crew + fire crew	1991-07-25	Jarosa	Rio Arriba	8700
609		J Gachupin, wildlife crew + fire crew	1991-07-25	Jarosa	Rio Arriba	8700
610		J Gachupin, wildlife crew + fire crew	1991-07-25	Jarosa	Rio Arriba	8605
611		J Gachupin, wildlife crew + fire crew	1991-07-25	Jarosa	Rio Arriba	8605

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MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
612		J Gachupin, wildlife crew + fire crew	1991-07-25	Jarosa	Rio Arriba	8600
613		J Gachupin, wildlife crew + fire crew	1991-07-26	Jarosa	Rio Arriba	8700
614		J Gachupin, wildlife crew + fire crew	1991-07-26	Jarosa	Rio Arriba	8750
615		L West + 8 person crew	1991-07-26	Jarosa	Rio Arriba	8800
616		L West + 8 person crew	1991-07-26	Jarosa	Rio Arriba	9100
617		L West + 8 person crew	1991-07-26	Jarosa	Rio Arriba	8850
618		L West + 8 person crew	1991-07-26	Jarosa	Rio Arriba	8800
619		L West + 8 person crew	1991-07-26	Jarosa	Rio Arriba	8750
620		L West + 8 person crew	1991-07-26	Jarosa	Rio Arriba	8850
628		M Gachupin, Jemez Eagles	1991-07-29	Jarosa	Rio Arriba	8850
622		M Gachupin, Jemez Eagles	1991-07-29	Jarosa	Rio Arriba	8800
623		M Gachupin, Jemez Eagles	1991-07-29	Jarosa	Rio Arriba	8800
624		M Gachupin, Jemez Eagles	1991-07-29	Jarosa	Rio Arriba	9000
625		M Gachupin, Jemez Eagles	1991-07-29	Jarosa	Rio Arriba	9300
626		M Gachupin, Jemez Eagles	1991-07-29	Jarosa	Rio Arriba	9100
627		M Gachupin, Jemez Eagles	1991-07-29	Jarosa	Rio Arriba	9300
628		M Gachupin, Jemez Eagles	1991-07-29	Jarosa	Rio Arriba	9000
629		J Gachupin, Trujillo, Jemez SWFF crew	1991-07-29	Jarosa	Rio Arriba	8900
630		J Gachupin, Jemez Eagles	1991-07-29	Jarosa	Rio Arriba	8800
631		J Gachupin, Jemez SWFF	1991-07-30	Jarosa	Rio Arriba	9000
632		J Gachupin, Jemez SWFF	1991-07-29	Jarosa	Rio Arriba	9300
633		J Gachupin, Jemez Eagles	1991-07-29	Jarosa	Rio Arriba	9200
634		J Gachupin, Jemez Eagles	1991-07-29	Jarosa	Rio Arriba	9100
635		A Trujillo + 4 crew	1991-08-08	Seven Springs	Sandoval	8430
636		A Trujillo + 4 crew	1991-08-08	Seven Springs	Sandoval	8200
637		A Trujillo + 4 crew	1991-08-08	Seven Springs	Sandoval	8200
638		A Trujillo + 4 crew	1991-08-08	Seven Springs	Sandoval	8800
640		A Trujillo + 4 crew	1991-08-08	Seven Springs	Sandoval	8550
641		A Trujillo + 4 crew	1991-08-08	Seven Springs	Sandoval	8500
642		A Trujillo + 4 crew	1991-08-08	Seven Springs	Sandoval	8730
643		J Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	ca8500
644		J Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8600
645		J Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8740
646		J Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8000
647		J Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8000
648		J Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8000
649		J Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8400
650		J Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8840

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
651		J Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8600
652		J Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8200
653		J Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8600
654		J Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8000
655		J Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	7840
656		J Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8000
657		M Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8430
658		M Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8600
659		M Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8280
660		M Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8400
661		M Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8400
662		M Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8600
663		M Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8300
664		M Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	ca8200
665		M Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8600
666		M Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8600
667		M Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8600
668		M Gachupin, Jemez Eagles	1991-08-08	Seven Springs	Sandoval	8700?
669		M Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8000
670		J Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8000
671		J Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8000
672		M Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8800
673		M Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8800
674		M Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	9000
675		M Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	9050
676		M Gachupin, Jemez Eagles	1991-08-09	Valle San Antonio	Sandoval	9100
677		M Gachupin, Jemez Eagles	1991-08-09	Valle San Antonio	Sandoval	9400
678		M Gachupin, Jemez Eagles	1991-08-09	Valle San Antonio	Sandoval	9050
679		M Gachupin, Jemez Eagles	1991-08-09	Valle San Antonio	Sandoval	8900
680		A Trujillo + 2	1991-08-09	Seven Springs	Sandoval	8400
681		A Trujillo + 2	1991-08-09	Seven Springs	Sandoval	8430
682		A Trujillo + 2	1991-08-09	Seven Springs	Sandoval	8200
683		A Trujillo + 2	1991-08-09	Seven Springs	Sandoval	8400
684		J Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8500
685		J Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8530
686		J Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8400
687		J Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8400
688		J Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8500

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MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
689		J Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8300
690		J Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8400
691		J Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8400
692		J Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8500
693		J Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8400
694		J Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8600
695		J Gachupin, Jemez Eagles	1991-08-09	Seven Springs	Sandoval	8650
696		L Tosa, Jemez Eagles, 9 crew	1991-08-12	Seven Springs	Sandoval	8500
697		L Tosa, Jemez Eagles, 9 crew	1991-08-12	Seven Springs	Sandoval	8820
698		L Tosa, Jemez Eagles, 9 crew	1991-08-12	Seven Springs	Sandoval	8800
699		L Tosa, Jemez Eagles, 9 crew	1991-08-12	Valle San Antonio	Sandoval	9000
700		L Tosa, Jemez Eagles, 9 crew	1991-08-12	Valle San Antonio	Sandoval	9400
701		L Tosa, Jemez Eagles, 9 crew	1991-08-12	Valle San Antonio	Sandoval	8800
702		L Tosa, Jemez Eagles, 9 crew	1991-08-12	Seven Springs	Sandoval	8600
703		L Tosa, Jemez Eagles, 9 crew	1991-08-12	Seven Springs	Sandoval	8800
704		L Tosa, Jemez Eagles, 9 crew	1991-08-12	Seven Springs	Sandoval	8800
705		L Tosa, Jemez Eagles, 9 crew	1991-08-12	Seven Springs	Sandoval	8800
706		L Tosa, Jemez Eagles, 9 crew	1991-08-12	Seven Springs	Sandoval	8800
707		L Tosa, Jemez Eagles, 9 crew	1991-08-12	Valle San Antonio	Sandoval	8800
708		L Tosa, Jemez Eagles, 9 crew	1991-08-12	Valle San Antonio	Sandoval	8800
709		L Tosa, Jemez Eagles, 9 crew	1991-08-12	Valle San Antonio	Sandoval	8800
710		M Gachupin, Jemez Eagles	1991-08-12	Seven Springs	Sandoval	8600
711		M Gachupin, Jemez Eagles	1991-08-12	Seven Springs	Sandoval	8800
712		M Gachupin, Jemez Eagles	1991-08-12	Seven Springs	Sandoval	9000
713		M Gachupin, Jemez Eagles	1991-08-12	Seven Springs	Sandoval	9100
714		M Gachupin, Jemez Eagles	1991-08-12	Seven Springs	Sandoval	9200
715		M Gachupin, Jemez Eagles	1991-08-12	Valle San Antonio	Sandoval	9400
716		M Gachupin, Jemez Eagles	1991-08-12	Valle San Antonio	Sandoval	9250
717		M Gachupin, Jemez Eagles	1991-08-12	Seven Springs	Sandoval	9000
718		M Gachupin, Jemez Eagles	1991-08-12	Seven Springs	Sandoval	9000
719		M Gachupin, Jemez Eagles	1991-08-12	Seven Springs	Sandoval	9000
720		L Tosa, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8600
721		L Tosa, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8600
722		L Tosa, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8600
723		L Tosa, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8900
724		L Tosa, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8800
725		L Tosa, Jemez Eagles	1991-08-13	Valle San Antonio	Sandoval	9000
726		L Tosa, Jemez Eagles	1991-08-13	Valle San Antonio	Sandoval	8800

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
727		L Tosa, Jemez Eagles	1991-08-13	Valle San Antonio	Sandoval	8600
728		L Tosa, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8600
729		L Tosa, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8600
730		M Gachupin, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8600
731		M Gachupin, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8600
732		M Gachupin, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8740
733		M Gachupin, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8600
734		M Gachupin, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8700
735		M Gachupin, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8400
736		M Gachupin, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8600
737		M Gachupin, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8400
738		M Gachupin, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8500
739		M Gachupin, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8200
740		M Gachupin, Jemez Eagles	1991-08-13	Seven Springs	Sandoval	8400
741		L Tosa, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	8600
742		L Tosa, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	8600
743		L Tosa, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	8200
744		L Tosa, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	8400
745		L Tosa, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	8200
746		L Tosa, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	8200
747		L Tosa, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	7800
748		M Gachupin, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	8200
749		M Gachupin, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	8200
750		M Gachupin, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	8200
751		M Gachupin, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	8000
752		M Gachupin, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	8200
753		M Gachupin, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	8200
754		M Gachupin, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	8100
755		M Gachupin, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	8700
756		M Gachupin, Jemez Eagles	1991-08-14	Seven Springs	Sandoval	8700
757		J Gachupin, SWFF crew	1991-07-30	Cerro del Grant	Rio Arriba	10000
758	758	J Gachupin, SWFF crew	1991-07-30	Cerro del Grant	Rio Arriba	10000
759		J Gachupin, SWFF crew	1991-07-30	Cerro del Grant	Rio Arriba	10000
760		J Gachupin, SWFF crew	1991-07-30	Cerro del Grant	Rio Arriba	10200
761		M Gachupin, Jemez Eagles	1991-07-30	Cerro del Grant	Rio Arriba	9800
762	762	M Gachupin, Jemez Eagles	1991-07-30	Cerro del Grant	Rio Arriba	9900
763	763	M Gachupin, Jemez Eagles	1991-07-30	Cerro del Grant	Rio Arriba	9200
764		M Gachupin, Jemez Eagles	1991-07-30	Cerro del Grant	Rio Arriba	9600

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
765		A Trujillo, 9 person crew	1991-07-30	Cerro del Grant	Rio Arriba	10300
766	766	A Trujillo, 9 person crew	1991-07-30	Cerro del Grant	Rio Arriba	10200
767		A Trujillo, 9 person crew	1991-07-30	Cerro del Grant	Rio Arriba	10100
768		A Trujillo, 9 person crew	1991-07-30	Cerro del Grant	Rio Arriba	9900
769	769	A Trujillo, 9 person crew	1991-07-30	Cerro del Grant	Rio Arriba	10100
770		M Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	9700
771		M Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	9900
772		M Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	9800
773		M Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	10100
774		M Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	10000
775		M Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	10000
776		M Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	10000
777		M Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	9950
778		M Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	10100
779		J Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	9800
780		J Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	9800
781		J Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	9800
782		J Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	9700
783		J Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	9700
784		J Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	9700
785		J Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	9700
786		J Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	10100
787		J Gachupin, Jemez Eagles	1991-07-31	Cerro del Grant	Rio Arriba	9700
788		M Gachupin + 8	1991-08-01	Cerro del Grant	Rio Arriba	9800
789	789	M Gachupin + 8	1991-08-01	Cerro del Grant	Rio Arriba	9700
790	790	M Gachupin + 8	1991-08-01	Cerro del Grant	Rio Arriba	9800
791		M Gachupin + 8	1991-08-01	Cerro del Grant	Rio Arriba	10200
792		J Gachupin, Jemez crew, 9	1991-08-01	Cerro del Grant	Rio Arriba	9900
793		J Gachupin, Jemez crew, 9	1991-08-01	Cerro del Grant	Rio Arriba	9700
794		J Gachupin, Jemez crew, 9	1991-08-01	Cerro del Grant	Rio Arriba	9900
795		J Gachupin, Jemez crew, 9	1991-08-01	Cerro del Grant	Rio Arriba	10000
796		J Gachupin, Jemez crew, 9	1991-08-01	Cerro del Grant	Rio Arriba	9600
797	766	J Gachupin, Jemez crew, 9	1991-08-01	Cerro del Grant	Rio Arriba	10000
798	769	J Gachupin, Jemez crew, 9	1991-08-01	Cerro del Grant	Rio Arriba	10200
799		J Gachupin, Jemez crew, 9	1991-08-01	Cerro del Grant	Rio Arriba	9900
800	758	A Trujillo, 7 crew members	1991-08-01	Cerro del Grant	Rio Arriba	9700
801		A Trujillo, 7 crew members	1991-08-01	Cerro del Grant	Rio Arriba	9800
802	762	A Trujillo, 7 crew members	1991-08-01	Cerro del Grant	Rio Arriba	9600

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
803		A Trujillo, 7 crew members	1991-08-01	Cerro del Grant	Rio Arriba	9100
804	763	A Trujillo, 7 crew members	1991-08-01	Cerro del Grant	Rio Arriba	9600
805		A Trujillo, 3 crew members	1991-08-02	Cerro del Grant	Rio Arriba	9600
806		A Trujillo, 3 crew members	1991-08-02	Cerro del Grant	Rio Arriba	9600
807		A Trujillo, 3 crew members	1991-08-02	Cerro del Grant	Rio Arriba	9600
808		A Trujillo, 3 crew members	1991-08-02	Cerro del Grant	Rio Arriba	8600
809		J Gachupin, Jemez crew	1991-08-05	Cerro del Grant	Rio Arriba	9800
810		J Gachupin, Jemez crew	1991-08-05	Cerro del Grant	Rio Arriba	9600
811		J Gachupin, Jemez crew	1991-08-05	Cerro del Grant	Rio Arriba	9700
812		J Gachupin, Jemez crew	1991-08-05	Cerro del Grant	Rio Arriba	9600
813	789	J Gachupin, Jemez crew	1991-08-05	Cerro del Grant	Rio Arriba	9800
814	790	J Gachupin, Jemez crew	1991-08-05	Cerro del Grant	Rio Arriba	9600
815		M Gachupin, Jemez crew	1991-08-05	Cerro del Grant	Rio Arriba	9500
816		M Gachupin, Jemez crew	1991-08-05	Cerro del Grant	Rio Arriba	9000
817		M Gachupin, Jemez crew	1991-08-05	Cerro del Grant	Rio Arriba	9500
818		M Gachupin, Jemez crew	1991-08-05	Cerro del Grant	Rio Arriba	9400
819		M Gachupin, Jemez crew	1991-08-05	Cerro del Grant	Rio Arriba	9300
820		M Gachupin, Jemez crew	1991-08-05	Cerro del Grant	Rio Arriba	9600
821		M Gachupin, Jemez crew	1991-08-05	Cerro del Grant	Rio Arriba	9700
822		M Gachupin, Jemez crew	1991-08-05	Cerro del Grant	Rio Arriba	9800
823		A Trujillo, 5 crew	1991-08-05	Cerro del Grant	Rio Arriba	9700
824		A Trujillo, 5 crew	1991-08-05	Cerro del Grant	Rio Arriba	9800
825		A Trujillo, 5 crew	1991-08-05	Cerro del Grant	Rio Arriba	9700
826		A Trujillo, 5 crew	1991-08-05	Cerro del Grant	Rio Arriba	9800
827		A Trujillo, 5 crew	1991-08-05	Cerro del Grant	Rio Arriba	9700
828		A Trujillo, 5 crew	1991-08-05	Cerro del Grant	Rio Arriba	9700
829		A Trujillo, 5 crew	1991-08-05	Cerro del Grant	Rio Arriba	9700
830		A Trujillo, 5 crew	1991-08-05	Cerro del Grant	Rio Arriba	9700
831		A Trujillo, 5 crew	1991-08-05	Cerro del Grant	Rio Arriba	9800
832		J Gachupin, Jemez crew	1991-08-06	Cerro del Grant	Rio Arriba	10000
833		J Gachupin, Jemez crew	1991-08-06	Cerro del Grant	Rio Arriba	9800
834		J Gachupin, Jemez crew	1991-08-06	Cerro del Grant	Rio Arriba	9800
835		J Gachupin, Jemez crew	1991-08-06	Cerro del Grant	Rio Arriba	9700
836		J Gachupin, Jemez crew	1991-08-06	Cerro del Grant	Rio Arriba	10100
837		J Gachupin, Jemez crew	1991-08-06	Cerro del Grant	Rio Arriba	9700
838		J Gachupin, Jemez crew	1991-08-06	Cerro del Grant	Rio Arriba	9700
839		M Gachupin, Jemez Eagles	1991-08-06	Cerro del Grant	Rio Arriba	9700
840		M Gachupin, Jemez Eagles	1991-08-06	Cerro del Grant	Rio Arriba	10000

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MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
841		M Gachupin, Jemez Eagles	1991-08-06	Cerro del Grant	Rio Arriba	9700
842		A Trujillo, 4 crew	1991-08-06	Cerro del Grant	Rio Arriba	9300
843		A Trujillo, 4 crew	1991-08-06	Cerro del Grant	Rio Arriba	9600
844		A Trujillo, 4 crew	1991-08-06	Cerro del Grant	Rio Arriba	9500
845		A Trujillo, 4 crew	1991-08-06	Cerro del Grant	Rio Arriba	9200
846		A Trujillo, 4 crew	1991-08-06	Cerro del Grant	Rio Arriba	8800
847		A Trujillo, 4 crew	1991-08-06	Cerro del Grant	Rio Arriba	8700
848		A Trujillo, 4 crew	1991-08-07	Cerro del Grant	Rio Arriba	8500
849		M Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9900
850		M Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	10000
851		M Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9800
852		M Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9900
853		M Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9700
854		M Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9700
855		M Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9900
856		M Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9700
857		M Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9650
858		J Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	10200
859		J Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	10000
860		J Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	10200
861		J Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9900
862		J Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9700
863		J Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9900
864		J Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	10000
865		J Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9900
866		J Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	10000
867		J Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9950
868		J Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9900
869		J Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9900
870		J Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9900
871		J Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9760
872		J Gachupin, Jemez Eagles	1991-08-07	Cerro del Grant	Rio Arriba	9500
873		CD Allen	1991-08-04	Frijoles	Sandoval	7950
874	874	CD Allen	1991-08-04	Bland	Sandoval	8900
875		fire crew	1991-08-06	Bland	Sandoval	9060
876			1991-08-07	Bland	Sandoval	9200
877		CD Allen, DCO, JRM	1991-08-08	Bland	Los Alamos	7800
878		CD Allen, DCO, JRM	1991-08-08	Bland	Los Alamos	7650

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879	879	DCO, JRM	1991-08-09	Bland	Los Alamos	9000
880		DCO, JRM	1991-08-12	Frijoles	Los Alamos	7000
881		DCO, JRM	1991-08-14	Bland	Sandoval	8700
882		DCO, JRM	1991-08-14	Bland	Sandoval	8650
883		Altenbach, R Larranaga, RS Bristol	1992-08-07	Seven Springs	Sandoval	8600
884	97	Altenbach, MW Doles	1992-07-27	Seven Springs	Sandoval	8560
885		Altenbach, Painter, MW Doles	1992-07-14	Seven Springs	Sandoval	8800
886	886	Altenbach, Painter, MW Doles	1992-07-14	Redondo Peak	Sandoval	ca?
887		Altenbach, MW Doles	1992-07-20	Cerro del Grant	Rio Arriba	9000
888		Altenbach, MW Doles	1992-07-20	Cerro del Grant	Rio Arriba	9200
889		Altenbach, CW Bailey, R Larranaga, MW Doles	1992-07-29	Seven Springs	Sandoval	8500
890		Altenbach, CW Bailey, R Larranaga, MW Doles	1992-07-29	Seven Springs	Sandoval	8400
891	891	Altenbach, Bristol, R Larranaga, R Remillard	1992-08-03	Bland	Sandoval	9300
892	891	Altenbach, Bristol, R Larranaga	1992-08-06	Bland	Sandoval	9300
893		Altenbach, Bristol, Larranaga, EA Cervantes, Bailey	1992-08-10	Jemez Springs	Sandoval	8550
894		J Gachupin	1992-08-27	Redondo Peak	Sandoval	8300
895		J Gachupin	1992-08-27	Redondo Peak	Sandoval	8200
896		J Gachupin	1992-08-28	Redondo Peak	Sandoval	8200
897		J Gachupin	1992-08-28	Redondo Peak	Sandoval	8320
898		J Gachupin	1992-08-28	Redondo Peak	Sandoval	8400
899	97	Altenbach, Painter	1993-08-31	Seven Springs	Sandoval	8560
900		Ramotnik	1984-06-03	Seven Springs	Sandoval	ca8600
901		Ramotnik	1984-06-07	Seven Springs	Sandoval	ca8800
902		Ramotnik	1984-06-07	Seven Springs	Sandoval	ca8700
903		Ramotnik	1984-06-07	Seven Springs	Sandoval	ca8400
904		Ramotnik	1984-06-12	Seven Springs	Sandoval	ca8500
905		Ramotnik	1984-06-18,19	Seven Springs	Sandoval	ca8500
906		Ramotnik	1984-06-18,19	Seven Springs	Sandoval	ca8400
907		Ramotnik	1984-06-19	Seven Springs	Sandoval	ca8700
908		Ramotnik	1984-06-19	Seven Springs	Sandoval	ca8840
909		Ramotnik	1984-06-20	Seven Springs	Sandoval	ca8200
910		Ramotnik	1984-06-20	Seven Springs	Sandoval	ca7900
911		Ramotnik	1984-06-20	Seven Springs	Sandoval	ca8600
912		Ramotnik	1984-06-23	Seven Springs	Sandoval	ca8200
913		Ramotnik	1984-06-24	Redondo Peak	Sandoval	?
914		Ramotnik	1984-06-25	Redondo Peak	Sandoval	?
915	267	Ramotnik	1985-05-14	Seven Springs	Sandoval	ca8400
916		Ramotnik	1985-06-19,25	Valle Toledo	Los Alamos	?

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MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
917		Ramotnik	1985-05-20	Valle Toledo	Los Alamos	?
918		Ramotnik	1985-05-20	Guaje Mountain	Los Alamos	ca7200
919		Ramotnik	1985-06-19	Guaje Mountain	Los Alamos	ca7200
920		Ramotnik	1985-05-20	Bland	Sandoval	ca9200
921	886	Ramotnik	1985-05-20	Redondo Peak	Sandoval	?
922	922	Ramotnik	1985-05-22,24	Frijoles	Los Alamos	?
923	922	Ramotnik	1985-06-02,04	Frijoles	Los Alamos	?
924	922	Ramotnik	1985-07-05	Frijoles	Los Alamos	?
925		Ramotnik	1985-05-22	Frijoles	Los Alamos	?
926		Ramotnik	1985-05-22	Guaje Mountain	Los Alamos	ca7100
927		Ramotnik	1985-05-23	Guaje Mountain	Los Alamos	ca7100
928		Ramotnik	1985-05-23	Guaje Mountain	Los Alamos	?
929		Ramotnik	1985-05-23	Frijoles	Los Alamos	?
930		Ramotnik	1985-05-24	Guaje Mountain	Los Alamos	?
931		Ramotnik	1985-06-10	Guaje Mountain	Los Alamos	?
932		Ramotnik	1985-06-19,25	Guaje Mountain	Los Alamos	?
933		Ramotnik	1985-07-05,12	Guaje Mountain	Los Alamos	?
934	934	Ramotnik	1985-05-26	Guaje Mountain	Los Alamos	?
935	934	Ramotnik	1985-07-02	Guaje Mountain	Los Alamos	?
936	936	Ramotnik	1985-05-03	Frijoles	Los Alamos	?
937	936	Ramotnik	1985-06-02	Frijoles	Los Alamos	?
938	936	Ramotnik	1985-07-02,15	Frijoles	Los Alamos	?
939		Ramotnik	1985-06-01	Redondo Peak	Sandoval	?
940	940	Ramotnik	1985-06-06	Frijoles	Los Alamos	?
941	940	Ramotnik	1985-06-07	Frijoles	Los Alamos	?
942		Ramotnik	1985-06-07	Frijoles	Los Alamos	?
943		Ramotnik	1985-06-10-12	Frijoles	Los Alamos	?
944		Ramotnik	1985-06-23	Seven Springs	Sandoval	ca8600
945	69	Ramotnik	1985-09-05	Seven Springs	Sandoval	ca8300
946		Ramotnik	1985-07-12	Guaje Mountain	Los Alamos	?
947		Ramotnik	1985-08-14	Seven Springs	Sandoval	ca8200
948		Ramotnik	1985-08-19	Cuba	Rio Arriba	9720
949		Ramotnik	1985-08-20	Nacimiento Peak	Rio Arriba	9410
950		Ramotnik	1985-08-20	Jarosa	Rio Arriba	ca8700
951		Ramotnik	1985-09-02	Redondo Peak	Sandoval	?
952		Ramotnik	1985-09-03	Guaje Mountain	Los Alamos	?
953		Ramotnik	1985-09-04	Cerro del Grant	Rio Arriba	ca8950
954		Ramotnik	1984-06-25	Redondo Peak	Sandoval	ca8440

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
955		Altenbach, Painter, Gallegos, P Cassidy, S Brown	1990-08-10	Valle San Antonio	Sandoval	9100
956		Altenbach, Painter, Gallegos, P Cassidy, S Brown	1990-08-10	Valle San Antonio	Sandoval	9350
957		Altenbach, Painter, Gallegos, P Cassidy, S Brown	1990-08-10	Redondo Peak	Sandoval	11000
958		Altenbach, Painter, Gallegos, P Cassidy, S Brown	1990-08-10	Valle San Antonio	Sandoval	10050
959		Altenbach, Painter, Gallegos, P Cassidy, S Brown	1990-08-10	Valle San Antonio	Sandoval	10100
960		Altenbach, Painter, Gallegos, P Cassidy, S Brown	1990-08-10	Valle San Antonio	Sandoval	9900
961		Altenbach, Painter, M Gorresen, D Tedrick, W Baker	1991-08-13	Valle Toledo	Los Alamos	9050
962		Altenbach, Painter, M Gorresen, D Tedrick, W Baker	1991-08-13	Valle Toledo	Los Alamos	8950
963		GL Burton, M Gorresen	1991-08-12	Valle Toledo	Los Alamos	8760
964		GL Burton, M Gorresen	1991-08-12	Guaje Mountain	Los Alamos	8200
965		McGrath, Hessing	1993-09-01	Bland	Sandoval	8900
966		Allen, KB, Derek	1994-08-16	Bland	Sandoval	8950
967		Allen, DE	1994-08-26	Bland	Sandoval	9020
968	371	MJA, MLT	1994-07-28	Valle Toledo	Los Alamos	9470
969	371	MLT,MJA,KEC,CWB	1994-08-03	Valle Toledo	Los Alamos	9470
970	371	CWP,MJA,EBW	1994-08-25	Valle Toledo	Los Alamos	9470
971	82	MJA,MLT,KEC,CWB	1994-07-27	Valle Toledo	Los Alamos	9400
972	82	MLT,MJA	1994-08-02	Valle Toledo	Los Alamos	9400
973	82	MJA,CWP,ERIKA M. BRIAN LANG	1994-08-24	Valle Toledo	Los Alamos	9400
974	344	Painter, Altenbach	1994-07-29	Bland	Sandoval	8750
975	344	CWP,MJA,GLB,CWB	1994-08-16	Bland	Sandoval	8750
976	344	CWP,MJA,EBW	1994-08-26	Bland	Sandoval	8750
977	977	MJA,MLT,RSB,ALB,KRC,CLS	1994-07-29	Bland	Sandoval	8600
978	977	MJA,CWP,JLB,PH,TJM	1994-08-15	Bland	Sandoval	8600
979	977	MJA,CWP,CWB,BL,CT	1994-08-23	Bland	Sandoval	8600
980	977	CWP,MJA,EBW,BL	1994-08-25	Bland	Sandoval	8600
981		MJA,MLT	1994-07-25	Bland	Sandoval	8650
982	196	CWP,MJA,MLT,JLB,EC	1994-08-08	Seven Springs	Sandoval	8240
983	98	MJA,CWP,CWB,CT,BL	1994-08-23	Seven Springs	Sandoval	8480
984	95	MJA,CWP,CWB,CT,BL	1994-08-23	Seven Springs	Sandoval	8560
985	90	MJA,CWP,CWB,CT,BL	1994-08-23	Seven Springs	Sandoval	8600
986	91	MJA,CWP,CWB,CT,BL	1994-08-23	Seven Springs	Sandoval	8480
987		CWP, TJH	1995-08-22	Vallecitos	Vallecitos	7580
988		CWP, TJH	1995-08-22	Vallecitos	Vallecitos	7800
989		CWP, TJH	1995-08-23	Cerro del Grant	Vallecitos	9620
990	248	Wiltenmuth	1995-07-26	Redondo Peak	Sandoval	9120
991	261	Wiltenmuth	1995-07-27	Redondo Peak	Sandoval	9000
992	248	Wiltenmuth	1995-07-27	Redondo Peak	Sandoval	9120

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
993	248	Wiltenmuth	1995-07-28	Redondo Peak	Sandoval	9120
994	248	Wiltenmuth	1995-07-28	Redondo Peak	Sandoval	9120
995	258	Wiltenmuth	1995-07-29	Bland	Sandoval	8750
996	258	Wiltenmuth	1995-07-30	Bland	Sandoval	8750
997		Wiltenmuth	1995-07-31	Seven Springs	Sandoval	8160
998	998	Wiltenmuth	1995-07-31	Seven Springs	Sandoval	8440
999	998	Wiltenmuth	1995-08-01	Seven Springs	Sandoval	8440
1000	998	Wiltenmuth	1995-08-02	Seven Springs	Sandoval	8440
1001	998	Wiltenmuth	1995-08-03	Seven Springs	Sandoval	8440
1002	256	Witenmuth	1995-08-04	Bland	Sandoval	8500
1003	245	Wiltenmuth	1995-08-04	Bland	Sandoval	8540
1004		Wiltenmuth	1995-08-04	Bland	Sandoval	8540
1005		Wiltenmuth	1995-08-04	Bland	Sandoval	8620
1006	1006	Wiltenmuth	1995-08-04	Bland	Sandoval	8670
1007	1005	Wiltenmuth	1995-08-05	Bland	Sandoval	8620
1008	1006	Wiltenmuth	1995-08-05	Bland	Sandoval	8670
1009	1009	Wiltenmuth	1995-08-05	Bland	Sandoval	8710
1010	1009	Wiltenmuth	1995-08-06	Bland	Sandoval	8710
1011	184	Wiltenmuth	1995-08-07	Seven Springs	Sandoval	8320
1012		AW,LM,MLG,TC	1996-08-13	Bland	Sandoval	8084
1013		AW,LM,MLG,TC	1996-08-13	Bland	Sandoval	8084
1014		AW,LM,MLG,TC	1996-08-13	Bland	Sandoval	8084
1015	513	MJA,JES,MLG,LJM,TRC	1996-08-05	Bland	Sandoval	8660
1016	368	MJA,JES,MLG,LJM,TRC	1996-08-05	Bland	Sandoval	8680
1017		Jemez fire crew	1996-08-09	Bland	Sandoval	8800
1018		Jemez fire crew	1996-08-09	Bland	Sandoval	8800
1019	513	MLG,RTC,MH,DT,UNG	1996-08-12	Bland	Sandoval	8788
1020		MLG,TRC,LR	1996-08-15	Bland	Sandoval	8000
1021		MLG,DT,MLR	1996-08-12	Bland	Sandoval	7800
1022		TJH	1996-08-22	Bland	Sandoval	8100
1023		TJH	1996-08-22	Bland	Sandoval	8100
1024		TJH	1996-08-22	Bland	Sandoval	8200
1025		USFS Crew	1996-08-14	Bland	Sandoval	8200
1026		USFS Crew	1996-08-14	Bland	Sandoval	8200
1027		USFS Crew	1996-08-14	Bland	Sandoval	8880
1028		USFS Crew	1996-08-14	Bland	Sandoval	8880
1029		USFS Crew	1996-08-14	Bland	Sandoval	8600
1030		USFS Crew	1996-08-14	Bland	Sandoval	8600

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
1031		USFS Crew	1996-08-14	Bland	Sandoval	8640
1032		MLG,TRC,LR	1996-08-15	Bland	Sandoval	8400
1033		MLG,TRC,LR	1996-08-15	Bland	Sandoval	8400
1034		MLG,TRC,LR	1996-08-26	Bland	Sandoval	7700
1035		MLG,TRC,LR	1996-08-26	Bland	Sandoval	7700
1036		LR	1996-08-27	Bland	Sandoval	7700
1037		MLG,JG,LR	1996-08-28	Bland	Sandoval	7700
1038		MLG,JG,LR	1996-08-28	Bland	Sandoval	7700
1039		MLG,LR	1996-08-27	Bland	Sandoval	8400
1040		MLG,LR	1996-08-28	Bland	Sandoval	8300
1041		MLG,LR	1996-09-05	Bland	Sandoval	8600
1042		MLG,LR	1996-09-05	Bland	Sandoval	8400
1043		MLG,LR	1996-09-05	Bland	Sandoval	8600
1044	196	CWP,TJH	1995-08-23	Seven Springs	Sandoval	8240
1045	258	MJA,CWP,TJH,MLG,LJM,JG	1996-08-08	Bland	Sandoval	8750
1046		USFS crew	1996-06-09	Seven Springs	Sandoval	7930
1047		USFS crew	1996-06-09	Seven Springs	Sandoval	7950
1048		Engine 5+6=7	1996-08-11	Bland	Sandoval	8600
1049		USFS crew	1996-08-23	Bland	Sandoval	7700
1050		USFS crew	1996-08-23	Bland	Sandoval	7500
1051		USFS crew	1996-08-23	Bland	Sandoval	7500
1052		Engine crew	1996-08-10	Bland	Sandoval	8710
1053		USFS crew	1996-08-10	Bland	Sandoval	8700
1054		USFS crew	1996-08-10	Bland	Sandoval	8650
1055		USFS crew	1996-08-10	Bland	Sandoval	8630
1056	256	USFS crew	1996-08-11	Bland	Sandoval	8600
1057		USFS crew	1996-06-09	Seven Springs	Sandoval	7840
1058		USFS crew	1996-04-08	Seven Springs	Sandoval	7860
1059		USFS crew	1996-04-08	Seven Springs	Sandoval	7840
1060		USFS crew	1996-04-08	Seven Springs	Sandoval	7840
1061		USFS crew	1996-04-08	Seven Springs	Sandoval	7840
1062		USFS crew	1996-08-11	Bland	Sandoval	8530
1063		CWP, MJA	1992-07-31	Bland	Sandoval	8500
1064	69	MJA,KES, Linda DeLay	1997-08-02	Seven Springs	Sandoval	8240
1065	412	MJA, MAW, KES	1997-08-03	Seven Springs	Sandoval	8680
1066	95	MJA,KES,MAW	1997-08-03	Seven Springs	Sandoval	8400
1067	90	MJA,KES,MAW	1997-08-03	Seven Springs	Sandoval	8600
1068		MJA,KES,MAW	1997-08-03	Seven Springs	Sandoval	8260

