Status and Habitat Associations of the Spotted Frog *Rana pretiosa* in Southwestern Idaho

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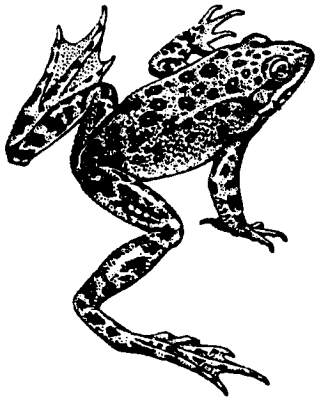

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STATUS AND HABITAT ASSOCIATIONS OF THE SPOTTED FROG, *RANA PRETIOSA*, IN SOUTHWESTERN IDAHO

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Final Report from a
Cooperative Challenge Cost Share Project
with the
Bureau of Land Management
Boise District
Boise, ID 83706

Summary: The status of the Great Basin population spotted frog, Rana pretiosa, (presently federally classified as C1) is poorly known, particularly in southwestern Idaho. We conducted a second year of surveys of the amphibians in wetland areas of the Owyhee Mountains and collected data on potentially important habitat variables. We found adult spotted frogs at 24 sites and their larvae at one site out of 168 characterized. When combined with the data from 1993 (adult spotted frogs at 41 sites and their larvae at 3 sites out of 204 characterized), we are able to make the following generalizations: Adult spotted frogs tended to be found at oxbows, pools, or ponds, at sites with sandy substrate, at sites with lower sagebrush cover, and at sites with hideaways present. At one site (Stoneman Creek) we estimated that the population contains 60-200 frogs. We found two other species of amphibians (Pseudacris regilla and Bufo boreas) and 11 species of reptiles during our surveys as well.

INTRODUCTION.

The Boise district plans to prepare a Resource Management Plan for the Bruneau Resource Area in the mid-1990's. To allow construction of an RMP that is sensitive to the wildlife of an area, it is important to know the occurrence and status of species present in the area. At the present time, however, little is known of the occurrence in the resource area of members of two classes of vertebrates, amphibians and reptiles.

Of particular concern are the amphibians. A number of researchers have argued that amphibian populations worldwide are undergoing a decline (e.g. Freda and Dunson 1986, Weygoldt 1989, Wake and Morowitz 1990 and Wyman 1990). The hypothesized reasons for decline include: (i) global phenomena, either increased ultraviolet radiation (due to partial loss of the protective ozone layer) or climate change. (ii) pollution, in the form of pesticides or acid rain, the effects of which may be exacerbated by the relatively permeable skin of amphibians, (iii) loss of breeding habitat due to human impacts, or the fragmentation of habitat, leading to local extinctions without recolonization, and (iv) the introduction of exotic species, both fishes and

amphibians, which prey upon larval forms.

Of the species of amphibian that occur in the Bruneau Resource Area, the spotted frog (Rana pretiosa) is the only species recognized by the federal government as being potentially in trouble. The spotted frog has a distribution that covers much of western North America, from southern Alaska to central Nevada, and historically from the Pacific coast to Wyoming. It usually occurs in mountainous areas near slow-flowing streams and rivers, lakes, springs, and marshes. It is highly aquatic, typically occurring near cool permanent quiet water. In the more arid portions of its range, it exists as isolated populations, inhabiting higher elevation ranges. Spotted frogs are recognized to occur in 5 populations (Green et al., in press). The main population (Alaska through Montana, and north of the Snake River in Idaho) is listed as C2 by the USFWS and is not considered to be in imminent danger. However, the USFWS (Turner 1993) elevated to C1 status the other 4 populations, based on documented extinctions and declines as well as the existence of continuing threats. One C1 population, the Great Basin population, occupies isolated mountain ranges in southwestern Idaho and Nevada. Its elevation to C1 status was based on loss of populations in a number of areas of Nevada. Although technically a part of the Great Basin population, the isolated population occupying the Owyhee Mountains of SW Idaho is relatively poorly known. .

Recently, Munger et al. (1995) produced a Habitat Conservation Assessment and Strategy for the spotted frog in Idaho in which we described research efforts needed to identify the status of and threats to the Owyhee Mountains population. We simply do not know whether this population is stable or is suffering declines. Similarly, it is unknown how strongly various land use practices, such as grazing, affect spotted frogs in arid environments. In addition, we have no quantitative means for predicting the presence of spotted frogs. And finally, there are a number of aspects of the basic biology of spotted (e.g.,where do they hibernate?) that are simply unknown for spotted frogs in the Great Basin. Answering these questions will define the need for management of spotted frogs in SW Idaho, and will give us the knowledge and means of accomplishing it.