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
1069	379	MJA,KES,MAW	1997-08-03	Seven Springs	Sandoval	8720
1070	513	MJA,KES,MAW,SRM,TKH,EIN	1997-08-05	Bland	Sandoval	8788
1071	421	MJA,KES,MAW,SRM,TKH,EIN	1997-08-05	Guaje Mountain	Los Alamos	8850
1072	977	MJA,KES,MAW,SRM,TKH,EIN	1997-08-05	Bland	Sandoval	8600
1073	84	MJA,KES,MAW,SRM,TKH,EIN	1997-08-05	Guaje Mountain	Los Alamos	9550
1084	8	CWP,BGF,LKK	1997-08-27	Bland	Sandoval	8750
1074		CWP,BGF,JLK	1997-08-15	Bland	Los Alamos	8300-8500
1075		CWP,BGF,JLK	1997-08-15	Bland	Los Alamos	8360
1076		CWP,BGF,JLK	1997-08-15	Bland	Los Alamos	8750
1077		CWP,BGF,LKK,EIN,PG	1997-08-19	Bland	Los Alamos	8600
1078		CWP,BGF,JLK	1997-08-15	Bland	Los Alamos	8600
1079		CWP,BGF,LKK,EIN,PG	1997-08-20	Bland	Los Alamos	8300-8350
1080		CWP,BGF,LKK,EIN,PG	1997-08-19	Frijoles	Los Alamos	7940
1081		CWP,BGF,LKK,EIN,PG	1997-08-19	Frijoles	Los Alamos	8100
1082		CWP,BGF,LKK,EIN,PG	1997-08-20	Frijoles	Los Alamos	7800-7900
1083	47	CWP,BGF,LKK	1997-08-27	Seven Springs	Sandoval	ca 8100
1085	344	CWP,BGF,LKK,LS	1997-08-19	Bland	Sandoval	8750
1086	344	CWP,BGF,LKK,JLK	1997-08-26	Bland	Sandoval	8750
1087	980	MJA,TJH,LUM,CWP,MJG,JWG	1996-08-08	Bland	Sandoval	8600
1088	980	CWP,MJA,LS,BGF,LKK,EIN,PEG	1997-08-18	Bland	Sandoval	8600
1089	980	CWP,JLK,MJA,BGF,LKK	1997-08-25	Bland	Sandoval	8600
1090	82	MJA,CWP,EIN,PEG,LKK,BGF	1997-08-21	Valle Toledo	Los Alamos	9470
1091	82	CWP,JLK,LKK,MJA,BGF,KS	1997-08-28	Valle Toledo	Los Alamos	9470
1092	371	CWP,MJA,BGF,JK,LKK,KS	1997-08-28	Valle Toledo	Los Alamos	9470
1093	371	CWP,EIN,BGF,PG,	1997-08-21	Valle Toledo	Los Alamos	9470
1094	49	JJK	1967-09-24	Redondo Peak	Sandoval	ca 8900
1095		CWP, B. SANCHEZ, T. DORTIGNAC, S. HINZ (FED HWYS)	1998-07-31	Seven Springs	Sandoval	7840
1096		CWP, MAW	1998-07-31	Redondo Peak	Sandoval	8200
1097		L. Gachupin, B. Fragua, et al.	1997-08-12	Seven Springs	Sandoval	8400
1098		L. Gachupin, B. Fragua, et al.	1997-08-12	Seven Springs	Sandoval	8400
1099	103	M. Gachupin, L. Gachupin, B. Sanchez et al.	1997-08-11	Seven Springs	Sandoval	8200
1100		L. Gachupin, C. Toya, S. Shondo	1997-08-11	Seven Springs	Sandoval	8200
1101		L. Gachupin, C. Toya, S. Shondo	1997-08-12	Seven Springs	Sandoval	8300
1102		L. Gachupin, C. Toya, S. Shondo	1997-08-12	Seven Springs	Sandoval	8200
1103		L. Gachupin, C. Toya, S. Shondo	1997-08-13	Seven Springs	Sandoval	8400
1104		L. Gachupin, C. Toya, S. Shondo	1997-08-14	Seven Springs	Sandoval	8300
1105		L. Gachupin, C. Toya, S. Shondo	1997-08-13	Seven Springs	Sandoval	8400
1106		L. Gachupin, C. Toya, S. Shondo	1997-08-14	Seven Springs	Sandoval	8400

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MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
1107		B. Fragua, C. Toya, S. Shondo	1997-08-13	Seven Springs	Sandoval	8400
1108		L. Gachupin, C. Toya, S. Shondo	1997-08-14	Seven Springs	Sandoval	8400
1109		L. Gachupin, C. Toya, S. Shondo	1997-08-14	Seven Springs	Sandoval	8400
1110		L. Gachupin, C. Toya, S. Shondo	1997-08-19	Seven Springs	Sandoval	8600
1111		L. Gachupin, C. Toya, S. Shondo	1997-08-18	Seven Springs	Sandoval	8600
1112		L. Gachupin, C. Toya, S. Shondo	1997-08-15	Seven Springs	Sandoval	8800
1113		L. Gachupin, C. Toya, S. Shondo	1997-08-15	Seven Springs	Sandoval	8700
1114		L. Gachupin, C. Toya, S. Shondo	1997-08-18	Seven Springs	Sandoval	8520
1115		L. Gachupin, C. Toya, S. Shondo	1997-08-18	Seven Springs	Sandoval	8500
1116		L. Gachupin, C. Toya, S. Shondo	1997-08-20	Seven Springs	Sandoval	8100
1117		L. Gachupin, C. Toya, S. Shondo	1997-08-20	Seven Springs	Sandoval	8100
1118		L. Gachupin, C. Toya, S. Shondo	1997-08-20	Seven Springs	Sandoval	8100
1119		L. Gachupin, C. Toya, S. Shondo	1997-08-20	Seven Springs	Sandoval	8100
1120		L. Gachupin, C. Toya, S. Shondo	1997-08-21	Seven Springs	Sandoval	8000
1121		L. Gachupin, C. Toya, S. Shondo	1997-08-21	Seven Springs	Sandoval	8000
1122		L. Gachupin, C. Toya, S. Shondo	1997-08-22	Seven Springs	Sandoval	8500
1123		CWP, MAW	1998-07-31	Redondo Peak	Sandoval	8220
1124	980	CWP, MJA, et al.	1999-08-09	Bland	Sandoval	8600
1125	980	MJA, JLK, et al.	1999-08-25	Bland	Sandoval	8600
1126	82	CWP, MJA, et al.	1999-08-10	Valle Toledo	Los Alamos	9470
1127	82	CWP, MJA, et al.	1999-08-26	Valle Toledo	Los Alamos	9470
1128	371	CWP, MJA, et al.	1999-08-10	Valle Toledo	Los Alamos	9470
1129	371	CWP, MJA, et al	1999-08-26	Valle Toledo	Los Alamos	9470
1130	344	CWP, MJA, et al.	1999-08-09	Bland	Sandoval	8750
1131	344	MJA, JLK, et al.	1999-08-25	Bland	Sandoval	8750
1132	95	MJA, CWP, et al.	1999-08-16	Seven Springs	Sandoval	8560
1133	90	MJA, CWP, et al.	1999-08-16	Seven Springs	Sandoval	8600
1134	98	MJA, CWP, et al.	1999-08-16	Seven Springs	Sandoval	8480
1135		CWP, ARW, et al.	1999-08-17		Los Alamos	8240
1136		CWP, ARW, et al.	1999-08-17		Los Alamos	8530
1137		CWP, ARW, et al.	1999-08-17		Los Alamos	8650
1138		CWP, ARW, et al.	1999-08-17		Los Alamos	9000
1139		CWP, ARW, et al.	1999-08-17		Los Alamos	9380
1140	980	CWP, MJA, CTD, MAW, et al.	1998-07-27	Bland	Sandoval	8600
1141	980	CWP, MJA, MAW, CTD, et al	1998-08-05	Bland	Sandoval	8600
1142	344	MJA, MAW, CTD, et al	1998-07-28	Bland	Sandoval	8750
1143	344	CWP, CTD, KES, et al	1998-08-05	Bland	Sandoval	8750
1144	82	MJA, CWP, MAW, CTD	1998-07-29	Valle Toledo	Los Alamos	9470

MAP NO	Same As No	COLLECTOR	COLLECTION DATE	QUAD NAME	COUNTY	ELEV
1145	82	CWP, MJA, et al	1998-08-06	Valle Toledo	Los Alamos	9470
1146	371	CWP, et al	1998-07-29	Valle Toledo	Los Alamos	9470
1147	371	CWP, et al	1998-08-06	Valle Toledo	Los Alamos	9470
1148	1148	B. Sanchez, M. Gachupin, C. Toya	1999-07-22	Bland	Sandoval	8600
1149	1149	Armstrong, Orr, Johnson, Fowler, Serrano	1999-08-12	Guaje Mountain	Sandoval	
1150	977	CWP, MJA, BLC, et al.	2000-07-18	Bland	Sandoval	8600
1151	175	CWP, MJA, BLC, et al.	2000-07-18	Bland	Sandoval	9170
1152	252	CWP, MJA, BLC, et al.	2000-07-18	Redondo Peak	Sandoval	9400
1153	248	CWP, MJA, BLC, et al.	2000-07-18	Redondo Peak	Sandoval	9120
1154	980	CWP, MJA, BLC, et al.	2000-07-19	Bland	Sandoval	8600
1155	344	CWP, MJA, BLC, et al.	2000-07-19	Bland	Sandoval	8750
1156	82	CWP, MJA, BLC, et al.	2000-07-20	Valle Toledo	Los Alamos	9470
1157	371	CWP, MJA, BLC, et al.	2000-07-20	Valle Toledo	Los Alamos	9470
1158	1158	CWP, MJA, BLC, et al.	2000-07-20	Guaje Mountain	Los Alamos	9320
1159	1158	CWP, BLC, et al.	2000-07-21	Guaje Mountain	Los Alamos	9330
1160		CWP, BLC, et al.	2000-07-28	Valle Toledo	Los Alamos	
1161	1161	CWP, BLC, et al.	2000-07-28	Valle Toledo	Los Alamos	9230
1162	980	CWP, BLC, et al.	2000-07-26	Bland	Sandoval	8600
1163	344	CWP, MAW, et al.	2000-07-26	Bland	Sandoval	8750
1164	82	CWP, BLC, et al.	2000-07-27	Valle Toledo	Los Alamos	9470
1165	371	CWP, et al.	2000-07-27	Valle Toledo	Los Alamos	9470
1166	98	MJA, CWP, et al.	2000-08-20	Seven Springs	Sandoval	8480
1167	90	MJA, CWP, et al.	2000-08-20	Seven Springs	Sandoval	8600
1168	95	MJA, CWP, et al.	2000-08-20	Seven Springs	Sandoval	8560
1169	82	CWP, BLC, et al.	2000-08-23	Valle Toledo	Los Alamos	9470
1170	371	CWP, BLC, et al.	2000-08-23	Valle Toledo	Los Alamos	9470
1171	91	MA Ramsey, RL Gallegos, CW Painter	1988-08-26	Seven Springs	Sandoval	8480

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
1	1	12 mi W, 4 mi S of Los Alamos, Jemez Mts	18N	4E	3,NE1/4
2		1.4 mi S of Paso del Norte	18N	4E	12,NW1/4
3	29	E fork Rio do los Frijoles, at jct w/ Hwy 4	19N	5E	28*
4		Jemez Mts., 9 mi N Del Norte Pass	20N	4E	*
5	112	11.5 mi W & 3.5 mi S Los Alamos, S side Jemez Mtns (Valle Grande)	19N	4E	35,SW1/4*
6	112	11.5 mi W & 3.5 mi S Los Alamos	19N	4E	35,SW1/4*
7	112	11.5 mi W & 3.5 mi S Los Alamos	19N	4E	35,SW1/4*
8	1	12 mi W, 4 mi S of Los Alamos	18N	4E	3,NE1/4
9		0.9 mi S Del Norte Pass, Jemez Crater Area	18N	4E	1,SW1/4
10	1	12 mi W, 4 mi S Los Alamos (Los Alamos Co)	18N	4E	3,NE1/4
11	11	across from Valle Grande, 27 mi E Jemez Springs	19N	4E	25*
12	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
13		Jemez Mts	18N	4E	25,S1/4
14		Los Alamos, Pueblo Canyon near jct Canyon Rd & 15th Street	19N	6E	10,SW1/4
15		Jemez Mts, 1.5 mi N Cabin [=UMN Biology Cabin, near Type Locality]	19N	4E	*
16	1	19 km W Los Alamos (230 m S Hwy 4)	18N	4E	3,NE1/4
17	1	19 km W Los Alamos (230 m S Hwy 4)	18N	4E	3,NE1/4
18	1	19 km W Los Alamos (230 m S Hwy 4)	18N	4E	3,NE1/4
19	1	19 km W Los Alamos (230 m S Hwy 4)	18N	4E	3,NE1/4
20	1	19 km W Los Alamos (230 m S Hwy 4)	18N	4E	3,NE1/4
21	1	19 km W Los Alamos (230 m S Hwy 4)	18N	4E	3,NE1/4
22	1	19 km W Los Alamos (230 m S Hwy 4)	18N	4E	3,NE1/4
25		on St Road 4, W side of jct with road to Pena Blanca	19N	4E	35*
26		E jct Hwy 4 and Hwy 44, on side Hwy 4, 40 rd mi	19N	5E	*
27	283	Jemez Mts, 68.8 km E jct Rts 4 & 44	19N	5E	28*
28	1	Jemez Mts, 12 mi W Los Alamos Road	18N	4E	3,NE1/4
29	29	E Branch of Rito de Frijoles	19N	5E	28*
30		0.25 mi W Valle Grande Vista Point	?	?	?
31	112	11.5 mi W, 3.5 mi S Los Alamos, S side Valle Grande	19N	4E	35,SW1/4*
32	133	11 mi W, 5 mi S Los Alamos, 1mi S Hwy 4 on Bland Cyn Rd	18N	4E	2,NE1/4
33		9 mi W of 4 mi S Los Alamos	19N	5E	30,N1/2*
34	112	3 1/2 mi S, 11 1/2 mi W Los Alamos	19N	4E	35,SW1/4*
35	1	4 mi S, 12 mi W Los Alamos	18N	4E	3,NE1/4
36	1	4 mi S, 12 mi W Los Alamos	18N	4E	3,NE1/4
37	249	2 mi N, 10 mi E Jemez Springs	18N	4E	10,SW1/4
38		Tent Rocks Ranch	18N	5E	18,SW1/4
39	39	just S Biology cabin, 1 mi E Las Conchas Campground	18N	4E	3,SW1/4
40		1 mi WSW Biology cabin, 1 mi E Las Conchas Campground	18N	4E	9,NE1/4*

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
41		Hwy 4, 1 mi E Las Conchas Campground	18N	4E	3,SW1/4
42	39	Biology cabin, 1 mi E Las Conchas Campground	18N	4E	3,SW1/4
43	43	1 mi E UNM Biology Cabin, NW slope	18N	4E	2,S1/2,middle
44	43	1 mi E UNM Biology cabin	18N	4E	2,S1/2,middle
45		1 mi SE Biology cabin	18N	4E	11,NW1/4
46	249	0.5 mi SW UNM Biology cabin, E-W ridge at head of Peralta Canyon	18N	4E	10,SW1/4
47	47	NW slope above Seven Springs fish hatchery	20N	2E	35,NW1/4
48	39	100 yds SE UNM Biology cabin	18N	4E	3,SW1/4
49	49	NW slope above UNM Biology cabin	18N	4E	3,SE1/4
50		N facing slope 12 mi SW Los Alamos	18N	4E	25,SE1/4
51	49	NW facing slope above UNM Biology Cabin, Jemez Mtns	18N	4E	3,SE1/4
52	49	NW facing slope above UNM Biology cabin, Jemez Mtns	18N	4E	3,SE1/4
53	53	N facing slope 14 mi WSW Los Alamos	18N	4E	?
54	54	NE facing wall Del Norte Canyon, 0.5 mi S Del Norte Pass	18N	4E	1,NW1/4
55	39	SE UNM Biology cabin, 150-200' SE	18N	4E	3,SW1/4
56	43	1 mi E UNM Biology cabin	18N	4E	2,S1/2,middle
57		NE facing slope opposite UNM Biology cabin	18N	4E	3,SW1/4
58	249	0.5 mi SW Biology cabin, E-W ridge at head of Peralta Canyon	18N	4E	10,SW1/4
59	47	NW facing slope above Seven Springs fish hatchery	20N	2E	35,NW1/4
60	39	100 yds SE UNM Biology cabin	18N	4E	3,SW1/4
61		200 yds SE UNM Biology cabin	18N	4E	3,SW1/4
62	49	NW facing slope above UNM Biology cabin	18N	4E	3,SE1/4
63	49	NW facing slope above UNM Biology cabin	18N	4E	3,SE1/4
64	49	NW facing slope above UNM Biology cabin	18N	4E	3,SE1/4
65	49	NW facing slope above UNM biology cabin	18N	4E	3,SE1/4
66	112	11.5 mi W, 3.5 mi S Los Alamos, S side Valle Grande	19N	4E	35,SW1/4*
67	112	11.5 mi W & 2.5 mi S Los Alamos, S side Valle Grande	19N	4E	35,SW1/4*
68	112	11.5 mi W, 3.5 mi S Los Alamos, S side Valle Grande	19N	4E	35,SW1/4*
69	69	Oat Canyon Rio Cebolla	20N	2E	25,NE1/4
70		E slope of Pajarito Mtn, Sierra de los Valles, S fork of Los Alamos Creek	19N	5E	11*
71		Los Alamos Canyon above reservoir	19N	5E	*
72	39	1 mi E Las Conchas Campground	18N	4E	3,SW1/4
73	73	Del Norte Canyon, down canyon from Trail #113	18N	4E	13
74		0.2 mi NE Jct NM 4 & NM 126 on NM 4	19N	3E	20,NE1/4
75		NW slope Valle Canyon	19N	5E	26,NE1/4
76	76	Los Alamos Cyn at Jct 1st upper fork	19N	5E	11,NW1/4*
77		Pajarito Cyn, N facing slope	19N	5E	14,SW1/4*
78		Calaveras Cyn, 1st drainage(N facing slope) N of pipeline rd	20N	2E	1,NE1/4

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
79		1 mi S of Cerro Pelon	21N	3E	34,NE1/4
80	80	Pony Cyn, at bottom of mouth of Cyn, ca 2.4 km NE Seven Springs State Fish Hatchery	20N	3E	18,SW1/4
81	1	type locality, 12 mi W, 4 mi S Los Alamos	18N	4E	3,NE1/4
82	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0.2 mi S pipeline rd	20N	5E	34,SW1/4*
83		Guaje Cyn, 2.7 mi straight line above Guaje Reservoir	20N	5E	27middle*
84	84	Guaje Cyn, 1/4 mi E pipeline rd on Guaje Ridge Trail	20N	5E	36,SW1/4*
85		Bear Cyn, ca 0.5 mi E of mouth	20N	2E	35,SW1/4
86		Quemazon Cyn	20N	5E	34,SW1/4*
87		Canada Bonito Cyn	19N	5E	2,SW1/4*
88		Canada Bonito Cyn	19N	5E	2middle*
89		Canyon S of Oat Cyn, ca. 1.3 mi NE Seven Springs hatchery	20N	2E	25,SW1/4
90	90	side cyn off Barley cyn, ca. 2.0 mi E jct w/ Rt 126 & FSR 378	19N	2E	12,NW1/4
91	91	side cyn off Barley cyn, ca. 2.3 mi E jct w/ Rt 126 & FSR 378	19N	2E	12,NW1/4
92		0.7 mi NW Cienega Redondo, W facing slope of Canoncito Seco	21N	4E	23,SW1/4
93		0.3 mi W Cienega Redondo, SW facing slope	21N	4E	23,SW1/4
94	94	side cyn off Cebolla Creek, 4 mi NW La Cueva	19N	2E	2,NW1/4
95	95	3.5 mi WNW La Cueva, side cyn off Barley cyn	19N	2E	11,SW1/4
96		1.2 mi E Fenton Lake, 0.25 mi N NM Hwy 126	19N	2E	14,NW1/4
97	97	3.0 mi WNW La Cueva, side cyn off Barley cyn	19N	2E	11,SE1/4
98	98	3.5 mi NW La Cueva, side cyn off Barley cyn	19N	2E	11,NE1/4
99		8.75 mi SE La Cueva, 0.5 mi SE jct SR 4 & Route 280	18N	4E	3,NE1/4
100		ca. 11 mi SE Coyote, E facing slope Canoncito Seco	21N	4E	22,NE1/4
101	1	type locality near Peralta Cyn Rd, S Valle Grande	18N	4E	3,NE1/4
102		0.6 mi from FSR 314, 0.5 mi from Calaveras Cyn on St Hwy 126, E side of road	20N	2E	27,SE1/4
103	103	0.6 mi from FSR314, 0.5 mi from Calaveras Cyn on St Hwy 126, W side of road	20N	2E	27,SE1/4
104	104	along FSR103, 0.7 mi E jct w/ St Hwy 126	20N	2E	18,NW1/4
105		Alamo cyn	18N	5E	5,SE1/4*
106	106	Alamo cyn	18N	5E	9,NW1/4*
107	107	along pipeline road, 0.25 mi E of Calaveras Cyn	20N	2E	1 SE1/4
108		Baca location No 1 (NE1/4), Sierra de Toledo, ca. 1.4 mi NW Cerro Rubio	see	note	*
109		Baca location No 1 (NE1/4), Sierra de Toledo, ca. 1.95 mi NW Cerro Rubio	see	note	*
110	110	ca. 4.0 mi SW Los Alamos, 0.6 mi E Los Alamos Ski Basin	19N	5E	2,SW1/4*
111		Medio Dia Cyn ca 0.5mi downstream jct w/ Canyon del Norte	18N	4E	24,SE1/4
112	112	jct NM Hwy 4 and N Pena Blanca Rd, S side Valle Grande	19N	4E	35,SW1/4*
113	1	near type locality	18N	4E	3,NE1/4
114	1	Jemez Mts, near Type Locality	18N	4E	3,NE1/4
115	1	12 mi W, 4 mi S Los Alamos	18N	4E	3,NE1/4
116	1	12 mi W, 4 mi S Los Alamos	18N	4E	3,NE1/4

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
117	1	12 mi W, 4 mi S Los Alamos	18N	4E	3,NE1/4
118		Jemez Crk, 6 mi NW Bland	18N	4E	9,NW1/4*
119	119	Jemez Crk, 6 mi NW Bland	18N	4E	4,SW1/4
120	119	Jemez Crk, 6 mi NW Bland	18N	4E	4,SW1/4
121	283	E Fork Rito de Los Frijoles	19N	5E	28*
122	1	Jemez Mts, near Type Locality	18N	4E	3,NE1/4
123		Jemez Mts	?	?	?
124		Jemez Mts	?	?	?
125	112	11.5 mi W, 3.5 mi S Los Alamos, S side Valle Grande, Jemez Mtns	19N	4E	35,SW1/4*
126		Hwy 4, 0.8 mi n turnoff to Dome Lookout	19N	5E	29*
127	127	2 mi S NM Hwy 4 on road to Bland	18N	4E	1,SW1/4
128	283	E Fork Rito de los Frijoles	19N	5E	28*
129	283	E Fork Rito de los Frijoles	19N	5E	28*
130		Redondo Peak, Jemez Mts	19N	3E	*
131		?	?	?	?
132	112	Jemez Mts, near Del Norte Pass	19N	4E	*
133	133	Del Norte Pass	18N	4E	2,NE1/4
134	1	13 mi WSW Los Alamos - Type Locality	18N	4E	3,NE1/4
135	144	S side Valle Grande, 11 mi W, 2 mi S Los Alamos; Jemez Mts	19N	4E	*
136		19 mi S Del Norte Pass, Jemez Crater Area	U	?	?
137	127	2 mi SE S rim Valle Grande	18N	4E	1,SW1/4
138		Jemez Mts, Valle Grande	U	?	?
139	139	0.25 mi S Hwy 4 on Bland Cyn Road	19N	4E	35,SW1/4*
140	139	0.25 mi S Hwy 4 on Bland Cyn Road	19N	4E	35,SW1/4*
141	1	12 mi W, 4 mi S Los Alamos	18N	4E	3,NE1/4
142	1	12 mi W, 4 mi S Los Alamos	18N	4E	3,NE1/4
143	1	12 mi W, 4 mi S Los Alamos	18N	4E	3,NE1/4
144	144	4 mi S, 11 mi W (by road) Los Alamos	19N	4E	*
145	73	Bland Canyon, 10 mi SW Los Alamos	18N	4E	13,middle
146		Jemez Mts, 22 mi E Jemez Springs	18N	4E	3,SW1/4
147	11	Jemez Mts, 27 mi E Jemez Springs	19N	4E	25*
148	1	12 mi W, 4 mi S Los Alamos, Jemez Mts	18N	4E	3,NE1/4
149	39	Jemez Mts, vicinity of UNM Biology Cabin	18N	4E	3,SW1/4
150	112	11.5 mi W & 3.5 mi S Los Alamos	19N	4E	35,SW1/4*
151	1	12 mi W, 4 mi S Los Alamos	18N	4E	3,NE1/4
152	54	1.5 mi towards Bland from Hwy 4	18N	4E	1,NW1/4
153		2.2 mi towards Bland from Hwy 4	18N	4E	12,NW1/4
154	133	1 mi on Bland Rd from Hwy 4, Del Norte Pass	18N	4E	2,NE1/4

MAP NO	Same As No	LOCALITY	T	R	S
155	54	1.5 mi towards Bland from Hwy 4	18N	4E	1,NW1/4
156	39	Jemez Mts, UNM Biology Cabin	18N	4E	3,SW1/4
157		Jemez Mts	U	?	?
158		9 mi N Del Norte Pass, Jemez Mts	20N	4E	*
159	1	SW of Las Alamos, type locality	18N	4E	3,NE1/4
160		Jemez Mts, NW of Santa Fe	U	?	?
161		Pines Canyon, 1.5 mi N Tent Rocks Ranch	18N	5E	7,NW1/4*
162		NW, NE facing slopes of Los Griegos	18N	4E	9*
163	163	N facing slope, head of unnamed cyn just S Oat cyn & Rio Cebolla	20N	2E	25,SW1/4
164	164	N facing slope, head of Hay cyn & Rio Cebolla	20N	2E	24,SE1/4
165		N facing slope, head of cyn between Hay & Pony cyns	20N	2E	24,NE1/4
166	80	N facing slope, head of Pony Cyn & Rio Cebolla	20N	3E	18,SW1/4
167		N facing slope, head of Road cyn & Rio Cebolla	20N	3E	18,middle
168	168	N facing slope, head of Twin Cabins cyn & Rio Cebolla	20N	3E	5,SE1/4
169		Rio Cebolla & Road 144	21N	3E	33,SW1/4
170		N facing slope, 0.25 mi W Apache Springs, upper Frijoles cyn	19N	5E	3,NE1/4*
171		Baca Geothermal site, San Antonio Mtn	20N	3E	22*
172		Baca Geothermal site, Redondo Border	19N	3E	2*
173		Baca Geothermal site, Redondo Peak	19N	4E	18*
174		Alamo Creek, headwaters	18N	5E	5,NW1/4*
175		Paso del Norte	18N	4E	1,NW1/4
176		Canyon del Norte, 1.3 mi S Paso del Norte	18N	4E	12,NW1/4
177	177	Canyon del Norte, 2.6 mi S Paso del Norte	18N	4E	13,NW1/4
178	178	Medio Dia Canyon, at intersection w/ Canyon del Norte	18N	4E	24,SE1/4
179	178	Medio Dia Canyon, at intersection w/ Canyon del Norte	18N	4E	24,SE1/4
180		Medio Dia Canyon, 0.25mi NW intersection w/ Canyon del Norte	18N	4E	24,middle
181		Medio Dia Canyon, at intersection w/ Canyon del Norte	18N	4E	24,SE1/4
182		0.4 mi E Las Conchas Cmpgd, S of Hwy 4	18N	4E	4,SW1/4
183	183	Pony Cyn, 0.25 mi from mouth	20N	3E	18,SE1/4
184	184	Oat Cyn, near mouth	20N	2E	25,NE1/4
185	185	Barley side Cyn, 0.3 mi from mouth, 0.9 mi E Hwy 126 on SR 378	19N	2E	10,SE1/4
186		Barley side Cyn, 0.2 mi from mouth, 0.9 mi E Hwy 126 on SR 378	19N	2E	10,SE1/4
187	168	Twin Cabins Cyn, 0.2 mi SE Rio Cebolla	20N	3E	5,SW1/4
188	80	Pony Cyn, at mouth	20N	3E	18,SW1/4
189	49	NW facing slope above UNM Biology cabin	18N	4E	3,SE1/4
190	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0.2 mi S pipeline rd	20N	5E	34,SW1/4
191	183	Pony Cyn, 0.25 mi from mouth	20N	3E	18,SE1/4
192	177	Canyon del Norte, 2.6 mi S Paso del Norte	18N	4E	13,NW1/4

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
193	168	Twin Cabins Cyn, 0.2 mi SE Rio Cebolla	20N	3E	5,SW1/4
194	90	side cyn off Barley cyn, ca. 2.0 mi E jct w/ Rt 126 & FSR 378	19N	2E	12,NW1/4
195	98	side cyn off Barley cyn, 0.2 mi N, 1.1 mi W jct NM 126 and Rt 144	19N	2E	11,NE1/4
196	184	Oat Cyn, 0.7 mi N, 1.8 mi E State Fish Hatchery	20N	2E	25,NE1/4
197	184	Oat Cyn, 0.7 mi N, 1.8 mi E State Fish Hatchery	20N	2E	25,NE1/4
198	184	Oat Cyn, 0.7 mi N, 1.8 mi E State Fish Hatchery	20N	2E	25,NE1/4
199	184	Oat Cyn, 0.7 mi N, 1.8 mi E State Fish Hatchery	20N	2E	25,NE1/4
200		Copar Pumice Mine, Las Conchas site	18N	4E	5,SW1/4
201		Bonito diversity unit	18N	4E	9,SE1/4*
202		Bonito diversity unit	18N	4E	7,SE1/4*
203	107	Calaveras diversity unit	20N	2E	1,SE1/4
204	80	Pony Cyn, west, 5.4 mi N, 3.6 mi E Fenton Lake	20N	3E	18,SW1/4
205		Medio Dia Cyn, 0.8 mi S intersection w/ Cyn del Norte	18N	4E	25,NE1/4
206	80	Pony Cyn, at bottom of mouth of Cyn, ca 2.4 km NE Seven Springs State Fish Hatchery	20N	3E	18,SW1/4
207	80	Pony Cyn, 5.4 mi N, 3.6 mi E Fenton Lake	20N	3E	18,SW1/4
208	80	Pony Cyn, at bottom of mouth of Cyn, ca 2.4 km NE Seven Springs State Fish Hatchery	20N	3E	18,SW1/4
209		Lower Los Alamos Cyn on Los Alamos Natl. Lab.	19N	6E	16,SE1/4
210	184	Oat Cyn, west end, 3.6 mi N, 3 mi E Fenton Lake	20N	2E	25,NE1/4
211		Pony Cyn, east end, 5.4 mi N, 3.8 mi E Fenton Lake	20N	3E	18,SE1/4
212	80	Pony Cyn, west end, 5.4 mi N, 3.6 mi E Fenton Lake	20N	3E	18,SW1/4
213	80	Pony Cyn, west end, 5.4 mi N, 3.6 mi E Fenton Lake	20N	3E	18,SW1/4
214		Valle de los Posos overlook, at jct pipeline rd & Baca No. 1 location, near Quemazon Cyn	20N	5E	34,SW1/4*
215	185	Barley Cyn ca. 1.6 km (air) SE Seven Springs	19N	2E	10,SE1/4
216	95	Barley Cyn ca. 1.1 mi (air) SE Seven Springs	19N	2E	11,SW1/4
217	90	Barley Cyn ca. 1.55 mi SSE Seven Springs	19N	2E	12,NW1/4
218	90	Barley Cyn ca. 1.55 mi SSE Seven Springs	19N	2E	12,NW1/4
219	98	Barley Cyn ca. 1.45 mi (air) SSE Seven Springs	19N	2E	11,NE1/4
220		Barley Cyn, small side cyn ca. 1.45 mi (air) E Seven Springs	19N	2E	1,SW1/4
221		Barley Cyn, small side cyn ca. 1.45 mi (air) E Seven Springs	19N	2E	1,SW1/4
222	94	ca. 1.0 mi (air) NE Seven Springs	19N	2E	2,NW1/4
223	91	Barley Cyn, ca. 1.65 mi (air) SSE Seven Springs	19N	2E	12,NW1/4
224	97	Barley Cyn, ca. 1.45 mi (air) SE Seven Springs	19N	2E	11,SE1/4
225	225	Camp May rd/ Canada Bonito	19N	5E	11,NW1/4*
226	110	Camp May rd/ Canada Bonito	19N	5E	2,SW1/4*
227	225	Camp May rd/ Canada Bonito	19N	5E	11,NW1/4*
228	110	Camp May rd/ Canada Bonito	19N	5E	2,SW1/4*
229	110	Camp May rd/ Canada Bonito	19N	5E	2,SW1/4*
231	90	Barley Cyn ca. 1.55 mi SSE Seven Springs	19N	2E	12,NW1/4