The objectives of this project are (1) To provide further information on the abundance and distribution of populations of spotted frogs in the southern portion of the Bruneau Resource Area, both from censuses and from museum records, (2) To provide an indication of the habitat variables important to spotted frogs, (3) to provide information on the presence of other species (amphibians and reptiles) incidentally captured in the same area, and (4) to indicate the reliability of using National Wetland Inventory maps to predict the presence of spotted frogs.

METHODS

Historical Locations

Dr. Charles Peterson at ISU has assembled a database of known locations of reptiles and

amphibians in Idaho. These were gathered from reponses to letters sent to the museums of over 100 College and Universities requesting records of specimens captured in Idaho. In summer of 1995, we visited (or attempted to visit) the six sites in southwestern Idaho at which spotted frogs had previously been captured. Each site was carefully examined for the presence of adult and larval frogs, and, where appropriate, dipnetted for larvae and eggs.

Survey for Amphibians. During the period of May 18 to August 1, 1994, we visited a number of sites in the Bruneau and Owyhee Resource Areas. Essentially, we visited as many sites as possible during this period, basing our decisions on which site to visit on accessibility and recommendations of BLM personnel. Once chosen, a given body of water (mostly streams, ponds, and reservoirs) was surveyed by walking as much of its length or circumference as possible. At these water bodies, we searched for amphibians by carefully examining all shallow and bank areas, watching for sudden movement, turning rocks and vegetation, and dipnetted for larvae and eggs in promising areas. When larval or adult amphibians were found, their location and species were noted. For larvae, their number was estimated and several were collected for later confirmation of identification.

Habitat Characterization: At most sites where amphibian adults or larvae were found, we conducted a site characterization. In practice, in those areas where relatively few amphibians were captured, each capture site was characterized. In areas where adults were abundant, we characterized a subsample of capture sites. We also characterized arbitrarily chosen sites roughly every 15 minutes of surveying ; these sites are called "random sites" and were later compared to capture sites.

For each water body (e.g. stream), we measured several variables: conductivity and pH were measured with a Corning Checkmate 60 handheld meter, and hardness and alkalinity of water samples were determined from using appropriate Hach test kits. Capture sites and random sites were characterized as follows: (i) We measured water characteristics: water temperature with a digital thermometer; depth and width of the body of water; characterization as run, riffle, pool, oxbow, or pond. (ii) Substrate was described by estimating the percent coverage underwater of mud, sand, gravel, cobble, and rock. (iii) Streamside vegetation was described by assigning a score of 0 to 3 for each of sagebrush, grass, forb, willow, cottonwood, reed, rock, and bare. (iv) Aquatic vegetation was described by assigning a score of 0 to 3 for each of algae, emergent vegetation, and submerged vegetation. (v) We scored whether there was a hiding place present, and whether that hideaway consisted of branches, vegetation, rocks, or an overhang. (vi) We extracted from National Wetland Inventory maps the system, the class, and the regime. (vii) We described the location to the nearest 1/64 section, and later determined UTM coordinates (viii) We classified the weather as sunny, partly cloudy, cloudy, and rainy; and measured the air temperature with a digital thermometer. (ix) We noted whether fish were seen. (x) We noted whether the topography was narrow, moderate, wide valley, or rolling. (xi) Finally, we classified the flow over the 100 m of stream near the site as meander, moderate, fast, or cascade. We also attempted to assess short-term impacts of grazing using several variables: (i) an overall score of evidence of grazing, ranging from 0 (none) to 3 (heavy), was given based on a quick visual inspection, (ii) evidence of clipping of grass and shrub vegetation was scored, (iii) evidence of use

consisting of cow pats and hoofprints was scored on a 0-3 scale, (iv) the streamside vegetation was scored 1-4 where 1 was composed of primarily hydrophytic species (presumed to indicate undegraded habitat) and 4 was composed of primarily upland species (presumed to indicate degraded habitat), (v) evidence of downcutting and/or of lateral erosion, both of which are thought to occur as a long-term result of overgrazing.