MAP NO	Same As No	LOCALITY	T	R	S
232	98	Barley Cyn ca. 1.45 mi (air) SSE Seven Springs	19N	2E	11,NE1/4
233	95	Barley Cyn ca. 1.1 mi (air) SE Seven Springs	19N	2E	11,SW1/4
234	185	Barley Cyn ca. 1.6 km (air) SE Seven Springs	19N	2E	10,SE1/4
235	94	ca. 1.0 mi (air) NE Seven Springs	19N	2E	2,NW1/4
236	106	Alamo cyn	18N	5E	9,NW1/4*
237	91	Barley Cyn, ca. 1.65 mi (air) SSE Seven Springs	19N	2E	12,NW1/4
238		Alamo cyn	18N	5E	9,NE1/4*
239	103	0.6 mi from FSR314, 0.5 mi from Calaveras Cyn on St Hwy 126, W side of road	20N	2E	27,SE1/4
240		Alamo cyn	18N	5E	9,NW1/4*
241		Alamo cyn	18N	5E	9,NW1/4*
242		Dome, stand 3360-702	18N	5E	5,SE1/4*
243		Dome, stand 3360-702	18N	5E	5,SE1/4*
244		Dome, stand 3360-702	18N	5E	5,SE1/4*
245	245	Dome, Capulin Cyn stand 3350-0102	18N	5E	9,SE1/4*
246		Cebolla Cyn side drainage, ca. 1.6 mi (air) SW of jct Rio Cebolla and Pipeline rd.	20N	3E	7,SE1/4
247	69	Oat Canyon 100 yds from mouth	20N	2E	25,NE1/4
248	248	Peralta cyn, at the jct cyn & FSR 280, S of rd	18N	4E	10,SW1/4
249	249	Peralta cyn, at the jct cyn & FSR 280, N of rd	18N	4E	10,SW1/4
250		Las Conchas Peak, W side	18N	4E	9,SW1/4
251		Las Conchas Peak, W side	18N	4E	16,NW1/4*
252		1.4 mi SSW Las Conchas cmpgd	18N	4E	17,NE1/4*
253		N side Los Griegos Peak	18N	4E	7,SE1/4*
254		Peralta cyn, NW of the jct cyn & FSR 280	18N	4E	9,SE1/4*
255		Dome, Capulin Cyn stand 3350-0700	18N	5E	15,NW1/4*
256	256	Dome, Capulin Cyn stand 3350-0102	18N	5E	9,SE1/4*
257		Rio Cebolla ca. 0.1 mi N of jct w/ pipeline rd	20N	3E	5,NE1/4
258	258	Dome, stand 3360-702	18N	5E	5,SE1/4*
259	69	Oat Canyon 100 yds from mouth	20N	2E	25,NE1/4
260	69	mouth of Oat Cyn and Rio Cebolla	20N	2E	25,NE1/4
261	261	1.0 mi S jct hwy 4 and FSR 280	18N	4E	3,SE1/4
262	164	mouth of Hay cyn & Rio Cebolla	20N	2E	24,SE1/4
263	80	Pony Cyn, at mouth	20N	3E	18,SW1/4
264		Pony Cyn, 0.3 km E of mouth	20N	3E	17,SW1/4
265		Ice Cave Cyn, ca. 0.3 mi E, 2 mi N rt 132	20N	3E	31,SE1/4
266		Several E-W ravines just S of Pony Cyn & Rio Cebolla	20N	3E	18,19
267	267	Pony Cyn, 0.3 km E of mouth	20N	3E	18,SW1/4
268	267	Pony Cyn, 0.3 km E of mouth	20N	3E	18,SW1/4
269	76	upper Los Alamos cyn, near Camp May	19N	5E	11,NW1/4*

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
270		Los Alamos, Pueblo Canyon near jct Canyon Rd & 15th Street	19N	6E	10,SW1/4
271		Lower Los Alamos Cyn on Los Alamos Natl. Lab.	19N	6E	16,SE1/4
272	69	mouth of Oat Cyn and Rio Cebolla	20N	2E	25,NE1/4
273	69	mouth of Oat Cyn and Rio Cebolla	20N	2E	25,NE1/4
274	69	mouth of Oat Cyn and Rio Cebolla	20N	2E	25,NE1/4
275	69	mouth of Oat Cyn and Rio Cebolla	20N	2E	25,NE1/4
276	163	unnamed cyn S of Oat Cyn	20N	2E	25,SW1/4
277		Water Cyn, at head	19N	5E	35,NE1/4
278		lower Bear Cyn	20N	2E	35,NW1/4
279		Barley Cyn	19N	2E	10,NE1/4
280		Frijoles Creek, W fork, below Hwy 4	19N	5E	*
281	281	Frijoles Creek, E fork, just below Hwy 4, 100yds N of spring	19N	5E	28,SE1/4*
282		Frijoles Creek, W fork, 20 ft from stream	19N	5E	*
283	283	Frijoles Creek, E fork, 2 ft from stream	19N	5E	28,SE1/4*
284	284	Frijoles Creek, E fork, 100 ft N of stream	19N	5E	28.SE1/4*
285		Frijoles Creek, E fork, 100-200ft N of stream	19N	5E	33.SE1/4*
286		San Antonio Peak, 5.2 mi NE Redondo Peak	20N	3E	*
287		unnamed peak, 5.5 mi NNE Redondo Peak	20N	3E	*
288		Redondo Border, 2.5 mi NE Redondo Peak	20N	3E	*
289		E slope of Pajarito Mtn, Sierra de los Valles, S fork Los Alamos Creek	19N	5E	11,SE1/4*
290		E slope of Pajarito Mtn, Sierra de los Valles, S fork Los Alamos Creek	19N	5E	11,SE1/4*
291		E slope of Pajarito Mtn, Sierra de los Valles, S fork Los Alamos Creek	19N	5E	11,SE1/4*
292		E slope of Pajarito Mtn, Sierra de los Valles, S fork Los Alamos Creek	19N	5E	11,SE1/4*
293		E slope of Pajarito Mtn, Sierra de los Valles, S fork Los Alamos Creek	19N	5E	14,NE1/4*
294		E slope of Pajarito Mtn, Sierra de los Valles, S fork Los Alamos Creek	19N	5E	14,NE1/4*
295		E slope of Pajarito Mtn, Sierra de los Valles, S fork Los Alamos Creek	19N	5E	14,NE1/4*
296		Baca Location No. 1, extreme NW corner	21N	3E	33,SE1/4
297		Bandelier Nat'l Monument, just E rd 289, 0.7mi S jct w/ Hwy 4	19N	5E	29,SE1/4*
298		Bandelier Nat'l Monument, Jct E and W forks of Frijoles Creek	19N	5E	33,SE1/4*
299		Bandelier Nat'l Monument, Apache Spring	18N	5E	3,NE1/4*
300		Bandelier Nat'l Monument, Frijoles cyn, 1 mi W of Upper Crossing	18N	5E	2,11,border*
301		Bandelier Nat'l Monument, upper Frijoles cyn, W fork	19N	5E	32,NE1/4
302		Bandelier Nat'l Monument, upper Frijoles cyn, E fork	19N	5E	33,NE1/4
303		Los Alamos Nat'l Lab., area B, trench C	19N	5E	24,NE1/4*
304		Cerro Pavo, SE slopes, stand 1552-20	21N	4E	20,SW1/4*
305		Hwy 4, near American Spring	19N	5E	35,SE1/4*
306		San Antonio Cyn, stand 3084-0801	20N	3E	30,SE1/4
307		San Antonio Cyn, stand 3082-0601	20N	3E	29,N1/2,middle

MAP NO	Same As No	LOCALITY	T	R	S
308		San Antonio Cyn, stand 3084-0104	20N	3E	16,NE1/4
309		San Antonio Cyn, stand 3084-0103	20N	3E	16,NE1/4
310		San Antonio Cyn, stand 3084-0102	20N	3E	16,NE1/4
311		San Antonio Cyn, stand 3084-0202	20N	3E	17,SE1/4
312		Los Alamos	U	?	?
313	53	N facing slope 14 mi WSW Los Alamos	18N	4E	?
314		Santa Clara Cyn, Sta Clara Indian Res., at Baca Location NO. 1 Boundary	20N	5E	*
315	315	Santa Clara Cyn, Sta Clara Indian Res., at Baca Location NO. 1 Boundary	20N	5E	*
316	315	Santa Clara Cyn, Sta Clara Indian Res., at Baca Location NO. 1 Boundary	20N	5E	*
317		Santa Clara Cyn, Sta Clara Indian Res., 2.8 mi SW Ranger Stn	20N	6E	*
318		upper Thompson Ridge, stand 3082-0301	20N	3E	21,SE1/4
319	184	Oat Cyn, near mouth	20N	2E	25,NE1/4
320	184	Oat Cyn, near mouth	20N	2E	25,NE1/4
321	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
322	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
323	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
324	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
325	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
326	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
327	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
328	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
329	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
330	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
331	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
332	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
333	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
334	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
335	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
336	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
337	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
338	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
339	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
340	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
341	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
342	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
343	1	Jemez Mts, ca 19 km W Los Alamos (230M S NM Hwy 4)	18N	4E	3,NE1/4
344	344	Dome, stand 3360-702	18N	5E	5,SE1/4*
345	344	Dome, stand 3360-702	18N	5E	5,SE1/4*

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
346	344	Dome, stand 3360-702	18N	5E	5,SE1/4*
347	344	Dome, stand 3360-702	18N	5E	5,SE1/4*
348	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0.2 mi S pipeline rd	20N	5E	34,SW1/4*
349	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0.2 mi S pipeline rd	20N	5E	34,SW1/4*
350	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0.2 mi S pipeline rd	20N	5E	34,SW1/4*
351	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0.2 mi S pipeline rd	20N	5E	34,SW1/4*
352	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0.2 mi S pipeline rd	20N	5E	34,SW1/4*
353	168	Twin Cabins Cyn, 0.2 mi SE Rio Cebolla	20N	3E	5,SW1/4
354	69	Oat Cyn, near mouth	20N	2E	25,NE1/4
355	69	Oat Cyn, near mouth	20N	2E	25,NE1/4
356		Pine Cyn, upper end	18N	4E	1,SW1/4
357		Capulin Cyn, near 3350-0700	18N	5E	15,NW1/4*
358		Alamo side cyn, near 3350-0700	18N	5E	15,NW1/4*
359	69	Oat Cyn, near mouth	20N	2E	25,NE1/4
360	90	Barley Cyn ca. 1.55 mi SSE Seven Springs	19N	2E	12,NW1/4
361	98	Barley Cyn ca. 1.45 mi (air) SSE Seven Springs	19N	2E	11,NE1/4
362	91	Barley Cyn, ca. 1.65 mi (air) SSE Seven Springs	19N	2E	12,NW1/4
363		ca. 1.0 mi (air) NE Seven Springs	19N	2E	2,NW1/4
364	80	Pony Cyn, west end, 5.4 mi N, 3.6 mi E Fenton Lake	20N	3E	18,SW1/4
365	80	Pony Cyn, west end, 5.4 mi N, 3.6 mi E Fenton Lake	20N	3E	18,SW1/4
366	366	Twin Cabins Cyn	20N	3E	5,SW1/4
367	103	0.6 mi from FSR314, 0.5 mi from Calaveras Cyn on St Hwy 126, W side of road	20N	2E	27,SE1/4
368	368	Dome, stand 3360-702	18N	5E	5,SE1/4*
369	369	Dome, Capulin Cyn stand 3350-0102	18N	5E	9,SE1/4*
370	366	Twin Cabins Cyn	20N	3E	5,SW1/4
371	371	Quemazon Cyn, flat above head of cyn	20N	5E	34,SW1/4*
372		Dome, Alamo cyn near stand 3360-0702	18N	5E	5,SE1/4*
373		Los Alamos Ski Basin Rd (FSR 1), 2.2 mi from jct w/ state hwy 501	19N	5E	13,NW1/4*
374	371	Quemazon Cyn, flat above head of cyn	20N	5E	34,SW1/4*
375		Peralta Cyn, head	18N	4E	10,SW1/4*
376	90	Barley Cyn ca. 1.55 mi SSE Seven Springs	19N	2E	12,NW1/4
377	98	Barley Cyn ca. 1.45 mi (air) SSE Seven Springs	19N	2E	11,NE1/4
378		Bandelier Nat'l Monument, Jct E and W forks of Frijoles Creek	19N	5E	33,SE1/4*
379		Oat Cyn, 0.8 mi SW FSR 144	20N	3E	30,NE1/4
380		Bear cyn, 0.5 mi from mouth near cutting unit 104	20N	2E	35,SW1/4
381		Bear cyn, ca. 0.7 mi from mouth of cyn, unit 106	20N	2E	35,SE1/4
382		flat above Barley side cyn, 0.9 mi E jct hwy 126 and rt 378 & ca 0.4 mi up cyn	19N	2E	10,SE1/4
383	383	Los Griegos, Bonito Timber Sale, upper site	18N	4E	7,SE1/4*

MAP NO	Same As No	LOCALITY	T	R	S
384	384	Los Griegos, Bonito Timber Sale, lower site	18N	4E	7,SE1/4*
385	385	Cochiti Mesa, near Tent Rocks	18N	5E	20,NW1/4
386	386	Canyon del Norte, 2.4 mi S rt 289 on rt 268	18N	4E	12,SW1/4
387		0.4 mi E Las Conchas Cmpgd, S hwy 4	18N	4E	4,SE1/4
388		Cochiti Cyn, near Tent Rocks	18N	5E	20,NW1/4
389		Cochiti Cyn, 1 mi S gate at Tent Rocks	18N	5E	29,NE1/4*
390		near Bland Cyn, 0.5 mi sw gate on 268	18N	4E	36,NE1/4*
391		on rt 144, ca 2 mi S jct w/ rt 453	21N	3E	33,SE1/4
392		Guaje Cyn, 0.4 mi E of reservoir	20N	6E	31,NW1/4
393		Guaje Cyn, 0.9 mi E of reservoir	20N	6E	32,NW1/4
394	394	0.4 mi E Las Conchas Cmpgd, S hwy 4	18N	4E	4,SE1/4,9,NE1/
395	394	0.4 mi E Las Conchas Cmpgd, S hwy 4	18N	4E	4,SE1/4,9,NE1/
396	384	Los Griegos, Bonito Timber Sale, lower site	18N	4E	7,SE1/4*
397	383	Los Griegos, Bonito Timber Sale, upper site	18N	4E	7,SE1/4*
398		Bonito TS, 0.25 mi N, 0.6 mi E Los Griegos Peak	18N	4E	8,SW1/4*
399		SE of jct NM4 and Rt 280	18N	4E	3,NE1/4
400		Bonito TS, jct rt 135 and rt 10	18N	3E	15,NE1/4
401		Oat Cyn, 0.8 mi SW FSR 144	20N	3E	30,NE1/4
402		Bear cyn, ca. 0.7 mi from mouth of cyn, unit 106	20N	2E	35,SE1/4
403	185	Barley side canyon, 0.4 mi N, 1.1 mi E Fenton Lake	19N	2E	10,SE1/4
404		Barley side canyon, 0.3 mi N, 1.2 mi E Fenton Lake	19N	2E	10,SE1/4
405	385	Cochiti Mesa, near Tent Rocks	18N	5E	20,NW1/4
406	386	Canyon del Norte, 2.4 mi S rt 289 on rt 268	18N	4E	12,SW1/4
407		Rito Penas Negras, 0.8 mi S, 0.2 mi E confluence w/ Rito Cafe	21N	2E	35,NW1/4
408		Tusas Timber Sale, NE jct rt 315 & rt 103	21N	2E	23,middle
409		Tusas Timber Sale, 0.6 mi S, 2.4 mi E jct Rt 315 & Rt 103	21N	3E	30,NE1/4
410		Tusas Timber Sale, 2.2 mi S, 2.8 mi E jct Rt 315 & Rt 103	21N	3E	31,32border
411		Barley TS, 1.6 mi N, 1.6 mi E Fenton Lake, 3101-303	19N	2E	2,middle
412		Barley TS, 1.0 mi N jct NM 126 & Rt 144, 3100-401	19N	3E	6,SW1/4
413		Barley TS, 0.4 mi N, 1.2 mi W jct NM 126 & Rt 144, 3100-1604	19N	2E	11,NE1/4
414		Bonito TS, 0.25 mi N, 0.4 mi E Las Conchas Peak	18N	4E	9,SE1/4*
415		Barley TS, 0 2 mi S, 0.7 mi W jct NM 126 & Rt 144, 3451-1101, 1201, 1301	19N	2E	12,SW1/4
416		Barley TS, 0.5 mi N, 1.4 mi W jct NM 126 & Rt 144, 3101-601	19N	2E	2,SE1/4
417		Mesa del Medio	21N	4E	21,S1/2
418		Mesa del Medio	21N	4E	16,NE1/4
419		Mesa del Medio	21N	4E	10,NW1/4
420		Cerro Pavo, N side	21N	4E	17,SW1/4
421	421	Guaje Ridge Trail	20N	6E	31,SW1/4

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
422		S of Valle Grande, near type locality	18N	4E	2,NW1/4
423		Tusas Timber Sale, upper Calaveras Cyn	21N	3E	30,SE1/4
424		Bear cyn, 0.5 mi from mouth near cutting unit 104	20N	2E	35,SW1/4
425		Bear cyn, 0.7 mi from mouth near cutting unit 106	20N	2E	35,SE1/4
426	185	flat above Barley side cyn, 0.9 mi E jct hwy 126 and rt 378 & ca 0.4 mi up cyn	19N	2E	10,SE1/4
427		Medio Dia Cyn, near Evans-Griffin Place	18N	4E	14,NE1/4
428		Medio Dia Cyn, near the head	18N	4E	11,SE1/4
429		Chicoma Peak	21N	5E	26,NE1/4*
430		Polvadera Creek, upper end	21N	5E	29,SE1/4
431		Polvadera Creek, west fork	21N	4E	23,NW1/4*
432		Bear cyn, 0.7 mi from mouth near cutting unit 3101-106	20N	2E	35,SE1/4
433		Bear cyn, 0.5 mi from mouth near cutting unit 3101-104	20N	2E	35,SE1/4
434		Barley TS, side cyn off Cebolla, stand 3071-506	20N	2E	36,NW1/4
435		Barley TS, N fork Bear Cyn, stand 3071-801	20N	3E	31,NW1/4
436		Bonito TS, S of Vallecitos de los Indios	18N	3E	14,NW1/4
437	437	Mesa del Medio, N on Rt. 2810, c.u.32	21N	4E	27,NE1/4
438	438	Mesa del Medio, N on Rt. 2810,c.u.24	21N	4E	22,SE1/4
439		Mesa del Medio, Canoncito Seco, c.u.22	21N	4E	15,SE1/4*
440	440	Mesa del Medio, Canoncito Seco, c.u. 42	21N	4E	26,SE1/4
441		Las Conchas (Copar) pumice mine, NE corner, PL 4 & PL 3	18N	4E	5,SW1/4
442	442	Las Conchas (Copar) pumice mine, N boundary from PL 4 to PL 7	18N	4E	5,SE1/4
443		Las Conchas (Copar) pumice mine, S boundary from PL 1 to PL 11	18N	4E	5,SE1/4
444		Las Conchas (Copar) pumice mine, E & W extended boundaries, PL3,4, PL8,9	18N	4E	5,SW,SE1/4
445		Las Conchas (Copar) pumice mine, N extended boundary, PL4 to PL8	18N	4E	5,SE1/4
446		Vegitas TS, near Lion Springs	22N	1W	1,NE1/4
447		San Pablo TS, unit 17	20N	1E	20,NE1/4
448	437	Mesa del Medio, C.U.32	21N	4E	27,NE1/4
449	440	Mesa del Medio, C.U.42	21N	4E	26,SE1/4
450	438	Mesa del Medio, C.U.24	21N	4E	22,SE1/4
451		Mesa del Medio, C.U.25	21N	4E	21,SE1/4
452		Mesa del Medio, NW of C.U.32	21N	4E	27,NE1/4
453	453	Bonito TS, c.u. 6	18N	4E	8,SW1/4*
454		Bonito TS, c.u. 5	18N	4E	8,SW1/4*
455		Bonito TS, c.u. 1	18N	4E	9,SE1/4*
456		Bonito TS, c.u. 1	18N	4E	9,SE1/4*
457		Calaveras, stand 3030-0101	20N	2E	2,NE1/4
458		Calaveras, stand 3030-0118	20N	2E	2,NW1/4
459		Calaveras, stand 3030-0121	20N	2E	2,SE1/4

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MAP NO	Same As No	LOCALITY	T	R	S
460		Calaveras, stand 3030-0122	20N	2E	2,SE1/4
461		Calaveras, stand 3030-0207	20N	2E	15,SE1/4
462		Calaveras, stand 3040-0110	20N	2E	6,SE1/4
463	184	Oat Cyn, validation site	20N	2E	25,NE1/4
464	97	Barley TS, stand 3100-1206	19N	2E	11,SE1/4
465		Barley TS, stand 3101-603	19N	2E	1,SW1/4
466		Calaveras, just below pumice turn on NM126	20N	2E	22,NW1/4
467		Calaveras cyn, S of NM 126	20N	2E	27,NE1/4
468		Calaveras TS	20N	2E	6,SW1/4
469		Calaveras TS	20N	2E	13,NE1/4
470	107	Calaveras TS	20N	2E	1,SE1/4
471		Calaveras TS, C.U.12	20N	2E	2,NE1/4
472		Calaveras TS	20N	2E	11,NW1/4
473		Virgin Cyn	18N	2E	3,SE1/4*
474		Virgin Cyn	18N	2E	2,NE1/4*
475		Penas Negras	20N	2E	7,SW1/4
476		Penas Negras at jct rt 117, slopes above	20N	2E	3,SE1/4
477		Negras TS, Rock Creek	20N	1E	1,SE1/4
478		Paliza D.U.,Cerro del Pino	18N	3E	27,SE1/4
479		Paliza D.U., slopes above Paliza Cyn	17N	3E	1,NE1/4
480		Paliza D.U., slopes above Paliza Cyn	17N	3E	1,NE1/4
481		Mesa del Medio, c.u.8	22N	4E	35,SE1/4
482		Mesa del Medio, c.u.7	22N	4E	34,SE1/4
483		Mesa del Medio, c.u.6	22N	4E	34,NE1/4
484		Mesa del Medio, c.u.12b & 12c	21N	4E	2,SW1/4*
485		Mesa del Medio, c.u.12a	21N	4E	2,NW1/4*
486		Cerro Pavo	21N	4E	8,NE1/4
487		Cerro Pavo	21N	4E	32,N1/2
488		Dome, Capulin Cyn, above Los Utes Spr	18N	5E	15,SW1/4*
489		Dome, Capulin Cyn	18N	5E	22,SW1/4*
490		Dome, Capulin Cyn	18N	5E	22,SW1/4*
491	103	Calaveras Cyn, Lake Fork D.U.	20N	2E	27,SE1/4
492		Calaveras Cyn, Lake Fork D.U.	20N	2E	27,SE1/4
493		Dome, near Rabbit Hill, N of Frijoles/Bland Trail	18N	5E	15,E1/2*
494		Dome, near Rabbit Hill, S of Frijoles/Bland Trail	18N	5E	14,W1/2*
495		Dome, Alamo Cyn	18N	5E	9,NW1/4*
496		Smokey Bear D.U., near Red Top, Trail TS	20N	1E	27,middle
497		Smokey Bear D.U.,SW of Trail Creek, Trail TS	20N	1E	33,SW1/4

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
498		Negras TS	20N	1E	24,NE1/4
499		Negras TS	20N	1E	19,NW1/4
500		Negras TS	20N	2E	19,SE1/4
501		Ojitos TS	20N	2E	28,SE1/4
502		Ojitos TS	20N	2E	33,NW1/4
503		Ojitos TS	19N	2E	4,SE1/4
504		Ojitos TS	20N	2E	30,SE1/4
505		Calaveras	20N	2E	26,27,NW,NE1/4
506		Bales TS	19N	1E	20,NE1/4*
507		Bales TS	19N	1E	29,SE1/4*
508		Oso TS	21N	5E	22,middle*
509		Oso/Canoncito TS boundary	21N	5E	13,SW1/4
510		Dome, Alamo Cyn	18N	5E	10,SW1/4
511		Dome, Alamo Cyn	18N	5E	15,NE1/4
512		Virgin Cyn	18N	2E	3,SE1/4*
513	513	Dome, flat above Alamo Cyn, c.u. 3360-0702	18N	5E	5,SE1/4*
514		Dome, c.u. 3340-0200	18N	5E	17,NE1/4
515		Bluebird, SE of rt 20	20N	1E	22,SW1/4
516		Rio de las Vacas, NW of jct w/ Trail Creek	20N	1E	2,NW1/4
517		Penas Negras	20N	2E	18,NW1/4
518	103	Lake Fork D.U., Calaveras Cyn, W of NM126	20N	2E	27,SE1/4
519		Bonito TS, c.u.4	18N	4E	17,8 border*
520		Bonito TS, c.u.5	18N	4E	17,NE1/4*
521		Bonito TS, c.u.3	18N	4E	17,NE1/4*
522		Calaveras Cyn, lower end	20N	2E	23,NE1/4
523	453	Bonito TS, c.u.6	18N	4E	8,SW1/4*
524		Rito del Abiquiu, 0.5 mi W jct w/ Rito del Oso	21N	5E	23*
525		Rito del Oso	21N	5E	23*
526		Oso (Espanola) TS, N end	21N	5E	15*
527		Canoncito/Chicoma TS, jct Cienega del Oso rd & rt 144	21N	5E	27,SW1/4*
528		Canoncito/Chicoma TS, 0.25 mijct Cienega del Oso rd & rt 144	21N	5E	27,SW1/4*
529		Bonito TS, c.u.8	18N	4E	7,SW1/4*
530		Bonito TS, c.u.9	18N	4E	7,SE1/4*
531		Bonito TS, c.u.12	18N	4E	6,SE1/4
532		Las Conchas (Copar) Pumice Mine, SW & W end	18N	4E	5,SE1/4
533		Las Conchas (Copar) Pumice Mine, E end	18N	4E	5,SW1/4
534	442	Las Conchas (Copar) Pumice Mine, from E end towards middle	18N	4E	5,SW1/4
535		Dome, Capulin Cyn, stand 3500-0700	18N	5E	15,NW1/4*

MAP NO	Same As No	LOCALITY	T	R	S
536		Bonito TS, c.u.11	18N	4E	7,NE1/4*
537		Bonito TS, c.u.10	18N	4E	7,NE1/4*
538		Bonito TS, c.u.32	18N	3E	1,SE1/4
539		Bonito TS, c.u.16	18N	3E	1,SE1/4
540		Bonito TS, c.u.18	18N	3E	1,SW1/4
541		Bonito TS, c.u.17	18N	4E	6,SW1/4
542	91	Barley TS, c.u.13, stand 3100-1606	19N	2E	12,NW1/4
543		SR 4	19N	5E	34,35*
544		Los Alamos	19N	6E	8
545		Los Alamos	19N	6E	8
546		Los Alamos	19N	6E	8
547		Los Alamos	19N	6E	8
548		Dome, flat above head of Alamo Cyn	18N	5E	5,SE1/4*
549		Los Griegos, stand 319.1-0100	18N	3E	14
550		Los Griegos, stand 319.1-0500	18N	3E	14
551		Los Griegos, stand 319.1-0300	18N	3E	13
552		Los Griegos, stand 319.1-0200	18N	3E	13
553		Los Griegos, stand 319.1-0100	18N	3E	13
554		Los Griegos, stand 319.1-1400	18N	4E	18*
555		Los Griegos, stand 319.1-1500	18N	4E	18
556		Los Griegos, stand 319.1-0400	18N	3E	14
557		Los Griegos, stand 319.1-2200	18N	4E	18*
558		Los Griegos, stand 319.1-2000	18N	4E	18*
559		Los Griegos, stand 319.1-1600	18N	4E	18*
560		Los Griegos, stand 319.1-1900	18N	4E	19*
561		Los Griegos, stand 319.1-2100	18N	4E	18*
562		Los Griegos, stand 319.1-1800	18N	4E	19*
563		Los Griegos, stand 319.1-1700	18N	4E	18*
564		Los Griegos, stand 319.2-0100	18N	3E	13
565		Los Griegos, stand 319.2-0500	18N	3,4E	24,19*
566		Los Griegos, stand 319.2-0400	18N	4E	19*
567		Los Griegos, stand 319.2-0200	18N	4E	19*
568		Los Griegos, stand 319.2-0800	18N	4E	19*
569		Los Griegos, stand 319.2-1000	18N	4E	19*
570		Los Griegos, stand 319.2-0900	18N	4E	19*
571		Los Griegos, stand 319.2-1100	18N	4E	19*
572		Los Griegos, stand 319.2-1300	18N	4E	30*
573		Los Griegos, stand 319.2-1200	18N	4E	30*

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
574		Los Griegos, stand 319.2-0500	18N	4E	19*
575		Los Griegos, stand 319.2-0600	18N	4E	19*
576		Los Griegos, stand 319.2-1500	18N	4E	19*
577		Los Griegos, stand 319.2-0700	18N	4E	19*
578		Jarosa, stand 1372-34	21N	3E	7,18
579		Jarosa, stand 1372-29	21N	3E	18
580		Jarosa, stand 1372-44	21N	3E	18
581		Jarosa, stand 1391-18	21N	3E	18
582		Jarosa, stand 1391-15	21N	3E	18,17
583		Jarosa, stand 1391-16	21N	3E	18
584		Jarosa, stand 1372-45	21N	3E	18
585		Jarosa, stand 1391-12	21N	3E	18
586		Jarosa, stand 1391-13	21N	3E	18
587		Jarosa, stand 1391-11	21N	3E	18
588		Jarosa, stand 1372-42	21N	3E	7
589		Jarosa, stand 1391-6	21N	2,3E	18,7,13,12
590		Jarosa, stand 1391-8	21N	2,3E	18,13
591		Jarosa, stand 1391-4	21N	2E	12,13
592		Jarosa, stand 1391-5	21N	2E	12,13
593		Jarosa, stand 1372-40	21N	3E	7
594		Jarosa, stand 1372-37	21N	3E	7
595		Jarosa, stand 1372-35	21N	3E	7
596		Jarosa, stand 1372-34	21N	3E	7
597		Jarosa, stand 1374-3	21N	3E	7
598		Jarosa, stand 1374-2	21N	2,3E	7,12
599		Jarosa, stand 1374-4	21N	2E	12
600		Jarosa, stand 1374-5	21N	3E	7
601		Jarosa, stand 1374-7	21N	2E	12
602		Jarosa, stand 1374-8	21N	3E	7
603		Jarosa, stand 1374-10	21N	3E	7
604		Jarosa, stand 1374-6	21N	3E	7
605		Jarosa, stand 1372-24	21N	3E	7
606		Jarosa, stand 1372-25	21N	3E	7
607		Jarosa, stand 1374-01	21N	2E	12
608		Jarosa, stand 1372-22	21N	3E	7
609		Jarosa, stand 1372-27	21N	3E	8
610		Jarosa, stand 1372-21	21N	3E	8
611		Jarosa, stand 1372-28	21N	3E	8

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
612		Jarosa, stand 1372-20	21N	3E	8
613		Jarosa, stand 1391-2	21N	2E	13,12
614		Jarosa, stand 1391-9	21N	2E	13
615		Jarosa, stand 1391-22	21N	2E	13
616		Jarosa, stand 1391-33	21N	2E	24
617		Jarosa, stand 1391-23	21N	2E	24,13
618		Jarosa, stand 1391-21	21N	2E	13
619		Jarosa, stand 1391-19	21N	2E	13
620		Jarosa, stand 1391-10	21N	2,3E	13,18
628		Jarosa, stand 1391-28	21N	2E	23
622		Jarosa, stand 1391-25	21N	2E	23
623		Jarosa, stand 1391-29	21N	2E	24
624		Jarosa, stand 1391-32	21N	2E	24
625		Jarosa, stand 1391-36	21N	3E	19
626		Jarosa, stand 1391-37	21N	3E	19
627		Jarosa, stand 1391-38	21N	3E	19
628		Jarosa, stand 1391-27	21N	2E	23
629		Jarosa, stand 1391-29	21N	2E	24
630		Jarosa, stand 1391-30	21N	2E	24
631		Jarosa, stand 1391-31	21N	2E	24
632		Jarosa, stand 1391-35	21N	2E	24
633		Jarosa, stand 1391-34	21N	2E	24
634		Jarosa, stand 1391-18	21N	2E	24
635		Basin, stand 3084-0404	20N	3E	29
636		Basin, stand 3084-0702	20N	3E	29
637		Basin, stand 3084-0701	20N	3E	29
638		Basin, stand 3084-0600	20N	3E	30
640		Basin, stand 3084-0502	20N	3E	29
641		Basin, stand 3084-0501	20N	3E	29
642		Basin, stand 3084-1030	20N	3E	30
643		Basin, stand 3081-0100	20N	3E	32
644		Basin, stand 3081-0200	20N	3E	31,32
645		Basin, stand 3081-0300	19,2	3E	31,6,5
646		Basin, stand 3081-0401	19,2	3E	31,6
647		Basin, stand 3081-0402	19N	3E	5,6
648		Basin, stand 3081-0403	19N	3E	6
649		Basin, stand 3081-0404	19N	3E	5
650		Basin, stand 3081-0901	19N	3E	5