Population density estimates: We used mark-recapture methods to estimate the population density of spotted frogs on Stoneman Creek. We surveyed the section of the creek that parallels Mudflat Road; the upstream end of the transect begins where the road first draws close to the stream; the downstream end is where the stream enters a narrow rocky area and a 1 m high and 10 m long rocky outcrop can be found on the north side. This section of stream was walked on June 13, July 5, twice on July 12, and July 20, 1994. Frogs captured on June 13 and July 5 were marked by freezebranding: a loop of copper wire was immersed in liquid nitrogen for > 15 seconds, then applied to the left side of the abdomen (June 13) or the right side of the abdomen (July 5) for at least 10 seconds, leaving an angle shaped mark. On July 5, 12, and 20, the total number of frogs captured, as well as the number with marks, was recorded. Population estimates were calculated using a simple Lincoln index. This procedure was repeated in 1995: on July 9, frogs were captured and individually marked by freezebranding. On July 16, the area was re-surveyed.

GIS Analysis: Several relevant GIS layers exist for the Owyhee Resource Area: (i) perennial and intermittent streams, and ponds and reservoirs, (ii) National Wetland Inventory (NWI) designation, (iii) riparian condition (satisfactory vs. unsatisfactory), (iv) fish habitat condition (satisfactory vs. unsatisfactory), and (v) land ownership. Wetland class was determined by intersecting buffered lines (representing stream segments surveyed) and points (representing sites with spotted frogs) with the polygonal and linear wetlands that had originally been digitized from NWI maps. Because these are not truly coincident data sets, each line and point that did not obtain a class was manually checked. We created two other layers, points at which spotted frogs were found and stream segments, ponds, and reservoirs that we surveyed. We then determined the total stream length and reservoir perimeter surveyed falling in each NWI designation, each riparian condition designation, each fish habitat designation, and whether the water body was perennial or intermittent. For stream segments in the Bruneau Resource Area, we used a digitizer to determine the lengths of stream segments of each NWI designation; other designations (e.g. riparian condition) were not available. The combined frequencies from the Owyhee and Bruneau resource areas were then compared to the number of spotted frog sightings falling into each category.

Statistical Analysis: Statistical analyses were used to provide an initial indication of which habitat variables appear to be more or less associated with the presence of spotted frogs. Because Pacific treefrogs, *Pseudacris regilla*, were quite abundant throughout the site, we performed similar analyses on this species. The two other amphibian species encountered, Woodhouse's toad (*Bufo woodhousei*) and the western toad (*Bufo boreas*) were encountered too rarely to warrant analysis. The primary analyses used was logistic regression (PROC LOGIST; SAS 1986), which

was used to determine which habitat variables served to best differentiate between sites where spotted frogs (or treefrogs) were found and sites where they were not found. Because of missing values for a number of variables it was necessary to run the logistic regression analysis using two different models, one including nearly all of the variables (but therefore excluding a portion of the sites) and one excluding variables for which there were a high number of missing values (but including nearly all of the sites). We also ran logistic regression analyses for 1994 data alone and for both years combined.

To allow examination of the strength of association of all variables, two additional analyses were performed: (i) contingency table analysis (PROC FREQ; SAS 1986) for categorical habitat variables vs. presence or absence of each species, and (ii) multivariate analysis of variance (PROC GLM; SAS 1986) to determine if the means of non-categorical (including ranked) habitat variables (e.g. water depth) differed between sites where a species was present and sites where it was not present. Note that sites where a species was not present included (i) random sites and (ii) sites where a different species was found. Analyses of conductivity, pH, hardness, and temperature were conducted using separate ANOVA's because a substantial number of values for these variables are missing, and these missing values would have compromised the power of the MANOVA.

Incidental Sightings. While conducting amphibian surveys or while walking or driving to sites, we occasionally encountered reptiles or other amphibians. The locations of these sightings were recorded, and some animals were collected for voucher specimens.

Sample Collection and Deposition: An adult of each species of amphibian and reptile was collected, fixed in 10% formalin, and preserved in 70% ethanol for deposition in Boise State University's Vertebrate Museum. In general, additional specimens were preserved if they were taken from greater than 10 miles from the sites of other specimens of the same species.

RESULTS

In 1993, (as noted in Munger et al. 1994) we characterized a total of 204 sites. Of these, 103 were random sites, 41 were at *Rana pretiosa* adult sites and 3 were at *R. pretiosa* larval sites. Spotted frogs were observed in the following drainages: Rock Creek, Camas Creek, Deep Creek, Camel Creek, Hurryback Creek, Stoneman Creek, Pole Creek, Slack Creek, and in two ponds and one reservoir. Another possible sighting was made at Dry Creek.