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
651		Basin, stand 3081-0902	19N	3E	5
652		Basin, stand 3081-1003	19N	3E	5,8
653		Basin, stand 3081-1002	19N	3E	5
654		Basin, stand 3081-0403	19N	3E	6
655		Basin, stand 3081-1001	19N	3E	6,7
656		Basin, stand 3081-0802	19N	3E	7
657		Basin, stand 3081-0601	19,2	3E	31,6
658		Basin, stand 3081-0602	19N	3E	6
659		Basin, stand 3081-0502	19N	3E	6
660		Basin, stand 3081-0603	19N	3E	6
661		Basin, stand 3081-0501	19N	3E	6
662		Basin, stand 3081-0701	19N	3E	6
663		Basin, stand 3081-0702	19N	3E	6,7
664		Basin, stand 3081-0801	19N	3E	7
665		Basin, stand 3081-1203	19N	3E	18
666		Basin, stand 3081-1201	19N	3E	7
667		Basin, stand 3081-1202	19N	3E	7
668		Basin, stand 3081-0703	19N	3E	7
669		Basin, stand 3081-1101	19N	3E	8
670		Basin, stand 3081-1103	19N	3E	8
671		Basin, stand 3081-1102	19N	3E	8
672		Basin, stand 3082-0907	20N	3E	32,33
673		Basin, stand 3082-0906	20N	3E	33
674		Basin, stand 3082-0905	20N	3E	33
675		Basin, stand 3082-0902	20N	3E	33
676		Basin, stand 3082-0901	20N	3E	33
677		Basin, stand 3082-0801	20N	3E	28
678		Basin, stand 3082-0902	20N	3E	28,33?
679		Basin, stand 3082-0908	20N	3E	33
680		Basin, stand 3084-0802	20N	3E	31
681		Basin, stand 3084-0803	20N	3E	31
682		Basin, stand 3084-0901	20N	3E	32
683		Basin, stand 3084-0902	20N	3E	32
684		Basin, stand 3082-1003	20N	3E	29,32
685		Basin, stand 3082-1102	20N	3E	32
686		Basin, stand 3082-1004	20N	3E	32
687		Basin, stand 3082-1101	20N	3E	32
688		Basin, stand 3082-1006	20N	3E	32

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
689		Basin, stand 3082-1001	20N	3E	29
690		Basin, stand 3082-1002	20N	3E	29
691		Basin, stand 3082-0602	20N	3E	29
692		Basin, stand 3082-0705	20N	3E	29
693		Basin, stand 3082-0503	20N	3E	20
694		Basin, stand 3082-0502	20N	3E	20
695		Basin, stand 3082-0303	20N	3E	20
696		Basin, stand 3082-1003	20N	3E	29,32
697		Basin, stand 3082-0303	20N	3E	21,20
698		Basin, stand 3082-0501	20N	3E	21
699		Basin, stand 3082-0302	20N	3E	21
700		Basin, stand 3082-0400	20N	3E	21
701		Basin, stand 3082-0201	20N	3E	21
702		Basin, stand 3082-0202	20N	3E	21
703		Basin, stand 3082-1103	20N	3E	21
704		Basin, stand 3082-0100	20N	3E	21
705		Basin, stand 3084-0403	20N	3E	21
706		Basin, stand 3084-0402	20N	3E	21,16
707		Basin, stand 3084-0401	20N	3E	21,16
708		Basin, stand 3084-1100	20N	3E	16
709		Basin, stand 3084-0300	20N	3E	16
710		Basin, stand 3082-1005	20N	3E	32
711		Basin, stand 3082-0703	20N	3E	32
712		Basin, stand 3082-0904	20N	3E	33
713		Basin, stand 3082-0902	20N	3E	28
714		Basin, stand 3082-0802	20N	3E	28
715		Basin, stand 3082-0801	20N	3E	28
716		Basin, stand 3082-0701	20N	3E	28
717		Basin, stand 3082-0702	20N	3E	28
718		Basin, stand 3082-0703	20N	3E	29
719		Basin, stand 3082-0704	20N	3E	29
720		Basin, stand 3083-0102	20N	3E	32
721		Basin, stand 3083-0201	20N	3E	32
722		Basin, stand 3083-0101	20N	3E	32
723		Basin, stand 3083-0103	20N	3E	33
724		Basin, stand 3083-0300	19N	3E	4
725		Basin, stand 3083-0104	20N	3E	33
726		Basin, stand 3083-0601	19N	3E	4

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
727		Basin, stand 3083-0602	19N	3E	4
728		Basin, stand 3083-0406	19N	3E	4
729		Basin, stand 3083-0401	19N	3E	4
730		Basin, stand 3083-0201	20N	3E	32
731		Basin, stand 3083-0202	20N	3E	32
732		Basin, stand 3083-0203	20N	3E	32
733		Basin, stand 3083-1000	19N	3E	5
734		Basin, stand 3083-0203	19N	3E	5
735		Basin, stand 3083-0501	19N	3E	5
736		Basin, stand 3083-0502	19N	3E	5
737		Basin, stand 3083-0405	19N	3E	5
738		Basin, stand 3083-0701	19N	3E	5
739		Basin, stand 3083-0801	19N	3E	8
740		Basin, stand 3083-0702	19N	3E	9
741		Basin, stand 3083-0402	19N	3E	4
742		Basin, stand 3083-0403	19N	3E	4
743		Basin, stand 3083-0603	19N	3E	9
744		Basin, stand 3083-0404	19N	3E	9
745		Basin, stand 3083-0604	19N	3E	9
746		Basin, stand 3083-0605	19N	3E	16,9
747		Basin, stand 3083-2000	19N	3E	16
748		Basin, stand 3083-0802	19N	3E	8
749		Basin, stand 3083-0803	19N	3E	8
750		Basin, stand 3083-0705	19N	3E	8
751		Basin, stand 3083-0707	19N	3E	17
752		Basin, stand 3083-0706	19N	3E	17
753		Basin, stand 3083-0704	19N	3E	17
754		Basin, stand 3083-0703	19N	3E	17
755		Basin, stand 3084-0101	20N	3E	16
756		Basin, stand 3084-0201	20N	3E	16,17
757		Cerro Pavo, stand 1551-28	21N	4E	29
758	758	Cerro Pavo, stand 1551-23	21N	4E	29
759		Cerro Pavo, stand 1551-22	21N	4E	29
760		Cerro Pavo, stand 1551-20	21N	4E	32
761		Cerro Pavo, stand 1551-24	21N	4E	29
762	762	Cerro Pavo, stand 1551-25	21N	4E	29
763	763	Cerro Pavo, stand 1551-26	21N	4E	29
764		Cerro Pavo, stand 1551-27	21N	4E	29

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
765		Cerro Pavo, stand 1551-18	21N	4E	32
766	766	Cerro Pavo, stand 1551-14	21N	4E	30
767		Cerro Pavo, stand 1551-16	21N	4E	30,31
768		Cerro Pavo, stand 1551-21	21N	4E	32
769	769	Cerro Pavo, stand 1551-15	21N	4E	30
770		Cerro Pavo, stand 1552-9	21N	4E	7
771		Cerro Pavo, stand 1552-10	21N	4E	18
772		Cerro Pavo, stand 1552-11	21N	4E	18
773		Cerro Pavo, stand 1552-16	21N	4E	18
774		Cerro Pavo, stand 1552-15	21N	4E	19
775		Cerro Pavo, stand 1552-17	21N	4E	19
776		Cerro Pavo, stand 1552-19	21N	4E	19
777		Cerro Pavo, stand 1552-21	21N	4E	20
778		Cerro Pavo, stand 1552-18	21N	4E	19
779		Cerro Pavo, stand 1551-17	21N	4E	31
780		Cerro Pavo, stand 1551-6	21N	3E	25
781		Cerro Pavo, stand 1551-8	21N	4E	30
782		Cerro Pavo, stand 1551-5	21N	3E	25
783		Cerro Pavo, stand 1551-2	21N	3E	24,25
784		Cerro Pavo, stand 1551-1	21N	3E	24
785		Cerro Pavo, stand 1551-3	21N	3E	25,26
786		Cerro Pavo, stand 1551-16	21N	4E	31
787		Cerro Pavo, stand 1551-4	21N	3E	25
788		Cerro Pavo, stand 1552-12	21N	4E	18
789	789	Cerro Pavo, stand 1552-13	21N	4E	18
790	790	Cerro Pavo, stand 1552-14	21N	4E	18
791		Cerro Pavo, stand 1552-22	21N	4E	20
792		Cerro Pavo, stand 1551-9	21N	4E	19
793		Cerro Pavo, stand 1551-10	21N	4E	19
794		Cerro Pavo, stand 1551-11	21N	4E	19
795		Cerro Pavo, stand 1551-13	21N	4E	30
796		Cerro Pavo, stand 1551-7	21N	4E	19
797	766	Cerro Pavo, stand 1551-14	21N	4E	30
798	769	Cerro Pavo, stand 1551-15	21N	4E	30
799		Cerro Pavo, stand 1551-12	21N	4E	30,12
800	758	Cerro Pavo, stand 1551-23	21N	4E	29
801		Cerro Pavo, stand 1551-24	21N	4E	29
802	762	Cerro Pavo, stand 1551-25	21N	4E	29

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
803		Cerro Pavo, stand 1551-27	21N	4E	29
804	763	Cerro Pavo, stand 1551-26	21N	4E	29
805		Cerro Pavo, stand 1512-13	21N	4E	6
806		Cerro Pavo, stand 1512-16	21N	4E	6
807		Cerro Pavo, stand 1512-18	21N	4E	6
808		Cerro Pavo, stand 1512-17	21N	4E	6
809		Cerro Pavo, stand 1520-13	22N	4E	32
810		Cerro Pavo, stand 1520-9	21N	4E	5
811		Cerro Pavo, stand 1520-19	21N	4E	5
812		Cerro Pavo, stand 1520-20	21N	4E	5
813	789	Cerro Pavo, stand 1552-13	21N	4E	18
814	790	Cerro Pavo, stand 1552-14	21N	4E	18
815		Cerro Pavo, stand 1552-1	21N	4E	8
816		Cerro Pavo, stand 1552-2	21N	4E	8
817		Cerro Pavo, stand 1552-3	21N	4E	8
818		Cerro Pavo, stand 1552-4	21N	4E	8
819		Cerro Pavo, stand 1552-5	21N	4E	8
820		Cerro Pavo, stand 1552-6	21N	4E	17
821		Cerro Pavo, stand 1552-7	21N	4E	17
822		Cerro Pavo, stand 1552-8	21N	4E	7
823		Cerro Pavo, stand 1511-13	21N	3E	1
824		Cerro Pavo, stand 1511-14	21N	3E	1
825		Cerro Pavo, stand 1511-11	21N	3E	1
826		Cerro Pavo, stand 1511-12	21N	3E	1
827		Cerro Pavo, stand 1511-9	21N	3E	1
828		Cerro Pavo, stand 1511-10	21N	3E	1
829		Cerro Pavo, stand 1511-15	21N	3E	1
830		Cerro Pavo, stand 1511-2	21N	3E	1
831		Cerro Pavo, stand 1511-8	21N	3E	1
832		Cerro Pavo, stand 1513-27	21N	4E	19
833		Cerro Pavo, stand 1513-26	21N	4E	19
834		Cerro Pavo, stand 1513-25	21N	4E	19
835		Cerro Pavo, stand 1513-28	21N	4E	19
836		Cerro Pavo, stand 1513-22	21N	4E	18
837		Cerro Pavo, stand 1513-23	21N	4E	18
838		Cerro Pavo, stand 1513-24	21N	4E	18
839		Cerro Pavo, stand 1512-22	21N	4E	6
840		Cerro Pavo, stand 1512-21	21N	4E	6

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
841		Cerro Pavo, stand 1512-23	21N	4E	6
842		Cerro Pavo, stand 1520-16	21N	4E	4
843		Cerro Pavo, stand 1520-17	21N	4E	4
844		Cerro Pavo, stand 1520-15	21N	4E	4
845		Cerro Pavo, stand 1520-18	21N	4E	4
846		Cerro Pavo, stand 1520-22	21N	4E	4
847		Cerro Pavo, stand 1520-23	21N	4E	9
848		Cerro Pavo, stand 1520-21	21N	4E	4
849		Cerro Pavo, stand 1512-26	21N	4E	7
.850		Cerro Pavo, stand 1512-27	21N	3E	12
851		Cerro Pavo, stand 1512-24	21N	3E	12
852		Cerro Pavo, stand 1512-25	21N	3E	12
853		Cerro Pavo, stand 1512-32	21N	3E	13
854		Cerro Pavo, stand 1512-31	21N	3E	12
855		Cerro Pavo, stand 1512-28	21N	3E	12
856		Cerro Pavo, stand 1512-29	21N	3E	12
857		Cerro Pavo, stand 1512-30	21N	3E	12
858		Cerro Pavo, stand 1513-18	21N	3E	13
859		Cerro Pavo, stand 1513-19	21N	3E	13
860		Cerro Pavo, stand 1513-20	21N	3E	13
861		Cerro Pavo, stand 1513-21	21N	3E	13
862		Cerro Pavo, stand 1513-2	21N	3E	13
863		Cerro Pavo, stand 1513-12	21N	3E	13
864		Cerro Pavo, stand 1513-17	21N	3E	13
865		Cerro Pavo, stand 1513-15	21N	3E	13
866		Cerro Pavo, stand 1513-16	21N	3E	13
867		Cerro Pavo, stand 1513-14	21N	3E	13
868		Cerro Pavo, stand 1513-13	21N	3E	13
869		Cerro Pavo, stand 1513-11	21N	3E	13
870		Cerro Pavo, stand 1513-10	21N	3E	13,14
871		Cerro Pavo, stand 1551-3	21N	3E	25
872		Cerro Pavo, stand 1513-1	21N	3E	12
873		ca 0.5 mi E Apache Spr Trailhead S of NM 4, UTM 3966,000N,376,600E	19N	5E	36,SW1/4*
874	874	Frijoles Cyn, head, UTM 3968,350N, 372,500E	19N	5E	28,NE1/4*
875		Bandelier, W of NM 4, UTM 3967N, 373E	19N	5E	34,NW1/4*
876		Bandelier, upper slopes of Scooter Peak	19N	5E	*
877		Bandelier, upper Frijoles cyn, UTM 3,964,800N,372,400E	18N	5E	4*
878		Bandelier, upper Frijoles cyn, UTM 3,964,200N,373,400E	18N	5E	3,SW1/4*

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
879	879	Frijoles Cyn, at head just S NM 4	19N	5E	28,NE1/4*
880		Bandelier, Frijoles Cyn at Upper Crossing	18N	5E	1,SE1/4*
881		Bandelier, Frijoles Cyn upper W fork	19N	5E	*
882		Bandelier, Frijoles Cyn upper E fork	19N	5E	*
883		Barley TS, C.u. 33	19N	2E	2,NW1/4
884	97	Barley TS, C.u. 6	19N	2E	11,SE1/4
885		Basin TS, Thompson Ridge	20N	3E	21,SW1/4
886	886	S of Valle Grande, rt 280	18N	4E	10,NE1/4*
887		NW of Baca Location No.1	21N	3E	28,SE1/4
888		NW of Baca Location No.1	21N	3E	28,SE1/4
889		Ice Caves Cyn	20N	3E	32,SW1/4
890		Ice Caves Cyn	20N	3E	32,SW1/4
891	891	Pines Cyn, head	18N	4E	1,NW1/4
892	891	Pines Cyn, head	18N	4E	1,NW1/4
893		Cebollita Mesa, 0.9 mi E jct rt 376 & rt 604 on 604	19N	3E	19*
894		Bonito TS	18N	3E	1,S1/2
895		Bonito TS	18N	3E	1,S1/2
896		Bonito TS	18N	3E	1,S1/2
897		Bonito TS	18N	3E	1,SE1/4
898		Bonito TS	18N	3,4E	1,6,7
899	97	Barley, c.u.6	19N	2E	11,SE1/4
900		Oat Cyn, 0.9 mi W jct rt 144 & 380 along 380	20N	3E	30,NW1/4
901		Twin Cabins & Rio Cebolla, head	20N	3E	5,SE1/4
902		Calaveras Cyn, 2.6 mi W jct rt 144 & Pipeline rd	20N	2E	1
903		Moon Cyn, jct NM 126 & 117 on 117	20N	2E	20,NE1.4
904		Barley, mouth of unnamed cyn between Pony & Hay cyns	20N	2E	24,NE1/4
905		Calaveras Cyn,	20N	2E	14,SW1/4
906		Calaveras Cyn,	20N	2E	23
907		Road Cyn, jct rt 381 & 144 on 144	20N	3E	8,SW1/4
908		Road Cyn, 0.5 km E jct rt 381 & 144 on 144	20N	3E	17,NE1/4
909		Bear Cyn, 1 mi W rt 144	20N	2E	35,middle
910		Barley Cyn, 1 mi E jct NM 126 & rt 378 along 378	19n	2E	10,SE1/4
911		Barley Cyn, 0.3 km W jct rt 144 & 378 along 378	19n	2E	1,SE1/4
912		Ice Cave Cyn, ca 0.5 mi E, 2 mi N rt 132	20n	3E	31,SE1/4
913		Peralta Cyn	18N	4E	21,SE1/4*
914		Jemez River, East Fork	18N	4E	5,N1/2
915	267	Pony Cyn, 0.3 km E mouth	20N	3E	18,SW1/4
916		Los Alamos Cyn, upper, near Camp May	19N	5E	11,NW1/4*

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
917		Los Alamos Cyn, upper, jct w/ Canada Bonito	19N	5E	11*
918		Pueblo Cyn, Jct 15th St & Canyon Rd	19N	6E	10,SW1/4
919		Pueblo Cyn, Jct 15th St & Canyon Rd	19N	6E	10,SW1/4
920		Canon del Norte, off rt 268	18N	4E	1,NW1/4
921	886	S of Valle Grande, ca 1 mi S Las Conchas Cmpgd off rt 280	18N	4E	10,NE1/4*
922	922	Mortandad Cyn, LANL	19N	6E	21,22border
923	922	Mortandad Cyn, LANL	19N	6E	21,22border
924	922	Mortandad Cyn, LANL	19N	6E	21,22border
925		Sandia Cyn, middle, LANL	19N	6E	22,NW1/4
926		Los Alamos Cyn, near Diamond Dr bridge overpass, LANL	19N	6E	16,NW1/4
927		Pueblo Cyn, middle	19N	6E	9,SE1/4
928		Pueblo Cyn, along Cyn Rd, ca 0.5 mi W 15th St	19N	6E	10,SW1/4
929		Water Cyn, just W LANL boundary	19N	5E	36,SE1/4*
930		Los Alamos Cyn, ca 2 mi E Diamond Dr bridge overpass, LANL	19N	6E	15,SE1/4
931		Los Alamos Cyn, ca 2 mi E Diamond Dr bridge overpass, LANL	19N	6E	15,SE1/4
932		Los Alamos Cyn, ca 1 mi E Diamond Dr bridge overpass, LANL	19N	6E	16,SE1/4
933		Los Alamos Cyn, ca 1 mi E Diamond Dr bridge overpass, LANL	19N	6E	16,SE1/4
934	934	Los Alamos Cyn, ca 0.4 mi E Diamond Dr bridge overpass, LANL	19N	6E	16,SW1/4
935	934	Los Alamos Cyn, ca 0.4 mi E Diamond Dr bridge overpass, LANL	19N	6E	16,SW1/4
936	936	Water Cyn, E of W Jemez Rd	19N	5E	36,E1/2*
937	936	Water Cyn, E of W Jemez Rd	19N	5E	36,E1/2*
938	936	Water Cyn, E of W Jemez Rd	19N	5E	36,E1/2*
939		S of Valle Grande, ca 1.5 mi SE Las Conchas Cmpgd off rt 280	18N	4E	10*
940	940	Two-Mile Cyn, upper, LANL	19N	6E	20,NE1/4
941	940	Two-Mile Cyn, upper, LANL	19N	6E	20,NE1/4
942		Valle Cyn, LANL	19N	6E	29,SE1/4*
943		Pajarito Cyn, upper end, LANL	19N	6E	29,N 1/2*
944		Fenton Hill, cyn behind LANL Geothermal Site	19n	2E	13
945	69	Oat Cyn, mouth	20N	2E	25,NE1/4
946		Pueblo Cyn, head	19N	5E	12,NE1/4*
947		Ice Cave Cyn, ca 0.3 mi E, 2 mi N rt 132	20N	3E	31,SE1/4
948		San Pedro Parks Wilderness, E of Los Pinos Trail	22N	1E	31,N1/2
949		San Gregorio Reservoir, San Pedro Parks Wilderness	21N	1E	20, unsurveyed
950		Calaveras Cyn, upper	21N	2E	35,SE,36,SW1/4
951		Jemez Falls	18N	3E	10,NE1/4
952		Guaje Reservoir	20N	6E	31,N1/2
953		near Rio Cebolla, W of Baca boundary	21N	3E	33,NE1/4
954		Jemez River, East Fork	18N	4E	5,middle

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
955		Baca, 5 mi N hwy 4 up Redondo Creek	19N	3E	*
956		Baca, 5.5 mi N hwy 4 up Redondo Creek	19N	3E	*
957		Baca, 6.8 road miles from 7-roads crossing up Redondo Peak	19N	4E	*
958		Baca, 2.0 road miles from 7-roads crossing up Redondo Peak	19N	4E	*
959		Baca, 1.5 road miles from 7-roads crossing up Redondo Peak	19N	4E	*
960		Baca, 0.9 road miles from 7-roads crossing up Redondo Peak	19N	4E	*
961		Santa Clara, 1.0 mi S pond 3 in side cyn	20N	5E	*
962		Santa Clara, 0.8 mi S pond 3 in side cyn	20N	5E	*
963		Santa Clara cyn	20N	5E	*
964		Santa Clara cyn	20N	6E	*
965		Ayers Curve East	19N	5E	28,NE1/4
966		MC-A	19N	5E	28,NE1/4
967		Pitfall Line MC-E	19N	5E	34,NW1/4NW1/4
968	371	Quemazon cyn, flat above head of cyn	20N	5E	34,SW1/4
969	371	Quemazon cyn, flat above head of cyn	20N	5E	34,SW1/4
970	371	Quemazon cyn, flat above head of cyn	20N	5E	34,SW1/4
971	82	Posos	20N	5E	34,SW1/4*
972	82	Posos	20N	5E	34,SW1/4*
973	82	Posos	20N	5E	34,SW1/4*
974	344	Dome, stand 3360-702	18N	5E	5,SE1/4*
975	344	Dome, stand 3360-702	18N	5E	5,SE1/4*
976	344	Dome, stand 3360-702	18N	5E	5,SE1/4*
977	977	Dome, stand 3360-702	18N	5E	5,SE1/4*
978	977	Dome, stand 3360-702	18N	5E	5,SE1/4*
979	977	Dome, stand 3360-702	18N	5E	5,SE1/4*
980	977	Dome, stand 3360-702	18N	5E	5,SE1/4*
981		Dome, near stand 3360-702	18N	5E	5,SE1/4*
982	196	Oat Cyn, 0.7 mi N, 1.8 mi E State Fish Hatchery	20N	2E	25,NE1/4
983	98	Barley Cyn ca. 1.45 mi (air) SSE Seven Springs	19N	2E	11,NE1/4
984	95	Barley Cyn ca. 1.1 mi (air) SE Seven Springs	19N	2E	11,SW1/4
985	90	Barley Cyn ca. 1.55 mi SSE Seven Springs	19N	2E	12,NW1/4
986	91	Barley Cyn, ca. 1.65 mi (air) SSE Seven Springs	19N	2E	12,NW1/4
987		N. of FSR 144	21N	6E	26,W Center
988		N. of FSR 144, Gallina Creek	21N	6E	21,SW1/4
989		N. of FSR 144, Chihuahuenos Creek Canyon	21N	4E	21,NE1/4
990	248	FR 280, 2.2 mi from Hwy 4	18N	4E	10,SW1/4
991	261	FR 280, 1.3 mi from Hwy 4, NW slope	18N	4E	3,SE1/4
992	248	FR 280, 2.2 mi from Hwy 4, SW slope	18N	4E	10,SW1/4

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
993	248	FR 280, 2.2 mi from Hwy 4, SW slope	18N	4E	10,SW1/4
994	248	FR 280, 2.2 mi from Hwy 4, NW slope	18N	4E	10,SW1/4
995	258	Dome activity plot site	18N	5E	5,SE1/4*
996	258	Dome activity plot site	18N	5E	5,SE1/4*
997		Oat Canyon, NW & SW slopes	20N	2E	25,NE1/4
998	998	Oat Canyon, NNE slope & flats	20N	3E	30,NW1/4
999	998	Oat Canyon, NNE slope & flats	20N	3E	30, NW1/4
1000	998	Oat Canyon, NNE slope & flats	20N	3E	30, NW1/4
1001	998	Oat Canyon, NNE slope & flats	20N	3E	30, NW1/4
1002	256	FR 288, 1.4 mi from FR 289	18N	5E	9,SE1/4*
1003	245	FR 288, 0.9-1.1 mi from FR 289	18N	5E	9,SE1/4*
1004		FR 287, 2.1 mi from FR 289, SE slope	18N	5E	9, NE1/4
1005		FR 287, 2.0 mi from FR 289, flats	18N	5E	4,SW1/4
1006	1006	FR 287, 1.7 mi from FR 289, flats	18N	5E	5,NE 1/4
1007	1005	FR 287, 2.0 mi from FR 289, flats	18N	5E	4,SW1/4
1008	1006	FR 287, 1.7 mi from FR 289, flats	18N	5E	5,NE 1/4
1009	1009	FR 287, 1.4 mi from FR 289, flats	18N	5E	4,SW1/4
1010	1009	FR 287, 1.4 mi from FR 289, flats	18N	5E	4,SW1/4
1011	184	Oat Cyn, near mouth	20N	2E	25,NE1/4
1012		Rabbit Hill "A" on stand 3350-0009 and 0011	18N	5E	14*
1013		Rabbit Hill "B"	18N	5E	14*
1014		Rabbit Hill "C"	18N	5E	14*
1015	513	Dome, Alamo Cyn & c.u. 3360-0702	18N	5E	5,SE1/4*
1016	368	Dome, stand 3360-702	18N	5E	5,SE1/4*
1017		Alamo Spring	18N	5E	5,
1018		Alamo South	18N	5E	5,
1019	513	Dome, flat above Alamo Cyn, c.u. 3360-0702	18N	5E	5,SE1/4*
1020		Rabbit Hill	18N	5E	15,SE1/4
1021		142/Sandy Salvage Mt.	18N	5E	22
1022		North Lower Capulin #1	18N	5E	23,NW1/4
1023		North Lower Capulin #2	18N	5E	23,NW1/4
1024		North Lower Capulin #3	18N	5E	14,SW1/4
1025		Dome DU Stand 3350-0032	18N	5E	8
1026		Dome DU Stand 3350-0032	18N	5E	8,NE1/4
1027		Dome DU Stand 3350-0032	18N	5E	9,NW1/4
1028		Dome DU Stand 3350-0032	18N	5E	9
1029		Dome DU Stand 3350-0005	18N	5E	9,SW1/4
1030		Dome DU Stand 3350-0005	18N	5E	9

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	LOCALITY	T	R	S
1031		Dome DU Stand 3350-0004	18N	5E	9,W
1032		Upper Capulin #1	18N	5E	15,SW1/4
1033		Upper Capulin #2	18N	5E	15,SW1/4
1034		Dome Salvage Unit #1	18N	5E	26,NW1/4
1035		Dome Salvage Unit #2	18N	5E	26,NW1/4
1036		Lower Capulin #1	18N	5E	23,SW1/4
1037		Lower Capulin #2	18N	5E	23,SW1/4
1038		Lower Capulin #3	18N	5E	23,SW1/4
1039		Upper Capulin #1	18N	5E	15,NW1/4
1040		Upper Capulin #2	18N	5E	15
1041		289 Salvage Unit #1	18N	5E	16
1042		289 Salvage Unit #2	18N	5E	16
1043		289 Salvage Unit #3	18N	5E	16
1044	196	Oat Cyn, 0.7 mi N, 1.8 mi E State Fish Hatchery	20N	2E	25,NE1/4
1045	258	Dome activity plot site	18N	5E	5,SE1/4*
1046		W of Seven Springs	19N	2E	3,SW1/4
1047		W of Seven Springs	19N	2E	3,SW1/4
1048		Alamo South # 6 3350-0100	18N	5E	9
1049		Baletas Salvage Unit 3380-0005	18N	5E	34,NW1/4
1050		Baletas	18N	5E	34,NW1/4
1051		Baletas	18N	5E	34,NW1/4
1052		Alamo South 3350-0031	18N	5E	5,SE1/4
1053		Alamo South 3350-0032	18N	5E	5
1054		Alamo South 3350-0032	18N	5E	9
1055		Alamo South 3350-0032	18N	5E	?
1056	256	Alamo South	18N	5E	9,SE
1057		126 road	19N	2E	3,middle
1058		Horseshoe Spring #2	19N	3E	18, NE1/4
1059		Horseshoe Spring #1	19N	3E	18, NE1/4
1060		Horseshoe Spring #3	19N	3E	18, NE1/4
1061		Horseshoe Spring #4	19N	3E	18, NE1/4
1062		Alamo South #6	18N	5E	9
1063		Dome, Capulin Cyn stand 3350-0102	18N	5E	9,SE1/4*
1064	69	Oat Cyn, validation site	20N	2E	25,NE1/4
1065	412	Barley TS, 1.0 mi N jct NM 126 & Rt 144, 3100-401	19N	3E	6,SW1/4
1066	95	3.5 mi WNW La Cueva, side cyn off Barley cyn	19N	2E	11,SW1/4
1067	90	side cyn off Barley cyn, ca. 2.0 mi E jct w/ Rt 126 & FSR 378	19N	2E	12,NW1/4
1068		Barley TS, 0.4 mi N, 1.2 mi W jct NM 126 & Rt 144, 3100-1604	19N	2E	11,NE1/4

MAP NO	Same As No	LOCALITY	T	R	S
1069	379	Oat Cyn, 0.8 mi SW FSR 144	20N	3E	30,NE1/4
1070	513	Dome, flat above Alamo Cyn, c.u. 3360-0702	18N	5E	5,SE1/4*
1071	421	Guaje Ridge Trail	20N	6E	31,SW1/4
1072	977	Dome, stand 3360-702	18N	5E	5,SE1/4*
1073	84	Guaje Cyn, 1/4 mi E pipeline rd on Guaje Ridge Trail	20N	5E	36,SW1/4*
1084	8	12 mi W, 4 mi S of Los Alamos	18N	4E	3,NE1/4
1074		Ca 500ft SE of American Spring	19N	5E	35, NW1/4
1075		Ca 500ft S of Armstead Spring	19N	5E	26, SW1/4
1076		Ca 0.75 air mi NW of Armstead Spring on W side of Water Canyon	19N	5E	27, NE1/4
1077		ca 1.15 air mi N of Armstead Spring on North-facing slope of Canon Valle	19N	5E	23, SW1/4
1078		ca 0.5 mi NE of Armstead Spring in bottom of Water Canyon	19N	5E	27, NE1/4
1079		ca 2000 ft E of ski lodge, 0.5 mi S of American Spring	19N	5E	35, SW1/4
1080		Ca 0.5 mi from Hwy 4 on jeep trail on North-facing slope of Canon del Valle.	19N	5E	25, SW1/4NE1/4
1081		Ca 1.2 mi from Hwy 4 on jeep trail. Bottom of Canon del Valle	19N	5E	26, NE1/4
1082		Ca 0.5 air mi ENE of Ponderosa campground.	19N	5E	36,middle
1083	47	On NW facing slope above Seven Springs fish hatchery	20N	2E	35,NW1/4
1085	344	Dome, stand 3360-702	18N	5E	5,SE1/4*
1086	344	Dome, stand 3360-702	18N	5E	5,SE1/4*
1087	980	Dome, stand 3360-702	18N	5E	5,SE1/4*
1088	980	Dome, stand 3360-702	18N	5E	5,SE1/4*
1089	980	Dome, stand 3360-702	18N	5E	5,SE1/4*
1090	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0.2 mi S pipeline rd	20N	5E	34,SW1/4*
1091	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0.2 mi S pipeline rd	20N	5E	34,SW1/4*
1092	371	Quemazon Cyn, flat above head of cyn	20N	5E	34,SW1/4*
1093	371	Quemazon Cyn, flat above head of cyn	20N	5E	34,SW1/4*
1094	49	NW slope above UNM Biology cabin	18N	4E	3,SE1/4
1095		NM 126 alignment;	20N	2E	3, S1/2
1096		Peralta Crk. at jct. USFS Rd 280, ca. 6 mi S NM Hwy 4	18N	4E	27
1097		NM 126 alignment; 1(126)	20N	2E	34
1098		NM 126 alignment; 2(126)	20N	2E	27,34
1099	103	NM 126 alignment; 3(126)	20N	2E	27
1100		NM 126 alignment; 4(126)	20N	2E	27
1101		NM 126 alignment; 5(126)	20N	2E	27
1102		NM 126 alignment; 6(126)	20N	2E	27
1103		NM 126 alignment; 7(126)	20N	2E	27, 26
1104		NM 126 alignment; 8(126)	20N	2E	27
1105		NM 126 alignment; 9(126)	20N	2E	27
1106		NM 126 alignment; 10(126)	20N	2E	27

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MAP NO	Same As No	LOCALITY	T	R	S
1107		NM 126 alignment; 11(126)	20N	2E	22,27
1108		NM 126 alignment; 12(126)	20N	2E	22
1109		NM 126 alignment; 13(126)	20N	2E	22
1110		NM 126 alignment; 14(126)	20N	2E	22
1111		NM 126 alignment; 15(126)	20N	2E	22,15
1112		NM 126 alignment; 16(126)	20N	2E	15
1113		NM 126 alignment; 17(126)	20N	2E	15
1114		NM 126 alignment; 18(126)	20N	2E	22
1115		NM 126 alignment; 19(126)	20N	2E	22
1116		NM 126 alignment; 20(126)	20N	2E	3,4,9,10
1117		NM 126 alignment; 21(126)	20N	2E	3
1118		NM 126 alignment; 22(126)	20N	2E	3
1119		NM 126 alignment; 23(126)	20N	2E	3
1120		NM 126 alignment; 24(126)	20N	2E	15
1121		NM 126 alignment; 25(126)	20N	2E	15, 10
1122		NM 126 alignment; 30(126)	20N	2E	22
1123		Along Peralta Crk., ca 6.5 mi S NM Hwy 4	18N	4E	27, unsurveyed
1124	980	Dome, stand 3360-702	18N	5E	5,SE1/4*
1125	980	Dome, stand 3360-702	18N	5E	5,SE1/4*
1126	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0.2 mi S pipeline rd	20N	5E	34,SW1/4*
1127	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0.2 mi S pipeline rd	20N	5E	34,SW1/4*
1128	371	Quemazon Cyn, flat above head of cyn	20N	5E	34,SW1/4*
1129	371	Quemazon Cyn, flat above head of cyn	20N	5E	34,SW1/4*
1130	344	Dome, stand 3360-702	18N	5E	5,SE1/4*
1131	344	Dome, stand 3360-702	18N	5E	5,SE1/4*
1132	95	Barley Cyn ca. 1.1 mi (air) SE Seven Springs	19N	2E	11,SW1/4
1133	90	Barley Cyn ca. 1.55 mi SSE Seven Springs	19N	2E	12,NW1/4
1134	98	Barley Cyn ca. 1.45 mi (air) SSE Seven Springs	19N	2E	11,NE1/4
1135		Pipeline road	19N	6E	7, NW1/4
1136		Pipeline road	19N	6E	7, NW1/4
1137		Pipeline road	19N	5E	12, NE1/4
1138		Pipeline road	19N	5E	1, S1/2
1139		Pipeline road	19N	5E	1, NW1/4
1140	980	Dome, stand 3360-702	18N	5E	5,SE1/4*
1141	980	Dome, stand 3360-702	18N	5E	5,SE1/4*
1142	344	Dome, stand 3360-702	18N	5E	5,SE1/4*
1143	344	Dome, stand 3360-702	18N	5E	5,SE1/4*
1144	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0.2 mi S pipeline rd	20N	5E	34,SW1/4*

MAP NO	Same As No	LOCALITY	T	R	S
1145	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0.2 mi S pipeline rd	20N	5E	34,SW1/4*
1146	371	Quemazon Cyn, flat above head of cyn	20N	5E	34,SW1/4*
1147	371	Quemazon Cyn, flat above head of cyn	20N	5E	34,SW1/4*
1148	1148	Upper E. fork Spruce Cyn, Alamo Allotment	18N	4E	8
1149	1149	Stand adjacent to Pajarito Ski Area to east			
1150	977	Adjacent to Dome Slope Activity Plot	18N	5E	5,SE1/4*
1151	175	Paso del Norte	18N	4E	1,NW1/4
1152	252	1.4 mi SSW Las Conchas cmpgd	18N	4E	17,NE1/4*
1153	248	Peralta cyn, at the jct cyn & FSR 280, S of rd	18N	4E	10,SW1/4
1154	980	Dome, stand 3360-702	18N	5E	5,SE1/4*
1155	344	Dome, stand 3360-702	18N	5E	5,SE1/4*
1156	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0 2 mi S pipeline rd	20N	5E	34,SW1/4*
1157	371	Quemazon Cyn, flat above head of cyn	20N	5E	34,SW1/4*
1158	1158	Pipeline road, road cut	19N	5E	1, unsurveyed
1159	1158	Pipeline road, above road cut	19N	5E	1, unsurveyed
1160		Trail N of Camp May,	19N	5E	
1161	1161	Trail N of Camp May, between Canada Bonito and Los Alamos Canyons	19N	5E	11, NW1/4*
1162	980	Dome, stand 3360-702	18N	5E	5,SE1/4*
1163	344	Dome, stand 3360-702	18N	5E	5,SE1/4*
1164	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0.2 mi S pipeline rd	20N	5E	34,SW1/4*
1165	371	Quemazon Cyn, flat above head of cyn	20N	5E	34,SW1/4*
1166	98	Barley Cyn ca. 1.45 mi (air) SSE Seven Springs	19N	2E	11,NE1/4
1167	90	Barley Cyn ca. 1.55 mi SSE Seven Springs	19N	2E	12,NW1/4
1168	95	Barley Cyn ca. 1.1 mi (air) SE Seven Springs	19N	2E	11,SW1/4
1169	82	upper slopes Valle de los Posos, 0.3 mi E Baca Land and Cattle Boundary, 0.2 mi S pipeline rd	20N	5E	34,SW1/4*
1170	371	Quemazon Cyn, flat above head of cyn	20N	5E	34,SW1/4*
1171	91	Barley Cyn, ca 1.65 mi (air) SSE Seven Springs	19N	2E	12,NW1/4

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
1	1	3965377.8	364953.3	type locality
2		3963659.8	367171.5	used road miles
3	29	3968431.0	372422.8	NM permit 1753
4		3979537.3	366693.0	strange locality, could be 0.9mi N Paso del Norte?
5	112	3966342.5	365894.4	used rd miles
6	112	3966343.0	365894.4	used rd miles
7	112	3966342.5	365895.0	used rd miles
8	1	3965377.8	364953.3	PARATYPE SPECIMENS, type locality
9		3964274.0	366998.9	used road miles
10	1	3965377.8	364953.3	type locality
11	11	3967698.8	367749.9	used road miles
12	1	3965377.8	364953.3	used road miles, type locality?
13		3957778.8	367554.8	none
14		3971991.8	382938.1	north facing slope
15		3967055.5	364149.0	location #1
16	1	3965377.8	364953.3	29-30,SRW100-101
17	1	3965377.8	364953.3	86038-86041, Trap #1, preserved 1973-11-24
18	1	3965377.8	364953.3	
19	1	3965377.8	364953.3	
20	1	3965377.8	364953.3	86053-60 preserved 1973-11-12, 61-69 preserved 1973-11-24
21	1	3965377.8	364953.3	
22	1	3965377.8	364953.3	
25		3966280.5	365707.7	could be SR 289 instead
26		3968526.3	371111.8	none
27	283	3968231.5	372534.7	used road miles
28	1	3965377.8	364953.3	used road miles from jct Hwy 4 & Hwy 501
29	29	3968431.0	372422.8	none
30		3968085.5	368335.3	none
31	112	3966342.5	365895.0	used rd miles
32	133	3965404.0	366503.3	
33		3968148.0	368605.0	used road miles
34	112	3966342.5	365894.4	used road miles
35	1	3965377.8	364953.3	type locality
36	1	3965377.8	364953.3	type locality
37	249	3962916.0	363405.4	used air miles
38		3961507.0	368769.8	none
39	39	3964623.0	364162.0	none
40		3963751.5	362764.3	none

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
41		3964394.3	363702.9	elev. from Reagan, 1967
42	39	3964623.0	364162.0	none
43	43	3964714.0	365794.5	used air miles
44	43	3964714.5	365798.2	used air miles
45		3963571.5	365342.7	used air miles
46	249	3962916.0	363405.4	none
47	47	3976806.3	346491.6	none
48	39	3964623.0	364162.0	none
49	49	3964564.0	364359.4	none
50		3957778.3	367555.4	used air miles
51	49	3964564.0	364359.4	used air miles
52	49	3964564.0	364359.4	none
53	53	3964111.0	362872.7	used air miles
54	54	3965028.8	366891.5	used road miles
55	39	3964623.0	364162.0	none
56	43	3964714.0	365798.2	used air miles
57		3964507.3	363860.7	none
58	249	3962916.0	363405.4	none
59	47	3976807.0	346488.5	none
60	39	3964623.0	364162.0	none
61		3964494.0	364179.3	none
62	49	3964564.0	364359.4	none
63	49	3964564.0	364359.4	none
64	49	3964564.0	364359.4	none
65	49	3964564.0	364359.4	none
66	112	3966340.5	365901.7	used rd miles
67	112	3966340.5	365899.3	used rd miles
68	112	3966340.5	365898.6	used rd miles
69	69	3978006.5	349135.8	none
70		3972776.3	375377.0	see map #289-95
71		3971816.0	377592.4	none
72	39	3964623.0	364162.0	used air miles, biology cabin?
73	73	3961733.0	367437.9	none
74		3970455.5	352329.8	used rd miles
75		3968503.3	375961.3	none
76	76	3973148.0	374628.3	none
77		3970368.3	376090.3	none
78		3984389.0	349219.2	none

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
79		3986451.8	356020.8	1.1 person-hr, 2 total, 1 collected
80	80	3980594.8	349866.8	CAR 1801
81	1	3965377.8	364953.3	type locality
82	82	3964550.0	374309.4	25/2person-hr
83		3977998.8	374672.4	2 person-hr, 6 total
84	84	3975919.5	376816.8	2 person-hr, 3 total
85		3976277.0	346624.3	2 person-hr, 3 total
86		3975872.3	374596.4	2 person-hr, 7 total
87		3974201.5	374810.5	2 person-hr, 5 total
88		3973806.5	375319.5	2 person-hr, 2 total
89		3977504.0	348739.0	2 person-hr, 1 total
90	90	3973431.3	347859.4	2 person-hr, 10 total, PT 3
91	91	3973784.5	348127.1	2 person-hr, 1 total
92		3988763.8	365961.3	2 person-hr, 4 total
93		3988505.0	366265.8	2 person-hr, 1 total
94	94	3975208.3	346813.3	2 person-hr, 4 total
95	95	3972761.5	346571.9	2 person-hr, 7 total, PT 2
96		3972017.0	346257.8	2 person-hr, 2 total
97	97	3972903.3	347363.0	2 person-hr, 2 total
98	98	3973392.0	347723.1	on transect, 3 total, PT 4
99		3965190.3	364858.4	0.75 person-hr, 2 total
100		3989844.0	365569.3	2 person-hr, 1 total
101	1	3965377.8	364953.3	type locality
102		3977806.8	346068.4	2 person-hr, 1 total
103	103	3977709.8	345829.6	2 person-hr, 15 total
104	104	3981735.8	340023.4	2 person-hr, 1 total
105		3964138.3	371350.3	2 person-hr, 17 total
106	106	3963540.3	372310.5	2 person-hr, 10 total, 1 salam on N facing slope, 6 on the flat, 3 on S facing slope
107	107	3983529.3	349258.9	none
108		3979934.5	372063.3	35d, 57', 30" x 106d, 25', 0"
109		3980590.0	371176.5	35d, 58', 0" x 106d, 25', 0"
110	110	3973938.3	374914.1	3 person-hrs
111		3959353.3	367847.1	ESP1429, W-facing slope, just north section fence
112	112	3966342.5	365895.0	used SR268, could be SR289
113	1	3965377.8	364953.3	? how near
114	1	3965377.8	364953.3	near type locality
115	1	3965377.8	364953.3	type locality
116	1	3965377.8	364953.3	PARATYPE SPECIMENS

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
117	1	3965377.8	364953.3	PARATYPE AND HOLOTYPE(49033) SPECIMENS
118		3964117.3	362354.3	some data from field notes
119	119	3964352.8	362477.5	some data from field notes
120	119	3964352.8	362477.5	some data from field notes
121	283	3968231.5	372534.7	none
122	1	3965377.8	364953.3	near type locality
123				no additional data
124				none
125	112	3966340.5	365898.6	used rd miles
126		3968438.0	370688.2	used rd miles
127	127	3964156.0	367058.3	used road miles,SR268
128	283	3968231.5	372534.7	none
129	283	3968231.5	372534.7	none
130		3971606.0	358674.5	See Whitford, 1968 localities
131				waiting for #s, E. Panitz, 1967, I bet these are UMMZ nos.
132	112	3966340.5	365898.6	? which direction from Del Norte Pass
133	133	3965404.0	366503.3	none
134	1	3965377.8	364953.3	type locality
135	144	3966843.5	366480.1	? not a good locality, used rd mi from jct hwy 4 & hwy 501
136				probably 1.9mi s Paso del Norte, unmappable as is
137	127	3964156.0	367058.3	used rd miles, assumed FSR268
138				Species id = Eurycea multipicata; (missing Jan 27, '49-TPM); see xerox card
139	139	3966147.8	366182.1	SR268, used road miles
140	139	3966147.8	366182.7	none
141	1	3965377.8	364953.3	type locality
142	1	3965377.8	364953.3	type locality (11 specimens)
143	1	3965377.8	364953.3	type locality, PARATYPE
144	144	3966843.5	366479.5	none
145	73	3961732.5	367440.3	?, mileage puts this in Canyon del Norte, used air miles
146		3964833.8	363793.5	used road miles
147	11	3967698.0	367749.9	used road miles
148	1	3965377.8	364953.3	type locality
149	39	3964623.0	364162.0	none
150	112	3966340.5	365898.6	used rd miles
151	1	3965377.8	364953.3	type locality
152	54	3965029.3	366896.3	used road miles
153		3963977.5	367145.4	used road miles
154	133	3965404.0	366503.3	used road miles

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
155	54	3965025.5	366902.4	used road miles
156	39	3964623.0	364162.0	none
157				no additional data
158		3979537.3	366692.3	strange locality, could be 0.9mi N Paso del Norte?
159	1	3965377.8	364953.3	type locality, PARATYPE of P neomexicanus
160				mentioned in Dunn, 1926 as Eurycea multiplicata
161		3963528.3	368372.9	could be same as map nos. 50,51. N,E,&W facing slopes
162		3963134.5	362332.3	see no. 40
163	163	3977791.3	348448.0	abundant
164	164	3978951.3	349431.7	abundant
165		3979653.8	349355.6	abundant
166	80	3980593.5	349870.5	abundant
167		3980960.5	350165.7	abundant
168	168	3983756.3	351812.7	abundant
169		3985374.5	353423.8	N slope,not abundant
170		3965175.5	374470.4	N slope, collected
171		3978773.8	355619.6	picked a point from an area
172		3974301.8	357091.4	picked a point from an area
173		3971909.5	360630.3	picked a point from an area, see also map no. 130
174		3965379.0	370406.4	'500ft S Bandelier Nat'l Monument boundary, E facing slope
175		3965347.8	366651.1	1.5 person-hrs, N facing slope
176		3963733.8	367093.4	1 person-hr, E facing slope
177	177	3962405.5	367097.9	0.5 person-hr, NE facing slope
178	178	3959886.8	367533.4	0.5 person-hr, 4 total, NE facing slope
179	178	3959886.8	367533.4	on transect, NE facing slope
180		3960105.3	367239.8	2/1 person-hr, 3 on transect, NE facing slope
181		3959938.0	367685.2	2/0.5 person-hr, 5 on transect, SW facing slope
182		3964257.0	363124.8	1 person-hr
183	183	3980515.5	350403.9	on transect
184	184	3978009.3	349276.8	on transect
185	185	3972693.0	345959.5	1 person-hr
186		3972939.0	346011.7	1 person-hr
187	168	3983756.3	351812.7	1/5 min, 3 on transect
188	80	3980592.5	349870.5	
189	49	3964564.0	364359.4	
190	82	3976160.3	374309.4	2 person-hrs
191	183	3980515.5	350403.3	2 person-hrs
192	177	3962405.5	367097.9	2 person-hrs

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
193	168	3983755.8	351812.7	2 person-hrs
194	90	3973431.3	347859.4	on transect, PT 3
195	98	3973392.0	347723.1	2 person-hrs, PT 4
196	184	3978009.3	349276.8	2 person-hrs
197	184	3978009.3	349276.8	2 person-hrs
198	184	3978008.5	349276.8	2 person-hrs
199	184	3978008.5	349276.8	2 person-hrs
200		3964498.8	361224.3	6 person-hrs
201		3963156.8	363211.8	2 person-hrs
202		3962764.3	359943.5	2 person-hrs
203	107	3983529.3	349258.9	.75 person-hr
204	80	3980591.8	349870.4	CAR 1434
205		3958652.3	367936.7	1.1 person-hr, 4 total, 1 collected, CAR 1895
206	80	3980591.8	349870.4	CAR 1793
207	80	3980591.3	349871.1	CAR 1785
208	80	3980587.5	349872.3	CAR 1792
209		3970842.0	382055.7	CAR 1787
210	184	3978008.5	349276.8	CAR 1519, lower insect pitfall
211		3980535.3	350765.8	CAR 1619
212	80	3980587.5	349872.3	CAR 1527,lower insect pitfall
213	80	3980585.8	349873.5	CAR 1527,lower insect pitfall
214		3976468.8	374712.1	3 person-hr, 12 total, 1 collected
215	185	3972693.0	345959.5	2 person-hrs, permanent transect (PT) 1
216	95	3972761.5	346571.9	9/2 person-hrs, 1 on transect, PT 2
217	90	3973431.3	347859.4	2 person-hrs, PT 3
218	90	3973431.3	347859.4	on transect, PT 3
219	98	3973392.0	347723.1	9/2 person-hrs, 5 on transect, PT 4
220		3974266.5	347921.5	2 person-hrs, PT 5 (new)
221		3974161.0	347894.0	5/2 person-hrs, 1 on transect, PT 5 (old)
222	94	3975208.3	346813.3	2 person-hrs, PT 7
223	91	3973784.5	348127.1	2 person-hrs, PT 8
224	97	3972903.3	347363.0	2 person-hrs, PT 9
225	225	3973634.8	374964.6	4 person-hrs
226	110	3973940.8	374910.5	3 person-hrs
227	225	3973634.8	374962.8	3 person-hrs
228	110	3973940.8	374910.5	15 person-hrs
229	110	3973940.8	374910.5	2 person-hrs
231	90	3973431.3	347859.4	2 person-hrs, PT 3

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
232	98	3973392.0	347723.1	2 person-hrs, PT 4
233	95	3972761.5	346571.9	2 person-hrs, PT 2
234	185	3972693.0	345959.5	2 person-hrs, permanent transect (PT) 1
235	94	3975208.3	346812.7	2 person-hrs, PT 7
236	106	3963540.3	372310.5	5 person-hr, 0 on N-facing slope, 6 on flat, 5 on S facing
237	91	3973780.3	348118.5	2 person-hrs, PT 8
238		3963130.8	372919.4	5 person-hr
239	103	3977709.8	345829.6	on transect, 1 total
240		3963602.3	372184.1	on transect, 1 total
241		3963679.8	372270.1	on transect, 4 total
242		3964499.8	371076.8	2 person-hrs, on the flat
243		3964669.0	370851.1	2 person-hrs
244		3964804.5	370717.3	2 person-hrs
245	245	3962692.5	372143.1	2 person-hrs
246		3982175.0	350371.1	2 person-hrs
247	69	3978006.5	349135.8	2 person-hrs, nocturnal survey
248	248	3962764.0	363393.9	2 person-hrs
249	249	3962916.0	363405.4	2 person-hrs
250		3962709.5	361916.8	2 person-hrs
251		3962536.8	361845.9	2 person-hrs
252		3962152.5	361439.4	1 person-hrs, 1 collected, ESP 1418
253		3962721.8	359846.1	2 person-hrs
254		3963178.5	363074.5	2 person-hrs
255		3961979.3	372904.0	2 person-hrs
256	256	3962557.5	372197.6	2 person-hrs
257		3984517.3	352088.5	2 person-hrs
258	258	3964568.0	370951.0	on transect, 1 total
259	69	3978006.5	349135.8	13/2 person-hr, 3 on transect
260	69	3978006.5	349135.8	4 person-hrs
261	261	3964267.5	364340.1	2 person-hrs, used rd miles
262	164	3978951.3	349431.7	2.5 person-hrs
263	80	3980585.0	349873.5	2 person-hrs
264		3980612.5	351216.6	3 person-hrs
265		3975978.5	350975.3	4 person-hrs
266		3980200.5	350173.0	1 person-hrs
267	267	3980574.5	350136.4	2.2 person-hrs
268	267	3980573.3	350138.2	3 person-hrs
269	76	3973148.0	374628.3	2 person-hrs

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
270		3971989.8	382937.5	1.5 person-hrs
271		3970842.0	382055.7	2.5 person-hrs
272	69	3978006.5	349135.8	2 person-hrs
273	69	3978006.5	349135.8	6 person-hrs
274	69	3978006.5	349135.8	5 person-hrs
275	69	3978006.5	349135.8	5 person-hrs
276	163	3977790.5	348448.0	1 person-hrs
277		3966779.3	376057.2	N and E facing slopes
278		3976636.3	346507.0	N & W facing slopes
279		3973514.8	346025.2	S facing slope
280		3966969.0	371527.1	N facing slope, 30 ft from stream
281	281	3967805.3	372440.3	S facing slope
282		3966203.5	371619.8	N facing slope in talus
283	283	3968231.5	372534.1	in pitfall trap
284	284	3967805.3	372440.9	S facing slope
285		3965976.3	372484.7	S facing slope
286		3978414.8	354082.9	
287		3979807.5	357722.8	
288		3973748.8	356299.9	
289		3972595.5	375683.9	probably same as Bogert MSB 36356-61 (date discrepancy)
290		3972365.5	375530.3	probably same as Bogert MSB 36356-61 (date discrepancy)
291		3972283.5	375582.8	probably same as Bogert MSB 36356-61 (date discrepancy)
292		3972190.3	375444.1	probably same as Bogert MSB 36356-61 (date discrepancy)
293		3972111.5	375602.9	probably same as Bogert MSB 36356-61 (date discrepancy)
294		3972068.8	375747.0	probably same as Bogert MSB 36356-61 (date discrepancy)
295		3971947.5	375766.6	probably same as Bogert MSB 36356-61 (date discrepancy)
296		3985709.0	353907.3	
297		3966914.0	371030.4	2 person-hrs, nearly flat
298		3965798.8	372328.8	1.3 person-hrs, flat
299		3965211.0	374247.3	2 person-hrs
300		3963952.3	375088.6	2 person-hrs
301		3966290.0	371349.5	2 person-hrs
302		3966667.5	372395.1	2 person-hrs
303		3970016.8	377745.3	1.6 person-hrs
304		3988777.8	361244.9	ESE facing slope
305		3966163.0	375943.5	2 person-hrs
306		3977726.0	351018.8	SE facing slope
307		3978293.8	351973.1	NW facing slope

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
308		3981521.8	353791.5	SE facing slope, 0.1 person/hr
309		3981457.3	353618.2	SE facing slope, 0.1 person/hr
310		3981311.8	353551.7	SE facing slope, 0.1 person/hr
311		3980424.3	352454.1	SSE facing slope
312				from 88 data base
313	53	3964111.0	362872.7	used air miles
314		3982376.3	373941.3	2 person-hrs, N facing slope
315	315	3982910.5	373986.5	2 person-hrs, S facing slope
316	315	3982910.5	373986.5	S facing slope
317		3982421.3	380617.8	2 person-hrs, N facing slope
318		3979144.8	353785.4	N facing slope, 0.1 person hour
319	184	3978008.5	349276.8	NNE facing slope, 2 person-hr
320	184	3978008.5	349276.8	NNE facing slope, 2 person-hr
321	1	3965377.8	364953.3	
322	1	3965377.8	364953.3	
323	1	3965377.8	364953.3	
324	1	3965377.8	364953.3	
325	1	3965377.8	364953.3	
326	1	3965377.8	364953.3	
327	1	3965377.8	364953.3	
328	1	3965377.8	364953.3	
329	1	3965377.8	364953.3	
330	1	3965377.8	364953.3	
331	1	3965377.8	364953.3	
332	1	3965377.8	364953.3	
333	1	3965377.8	364953.3	
334	1	3965377.8	364953.3	
335	1	3965377.8	364953.3	
336	1	3965377.8	364953.3	
337	1	3965377.8	364953.3	
338	1	3965377.8	364953.3	
339	1	3965377.8	364953.3	
340	1	3965377.8	364953.3	
341	1	3965377.8	364953.3	
342	1	3965377.8	364953.3	
343	1	3965377.8	364953.3	
344	344	3964620.0	370890.0	Dome Activity Plot
345	344	3964620.0	370890.0	Dome Activity Plot

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
346	344	3964620.0	370890.0	Dome Activity Plot, 1 recapture
347	344	3964620.0	370890.0	Dome Activity Plot
348	82	3976149.8	374318.8	Posos Activity Plot
349	82	3976149.0	374320.0	Posos Activity Plot
350	82	3976149.0	374320.0	Posos Activity Plot, 4 recaptures
351	82	3976147.8	374322.4	Posos Activity Plot
352	82	3976147.8	374322.4	Posos Activity Plot
353	168	3983762.5	351826.8	Twin Cabins Activity Plot
354	69	3978006.5	349135.8	NNE facing slope, 1 person-hr
355	69	3978006.5	349135.8	NNE facing slope, 1 person-hr
356		3964753.5	367791.8	WSW facing slope, 2 person-hr
357		3961952.5	372916.7	S,SW facing slope,2 person-hr
358		3962053.0	373787.9	N facing slope,2 person-hr
359	69	3978006.5	349135.8	NNE facing slope, 2 person-hr
360	90	3973431.3	347859.4	5 on transect, 8 in 2 person-hr, PT 3
361	98	3973392.0	347723.1	6 on transect, 16 in 2 person-hrs, PT 4
362	91	3973796.8	348093.2	2 person-hrs, PT 8
363		3975073.0	346805.2	2 person-hrs, PT 7
364	80	3980581.3	349935.6	food habits study, 1.2 person-hrs
365	80	3980580.0	349934.3	food habits study, 4.5 person-hrs
366	366	3983769.3	351973.3	food habits study, 2 person-hrs
367	103	3977709.8	345829.6	food habits study, 1.5 person-hrs
368	368	3964359.0	371173.4	food habits study
369	369	3962547.5	372173.3	food habits study, 2.9 person-hrs
370	366	3983769.3	351973.3	food habits study, 3.75 person-hrs
371	371	3976188.3	374662.2	food habits study, 2.5 person-hrs
372		3964635.3	370732.3	food habits study, 2 person-hr
373		3971704.5	376588.6	in road cut, 0.5 person-hr
374	371	3976188.3	374662.2	ca 1.0 person-hr
375		3962749.0	363312.3	found in 3 minutes
376	90	3973431.3	347859.4	8 in 2 person-hr, PT 3
377	98	3973392.0	347723.1	5 in 2 person-hrs, PT 4
378		3965759.3	372220.5	per 0.7 person-hrs, steep slope
379		3978439.8	350441.7	per 2 work-hr
380		3976234.0	346692.2	searched transect only
381		3976138.3	347359.0	per 1 work-hr
382		3972613.0	346142.3	searched transect only
383	383	3962672.0	359863.4	per 1 work-hr

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
384	384	3963193.8	359448.0	per 1 work-hr
385	385	3960150.8	369725.7	per 1 work-hr
386	386	3962780.5	367106.6	per 0.5 work-hr
387		3964233.8	363350.9	per 1 work-hr
388		3960269.3	370097.7	per 1 work-hr
389		3959094.0	370507.8	per 1 work-hr
390		3957044.5	367669.9	per 0.5 work-hr
391		3985711.8	353920.4	per 1 wk-hr
392		3976760.5	378948.2	per 1 wk-hr
393		3977111.5	379658.4	per 1 wk-hr
394	394	3964196.3	363178.3	per 2 work-hr & transect
395	394	3964196.3	363178.3	per 2 work-hr
396	384	3963193.8	359448.0	searched transect only
397	383	3962672.0	359863.4	searched transect only
398		3962413.3	360788.4	per 2 work-hr & transect
399		3965181.0	364856.9	per 2 work-hr & transect
400		3962302.0	355190.5	per 2 work-hr & transect (7-6-87)
401		3978439.8	350441.7	searched transect only
402		3976138.3	347359.0	searched transect only
403	185	3972620.3	346137.6	searched transect only
404		3972702.3	345980.7	searched transect only, PT1
405	385	3960150.8	369725.7	searched transect only
406	386	3962780.5	367106.6	searched transect only
407		3986354.8	346584.0	per 2 work-hr & transect
408		3989128.5	346818.1	per 2 work-hr & transect
409		3987989.0	350570.6	per 2 work-hr & transect
410		3985617.8	351257.7	per 2 work-hr & transect
411		3974736.8	347048.4	per 2 work-hr & transect
412		3974620.5	349615.3	per 2 work-hr & transect
413		3973553.8	347543.9	per 2 work-hr & transect
414		3963263.5	363022.9	per 2 work-hr & transect
415		3972814.5	348328.6	per 2 work-hr & transect
416		3973995.8	347277.1	per 2 work-hr & transect
417		3988480.3	363532.3	per 2 work-hr
418		3991153.3	363797.7	per 2 work-hr
419		3992618.8	364807.7	per 2 work-hr
420		3990411.5	361401.6	per 2 work-hr
421	421	3976089.3	379034.9	per 2 work-hr

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
422		3965489.5	365228.0	per 2 work-hr
423		3987214.0	350661.8	per 2 work-hr
424		3976022.8	346900.6	per 2 work-hr
425		3976061.8	347367.8	per 2 work-hr
426	185	3972620.3	346137.6	per 2 work-hr
427		3962154.3	366386.0	per 2 work-hr
428		3962624.8	366195.9	per 2 work-hr
429		3987186.8	376815.6	per 2 work-hr
430		3986956.3	371645.0	per 2 work-hr
431		3989577.3	366607.4	per 2 work-hr
432		3975851.8	347643.9	per 2 work-hr
433		3975999.0	347111.9	per 2 work-hr
434		3977063.5	348128.6	per 2 work-hr
435		3976999.3	349643.2	per 2 work-hr
436		3962429.5	356072.1	per 2 work-hr
437	437	3987601.0	365727.5	per 2 work-hr
438	438	3988212.5	365504.9	per 2 work-hr
439		3990707.0	365774.8	per 2 work-hr
440	440	3986625.5	366750.5	per 2 work-hr
441		3964567.8	361088.1	per 2 work-hr
442	442	3964655.3	360939.6	per 2 work-hr
443		3964516.3	360719.7	per 2 work-hr
444		3964537.8	360384.4	per 4 work-hr
445		3964748.0	360735.6	per 6 work-hr
446		4004290.0	330675.0	per 2 work-hr, dry
447		3979697.3	333167.9	per 2 work-hr
448	437	3987601.0	365727.5	per 2 work-hr
449	440	3986625.5	366750.5	per 2 work-hr
450	438	3988212.5	365504.9	per 2 work-hr
451		3988721.0	364055.1	per 2 work-hr
452		3988015.3	365574.3	per 2 work-hr
453	453	3962800.8	360242.4	per 2 work-hr
454		3962705.0	360637.4	per 2 work-hr
455		3963034.0	363294.6	per 2 work-hr
456		3963125.8	363269.0	per 2 work-hr
457		3984424.3	347406.1	per 2 work-hr
458		3984613.5	347017.8	per 2 work-hr
459		3984015.5	347587.6	per 2 work-hr

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
460		3983827.8	347884.4	per 2 work-hr
461		3980764.3	345877.7	per 2 work-hr
462		3983795.0	349676.8	per 2 work-hr
463	184	3978017.5	349303.4	per 2 work-hr & transect
464	97	3972902.5	347365.0	per 2 work-hr, PT9
465		3974274.3	347927.0	per 2 work-hr, dry w/in logs, PT5
466		3980167.5	345236.1	per 2 work-hr
467		3978599.8	345974.7	per 2 work-hr
468		3983536.3	349902.5	per 2 work-hr
469		3981049.3	349105.7	per 2 work-hr
470	107	3983543.3	349244.1	per 2 work-hr
471		3984558.3	347269.8	per 2 work-hr
472		3983081.0	346497.4	per 2 work-hr
473		3965127.5	345717.5	per 2 work-hr
474		3965612.3	346643.3	per 2 work-hr
475		3981975.0	340480.3	per 2 work-hr
476		3983754.0	345538.0	per 2 work-hr
477		3983759.8	339452.3	per 2 work-hr
478		3958168.8	355195.6	per 2 work-hr
479		3956187.8	357771.3	per 2 work-hr
480		3955975.0	357587.4	per 2 work-hr
481		3994693.5	366517.6	per 2 work-hr
482		3994901.5	365509.1	per 2 work-hr
483		3995950.3	365529.2	per 2 work-hr
484		3993308.3	366144.5	per 2 work-hr
485		3994211.0	366568.7	per 2 work-hr
486		3992349.0	362213.2	per 2 work-hr
487		3986186.5	361920.7	per 2 work-hr
488		3961281.3	373146.5	per 2 work-hr
489		3959543.0	373190.9	per 2 work-hr
490		3960175.8	372918.9	per 2 work-hr
491	103	3977709.8	345829.6	per 1/3 work-hr, PT10
492		3977630.3	345570.3	per 2 work-hr
493		3961449.3	374388.9	per 2 work-hr
494		3961212.3	375019.7	per 2 work-hr
495		3963597.8	372194.3	per 1 2/3 work-hr
496		3977740.8	335856.9	per 2 work-hr
497		3975771.0	333850.9	per 1 work-hr

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
498		3979954.5	339434.3	per 2 work-hr
499		3980193.8	339956.1	per 2 work-hr
500		3978885.0	340978.4	per 2 work-hr
501		3977335.3	344338.4	per 2 work-hr
502		3976668.3	343161.3	per 2 work-hr
503		3974508.5	343941.3	per 2 work-hr
504		3977374.5	340996.3	per 2 work-hr
505		3978715.3	346325.7	per 1 work-hr
506		3970674.8	332776.4	per 2 work-hr
507		3967771.5	332417.4	per 2 work-hr
508		3989150.3	375007.3	per 1 work-hr
509		3989673.8	377493.9	per 3/4 work-hr
510		3962804.5	373420.0	per 1 work-hr
511		3962379.0	374330.5	per 1 work-hr
512		3965127.5	345717.5	per 2 work-hr
513	513	3965165.5	370690.9	per 2 work-hr
514		3962159.8	371178.4	per 2 work-hr
515		3978873.8	335230.7	per 2 work-hr
516		3975438.8	337132.9	per 1.5 work-hr
517		3981797.8	340069.5	per 2 work-hr
518	103	3977709.8	345829.6	per 1.5 work-hr,nocturnal survey, PT10
519		3962823.3	361163.3	per 2 work-hr
520		3962638.5	360895.8	per 2 work-hr
521		3962038.3	361301.8	per 2 work-hr
522		3979978.5	347737.9	per 1 work-hr
523	453	3962800.8	360242.4	per 2 work-hr
524		3988624.8	375460.6	per 2 work-hr
525		3987999.8	375821.0	per 2 work-hr
526		3990260.0	374582.0	per 2 work-hr
527		3987094.5	375693.2	per 2 work-hr
528		3987212.5	376204.8	per 1 work-hr
529		3962826.3	359154.3	per 2 work-hr
530		3963221.8	359638.0	per 2 work-hr
531		3964323.5	359774.2	per 2 work-hr
532		3964693.3	360514.9	per 3 work-hr
533		3964678.8	361100.2	per 2 work-hr
534	442	3964655.3	360939.6	per 2 work-hr
535		3962124.3	373110.2	per 2 work-hr

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
536		3963846.5	360095.5	per 2 work-hr
537		3963469.0	359598.8	per 2 work-hr
538		3964525.3	358145.4	per 1 work-hr
539		3964718.5	358451.6	per 1 work-hr
540		3964795.8	357707.4	per 1 work-hr
541		3964935.5	358703.4	per 1 work-hr
542	91	3973747.0	348137.1	per 2 work-hr & transect, PT 8
543		3966211.5	375761.9	per 2 work-hr
544		3973108.5	379918.3	per 2 work-hr
545		3972796.5	380094.6	per 2 work-hr
546		3972222.3	379780.8	per 2 work-hr
547		3972448.3	380013.6	per 2 work-hr
548		3964775.5	370761.4	per 2 work-hr
549		3962323.3	355971.5	per 2 work-hr
550		3962004.8	355743.3	per 2 work-hr
551		3962077.8	358332.0	per 2 work-hr
552		3962366.5	357267.3	per 2 work-hr
553		3962503.3	357317.9	per 2 work-hr
554		3961985.0	358755.8	per 2 work-hr, dry
555		3961979.0	359238.0	per 2 work-hr, dry
556		3961562.3	356987.6	per 2 work-hr
557		3961886.3	360124.1	per 2 work-hr
558		3961174.5	359773.0	per 2 work-hr
559		3961525.5	358822.3	per 2 work-hr
560		3960835.0	359689.5	per 2 work-hr
561		3961739.3	359761.7	per 2 work-hr
562		3960699.3	359600.4	per 2 work-hr
563		3961227.3	358757.0	per 2 work-hr
564		3961301.0	358576.4	per 2 work-hr
565		3960338.3	358636.3	per 2 work-hr
566		3960817.5	359075.3	per 2 work-hr
567		3960660.8	358858.0	per 2 work-hr
568		3960155.3	360036.0	per 2 work-hr
569		3959691.8	359748.3	per 2 work-hr
570		3959988.8	359064.9	per 2 work-hr
571		3959507.0	359171.8	per 2 work-hr
572		3958980.5	358810.9	per 2 work-hr
573		3958712.0	358799.5	per 2 work-hr

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
574		3960265.5	358731.5	per 2 work-hr
575		3960198.8	358882.4	per 2 work-hr
576		3959891.3	358770.4	per 2 work-hr
577		3960523.3	359937.7	per 2 work-hr
578		3991478.5	350705.2	per 2 work-hr
579		3991087.0	350915.4	per 2 work-hr
580		3991170.0	350644.3	per 2 work-hr
581		3989953.5	349792.4	per 2 work-hr
582		3990703.8	351338.2	per 2 work-hr
583		3990544.8	350983.7	per 2 work-hr
584		3990889.8	351073.6	per 2 work-hr
585		3990756.3	350730.1	per 2 work-hr
586		3990771.8	350540.2	per 2 work-hr
587		3990630.0	349828.5	per 2 work-hr
588		3990669.3	350476.7	per 2 work-hr
589		3991476.5	349755.2	per 2 work-hr
590		3991004.5	349751.5	per 2 work-hr
591		3991447.8	349266.3	per 2 work-hr
592		3991464.0	349557.8	per 2 work-hr
593		3991591.5	349879.7	per 2 work-hr
594		3992147.3	350203.0	per 2 work-hr
595		3992195.3	350754.0	per 2 work-hr
596		3992691.8	350458.2	per 2 work-hr
597		3992482.3	350008.9	per 2 work-hr
598		3992530.3	349794.3	per 2 work-hr
599		3992739.8	349566.9	per 2 work-hr
600		3992809.3	349862.8	per 2 work-hr
601		3992881.3	349538.8	per 2 work-hr
602		3992981.0	349860.2	per 2 work-hr
603		3993000.8	350008.4	per 2 work-hr
604		3992814.0	350027.1	per 2 work-hr
605		3993011.8	350365.6	per 2 work-hr
606		3992899.0	350290.6	per 2 work-hr
607		3992713.0	349338.6	per 2 work-hr
608		3992964.0	351087.3	per 2 work-hr
609		3992714.8	351607.7	per 2 work-hr
610		3992836.8	352096.1	per 2 work-hr
611		3992655.3	352258.3	per 2 work-hr

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MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
612		3992831.5	352377.8	per 2 work-hr
613		3991126.5	349114.2	per 2 work-hr
614		3990789.3	349186.7	per 2 work-hr
615		3990085.5	349203.0	per 2 work-hr
616		3989311.8	348942.7	per 2 work-hr
617		3989834.8	349259.0	per 2 work-hr
618		3990285.5	349126.7	per 2 work-hr
619		3990515.3	349022.5	per 2 work-hr
620		3990307.0	349717.3	per 2 work-hr
628		3988592.5	347263.6	per 2 work-hr
622		3989142.3	347886.8	per 2 work-hr
623		3988576.8	348067.3	per 2 work-hr
624		3988594.3	348385.7	per 2 work-hr
625		3989525.3	349841.8	per 2 work-hr
626		3989035.5	350184.8	per 2 work-hr
627		3989711.3	350324.6	per 2 work-hr
628		3989017.0	347014.6	per 2 work-hr
629		3988356.8	348140.0	per 2 work-hr
630		3989266.8	348533.3	per 2 work-hr
631		3988751.8	348362.5	per 2 work-hr
632		3988979.8	349216.0	per 2 work-hr
633		3989429.3	349517.0	per 2 work-hr
634		3989702.3	349646.5	per 2 work-hr
635		3978027.3	351539.2	per 2 work-hr
636		3977715.8	351393.9	per 2 work-hr
637		3977552.0	351230.4	per 2 work-hr
638		3977189.0	350813.0	per 2 work-hr
640		3978263.8	351401.5	per 2 work-hr
641		3978411.5	351388.8	per 2 work-hr
642		3978236.5	351093.9	per 2 work-hr
643		3975648.0	351695.6	per 2 work-hr
644		3975698.5	351057.1	per 2 work-hr
645		3975400.0	351040.8	per 2 work-hr
646		3975427.3	350677.7	per 2 work-hr
647		3974980.5	350913.9	per 2 work-hr
648		3974306.0	350928.5	per 2 work-hr
649		3974548.8	351221.9	per 2 work-hr
650		3974475.8	351795.2	per 2 work-hr

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
651		3974160.5	351601.0	per 2 work-hr
652		3973832.3	351518.8	per 2 work-hr
653		3974015.3	351424.5	per 2 work-hr
654		3974665.8	350855.8	per 2 work-hr
655		3973881.3	350922.3	per 2 work-hr
656		3973544.8	350925.4	per 2 work-hr
657		3975462.5	350124.3	per 2 work-hr
658		3974780.0	350190.0	per 2 work-hr
659		3974932.0	350414.2	per 2 work-hr
660		3974574.0	350189.8	per 2 work-hr
661		3974197.3	350329.3	per 2 work-hr
662		3974082.0	350232.2	per 2 work-hr
663		3973856.8	350436.6	per 2 work-hr
664		3973549.5	350746.7	per 2 work-hr
665		3971963.8	349534.3	per 2 work-hr
666		3972483.5	349826.4	per 2 work-hr
667		3972376.0	350031.6	per 2 work-hr
668		3972657.8	350529.6	per 2 work-hr
669		3972860.8	351790.0	per 2 work-hr
670		3972909.8	351166.1	per 2 work-hr
671		3972732.8	351427.8	per 2 work-hr
672		3975850.3	352645.3	per 2 work-hr
673		3975910.0	352816.9	per 2 work-hr
674		3976040.0	353035.2	per 2 work-hr
675		3976450.0	353258.9	per 2 work-hr
676		3976751.5	353574.7	per 2 work-hr
677		3977359.3	353581.1	per 2 work-hr
678		3976450.8	353508.0	per 2 work-hr
679		3975553.3	353552.4	per 2 work-hr
680		3976428.3	350424.8	per 2 work-hr
681		3976346.5	350681.2	per 2 work-hr
682		3976663.5	351078.7	per 2 work-hr
683		3976611.3	351432.1	per 2 work-hr
684		3976992.8	352080.6	per 2 work-hr
685		3976047.0	351873.3	per 10 min
686		3976383.5	351843.2	per 2 work-hr
687		3976114.0	351586.1	per 10 min
688		3976202.3	351466.5	per 2 work-hr

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
689		3977502.0	351735.9	per 2 work-hr
690		3977110.3	351812.2	per 2 work-hr
691		3977944.5	351761.3	per 2 work-hr
692		3978006.5	352100.8	per 2 work-hr
693		3978880.5	352323.7	per 2 work-hr
694		3978787.8	352666.5	per 2 work-hr
695		3979098.8	352539.6	per 2 work-hr
696		3976992.8	352081.2	per 2 work-hr
697		3979145.5	352721.8	per 2 work-hr
698		3978723.3	352948.8	per 2 work-hr
699		3978811.8	353526.5	per 2 work-hr
700		3978016.3	353649.3	per 2 work-hr
701		3979467.3	353580.6	per 2 work-hr
702		3979306.0	353001.2	per 2 work-hr
703		3979554.0	353195.2	per 2 work-hr
704		3979811.8	353339.9	per 2 work-hr
705		3979857.5	352863.0	per 2 work-hr
706		3980125.3	353133.7	per 2 work-hr
707		3980039.3	353672.3	per 2 work-hr
708		3980480.5	353645.3	per 2 work-hr
709		3980624.8	353696.5	per 2 work-hr
710		3976376.5	352355.9	per 2 work-hr
711		3976772.0	352435.3	per 2 work-hr
712		3976827.8	352806.9	per 2 work-hr
713		3977178.8	353151.5	per 2 work-hr
714		3977934.5	353331.4	per 2 work-hr
715		3978450.0	353730.8	per 2 work-hr
716		3978442.6	353538.2	per 2 work-hr
717		3978079.3	352879.3	per 2 work-hr
718		3977967.3	352648.6	per 2 work-hr
719		3978117.0	352431.6	per 2 work-hr
720		3975535.8	352446.8	per 2 work-hr
721		3975672.8	352033.0	per 2 work-hr
722		3975896.5	352302.1	per 2 work-hr
723		3975475.0	352935.6	per 2 work-hr
724		3975228.3	353040.1	per 2 work-hr
725		3975472.3	353447.8	per 2 work-hr
726		3975091.5	353445.1	per 2 work-hr

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
727		3974695.3	353436.0	per 2 work-hr
728		3974570.5	353227.8	per 2 work-hr
729		3974755.8	353002.4	per 2 work-hr
730		3975487.0	352086.3	per 2 work-hr
731		3975485.0	351638.9	per 2 work-hr
732		3975579.3	351252.2	per 2 work-hr
733		3975193.5	351409.8	per 2 work-hr
734		3974921.8	351370.4	per 2 work-hr
735		3974260.0	351896.1	per 2 work-hr
736		3974304.5	352099.1	per 2 work-hr
737		3974644.8	352429.3	per 2 work-hr
738		3973925.0	352278.8	per 2 work-hr
739		3973078.3	352303.1	per 2 work-hr
740		3973321.3	352730.1	per 2 work-hr
741		3974376.3	352920.9	per 2 work-hr
742		3973957.8	352906.9	per 2 work-hr
743		3973501.0	353186.9	per 2 work-hr
744		3973217.3	352857.8	per 2 work-hr
745		3972652.5	352991.4	per 2 work-hr
746		3972226.5	352885.8	per 2 work-hr
747		3971783.5	352923.1	per 2 work-hr
748		3972987.3	352496.4	per 2 work-hr
749		3972740.8	352472.2	per 2 work-hr
750		3972439.0	351922.4	per 2 work-hr
751		3972095.8	351775.8	per 2 work-hr
752		3971897.8	352308.0	per 2 work-hr
753		3971557.8	352477.6	per 2 work-hr
754		3972075.8	352541.1	per 2 work-hr
755		3981014.8	353160.4	per 2 work-hr
756		3980967.0	352781.0	per 2 work-hr
757		3988112.5	361529.7	per 2 work-hr
758	758	3986952.8	361767.4	per 2 work-hr
759		3986593.8	361516.2	per 2 work-hr
760		3985773.0	362018.4	per 2 work-hr
761		3987854.3	361746.4	per 2 work-hr
762	762	3987349.3	362161.1	per 2 work-hr
763	763	3988090.8	362420.4	per 2 work-hr
764		3988077.8	362063.6	per 2 work-hr

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
765		3985866.0	361720.4	per 2 work-hr
766	766	3987248.8	360575.3	per 2 work-hr
767		3986523.3	360609.7	per 2 work-hr
768		3986386.8	361385.2	per 2 work-hr
769	769	3987068.3	360723.2	per 2 work-hr
770		3991896.5	360522.0	per 2 work-hr
771		3991305.0	360260.9	per 2 work-hr
772		3991137.5	361036.4	per 2 work-hr
773		3989837.5	360869.0	per 2 work-hr
774		3989697.0	360439.4	per 2 work-hr
775		3988906.5	360082.7	per 2 work-hr
776		3988572.3	360531.1	per 2 work-hr
777		3988336.0	361284.0	per 2 work-hr
778		3988891.8	360442.3	per 2 work-hr
779		3986210.3	360122.6	per 2 work-hr
780		3987274.3	359247.4	per 2 work-hr
781		3986704.3	359490.6	per 2 work-hr
782		3987405.0	358769.3	per 2 work-hr
783		3988187.5	358577.7	per 2 work-hr
784		3988741.3	357912.8	per 2 work-hr
785		3988015.5	357814.6	per 2 work-hr
786		3986351.0	360631.0	per 2 work-hr
787		3987539.8	358611.8	per 2 work-hr
788		3990530.5	360140.9	per 2 work-hr
789	789	3990661.5	360292.7	per 2 work-hr
790	790	3990388.0	360428.8	per 2 work-hr
791		3989325.0	361383.2	per 2 work-hr
792		3988815.3	359750.2	per 2 work-hr
793		3988257.5	359603.9	per 2 work-hr
794		3988313.3	359797.7	per 2 work-hr
795		3987694.5	360280.3	per 2 work-hr
796		3988228.0	359480.5	per 2 work-hr
797	766	3987248.8	360575.3	per 2 work-hr
798	769	3987069.0	360723.8	per 2 work-hr
799		3988126.5	360674.3	per 2 work-hr
800	758	3986952.8	361767.4	per 2 work-hr
801		3987678.8	361769.9	per 2 work-hr
802	762	3987350.0	362162.9	per 2 work-hr

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
803		3987874.3	362058.2	per 2 work-hr
804	763	3988095.0	362416.8	per 2 work-hr
805		3993972.5	360583.5	per 2 work-hr
806		3994531.8	360402.9	per 2 work-hr
807		3994222.0	359595.3	per 2 work-hr
808		3994505.0	359609.3	per 2 work-hr
809		3994777.8	362055.1	per 2 work-hr
810		3994403.5	361790.9	per 2 work-hr
811		3994076.8	362369.3	per 2 work-hr
812		3993419.0	362059.4	per 2 work-hr
813	789	3990661.5	360292.7	per 2 work-hr
814	790	3990388.0	360428.2	per 2 work-hr
815		3992634.3	361531.4	per 2 work-hr
816		3992211.8	361596.1	per 2 work-hr
817		3992236.3	361956.7	per 2 work-hr
818		3992168.0	362218.3	per 2 work-hr
819		3991926.3	362508.4	per 2 work-hr
820		3991178.0	361843.5	per 2 work-hr
821		3991208.0	361496.8	per 2 work-hr
822		3991680.0	360378.7	per 2 work-hr
823		3993348.8	358048.8	no suitable habitat
824		3993165.5	358174.7	per 2 work-hr
825		3994459.0	358333.8	per 2 work-hr
826		3994056.8	358203.6	no suitable habitat
827		3994359.5	358608.0	per 2 work-hr
828		3993900.8	358683.4	per 2 work-hr
829		3993729.3	358589.3	per 2 work-hr
830		3994460.5	358872.9	per 2 work-hr
831		3994318.8	357944.8	no suitable habitat
832		3989283.0	360013.9	per 2 work-hr
833		3989441.5	359936.0	per 2 work-hr
834		3989114.8	359671.6	per 2 work-hr
835		3988998.3	359498.0	per 15 min
836		3990696.0	359678.3	per 17 min
837		3990239.5	360000.0	per 15 min
838		3989813.3	360226.3	per 2 work-hr
839		3993524.5	360846.8	per 2 work-hr
840		3993160.0	359861.3	per 2 work-hr

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
841		3993491.8	359812.3	per 2 work-hr
842		3994540.5	362922.6	per 2 work-hr
843		3993987.0	363349.1	per 2 work-hr
844		3993982.5	363657.0	per 2 work-hr
845		3994336.3	364122.2	per 2 work-hr
846		3993081.5	363557.3	per 2 work-hr
847		3992666.0	363873.3	per 2 work-hr
848		3993220.0	363151.1	per 2 work-hr
849		3992625.3	359671.4	per 2 work-hr
850		3992130.8	359384.3	per 2 work-hr
851		3992506.5	358638.1	per 2 work-hr
852		3992342.0	359137.9	per 2 work-hr
853		3991420.5	358986.8	per 2 work-hr
854		3991741.0	358699.3	per 2 work-hr
855		3992221.3	358668.0	per 2 work-hr
856		3992701.5	358431.8	per 2 work-hr
857		3992954.8	358357.7	per 2 work-hr
858		3990699.3	358603.8	per 2 work-hr
859		3990952.8	358692.6	per 2 work-hr
860		3991203.3	358720.3	per 2 work-hr
861		3990920.3	359294.2	per 15 min
862		3990777.5	357972.8	?
863		3991417.0	358196.5	per 15 min
864		3990586.5	358418.7	per 15 min
865		3990352.8	358285.7	per 2 work-hr
866		3990110.5	358598.3	per 2 work-hr
867		3990074.3	358253.4	per 15 min
868		3990525.0	358109.7	per 2 work-hr
869		3991205.3	357932.5	per 15 min
870		3990969.0	357829.3	per 2 work-hr
871		3988085.5	358217.7	?
872		3992967.8	358124.3	per 2 work-hr
873		3965972.0	376607.7	per 0.5 work-hr
874	874	3968245.3	372544.3	per 0.6 work-hr
875		3966865.5	373165.1	per 2 work-hr
876		3966936.3	370563.3	per 2.5 work-hr
877		3964949.8	372524.3	per 0.75 work-hr
878		3964188.5	373364.1	per 2 work-hr

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
879	879	3968245.3	372544.3	per 1 work-hr
880		3964116.3	376741.2	per 2 work-hr
881		3967069.8	371652.3	per 2 work-hr
882		3967330.0	372239.4	per 2 work-hr
883		3975166.5	346923.5	per 2 work-hr, PT7
884	97	3972914.8	347364.0	per 2 work-hr & transect, PT9
885		3978964.5	352990.7	per 1 work-hr
886	886	3964055.3	364409.3	per 1.5 work-hr
887		3986851.5	354070.3	per 1 work-hr
888		3986784.8	354342.4	per 1 work-hr
889		3975788.5	351462.4	per 1 work-hr
890		3975994.3	351284.4	per 1 work-hr
891	891	3965378.0	367161.6	per 1 work-hr,dry
892	891	3965378.0	367161.6	per 1.5 work-hr
893		3970107.5	350119.1	per 2 work-hr
894		3964843.5	357967.6	per 2 work-hr
895		3964825.5	358095.3	per 1 work-hr
896		3964805.3	358374.5	per 2 work-hr
897		3964624.8	358009.4	per 2 work-hr
898		3964242.0	358682.6	per 2 work-hr
899	97	3972907.0	347351.0	per 2 work-hr, PT9
900		3978486.5	350154.0	per 2 work-hr
901		3983925.0	352146.5	per 4 work-hr
902		3983687.8	349418.1	per 2 work-hr
903		3979817.5	342770.8	per 2 work-hr
904		3979666.0	349359.4	per 1 work-hr
905		3980451.8	347010.9	per 3 work-hr
906		3980245.3	347089.4	per 5 work-hr
907		3982080.8	351251.3	per 2 work-hr
908		3981674.5	352668.8	per 2 work-hr
909		3976272.3	347061.7	per 2 work-hr
910		3973183.5	345992.4	per 2 work-hr
911		3974399.3	349345.6	per 2 work-hr
912		3976000.5	351002.6	per 2 work-hr
913		3959979.8	363067.6	per 1.5 work-hr
914		3965173.3	361113.3	per 1.5 work-hr
915	267	3980586.5	350156.9	per 0.5 work-hr
916		3973433.8	374800.7	per 3 work-hr

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
917		3973163.3	375882.0	per 1 work-hr
918		3971997.5	382915.1	per 0.5 work-hr
919		3971997.5	382915.1	per 3 work-hr
920		3965489.3	366618.2	per 0.5 work-hr
921	886	3964055.3	364409.3	per 0.5 work-hr
922	922	3969793.0	382493.8	per 0.5 work-hr
923	922	3969793.0	382493.8	per 4 work-hr
924	922	3969793.0	382494.4	per 2 work-hr
925		3970127.3	382961.9	per 1 work-hr
926		3971218.3	381002.2	per 1.5 work-hr
927		3972334.8	382100.5	per 1 work-hr
928		3972013.8	382571.8	per 1.5 work-hr
929		3966627.0	377042.8	per 1 work-hr
930		3970729.8	383491.2	per 2.5 work-hr
931		3970730.8	383490.0	per 3.5 work-hr
932		3970874.5	382039.0	per 5 work-hr
933		3970874.5	382039.0	per 5.5 work-hr
934	934	3971051.0	381393.8	per 2.5 work-hr
935	934	3971051.8	381388.3	per 3 work-hr
936	936	3966512.8	377402.9	per 3.5 work-hr
937	936	3966512.8	377402.9	per 22.5 work-hr
938	936	3966512.8	377402.9	per 18 work-hr
939		3963541.3	364109.9	per 14 work-hr
940	940	3969846.3	380725.3	per 6 work-hr
941	940	3969846.3	380724.7	per 8 work-hr
942		3967777.0	380339.2	per 6 work-hr
943		3968703.3	379914.5	per 24.5 work-hr
944		3971991.8	348756.2	per 10 work-hr
945	69	3978006.5	349135.8	per 0.5 work-hr
946		3973579.8	377786.0	per 2.5 work-hr
947		3976000.8	351002.0	per 3 work-hr
948		3996330.0	331190.0	per 6 work-hr
949		3989305.0	333295.0	per 4.5 work-hr
950		3985358.3	347931.5	per 9 work-hr
951		3964055.0	354887.8	per 2 work-hr
952		3976970.0	378551.1	per 2 work-hr
953		3986332.5	353756.2	per 9 work-hr
954		3964938.0	361134.6	per 1.5 work-hr

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
955		3973344.3	358140.6	per 0.5 work-hr
956		3973282.0	358512.3	per 0.5 work-hr
957		3970921.0	359201.3	per 1 work-hr
958		3971355.5	360741.2	per 0.5 work-hr
959		3971810.8	361018.8	per 0.5 work-hr
960		3972715.0	360577.4	per 0.5 work-hr
961		3980712.5	375459.1	per 2 work-hr
962		3981175.8	375148.6	per 2 work-hr
963		3981834.8	375159.4	
964		3982058.3	379547.0	
965		3968170.0	372720.0	2 work hours
966		3968170.0	372720.0	2 work hours
967		3967020.0	373200.0	2 work hours
968	371	3976188.3	374662.2	Quemazon Activity Plot
969	371	3976188.3	374662.2	Quemazon Activity Plot
970	371	3976188.3	374662.2	Quemazon Activity Plot
971	82	3976160.3	374309.4	Posos Activity Plot
972	82	3976160.3	374309.4	Posos Activity Plot
973	82	3976160.3	374309.4	Posos Activity Plot
974	344	3964620.0	370890.0	Dome Activity Plot
975	344	3964620.0	370890.0	8 total, 1 died, Dome Activity Plot
976	344	3964620.0	370890.0	Dome Activity Plot
977	977	3964550.0	370845.0	39 total, 1 died, Dome Slope Activity Plot
978	977	3964550.0	370845.0	Dome Slope Activity Plot
979	977	3964550.0	370845.0	Dome Slope Activity Plot, not completed,slope dry
980	977	3964550.0	370845.0	Dome Slope Activity Plot, 1 recapture
981		3964435.0	371100.0	per 2 work-hr
982	196	3978009.3	349276.8	2 person-hrs, conditions marginal
983	98	3973392.0	347723.1	2 person-hrs, PT 4, moist but not wet
984	95	3972761.5	346571.9	2 person-hrs, PT 2
985	90	3973431.3	347859.4	2 person-hrs, PT 3
986	91	3973784.5	348127.1	2 person-hrs, PT 8
987		3987000.0	385480.0	1 person-hr
988		3988380.0	381590.0	1 person-hr
989		3989200.0	363880.0	1 person-hr
990	248	3962764.0	363393.9	2 person-hrs
991	261	3964267.5	364340.1	2.25person-hrs
992	248	3962764.0	363393.9	2.5 person-hrs

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
993	248	3962764.0	363393.9	1.75 person-hrs
994	248	3962764.0	363393.9	1 person-hr
995	258	3964568.0	370951.0	2.5 person-hrs
996	258	3964568.0	370951.0	2.5 person-hrs
997		3978030.0	349050.0	2 person-hrs
998	998	3975045.0	349490.0	2.5 person-hrs
999	998	3975045.0	349490.0	5.5 person-hrs
1000	998	3975045.0	349490.0	3.25 person-hrs
1001	998	3975045.0	349490.0	4.0 person-hrs
1002	256	3962557.5	372197.6	2 person-hrs
1003	245	3962692.5	372143.1	1 person-hrs
1004		3963840.0	372260.0	0.25 person-hrs
1005		3963980.0	372220.0	1 person-hrs
1006	1006	3964170.0	371740.0	1.5 person-hrs
1007	1005	3963980.0	372220.0	2 person-hrs
1008	1006	3964170.0	371740.0	2 person-hrs
1009	1009	3964535.0	371425.0	
1010	1009	3964535.0	371425.0	2.5 person-hrs
1011	184	3978009.3	349276.8	5.5 person-hrs
1012		3961340.0	374680.0	8 person-hrs
1013		3961400.0	375080.0	8 person-hrs
1014		3961440.0	375400.0	8 person-hrs
1015	513	3965165.5	370690.9	per 2 work-hr
1016	368	3964359.0	371173.4	per 1 work-hr
1017		3965240.0	370580.0	2 person-hrs
1018		3965000.0	370600.0	2 person-hrs
1019	513	3965165.5	370690.9	1 person-hrs
1020		3961200.0	374200.0	2 person-hrs
1021		3958680.0	373640.0	2 person-hrs
1022		3960840.0	375120.0	2 person-hrs
1023		3960660.0	374900.0	2 person-hrs
1024		3960400.0	374660.0	2 person-hrs
1025		3963960.0	371000.0	2 person-hrs
1026		3963700.0	371140.0	2 person-hrs
1027		3963500.0	371340.0	2 person-hrs
1028		3963020.0	371600.0	2 person-hrs
1029		3962960.0	371780.0	2 person-hrs
1030		3962880.0	371900.0	2 person-hrs

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
1031		3963140.0	371450.0	2 person-hrs
1032		3963100.0	371460.0	2 person-hrs
1033		3961290.0	373420.0	2 person-hrs
1034		3959080.0	374700.0	2 person-hrs
1035		3959080.0	374900.0	2 person-hrs
1036		3959980.0	374760.0	2 person-hrs
1037		3959980.0	375880.0	2 person-hrs
1038		3960080.0	375180.0	2 person-hrs
1039		3961840.0	373370.0	2 person-hrs
1040		3961700.0	373460.0	2 person-hrs
1041		3961250.0	371880.0	2 person-hrs
1042		3961680.0	371970.0	2 person-hrs
1043		3961980.0	371920.0	2 person-hrs
1044	196	3978009.3	349276.8	1 person-hrs
1045	258	3964568.0	370951.0	2.5 person-hrs
1046		3974122.0	345185.0	Highway 126 widening project
1047		3974240.0	345260.0	Highway 126 widening project, 2 wkhr
1048		3963375.0	371960.0	2 person-hrs, 5% slope NNE
1049		3957190.0	373250.0	2 person-hrs, 25% slope SSE
1050		3956960.0	373220.0	2 person-hrs,30% slope ESE
1051		3957160.0	373150.0	2 person-hrs,30% slope SSE
1052		3964100.0	370910.0	2 person-hrs,0% slope NWE
1053		3963880.0	371060.0	2 person-hrs,1% slope ESE
1054		3963730.0	371410.0	2 person-hrs, ESE
1055		3963425.0	371775.0	2 person-hrs, 0-40% slope ESE
1056	256	3962557.5	372197.6	2 person-hrs, 5-10% slope ENE,SE
1057		3974838.0	345440.0	2 person-hrs, 10% slope ENE
1058		3971440.0	350615.0	2 person-hrs., 20% slope, N, NE
1059		3971530.0	350670.0	2 person-hrs., 5% slope, E
1060		3971650.0	350670.0	2 person-hrs., 10% slope, E
1061		3971785.0	350710.0	2 person-hrs., 10% slope, E, NE
1062		3962845.0	372660.0	96-11
1063		3962547.5	372173.3	salamander (ESP4153) found in stomach of T. elegans (ESP4154)
1064	69	3978006.5	349135.8	2 person-hrs, cryptogam study
1065	412	3974620.5	349615.3	2 person-hrs, cryptogam study
1066	95	3972761.5	346571.9	2 person-hrs, cryptogam study, PT 2
1067	90	3973431.3	347859.4	2 person-hrs, cryptogam study, PT 3
1068		3973420.0	347490.0	2 person-hrs, cryptogam study

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
1069	379	3978439.8	350441.7	2 person-hrs, cryptogam study
1070	513	3965165.5	370690.9	2 person-hrs, cryptogam study
1071	421	3976089.3	379034.9	2 person-hrs, cryptogam study
1072	977	3964550.0	370845.0	2 person-hrs, cryptogam study
1073	84	3975919.5	376816.8	2 person-hrs, cryptogam study
1084	8	3965377.0	364953.3	type locality
1074		3966560.0	375020.0	1.5 person-hrs
1075		3967290.0	374810.0	0.65 person-hrs, adequate moisture
1076		3968240.0	374090.0	presence/absence highgrade
1077		3969200.0	374960.0	2 person-hrs
1078		3968240.0	374400.0	
1079		3966050.0	375080.0	2 person-hrs
1080		3968120.0	377130.0	2 person-hrs
1081		3968520.0	376120.0	.08 person-hrs
1082		3966420.0	376765.0	2 person-hrs
1083	47	3976806.3	346491.6	3.5 person-hrs
1085	344	3964620.0	370890.0	Dome Flat activity plot, 0 recaptures
1086	344	3964620.0	370890.0	Dome Flat activity plot, 0 recaptures
1087	980	3972702.3	349866.8	Dome Slope activity plot, 0 recaptures
1088	980	3972702.3	349866.8	Dome Slope activity plot, 3 recaptures
1089	980	3972702.3	349866.8	Dome Slope activity plot, 8 recaptures
1090	82	3976147.8	374318.8	Posos activity plot, 0 recaptures
1091	82	3976147.8	374318.8	Posos activity plot, 4 recaptures
1092	371	3976188.3	374662.2	Quemazon activity plot, 0 recaptures
1093	371	3976188.3	374662.2	Quemazon activity plot, 0 recaptures
1094	49	3964564.0	364359.4	
1095		3974440.0	345400.0	found at 4+400 along proposed NM Hwy 126 alignment, not a timed search
1096		3959180.0	363810.0	2 people x 1 minute; down logging rd past creek ca. 50 m to rocky road cut
1097		3976820.0	345840.0	
1098		3977260.0	345600.0	abundant surface rock
1099	103	3977709.8	345829.6	rocky slope with conifer overstory
1100		3977660.0	345710.0	3 salmanders collected; all under bark
1101		3977320.0	345800.0	
1102		3977820.0	345980.0	adequate appearing decayed woody debris
1103		3978000.0	346120.0	adequate appearing decayed woody debris
1104		3978320.0	345760.0	habitat, logs were noticeably moist
1105		3978400.0	346200.0	habitat appeared suitable w/ adequate decaying logs
1106		3978720.0	345680.0	habitat/logs were noticeably moist

High Grade data summary for Jemez Mountains salamander

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
1107		3978840.0	346120.0	
1108		3979000.0	345340.0	woody debris generally sparse
1109		3979580.0	344740.0	suitable appearing habitat in stand
1110		3979920.0	345160.0	suitable appearing habitat in stand
1111		3980260.0	345440.0	
1112		3980760.0	345680.0	habitat/logs noticeably moist
1113		3980780.0	345500.0	
1114		3979860.0	345000.0	
1115		3979560.0	345200.0	
1116		3973980.0	344520.0	survey at jct 4 sections
1117		3974180.0	344700.0	much downed woody debris
1118		3974360.0	345020.0	much downed woody debris w/in survey area
1119		3974480.0	345240.0	much downed woody debris w/in survey area
1120		3972220.0	344640.0	logs in habitat lacking adequate decay
1121		3972460.0	344920.0	logs in habitat lacking adequate decay
1122		3979260.0	345600.0	woody debris plentiful
1123		3958255.0	363660.0	ca 2 person hrs
1124	980	3972702.3	349866.8	Dome Slope activity plot, 6 recaptures, weather rainy
1125	980	3972702.3	349866.8	Dome Slope activity plot, 3 recaptures, weather dry and warm
1126	82	3976147.8	374318.8	Posos activity plot, 7 recaptures, weather rainy
1127	82	3976147.8	374318.8	Posos activity plot, 2 recaptures, weather dry and warm
1128	371	3976188.3	374662.2	Quemazon activity plot, 1 recapture, raining
1129	371	3976188.3	374662.2	Quemazon activity plot, plot dry, subsurface ca 2-3" wet, clouds building
1130	344	3964620.0	370890.0	Dome Flat activity plot, 0 recaptures, weather rainy
1131	344	3964620.0	370890.0	Dome Flat activity plot, 0 recaptures, weather dry and warm
1132	95	3972761.5	346571.9	2 person-hrs, PT 2, one other salamander escaped, warm, cloudy, few inverts observed
1133	90	3973431.3	347859.4	2 person-hrs, PT 3, some clouds building
1134	98	3973392.0	347723.1	2 person-hrs, PT 4, 1 large salamander escaped, breezy, 50% clouds, warm
1135		3972655.9	378539.9	72 minute highgrade, ponderosa, mostly dry
1136		3973295.0	377810.3	2 person-hrs, CWD abundant, pine, Doug-fir, sunny, warm
1137		3973285.4	377143.0	2 person-hrs, CWD abundant, pine, Doug-fir, clouds building
1138		3973900.9	376997.3	6 minute highgrade, CWD and subsurface, angular rock abundant, clouds building
1139		3975370.1	376817.4	12 minute highgrade, CWD and subsurface, angular rock abundant, clouds building
1140	980	3972702.3	349866.8	Dome Slope activity plot, 9 recaptures
1141	980	3972702.3	349866.8	Dome Slope activity plot, 6 recaptures
1142	344	3964620.0	370890.0	Dome Flat activity plot, 1 recapture
1143	344	3964620.0	370890.0	Dome Flat activity plot, 1 recapture
1144	82	3976147.8	374318.8	Posos activity plot, 3 recaptures

MAP NO	Same As No	UTM Northing	UTM Easting	NOTES
1145	82	3976147.8	374318.8	Posos activity plot, 3 recaptures
1146	371	3976188.3	374662.2	Quemazon activity plot, 1 recapture
1147	371	3976188.3	374662.2	Quemazon activity plot, 1 recaptures
1148	1148	3964000.0	370480.0	
1149	1149	3972285.0	376020.0	Stand 69630702
1150	977	3964550.0	370845.0	HG 233, per 2 work-hr.
1151	175	3965347.8	366651.1	HG 234, per 2 work-hr
1152	252	3962152.5	361439.4	2 person-hrs, same as map #252
1153	248	3962764.0	363393.9	2 person-hrs
1154	980	3972702.3	349866.8	Dome Slope activity plot, 2 recaptures, marginal conditions
1155	344	3964620.0	370890.0	Dome Flat activity plot, 0 recaptures
1156	82	3976147.8	374318.8	Posos activity plot, 4 recaptures
1157	371	3976188.3	374662.2	Quemazon activity plot
1158	1158	3975302.0	376891.0	2 person-hrs
1159	1158	3975302.0	376891.0	2 person-hrs, 100% burned area
1160		0.0	0.0	Down slope of arthropod transect #2 (MRC).
1161	1161	3973763.0	374896.0	Mildly burned area, down slope of arthropod transect #17 (MRC).
1162	980	3972702.3	349866.8	Dome Slope activity plot, 3 recaptures
1163	344	3964620.0	370890.0	Dome Flat activity plot, 1 recapture
1164	82	3976147.8	374318.8	Posos activity plot, 4 recaptures
1165	371	3976188.3	374662.2	Quemazon activity plot, 0 recaptures
1166	98	3973392.0	347723.1	2 person-hrs, PT 4, dry except for topsoil, light breeze
1167	90	3973431.3	347859.4	2 person-hrs, PT 3, dry except for topsoil, light breeze
1168	95	3972761.5	346571.9	2 person-hrs, PT 2, possibly one salamander escaped, dry in intact logs, surface moist
1169	82	3976147.8	374318.8	Posos activity plot, 6 recaptures
1170	371	3976188.3	374662.2	Quemazon activity plot, 0 salamanders
1171	91	3973784.5	348127.1	None on transect, PT 8, hg 7/13/88

Appendix 2. Ramotnik (1997). Conservation Assessment of the Sacramento Mountain Salamander. This assessment will assist land managers in decision making regarding consequences of management actions affecting the Sacramento mountain salamander.

Appendix 2 is included only with the original copy of this document.

EWPAINTER

USDA United States Department of Agriculture

Forest Service

Rocky Mountain Forest and Range Experiment Station

Fort Collins, Colorado 80526

General Technical Report RM-GTR-293

Conservation Assessment of the Sacramento Mountain Salamander

Cynthia A. Ramotnik

Abstract

Ramotnik, Cynthia A. 1997. **Conservation assessment of the Sacramento Mountain salamander.** Gen. Tech. Rep. RM-GTR-293. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 19 p.

This document synthesizes existing information on the Sacramento Mountain salamander, a terrestrial amphibian endemic to three mountain ranges in southern New Mexico. The salamander is found in mixed-conifer forests primarily on USDA Forest Service lands, within and under decayed logs, and beneath rocks and litter. Because the salamander depends on a moist microhabitat, it is vulnerable to actions that directly or indirectly reduce the amount of moisture available to it. This assessment will assist land managers in making informed evaluations regarding consequences of management decisions and guide them toward a coordinated approach in the context of ecosystem management.

Keywords: Amphibia, Plethodontidae, *Aneides hardii*, mixed-conifer forest, logging, New Mexico

The Author

Cynthia A. Ramotnik is a museum specialist with the U.S. Geological Survey, Biological Resources Division (formerly the National Biological Service), and is stationed at the University of New Mexico in Albuquerque. She obtained a B.S. in biology from the State University of New York at Oneonta and an M.S. in zoology from Colorado State University. Ramotnik has conducted research on New Mexico's endemic salamanders since 1984. Her research interests include museum collection management and taxonomy and distribution of vertebrates, particularly amphibians, reptiles, and mammals, in the Southwest.

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Cover photo of Sacramento Mountain Salamander by Taro Narahashi.

Conservation Assessment of the Sacramento Mountain Salamander

Cynthia A. Ramotnik

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Conservation Assessment of the Sacramento Mountain Salamander

Introduction

The three salamander species known to inhabit New Mexico include the tiger salamander, *Ambystoma tigrinum*; the Sacramento Mountain salamander, *Aneides hardii*; and the Jemez Mountains salamander, *Plethodon neomexicanus*. Of the three, *A. tigrinum* is the single representative of the family Ambystomidae. While populations in Arizona, Colorado, and Utah have experienced recent unexplained die-offs (C. Carey, pers. comm.), *A. tigrinum* appears to remain stable in New Mexico, where it occurs throughout the state. The other two species, both in the family Plethodontidae, are endemic to distinct New Mexico mountain ranges, primarily on federal lands within the north-central (*P. neomexicanus*) and south-central (*A. hardii*) regions of the state. The close association of these two salamanders with mixed-conifer forests makes them particularly vulnerable to forest-management practices such as logging. *P. neomexicanus* has previously been the subject of both a formal Draft Management Plan and a Memorandum of Agreement between state and federal managers.

In contrast, many of the management strategies for *A. hardii* have never been formally adopted by state and federal managers. This conservation assessment is the first step in a process to facilitate coordination between cooperating federal and state agencies. It summarizes the scientific knowledge of the Sacramento Mountain salamander to assist land managers in making informed evaluations of the consequences of management decisions. The technical knowledge reviewed here was obtained from published and unpublished sources (research reports, agency files) and from discussions with individuals knowledgeable about various aspects of the biology of the salamander.

Administrative Status

The Sacramento Mountain salamander is listed as "threatened" by the State of New Mexico (New Mexico Department of Game and Fish 1996) and "sensitive" by the Forest Service (U.S. Forest Service 1988a). In 1985, the salamander was placed under review as a potentially threatened or endangered species (Category 2 Candidate Species) under the Federal Endangered Species Act (U.S. Fish and Wildlife Service 1985). Recently, the Fish and Wildlife Service discontinued the Category 2 (C2) status and currently refers to former C2 species as "species of concern" (U.S. Fish and Wildlife Service 1996). Current management efforts for the salamander are coordinated between state and federal managers and are guided by a combination of cooperative agreements, management recommendations, and monitoring protocols. Several of the agreements and protocols have not been finalized or formally adopted in writing. The chronology and details of these efforts are described below and summarized in table 1.

Table 1. Summary of listing and management actions (direct and indirect) for the Sacramento Mountain salamander. Abbreviations for agencies are: NMDGF (New Mexico Department of Game and Fish), USFWS (U.S. Fish and Wildlife Service), and USFS (USDA Forest Service).

Date	Action	Agency
1975	Listed as Endangered (Group II)	NMDGF
1985	Listed as C2 Candidate Species	USFWS
	Interagency Committee established	USFS, USFWS, NMDGF
1986	10-year Lincoln National Forest Plan	USFS
1988	Draft Interagency Agreement (specifies formation of New Mexico Salamander Working Group)	USFS, USFWS, NMDGF
	Listed as Sensitive	USFS
	Amendment to Lincoln National Forest Plan	USFS
1989	First meeting of New Mexico Salamander Working Group	USFS, USFWS, NMDGF
1990	Draft protocol to monitor status of salamander (lists several management recommendations)	USFS, USFWS NMDGF
1993	Federal Listing of Mex. spotted owl	USFWS
1995	Discontinuation of C2 Candidate Species List	USFWS
1996	Record of Decision for Amendment of Forest Plan	USFS

Following state listing of the Sacramento Mountain salamander in 1975, no formal management action was undertaken by state or federal managers for the next 10 years. In 1985, an Interagency Committee was established, consisting of representatives from the Forest Service, Fish and Wildlife Service, and New Mexico Department of Game and Fish. The goal of this committee was to identify data and management needs for both of New Mexico's endemic salamanders, *A. hardii* and *P. neomexicanus*. In 1988, the committee drafted an Interagency Agreement recognizing management responsibilities of the three agencies, which aimed to eliminate the need for protective status of both salamanders. Once the Agreement was signed by all parties, the Forest Service would suspend "lumbering and associated activities ... in all areas ... occupied by [*Aneides*], in 85% of ... potential occupancy, and in 50% of ... possible occupancy" (Draft Master Interagency Agreement 1988). A final version has been signed only for *Plethodon* (Memorandum of Agreement signed 30 May 1991). No Interagency Agreement for *Aneides* has been developed or signed.

The Draft Interagency Agreement also specified the creation of a "formal salamander task force" to serve in an advisory capacity for the management of *A. hardii* and *P. neomexicanus*. Although the Interagency Agreement has never been signed to "formalize" the task force (now called the New Mexico Salamander Working Group [Group]), the Group has met regularly since its inception in March 1989. In 1990, members of the Group drafted a document including a protocol for monitoring the status of Sacramento Mountain salamander populations and listed several management recommendations. The recommendations specified that, within a 10-year planning period, no more than 25% of the total known occupied salamander habitat can be harvested (logged), and no more than 40% can be harvested within a single planning area. Additional recommendations include leaving all unmerchantable logs over 12 inches diameter in all stand prescriptions, and allowing prescribed burns for site preparation in up to 5% of the occupied habitat. These recommendations have been complied with by the Forest Service since they were proposed, even though the document has never been finalized.

Long-term management goals of the Lincoln National Forest are specified in the Lincoln National Forest Plan (Plan) and are applicable for a 10-15 year period (U.S. Forest Service 1986). The Plan provides some management recommendations specific to *A. hardii*, most or all of which are found within Appendix C ("Forest-Wide Standards and Guidelines for Federal and State Threatened and Endangered Species") and within Plan Amendments (U.S. Forest Service 1988b). Appendix C discourages fuelwood gathering activities within salamander habitat and states that the Forest Service will cooperate with other agencies to determine the habitat requirements for the Sacramento Mountain salamander (U.S. Forest Service 1986:206). Until habitat requirements are determined, interim guidelines are provided to address slash disposal and winter logging. Interim guidelines are deleted in the Plan Amendment (U.S. Forest Service 1988a) and replaced with a statement that occupied salamander habitat will be evaluated on a "site-specific basis" and addressed through the integrated resource management process (IRM) (U.S. Forest Service 1988b: replacement page 206).

The Lincoln National Forest has an active survey program for Sacramento Mountain salamanders on the Sacramento District and maintains a Geographic Information System database that tracks the amount of acreage surveyed, the amount occupied by salamanders, and the subset of occupied habitat which has been logged. From 1986 to 1992, almost 95,000 acres have been surveyed, revealing that 27% (25,855 acres) is occupied by salamanders. During the current 10-year planning period, the Group's recommendation was met in regard to harvesting "no more than 25% of the total known occupied salamander habitat" (the actual number was 20%, D. Salas, pers. comm.), and no more than 40% was harvested within individual planning units (except in 1987). The Lincoln National Forest is mapping the habitat occupied by salamanders within the Sacramento District.

The Federal listing of the Mexican spotted owl (*Strix occidentalis lucida*) as threatened in 1993 (U.S. Fish and Wildlife Service 1993) has had recent indirect management implications for the Sacramento Mountain salamander, due to the close association of both species with mixed-conifer forest. Restrictions and modifications in resource management activities, such as logging and grazing in designated critical habitat for the owl, have been in effect since the late 1980s. However, the impact of these new restrictions on the salamander has been minimal, since the majority of mixed-conifer forest had been harvested within the Lincoln National Forest by 1986 (D. Salas, pers. comm.). Specific management guidelines for the owl went into effect 15 June 1996 in an amendment to the Forest Plan (U.S. Forest Service 1996). Some of the modifications having potentially beneficial impacts on the Sacramento Mountain salamander include the Forest-wide emphasis on uneven-aged silviculture methods versus even-aged methods, the extension of rotation ages for even-aged stands to greater than 200 years, and the retention of large snags and woody debris within mixed-conifer forest. Revision of the Lincoln National Forest 10-year Plan is scheduled to begin in 1999 (U.S. Forest Service 1996:13) and will provide an opportunity to review the contents of the latest amendment. What impact the revised Plan will have on the Sacramento Mountain salamander remains to be seen.

Review of Technical Knowledge

Systematics

The Sacramento Mountain salamander was discovered in New Mexico in 1940,when the presence of only one other plethodontid salamander, *Plethodon idahoensis*, was confirmed from the "entire Rocky Mountain system" (Lowe 1950:92). The salamander was described from a single, poorly preserved juvenile specimen, and was placed in the genus *Plethodon* (Taylor 1941). Lowe (1950) transferred the species to the genus *Aneides* based on comparison of skeletal features of *Plethodon* and *Aneides*. Sessions and Kezer (1987) examined chromosomal variation within the genus *Aneides* and concluded that *Aneides* has undergone pronounced karyological divergence from a *Plethodon*-like ancestor. Relative to *Plethodon*, *Aneides* demonstrates an increased rate of chromosomal rearrangement.

The genus *Aneides* consists of five species: *A. aeneus* occurs in the Appalachian region of the eastern United States; *A. hardii* is endemic to south-central New Mexico; and *A. ferreus*, *A. lugubris*, and *A. flavipunctatus* extend along the West Coast from Vancouver Island, Canada, to northern Baja California, Mexico. The ranges of the latter three species overlap in northern California. Compared to other members of the genus, *A. hardii* is the most generalized morphologically (Wake 1966) and the most sexually dimorphic (Staub 1989).

Protein comparisons reveal that *Aneides* is most closely related to the western group of *Plethodon*, from which it arose approximately 24-38 million years ago (Larson et al. 1981). Lowe (1950) argues that the distribution of the genus *Aneides* was associated with the transcontinental Arcto-Tertiary Flora until the late Miocene. Subsequent climatic and physiographic changes created large areas of savannah and grassland, isolating members of the genus to the cooler, more mesic (e.g., coastal and montane) areas. Electrophoretic and immunological data suggest that *A. hardii* diverged from other *Aneides* during the mid-Miocene, approximately 20 million years ago (Larson et al. 1981). Using electrophoretic techniques, Pope and Highton (1980) suggest that *A. hardii* separated into the three existing populations (Capitan, White, and Sacramento mountains) during the latter half of the Pleistocene.

Schad et al. (1959) examined geographic variation among the three populations of *A. hardii*. Whereas they noted that the Capitan population was morphologically the most distinct, differences between this population and the other two were not significant enough to warrant subspecific designation. Pope and Highton (1980) found that genetic divergence was small among the three populations.

Description

The Sacramento Mountain salamander is the smallest member of the genus, yet is typical with respect to masseter muscle development, sulci of the head and neck region, body proportions, and prominently overhanging teeth (Lowe 1950). Although habits of the genus range from terrestrial to arboreal, *A. hardii* shares body features typical of the terrestrial members: cylindrical trunk and tail and relatively short limbs and digits (Wake 1966). The tail is slightly shorter than the snout-vent length (SVL), which ranges from 43 to 63 mm in adults of both sexes (Staub 1989). Although males have a shorter trunk than females, they tend to be larger due to the greater head and tail length (Staub 1989). Costal grooves number 14-15 and there are 2 to 4-1/2 costal folds between adpressed limbs (Wake 1965). This monotypic species is light to dark brown on the dorsum with varying amounts of greenish gray to bronze mottling. The venter is light brown, the throat cream-colored. Adult males are easily distinguished from females by the prominent masseter muscles (which give the head a triangular shape) and the presence of a mental gland on the chin. Juveniles may have a brown or bronze dorsal stripe. Staub (1989) provides additional information on skull ossification and body proportions of adults and juveniles.

Geographic Distribution

The Sacramento Mountain salamander is restricted to three disjunct areas within the Capitan, White, and Sacramento mountains of south-central New Mexico in Lincoln and Otero counties (figure 1). Within these areas, salamanders have been found at elevations as low as 2438 m (4 mi NE Cloudcroft, Staub 1986; Scott Able Canyon, D. Salas, pers. comm.), and as high as 3600 m, near the summit of Sierra Blanca Peak (Moir and Smith 1970). Weigmann et al. (1980:33) state that salamanders were collected "from elevations of 7800-7900 ft" (2377-2408 m) but do not provide localities.

Findley (1959) obtained the first specimens from the Capitan Mountains (Lincoln County) in July 1958. Meents (1987) surveyed 42 locations in the Capitan Mountains and found salamanders at 27 of these sites, all above 2682 m. Some of these localities have been surveyed by the New Mexico Department of Game and Fish each year for a number of years (C. Painter, pers. comm.). All known localities within the Capitan Mountains occur within the Capitan Mountains Wilderness, Lincoln National Forest (Smokey Bear District).

The population in the White Mountains (Lincoln and Otero counties) is centered on Sierra Blanca Peak. Salamanders are known from localities to the north and north-

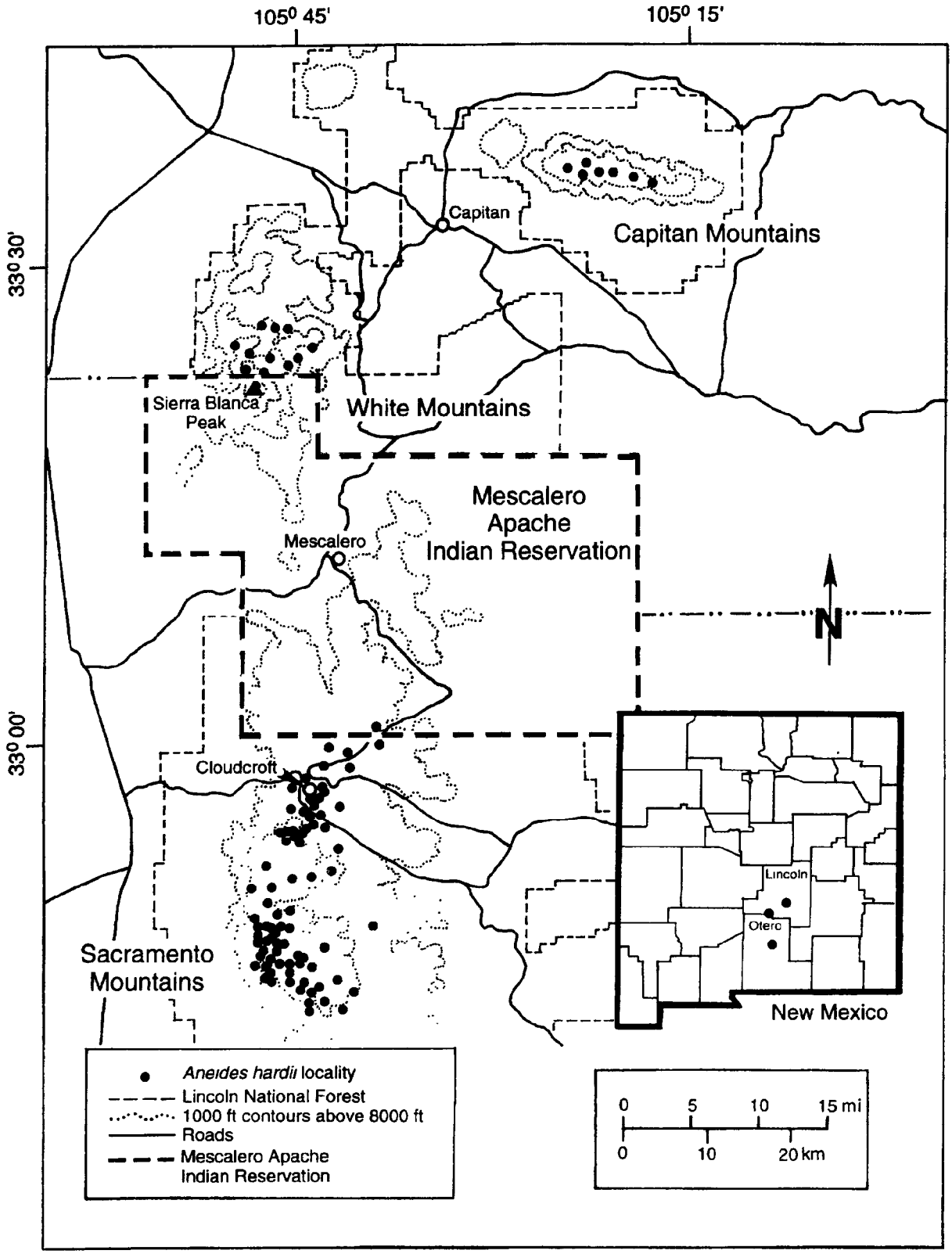

Figure 1. Distribution of the Sacramento Mountain salamander, Aneides hardii, *within Lincoln and Otero counties, New Mexico.*

east, on lands administered by the Lincoln National Forest (White Mountain Wilderness, Smokey Bear District). A single specimen is known from the southern end of the Mescalero Apache Reservation along State Highway 24. Additional specimens have been reported elsewhere on the reservation (N. Jojola, pers. comm.), but precise localities are not available.

The third population occurs within the Sacramento Mountains (Otero County), from the vicinity of Cloudcroft southward to the southern end of the mountain range. This population includes the type locality "Sacramento Mountains at Cloudcroft, 9000 ft" (Taylor 1941). The majority of known salamander localities occur within the Sacramento District, Lincoln National Forest, but a few occur on private lands.

The Capitan population is the most geographically isolated. It is separated from the Sierra Blanca populations by a straight-line distance of 12 miles of unsuitable habitat of pinyon-juniper vegetation (Schad et al. 1959). A weaker barrier occurs between the Sierra Blanca and Cloudcroft populations, where they presumably approach within two to three miles of each other in a narrow band of mixed ponderosa pine, spruce, and fir at 2286 m (within the Mescalero Apache Reservation). Schad et al. (1959:302) hypothesize that "relatively small climatic changes would suffice to reunite the two populations."

Habitat Description

Salamanders are found within mixed-conifer forest above 2400 m (figure 2). The dominant trees within these montane and subalpine forest habitats include Douglas-fir (*Pseudotsuga menziesii*), white fir (*Abies concolor*), and Engelmann spruce (*Picea engelmannii*). Salamanders are sometimes found in "pure stands of Engelmann spruce" (Johnston and Schad 1959:576). Aspen (*Populus tremuloides*), Rocky Mountain maple (*Acer glabrum*), gooseberry (*Ribes* spp.), and oceanspray (*Holodiscus dumosus*) share the understory with seedling conifers and downed logs in various stages of decay (Scott and Ramotnik 1992). Taylor (1941:77) identifies the habitat of the type specimen as "pine forest" but Lowe (1950) amends this to Douglas-fir based on elevation.

During June-September when salamanders are active on the surface, they are found within and under logs and moist litter, and under rockslides and surface objects such as bark, rocks, and small woody debris. Above timberline, they are associated with rocks and mats of mosses and lichens (Moir and Smith 1970). Whereas salamanders can be found beneath both coniferous and deciduous logs, they are most often found within coniferous logs (primarily Douglas-fir) in advanced stages of decay. The creation of internal channels within the decaying coniferous logs allows salamanders access to a greater portion of the log (figure 3). Weigmann et al. (1980) found no cover preference between juveniles and adults. Although salamanders can be found on slopes at all aspects, they are relatively easier to detect on the surface of more mesic north- and east-facing slopes. Because salamanders are absent from the surface during much of the year (they spend about eight months below the soil surface, Scott and Ramotnik 1992), they must be using other habitat components as well.

Several studies examined the habitat affinities of *A. hardii*. Meents (1987:2) studied the Capitan population and found that salamanders tended to occur on north- and

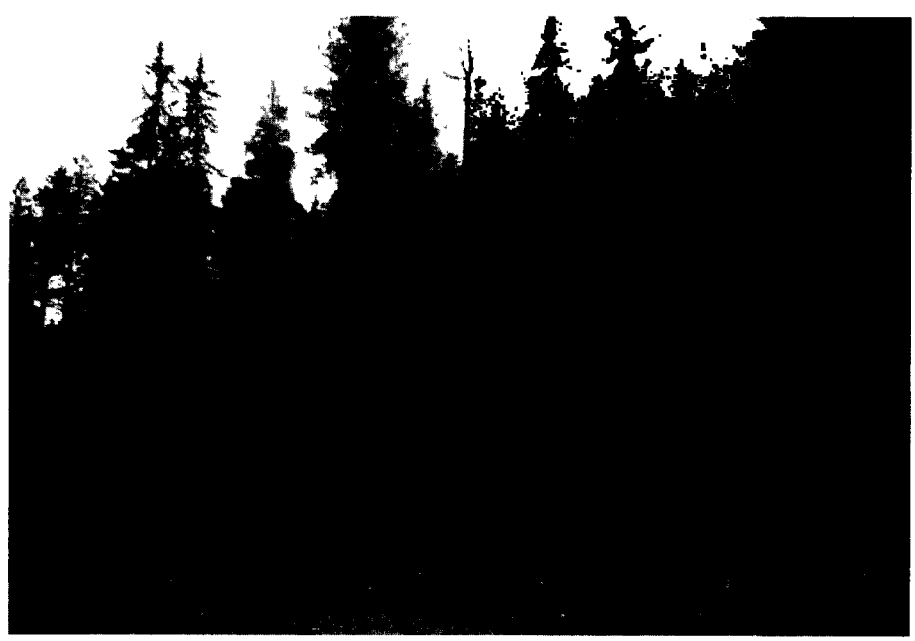

Figure 2. Habitat of the Sacramento Mountain salamander within the Sacramento Mountains, New Mexico. The mixed coniferous forest includes Douglas-fir, white fir, and Engelmann spruce. Salamanders are found within and under the decayed logs. Photograph by C.A. Ramotnik.

Figure 3 Well-decayed Douglas-fir log showing the internal channels where Sacramento Mountain salamanders can be found Photograph by C A Ramotnik

east-facing slopes and were found only "beneath or within logs, or under the bark of logs." Elsewhere, salamanders could be found in areas with a high canopy cover "if appropriate logs were also present" ("appropriate logs" consisted of Douglas-fir in an advanced state of decomposition). Weigmann et al (1980) studied the Sacramento Mountains population and concluded that salamanders were more often found in stands where either Douglas-fir or white fir or both predominated, but that the composition of the shrub layer also affected their abundance. Salamanders were more frequently associated with an understory of Rocky Mountain maple, less frequently with a sparse understory, and rarely with Gambel oak. In addition, salamanders were found on transects with steep slopes ($\bar{x}$ = 24%), high elevations ($\bar{x}$ = 2739 m), and high overstory cover ($\bar{x}$ = 71%) and ground story cover ($\bar{x}$ = 66%) Ramotnik and Scott (1988) developed a discriminant model to predict salamander occurrence. The variables with the best predictive value were high elevation; large numbers of Engelmann spruce, white fir, and Douglas-fir; and large downed logs. Salamanders were negatively correlated with the presence of pine.

General Ecology

Relationship With Environment

The physiological interaction of amphibians with their abiotic environment is a complex, dynamic system of related processes. Because they are ectotherms with a permeable body covering, terrestrial plethodontid salamanders such as *A. hardii* had to evolve adaptations to cope with the inevitable loss of body water while maintaining a moist skin for gas exchange. This has been made possible through a combination of many unique behavioral responses

Because *A. hardii* is lungless, gas exchange occurs primarily across moist skin To minimize evaporative water loss, most terrestrial amphibians are nocturnal, avoiding higher daytime temperatures and lower atmospheric humidity (Duellman and Trueb 1986) The use of diurnal retreats such as logs and the undersides of rocks, where humidity is higher, allows them to rehydrate when necessary. Although the extent to which *A. hardii* is nocturnal is unknown, the use of diurnal shelters is commonly reported. *A. hardii* is rarely, if ever, seen active away from cover and, if so, only during or after summer rains (pers. obs.). Laboratory humidity preferences for *A hardii* are high and range from 54.5 to 97 2° C ($\bar{x}$ =83 2° C; Carey 1988). The salamander can survive an average water loss of 28 2% (range=26.5 to 31 3%) of its body mass (Carey 1988), which is lower than that reported for other amphibians (Thorson and Svihla 1943). To reduce the amount of surface area exposed to evaporation, salamanders may curl their bodies and tails (Ray 1958), or form aggregations of two or more animals (Duellman and Trueb 1986). Clumping or aggregating has been observed for the Sacramento Mountain salamander and is more likely to occur in drier or less suitable habitats (Weigmann et al. 1980). Chris Borg (pers. comm.) observed clumping behavior more often in "cut patches" and noted a greater frequency of clumping behavior in 1995 versus 1996, which he speculates could be associated with lower rainfall in 1995. Small salamanders have greater rates of water loss than larger salamanders due to the greater proportion of surface area exposed.

Field temperatures of temperate terrestrial plethodontids range from -2.0 to 26.3° C ($\bar{x}$ = 13.5° C; Brattstrom 1963; Feder et al. 1982) and typically reflect the temperature of their immediate surroundings, especially the substrate (Duellman and Trueb 1986). Field temperatures of 390 cover objects in which *A. hardii* was found ranged from 8.0 to18.0° C ($\bar{x}$ = 11.4° C, Williams 1978). The preferred body temperature of *A. hardii* (defined as the mean value of the range of temperatures within which an organism is voluntarily active; Bogert 1949) is 11.3° C (range=6.1 to 15.9°C; Carey 1988) and is lower than that reported for 13 species of eastern terrestrial salamanders (Spotila 1972). Using the critical thermal maximum (CTM) as a measure of temperature tolerance of an organism where 50% survive, Whitford (1968) and Carey (1988) showed the CTM of *A. hardii* to be 33.3° C and 30.8° C, respectively. This is significantly lower than for terrestrial eastern plethodontids but is comparable to species inhabiting cold mountain streams in the eastern United States (Whitford 1968). The low thermal preferences and CTM most likely reflect adaptations by *A. hardii* to the low temperatures characteristic of the microclimate of its habitat.

The standard metabolic rate (maintenance costs) of *A. hardii* is low, yet comparable to that of other plethodontid salamanders at equivalent temperatures, and is consistent with an ecological strategy of a low-temperature, low-energy utilization lifestyle (Carey 1988). Metabolic costs are higher at higher temperatures and, based on laboratory results, would be expected to increase 2.8-fold between 5 and 15° C and 3.5-fold between 15 and 25° C (Carey 1988). Whitford (1968:250) suggests that temperatures around 15° C may represent an "environmental optimum" for *A. hardii*, based on measurements of oxygen consumption and heart rate at different temperatures.

Food and Feeding

A. hardii feeds on ground-dwelling invertebrates, primarily arthropods in classes Arachnida and Insecta, some molluscs (Johnston and Schad 1959; Staub 1986), and earthworms (Scott 1990). Johnston and Schad (1959) examined the stomachs of 16 salamanders and found the following: 40% ants, 28% adult and larval beetles, 10% spiders, 8% *Acarina*, and 4.5% Mollusca. Scott (1990) examined the stomach contents of approximately 50 *A. hardii* and found an average of 21 food items from a wide variety of small arthropods, snails, earthworms, and isopods. Males and females exhibit little difference in the sizes of prey taken (Staub 1989).

A. hardii forages aboveground within and under logs, and under rocks and litter, where the majority of prey are found. Scott and Ramotnik (1989) examined arthropod density in soil pits and found few arthropods below the litter layer. Those found within the soil profile occurred down to 35 cm; only earthworm activity was extensive, as evidenced by the presence of castings extending to bedrock. Captive *A. hardii* initially foraged during daylight hours, but after acclimation they actively foraged at night or under low-light conditions (Johnston and Schad 1959). Prolonged droughts or periods of low humidity can restrict surface foraging, forcing salamanders belowground where prey are limited.

Ambient temperature has a direct influence on the digestive efficiency of salamanders. At lower temperatures, digestive efficiency increases because food remains in the digestive tract longer than at warm temperatures (Bobka et al. 1981). The increased processing time at lower temperatures is also advantageous when consuming prey containing large amounts of chitin (e.g., adult beetles and ants), which is undigestible by most amphibians except salamanders (Carey 1988). Feder (1983) suggests that plethodontid salamanders have a profound resistance to starvation, due to low metabolic rates and relatively large energy reserves, enabling them to survive indefinite periods between feedings.

Plethodontids probably use visual cues to detect moving prey but rely on olfaction for immobile prey (David and Jaeger 1981). This is strongly inferred by the presence of specialized chemoreceptors called nasolabial grooves (Brown 1968). Although some plethodontids can extend their tongues at distances equal to 44-80% of their body length to capture prey (Duellman and Trueb 1986), *A. hardii* has a relatively short tongue that can be extended usually less than 5 mm (Johnston and Schad 1959). This difference in tongue length may correlate with how various prey are detected and consumed.

Enemies and Defense

Parasites. The following information is taken from Johnston and Schad (1959), who conducted the only study of parasites of *A. hardii*. A sample of 30 adult salamanders collected in July showed a high infection rate, 83% and 90%, by two species of nematodes (roundworms), *Oswaldocruzia* sp. and *Thelandros* sp., respectively. Salamanders examined in September all had parasites and thus probably carried nematodes with them into their winter retreats. Judging by the high incidence of immature parasites in July, the authors speculated that salamanders lose their worms during the winter (due to inactivity that presumably prevents ingestion of infective stages) reacquiring parasites at or near the ground surface each spring.

Predation. Garter snakes (*Thamnophis elegans*) are the only known predators of the Sacramento Mountain salamander (N. Scott, pers. obs.). Other snakes (e.g., *Diadophis punctatus*, Duellman and Trueb 1986), passerine birds (Jaeger 1981), and nocturnal mammals (e.g., raccoons, skunks, and shrews, Duellman and Trueb 1986) are reported to prey on plethodontid salamanders elsewhere and may opportunistically consume Sacramento Mountain salamanders.

Antipredator mechanisms. Brodie (1983) listed 29 antipredator mechanisms in terrestrial salamanders, including nine observed in at least one species of *Aneides*. Although not mentioned in this list, adult Sacramento Mountain salamanders are able to spin or writhe in a continuous motion when held in hand (pers. obs.). This behavior could make it difficult for a predator to get a firm grip on the salamander and even cause it to release the prey.

Population Biology

Growth rates. Using marked salamanders, Staub (1986) found that the smallest size class in July grew 5 mm over the summer, while adults (≥ 43 mm SVL) grew 3.2 mm per year (assuming four months of growth per year and that growth rate continues to decrease with age). Staub postulated that it would take a hatchling of 13 mm SVL approximately four years to reach sexual maturity (43 mm SVL). In contrast, information on captive Sacramento Mountain salamanders indicates they can grow up to 8 mm in one month, suggesting that a juvenile (35 mm SVL) could grow to adult size (43 SVL) in one summer (Weigmann et al. 1980). The diet of these captive salamanders is unknown, but if they fed on a richer or more regular food source than wild salamanders, their growth rates could be expected to be greater.

Life span. Staub (1986) calculated that the largest salamanders (>60 mm SVL) were at least 10 years of age, assuming a growth rate of 3.2 mm per year. On the basis of records for captive individuals, some salamanders can live for three to four decades, but known ages for various captive plethodontids are up to 20 yrs (Snider and Bowler 1992).

Population density. The few density estimates available for *A. hardii* are variable and derived from surface searches of the Sacramento Mountain population. No variance estimates are available, but Weigmann et al. (1980) indicate that standard deviations are large. Weigmann et al. (1980) and Ramotnik and Scott (1988) computed density estimates of $0.001/m^2$ and $0.006/m^2$, respectively. Staub (1986) provided density estimates for three populations ranging from $0.38/m^2$ to $1.12/m^2$. Several factors could explain these variations. For example, Weigmann et al. (1980) found few juveniles, which would underestimate density. Ramotnik and Scott (1988) averaged the results (range = 1-41 salamanders) from sites that varied considerably with respect to slope, aspect, and elevation. In contrast, Staub's highest density estimate came from a mature forest, which had not been logged since the early 1900s.

While densities of local populations of plethodontid salamanders vary greatly, estimates for *A. hardii* are not inconsistent with those for other plethodontids (table 2).

Table 2. Estimated densities of populations of plethodontid salamanders using a variety of census techniques (modified from Duellman and Trueb 1986).

Species	Individuals/m²	Reference
Aneides aeneus	0.2500-0.1000	Gordon (1952)
Aneides lugubris	0.4051-0.4989[a]	Anderson (1960)
Aneides hardii	0.001	Weigmann et al. (1980)
Aneides hardii	0.006	Ramotnik and Scott (1988)
Aneides hardii	0.38-1.12	Staub (1986)
Ensatina eschscholtzi	0.1482-0.1729	Stebbins (1954)
Plethodon cinereus	0.0496	Test and Bingham (1948)
Plethodon cinereus	2.3670-2.5830[b]	Burton and Likens (1975)
Plethodon glutinosus	0 0040	Gordon et al. (1962)
Plethodon glutinosus	0 4180-0.8440	Semlitsch (1980)

[a] *Island populations.*
[b] *Minimal estimates.*

Population density estimates are dependent on many factors, including search methodology, local weather conditions, available resources, and variation in predatory pressures (Duellman and Trueb 1986). Additionally, because only a small proportion of the salamander population is on the surface at any time, density estimators can underestimate local populations. Test and Bingham (1948) and Taub (1959) showed that surface census plots gave unreliable total population estimates because they represent only those salamanders found in the top layer of soil. Furthermore, Taub (1961) estimated that only 2 to 32% of the population in the top 2.5 cm of soil is likely to be included in a surface census.

Sex ratio. Plethodontid salamanders are typical of most amphibians in that they have an initial 1:1 sex ratio (Duellman and Trueb 1986). The ratio can change due to differential survivorship of males and females, and timing relative to the breeding season. The sex ratio of *A. hardii* is 1:1 in July, and by September there is a four-fold increase in females on the surface (0.28M:1F; Staub 1986). Because females remain with their eggs until hatching, they are less common on the surface between July and September. After the eggs hatch, females are able to forage on the surface, and their numbers dramatically increase. At the same time, numbers of males decrease at the surface as they begin to retreat to subterranean cavities in September. Johnston and Schad (1959) pooled a sample of three populations of *A. hardii* for July through September, reporting an even sex ratio for the three-month period.

Because the data were pooled, it is impossible to discern monthly differences in the sex ratio.

Age ratio. At most times, the *A. hardii* population consists primarily of adults. Hatching occurs between August and September, at which time the proportion of juveniles increases. Staub (1986) reported 32% juveniles in the July sample, but this doubled in September (66%) as newly hatched salamanders appeared on the surface. Weigmann et al. (1980) found a low proportion of juveniles (6%) on the surface but do not indicate the month. Juveniles are difficult to detect due to their ability to blend with the substrate and, thus, can easily be underestimated in the population.

Movements and Territoriality

Activity. Sacramento Mountain salamanders begin to appear regularly on the surface in June and have been reported on the surface as early as 15 May (D. Salas, pers. comm.). Surface activity occurs throughout the summer months, which is the period of greatest precipitation (July and August). Unless otherwise noted, the following information is generalized for *A. hardii* from a variety of studies on plethodontid salamanders (see Heatwole 1962, Jaeger 1980, Keen 1984, Pauley 1978, Ramotnik 1988). During short periods of drought, salamanders move horizontally along the surface, retreating beneath surface objects (e.g., rocks, logs, sticks) or within litter, where humidity is greater and prey are abundant. During longer periods of drought, salamanders move vertically, either within large decayed logs, or to subterranean retreats. Salamanders respond to decreased temperature and precipitation in September by reducing their surface activity. By October they have retreated to subterranean sites, where they are presumed to be inactive throughout the winter (Johnston and Schad 1959), remaining there until more optimal temperatures and/or levels of moisture occur the following spring.

Because few field observations of salamanders have been reported, the evidence for nocturnal activity in the Sacramento Mountain salamander is scanty. Johnston and Schad (1959:578) observed captive *A. hardii* to be active only at night (following a period of acclimation) and speculated that this pattern was "probably typical ... under natural conditions." More recently, several researchers studied salamanders in the field and reported that nocturnal sampling is unproductive. Weigmann et al. (1980) found a single salamander from 24 transects during nocturnal surveys and suggest this is due to the cryptic coloration of the salamander. Norman Scott (pers. comm.) conducted several searches at night, finding few salamanders. Because of the strong association between surface activity and precipitation, Scott hypothesized that most nights are probably too dry and cold for salamanders. Similar results have been reported by Burton and Likens (1975), who noted that the eastern plethodontid, *Plethodon cinereus*, is active on the surface on rainy nights.

Movements. Staub (1986) recorded the movements of 15 marked salamanders, reporting that they moved an average of 22.7 m (range=0-50 m) between July and September. Because observations were not made at shorter, more regular intervals, there is no information available on daily or weekly movements, or on home range size. Movements of the Jemez Mountains salamander were studied by Ramotnik (1988) using radioactive isotopes. With few exceptions, salamanders moved infrequently and traveled short distances. Whereas several studies have reported a significant correlation between movements of salamanders and precipitation (Barbour et al. 1969; Kleeberger and Werner 1982; MacCulloch and Bider 1975; Semlitsch 1981), no correlation was found between movements of Jemez Mountains salamanders and precipitation. However, aboveground occurrence decreased as ambient air temperature increased, until a point above 20°C when no salamanders were found at the surface (Ramotnik 1988). *A. hardii* may respond similarly to the Jemez Mountains salamander with respect to movement patterns, differing perhaps only in regard to microhabitat preferences.

Territoriality. Interspecific competition is unlikely within the range of *A. hardii*, since the only salamander that occurs sympatrically, *Ambystoma tigrinum*, has distinctly different microhabitat preferences. Conspecific interactions are likely between males, between brooding females and males, and between juveniles and adults. Staub (1989, 1993) studied agonistic behavior of four of the five species of *Aneides* using scarring frequency as an index of agonistic interactions. The frequency of scarring in *A. hardii* was significantly lower than those three other western species. Sexual dimorphism was less pronounced in the three western species; both males and females showed jaw muscle hypertrophy, and consequently, dimorphism in head size was reduced. This suggests that social selection has been an important force in the evolution of derived morphology and reflects selective pressures for more efficient and intense aggressive behavior in both males and females (Staub 1989).

Reproductive Biology

Reproductive Strategy

The Sacramento Mountain salamander demonstrates a reproductive strategy often termed "K selection" (Williams 1976). This strategy is generally associated with a stable environment that predicts late maturity, multiple clutches, fewer but larger eggs, parental care, and intermittent reproductive effort, all of which are life history attributes of *A. hardii*.

Courtship and Mating

The following information is generalized for the family Plethodontidae; any modifications for *A. hardii* are noted where appropriate. Reproductive activity is induced by warming temperatures in late spring. Courtship takes place underground in June and involves a tail-straddling walk by the male, a behavior unique to plethodontid salamanders (Arnold 1977). Secretions from the well-developed mental gland of the male are transferred to the female via rubbing; in some species the protruding premaxillary teeth of the male are used to assist this transfer (Duellman and Trueb 1986). During the tail-straddling walk, the male deposits a spermatophore that is picked up by the female and stored in the spermatheca, a series of tubules located at the roof of the cloaca. The sperm remain in the spermatheca until ovulation occurs; fertilization is internal.

Sexual maturity is reached at 43 mm SVL, when females are four years of age (based on growth-rate estimates by Staub 1986). Williams (1976) reports that females reach sexual maturity between two and three years of age but do not oviposit for another year to allow the ova to reach sufficient size. Oviposition is asynchronous within the population, occuring between July and September every third year in individual females. Males gorge at the end of August in order to provide energy for spermatogenesis over the winter. Sperm is probably transferred to the vasa deferentia in late fall or winter and stored for spring mating (Williams 1976).

Eggs and Development

The clutch size for *A. hardii* is the lowest of any North American plethodontid salamander. Numbers of eggs range from 1-10, with an average of 5.9 eggs per clutch (Staub 1986). Clutches have been found from mid-July to September (table 3), usually within large, decaying Douglas-fir logs or stumps. The low numbers of clutches detected suggests that many may be oviposited belowground. Eggs are light yellow and suspended by pedicels, which are often intertwined like a cluster of grapes. Females stay with the eggs until the embryos hatch in late August or early September. Maternal care provides protection from predators, reduced risk of fungal infection, and enhanced aeration and/or prevention of adhesive malformation via periodic rotation of the eggs (Duellman and Trueb 1986). Females probably do not actively forage while guarding eggs, feeding only opportunistically. A food-habits study found brooding females with little or nothing in their stomachs, and relatively few females on the surface relative to males (Johnston and Schad 1959). Weigmann et al. (1980), describing a clutch hatched in captivity, report that newly emerged Sacramento Mountain salamanders measured 11-13 mm (SVL) and had color patterns similar to adults.

Table 3. Clutch sizes of Aneides hardii *(modified from Staub 1986).*

Number of clutches	Number of embryos	Month found	Reference
4	1,4,4,6	July	Johnston and Schad (1959)
3	3,5,10	July	Staub (1986)
1	3	August	Lowe (1950)
1	10	August	Schwartz (1955)
1	6	August	Weigmann et al. (1980)
9	3,5,5,5,6, 7,9,10,10	September	Staub (1986)

Threats to Survival

Logging

Because terrestrial salamanders require a moist microhabitat for cutaneous respiration, factors reducing the amount of moisture available to them can have immediate negative impacts. Timber harvest reduces or eliminates the canopy cover, resulting in increased insolation, higher soil and air temperatures, and lower relative humidity. Soil disturbance due to logging equipment and the increased networking of roads (and subsequent traffic on those roads) causes soil compaction, increased erosion (particularly on steep slopes), nutrient losses, and an ultimate decrease in litter depth and moisture.

Three studies examine logging impacts on the Sacramento Mountain salamander. The first was completed by Staub in 1986; two others are ongoing. Whereas no logging studies have been conducted on the Capitan or White mountains populations, Meents (1987) hypothesizes that numbers of salamanders are highest in the eastern part of the Capitan Mountains due to the combined impacts of fire and logging in the western part after 1950, which reduced habitat quality for the salamander.

Staub (1986) compared habitat characteristics and salamander abundance along transects (50 m x 1 m) at three sites within Atkinson Canyon; one site was a control and two had been logged (cable- and tractor-logged) a few years before the study. A second control was located several miles away in an undisturbed area of "prime salamander habitat" in Brown Canyon (Staub 1986:5). No salamanders were found on the logged sites, while numbers of salamanders (averaged from three randomly selected transects per site) on the controls varied from 6.3 (Atkinson) to 18.7 (Brown). Logged sites had significantly higher soil and air temperatures, less ground and canopy

cover, and fewer large, well-decayed logs than did unlogged sites. The best predictors of salamander presence and abundance were soil and air temperatures, and percent ground cover. Due to the absence of salamanders on the two logged sites, Staub (1986) concluded that logging is detrimental to them and should be conducted in patches, leaving large, undisturbed areas (minimum of 0.5 mi^2) for salamanders.

In 1986, researchers from the U.S. Fish and Wildlife Service established the first of 25 permanent plots as part of a multi-year, Forest Service-funded monitoring study (U.S. Fish and Wildlife Service 1986). Experimental plots were logged over the span of four years (1986-1990), and post-logging data are now available for up to 10 years on some plots. Since 1986, with the exception of two years, the 19 experimental and six control plots have been monitored annually, via time-constrained searches (Campbell and Christman 1982). Although rigid limits were not imposed on the size of the area searched, the searches covered an area 200-400 m^2 in diameter. With the exception of one plot, there is considerable yearly variation in the numbers of salamanders on logged and unlogged plots (table 4), with no trends discernible. The mean number of salamanders per plot on both logged and unlogged plots also varies somewhat across years, though when the ratio of these means is computed as a comparison of salamander abundance, the numbers appear to remain roughly constant from year to year (table 5). An exception is one cable-logged plot (BR3) located on the steepest slope of any permanent plot. Pre-logging numbers of salamanders on this plot were the highest of all plots, but post-logging numbers declined steadily over a seven-year span, from a high of 52 (1986) to a low of 10 (1994). This trend was reversed in 1995 when numbers of salamanders were comparable to those from the 1988-1989 season (Ramotnik 1996).

While the trend in salamander abundance on the permanent plots appears to be somewhat stable, there is a disconcerting trend regarding the distribution of size classes of salamanders. In three of the last four monitoring sessions, juvenile salamanders made up a significantly smaller proportion of all salamanders on logged plots (Ramotnik,

Table 4. Number of Aneides hardii *found on permanent study sites before and after logging, 1986-1996, on the Lincoln National Forest, Otero County, New Mexico. BR=Brown, TU=Turkey, HA=Harris, MO=Moore, and SA=Scott Able. Sites were cable-logged (LC) or tractor-logged (LT) after the salamander count in one year and before the next count. Dashed lines indicate that searches were not conducted.*

Site	1986	1987	1988	1989	1990	1992	1994	1995	1996
BR 1	20[b]	--, LC	9	19	16	19	10	20	11
BR 2	26[b]	--, LC	15	15	8	19	28	22	21
BR 3	52[b]	--, LC	41	31	23	20	10	36	23
BR 4	14[b], LT	14	15	34	57	59	50	71	47
BR 5	8[b], LT	6	24	34	12	20	37	61	41
BR 6[a]	--	9	10	20	7	40	39	51	32
BR 7[a]	--	10	28	41	55	40	42	56	62
TU 1	--	14, LT	20	19	41	26	41	32	22
TU 2	--	28, LT	14	23	34	32	45	28	47
TU 3	--	10, LT	9	24	8	29	32	20	22
TU 4	--	31	25, LT	34	20	129	59	28	46
TU 5[a]	--	--	38	88	92	105	77	58	69
HA 1	--	--	31	41, LT	12	17	41	24	66
HA 2	--	--	24	29, LT	6	26	34	24	30
HA 3[a]	--	--	36	43	17	49	52	34	49
HA 4	--	33	--	44, LT	15	40	43	36	35
HA 5	--	--	--	49, LT	27	48	82	44	65
MO 1	--	--	--	0, LT	0	3	0	0	1
MO 2	--	--	--	5, LT	1	4	1	0	0
MO 3	--	--	--	9, LT	1	8	8	4	3
MO 4[a]	--	--	--	3	2	7	7	5	4
SA 1	--	--	--	--	11, LT	9	2	3	3
SA 2	--	--	--	--	23, LT	20	20	20	13
SA 3[a]	--	--	--	--	17	16	19	7	14
SA 4	--	7	--	--	17, LT	8	10	9	5

[a] *Control site.*

[b] *Number of salamanders extrapolated to 2-hour equivalent based on a 1-hour search.*

Table 5. Trends in salamander abundance in time-constrained searches on logged and unlogged plots, 1986-1996, Lincoln National Forest, Otero County, New Mexico.

	1986	1987	1988	1989	1990	1992	1994	1995	1996
Logged sites									
Number of plots	--	2	8	9	16	19	19	19	19
Salamanders/plot ($\bar{x}$)	--	10.0	8.4	25.9	17.6	28.2	29.1	25.4	26.4
Unlogged sites									
Number of plots	5	8	7	12	9	6	6	6	6
Salamanders/plot ($\bar{x}$)	24	17.8	27.4	31.0	26.8	42.8	39.3	35.2	38.3
Salamanders/plot ($\bar{x}$)									
Ratio logged/unlogged	--	0.56	0.67	0.84	0.66	0.66	0.74	0.72	0.69

unpubl.). If we assume that the proportions of different size classes are sampled equally well in logged and unlogged plots, then these data suggest that populations on logged plots produce fewer young in some years. The lower reproductive rates or lower survival rates of eggs, hatchlings, or juvenile salamanders observed on logged plots could indicate that logged plots represent less than optimal habitat.

A third logging study was initiated in 1995 by Chris Borg, of New Mexico State University. His two-year study will examine the demographic structure of salamander populations in relation to temperature, moisture, and relative humidity in logged and unlogged sites. Preliminary data indicate that salamanders are found on sites logged within the last 10 years, often in aggregations of up to five individuals, and that within logged sites, salamanders occur under substrates with temperatures above the salamander's preferred maximum (C. Borg, pers. comm.). Due to the increased ecological and energetic costs associated with higher temperatures, salamanders may not be able to maintain their metabolic requirements. The synergistic effects of low humidity and high temperature are likely to result in hydric and thermal stresses whose impacts, if any, remain unknown.

Logging is the primary threat to the Red Hills salamander (*Phaeognathus hubrichti*) in Alabama and is implicated in declines of 29 other species of woodland salamanders (Scott and Ramotnik 1992). Despite differences in methodologies, geography, and harvest prescriptions, the results of numerous studies (Aubry et al. 1988, Bury and Corn 1988, Bury and Martin 1973, Pough et al. 1987), as well as two of the three logging studies on *A. hardii* mentioned above, show that salamanders are not eliminated from logged sites after several years. Whether or not this makes populations more vulnerable to other threats (i.e., drought, fire) is currently unknown. The absence of salamanders on logged plots in Staub's study (1986) could be a sampling artifact arising from the use of relatively narrow transects, resulting in the detection of consistently fewer salamanders than in time-constrained searches (pers. obs.).

Fire

While generalizations about the effects of fire are made difficult by variables such as fire intensity, size, and behavior, it is known that fire alters vegetation structure and composition, reduces litter depth and other surface features, and modifies the soil chemistry (e.g., pH, mineral content). The most dramatic effects occur during severe, stand-reducing fires that eliminate canopy cover and create younger seral stages. The return of conifer species can require considerable time. In the White Mountains of New Mexico, the return to coniferous trees takes 15-20 years under the most favorable conditions (Hanks and Dick-Peddie 1974).

Although the effects of fire on the Sacramento Mountain salamander have not been assessed directly, some information is available from the Danley Burn, an intense fire that occurred in 1967 within the range of the Sacramento Mountain salamander. Salamanders were not known specifically from the area before the fire but can be predicted to have occurred there based on elevation and tree composition (D. Salas, pers. comm.). An examination of soil pits dug in 1989 on slopes at the edge of the Danley Burn revealed shallow soils that were poorly stratified and well mixed with rocks probably due to sheet erosion following the fire. During the study, salamanders were found in logs far into the Danley Burn (N. Scott, pers. obs.).

Short-term survival of *A. hardii* following a fire is conceivable due to the salamander's ability to retreat belowground to avoid inhospitable surface conditions. In the long term, however, the paucity of prey beneath the surface and the elimination of litter on the surface (where the majority of prey are found) would hinder the salamander's ability to obtain enough energy to support its metabolic requirements. The extent to which *Aneides* can migrate horizontally to more hospitable conditions is unknown, though any extended moves would incur increased metabolic costs.

Grazing, Pesticides, Insects, and Disease

Public issues of management concern to the Lincoln National Forest include grazing, plus prescriptions to control invasive weeds, western spruce budworm, and dwarf mistletoe (U.S. Forest Service 1986). Grazing occurred historically at much greater levels within the range of *Aneides* than it does today (D. Salas, pers. comm.). Before the 1940s, there were approximately 20,000 sheep and a minimum of 20,000 cattle on the Sacramento District alone. The current 10-year plan calls for permitted livestock use of 147,000 AUM (=12,250 animals) Forest-wide, though grazing capacity is expected to increase through "improved management and additional structural and nonstructural range improvements" (U.S. Forest Service 1986:161). The primary detrimental effect of grazing is compaction of soil, which may destroy subterranean passages for salamanders. Grazing is not likely to occur in areas containing dense forest, abundant downed timber, or moderate to steep slopes, which are associated with salamander occurrence.

Whereas the effects of pesticide applications may be detrimental to larvae of aquatic amphibians (Berrill et al. 1993, 1994, 1995), information on potential adverse effects on terrestrial amphibians such as *A. hardii* is nonexistent or anecdotal. Considerations for pesticide application within the range of *A. hardii* include timing of the application, presence of buffer zones, length of time necessary for degradation of the pesticide, and potential for subsequent bioaccumulation within salamanders or their prey (Ramotnik, in letter to U.S. Forest Service, 11 December 1995).

Prescriptions designed to control destructive insects and disease organisms include prescribed burns, selective timber removal, and spraying. The extent to which such controls affect *A. hardii* depends on the size and intensity of the specific treatment and the amount of habitat affected within the range of the salamander. No specific studies have addressed these issues.

Climatic Changes

Scientists have long recognized climate, especially temperature and precipitation, as one of the major ecological forces affecting living organisms (LaRoe 1995). Over the next 60 years, significant changes in the patterns and abundance of precipitation are predicted, as well as an average increase in temperature of 5.4°F (Houghton et al. 1990). Currently, the Southwest (including the entire state of New Mexico) is enduring a multi-year drought. While there is evidence to suggest that global warming is influencing the distributions of some plants and animals elsewhere in the United States (LaRoe 1995), there is none to suggest that drought or global warming threaten *A. hardii* at this time. One consequence of global warming trends or drought could be the restriction of salamanders to the higher elevations within their range, where more hospitable conditions might persist.

Conservation Status

Available evidence does not indicate that the distribution of the Sacramento Mountain salamander is either expanding or contracting within the three disjunct areas it inhabits. In the past 10 years, researchers have revisited some historical localities known from the 1950s and 1960s in the Sacramento and Capitan mountains and have continued to find salamanders (Meents 1987, Scott et al. 1987; C. Painter, pers. comm.). New localities from the Sacramento Mountains have been documented during this time, though most merely fill gaps within the current range and do not represent expansions. The abundance of localities known from the Sacramento Mountains (figure 1) most likely reflects this increased effort by researchers. There are considerably fewer localities from the White and Capitan mountains (figure 1). This is due to the relatively lower survey effort made here, as well as the difficulty of accessing the highest parts of these mountains due to rugged terrain, inadequate roads, or lack of roads; most of the salamander's habitat within the White and Capitan mountains is in designated wilderness areas and therefore roadless. Relatively large areas of mixed-conifer forest within the Mescalero Apache Indian Reservation represent an untapped reservoir for additional populations and future range expansions. The proximity to both the White and Sacramento mountain populations makes the area suitable as a potential corridor between neighboring populations. Small, disjunct populations are subject to extinction due to chance environmental and demographic events, and to loss of genetic variability from genetic drift. The potential for movements between nearby populations alleviates these problems and makes each small population part of a larger, more viable metapopulation.

Due to limitations of the available data, regional trends in salamander abundance cannot be assessed. The abundance of salamanders in the White and Capitan populations has not been thoroughly documented; the only long-term monitoring data come from the ongoing study of logging impacts on salamanders in the Sacramento Mountains. Similar studies should be initiated in other parts of the salamander's range, particularly in the Capitan and White mountains, preferably beginning before planned forest disturbances in order to assess the status of natural, undisturbed populations. Although data from the long-term study indicate that numbers of salamanders can fluctuate considerably over time on both disturbed and undisturbed sites, it is important to establish a baseline

reference for natural fluctuations in populations, against which changes resulting from perturbations can be compared. Post-disturbance data are most meaningful when they can be compared to pre-disturbance data. Survey methods should be standardized, and data on sex, size class, and reproductive status should be collected in addition to presence/absence information.

Because the Sacramento Mountain salamander is restricted to mixed-conifer forests primarily within the Lincoln National Forest, it is assumed that these forests are essential to the survival of the species, and that management actions (past, present, and future) on Forest Service land directly impact salamanders. Historical logging in the Sacramento Mountains was brief (lasting just over 40 years) and often intense, beginning at the turn of the century (Glover 1989; figure 4). The introduction of steam-powered trains and an extensive railroad system (running between Alamogordo and the Sacramento Mountains) coincided with intensive, mechanized logging over a large area of the mountains (Glover 1989). During this time, portions of the Mescalero Apache Indian Reservation were logged, and to a lesser extent, the White and Capitan mountains Historical timber harvest intervals were probably longer than today because of the more intensive cuts (clearcuts) made then.

The current 10-year Lincoln National Forest Plan indicates that logging will occur only within the range of the southernmost population of *A. hardii*, and that 88% (122,000 of 139,000 acres) of the timber will be managed using the even-aged system (U S. Forest Service 1986:5) Immediate effects will include younger-aged stands, which will ultimately generate few or only small downed logs and less-extensive root systems. This may not be beneficial to the salamander, which seems to require a mix of young and old logs to ensure short- and long-term habitat components (Ramotnik and Scott 1988). At present, logging activities within occupied salamander habitat are complete and, in general, have complied with the management recommendations drafted by the New Mexico Salamander Working Group. The proposed timber harvest allotment

Figure 4 Mouth of Benson Canyon, Sacramento Mountains, Lincoln National Forest in June 1928. This intensely logged area was also impacted by fire and erosion. Photograph by E.S. Shipp.

of 15 million board feet per year in the 10-year Plan has not been met in recent years due to interim guidelines placing restrictions on logging in mixed-conifer forests within the range of the Mexican spotted owl. Standards and guidelines in the recent amendment to the 10-year plan (U.S. Forest Service 1996) and the impending revision of that plan will directly impact northern salamander populations The emphasis in the recent amendment on uneven-aged management should provide long-term benefits by ensuring long-term habitat components such as older, larger logs, while enhancing short-term benefits via retention of snags and woody debris larger than 12 inches in diameter (figure 5).

Plethodontids depend on moisture, so they are vulnerable to activities that dry the habitat. Unlike aquatic plethodontids, which must seek open bodies of water for breeding, *A. hardii* is not dependent on permanent water sources; therefore, it is not subject to environmental stresses such as ultraviolet radiation or high acidity levels, which may be partially responsible for declining amphibian populations elsewhere in the West (Blaustein et al. 1994). Logging results in dry surface conditions and appears to be the primary human-caused threat to the Sacramento Mountain salamander. Given that logging (sometimes intense) occurred within a large part of the historical range of the salamander, some areas were likely made inhospitable to salamanders. Although historical population levels are unknown, it is apparent that the salamander has endured some level of logging activities over the past 60-90 years. Whereas data indicate that logging reduces populations of Sacramento Mountain salamanders in some areas (Ramotnik 1996), there is no evidence that logging has eliminated any populations.

The consequences of large-scale, intense fires within the range of the Sacramento Mountain salamander also can negatively impact these amphibians. However, fires are generally infrequent at higher elevations, where generally cooler and moister conditions diminish flammability. Historically fires probably occurred more frequently but at lower intensities in the Sacramento Mountains than they

Figure 5. Photograph taken in 1908 of a section of the "Cloudcroft Reserve" (Lincoln National Forest) that has never been logged (note the large-diameter coniferous tree to the left and the dense undergrowth). Upon decay, large trees will provide long-term habitat components for Sacramento Mountain salamanders. Photographer unknown, 15 May 1908.

do today due to the decades-old trend of fire suppression by land management agencies. This suppression has left an explosive legacy on western lands during the 20th century. Fire behavior, as well as its impact on *Aneides*, may be difficult to predict in the immediate future as fuel loads continue to build, creating opportunities for large catastrophic fires.

Based on available information, populations of the Sacramento Mountain salamander appear to be relatively secure under current management practices. The distribution of the salamander appears to be consistent with that of its historical range, while populations to the south, which have received more attention than those elsewhere, seem to be locally abundant and widespread at appropriate elevations. Those to the north occur primarily in designated wilderness and thus receive some level of protection. Habitat association with the Mexican spotted owl will likely be beneficial to *Aneides*, so long as the owl's protective status remains.

Whereas there appears to be no crisis relative to the conservation of the salamander, we know that the species is sensitive to certain habitat changes resulting from management activities. A conservation strategy is needed in order to ameliorate these actions and to develop a coordinated approach for salamander conservation. The Lincoln National Forest Plan covering the next 10-15 years will have important ramifications for *Aneides* relative to logging expectations and schedules, logging intervals, and slash disposal. Significant changes during the next planning period could include logging just outside the Capitan Mountains and White Mountain wilderness areas, which were last logged in 1980 and 1964 before they were closed to logging by wilderness designation. The future direction for the management of the Sacramento Mountain salamander on the Lincoln National Forest could depend on what we have learned from consequences of our past management actions within the range of the salamander.

Research Needs

Many aspects of the basic biology and natural history of *A. hardii* remain to be ascertained. A large gap exists in our understanding of the importance of the subterranean environment to the salamander, resulting in uncertainty in our ability to accurately estimate population size. Traditional methods of surveying for terrestrial salamanders are more appropriately referred to as surface censuses, in that they include turning over surface objects such as logs, rocks, and coarse woody debris. These methods are convenient for researchers but may be inappropriate for determining densities when not all individuals are present on the surface during the survey. Studies by Taub (1959, 1961) and Test and Bingham (1948) showed that the majority of plethodontid salamanders occur beyond the accessible reaches of the surface, and that we are greatly underestimating population size. More recently, Fraser (1976) determined that some species of plethodontid salamanders make vertical movements in response to dry surface conditions, so that surface densities of salamanders are reduced as moisture decreases. If the subterranean habitat is the primary site for egg deposition, and the majority of salamanders move belowground when surface conditions are inhospitable, then we are likely underestimating population size when we conduct surface counts during dry conditions. We should strive to improve the methodology used to "count" salamanders so that variance estimates around a population estimate are available, allowing for some "confidence" in the estimates. We also need to decide whether we need to know absolute numbers of the total population, or relative abundance of the surface population.

If the subterranean element is an important component of the salamander's environment, we need to understand how they access it and how deep they must go to avoid lethal temperatures. An examination of soil pits dug in a variety of habitats within the Sacramento Mountains indicates that the only apparent routes to these depths are rotted-out root channels (Scott and Ramotnik 1992). If salamanders use decayed roots as access points to the subsoil, it is important to know at what age a tree produces roots large enough for a salamander to pass through once the roots have decayed. How will the lag-time in changing from even- to uneven-aged management impact salamanders? What effect does heavy equipment have on soil compaction? Is compaction sufficient to destroy passageways, such as decayed root channels, thus impeding salamander movement to the subsurface? Additional studies are needed to address these management issues with respect to logging intervals and soil compaction.

We still do not understand the relationship of large logs and salamander abundance. We know that salamanders are often found within and under the bark of large logs, and that all of the egg clutches to date have been found within large logs. It is possible that these logs are just a convenient place to find salamanders, because in areas where logs are absent, salamanders are found beneath rocks (N. Scott, pers. comm.). Can large logs provide winter refugia for salamanders, and if so, how does snow cover affect log temperature? Once large logs have decomposed, eliminating potentially important microhabitats for foraging and nesting, will salamanders disappear? If large logs serve these functions, we should be prepared to adjust management efforts in order to maintain a mix of young and old logs to ensure both short- and long-term components of the habitat.

The ability of salamanders to recolonize disturbed habitats is another area where data are lacking. We do know

that salamanders move short, horizontal distances within a log under dry conditions and make larger moves across the ground surface under wet conditions. How easily can they make longer moves to escape large disturbed areas, particularly during extended periods of drought? Can they find enough food to offset the metabolic costs of increased locomotor activities? Can they do so only when it rains, or only at night when the humidity is high? Can salamanders use corridors? And if so, what size should they be? Salamanders cannot always wait out extended periods of environmental stress but must return to the litter to forage where prey are most abundant. Their long-term survival will depend on their ability to escape inhospitable conditions and migrate to more optimal sites.

We need to begin monitoring salamander populations in the White and Capitan mountains to establish population trends, and to continue to monitor populations, particularly those from the long-term logging study. An analysis of the distribution of salamander size classes from this study is needed to determine if the pattern of fewer juveniles on logged sites is real, or merely a sampling artifact.

Finally, we need to continue defining the range of the Sacramento Mountain salamander while looking for additional populations. A survey of Carrizo Peak was conducted in August 1988, but no salamanders were detected despite the presence of seemingly good habitat at the peak (2943 m; Scott and Ramotnik 1989). This area should be reexamined under favorable (wet) conditions, and additional regions in the southern part of the state should be periodically surveyed for salamanders. New populations will provide another level of security for the current populations while increasing genetic variability of metapopulations. The work of Pope and Highton (1980) on genetic variation of metapopulations should be continued. Because they collected only single samples from each of three mountain ranges, the extent of within-isolate variation is unknown and warrants further study.

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