In 1994, we characterized a total of 168 sites. Twenty-four were at *Rana pretiosa* adult sites, 1 was at a *R. pretiosa* larval sites, 30 were at *Pseudacris regilla* adult sites, 29 were at *P. regilla* larval sites, and 2 were at *Bufo boreas* adult sites. Spotted frogs were observed in the following drainages: Camel Creek, Stoneman Creek, Josephine Creek, Wickiup Creek, Meadow Creek, and Trout Creek. Taken together, this represents a total of 11 populations. Figure 1 shows that spotted frog adults and larvae were found in a fairly narrow elevational range--from 4600 ft. to 5800 ft. Locations where spotted frogs were located may be found in Figure 2 and Appendices A, B, and E.

Historical Sites

We visited (or attempted to visit) all six historical sites identified from an examination of ISU's database (Table 1). Of these, one site was not visited because we were denied permision to enter the private land on which the site occurred. One site (along Flint Creek) could not be surveyed completely (it was on private land) but we were able to examine several places where the creek came close to the road or where tributaries crossed the road. Two other sites, Battle Creek and the confluence of South Fork of the Owyhee River and the Little Owyhee River, were comprehensively surveyed but no spotted frogs were found, despite the presence of apparently acceptable habitat. Bass (probably smallmouth) were seen at the latter site. At two sites, Trout Creek and Johnson Lakes, spotted frogs were found.

Population Estimates

Using a simple Lincoln index, we estimated the population of spotted frogs along Stoneman Creek to be between 62 and 195 in 1994 and 165 in 1995 (Table 2).

Habitat Relations

Logistic regression analyses for 1994 only and for 1993 and 1994 combined indicate that a number of variables act as predictors in one or more or the models: points where spotted frog adults were found tended to be higher in sand substrate, submerged vegetation, and algae; lower in grass, sagebrush, and rock substrate; and more often in areas that are oxbows or pools (Tables 3 and 4). Contingency table analysis confirmed that adult spotted frogs tended to be found more in oxbows and pools and less often in riffles and runs (Tables 5 and 6). MANOVA confirmed the positive association with sand substrate and negative association with sagebrush (Table 7). ANOVA of water variables (Table 8) showed that points with spotted frog adults tended to be at higher hardness values than points without spotted frogs.

The sample size of sites with spotted frog larvae was too small to allow a legitimate logistic regression analysis, and all contingency table analyses, MANOVA's and ANOVA's were insignificant. However, some trends were apparent: spotted frog larvae were found more often in ponds, less often in runs, and more often at sites with hiding places than would be expected (Table 5 and 6).

Points where treefrog larvae were found were lower in willow and higher in submerged vegetation, and more likely to be at a pond, oxbow, or pool than points without treefrog larvae. Points where treefrog adults were found were lower in willow and submerged vegetation, higher in gravel, and more likely to be at a pond or pool (Tables 5, 6, 7, 8, and 9).

National Wetland Inventory Classification

Association with NWI classification was analyzed in three ways. First, logistic regression was used to determine if frogs tended to be found more commonly with either the PSSC, PEMC, or R3UBH classifications. It was found that spotted frogs had a positive association with PSSC classification (Tables 3 and 4). Logistic regression was also used to determine if there was a positive or negative association with certain NWI systems, classes, or regimes. It was found that spotted frogs were positively associated with the C (seasonally flooded) regime (Tables 3 and 4).

Second, contingency table analysis was used to determine association of frogs with NWI system, NWI class, and NWI regime. As noted in Table 5 and 6, spotted frog adults tended to be positively associated with P (palustrine) and R4 (intermittant riverine) systems, SB (streambed) and SS (shrubscrub) classes, and C (seasonally flooded) regime, and negatively associated with R3 (upper perennial) system, EM (emergent) and UB (unconsolidated bottom) classes, and A (temporarily flooded), F (semipermanently flooded), and H (permanently flooded) regimes. Spotted frog larvae showed two trends: positive with emergent class and negative with shrubscrub class (both are opposite of the adult trends). Treefrog adults showed no pattern with NWI classification at any level; the larvae showed a positive association with EM (emergent) and UB (unconsolidated bottom) classes and a negative association with the SB (streambed) class.

In the third type of analysis, we used GIS to determine the miles of stream (includes perimeter of reservoirs) surveyed within each of the NWI classifications. The percent of miles within each classification represents an expected frequency of points with spotted frogs if spotted frogs were distributed randomly with respect to NWI classification. We found (ignoring the less common classifications) that spotted frogs were found more often than expected in PSSC situations and less often than expected for PEMC, R3UBH, R4SBA, and R4SBF classifications. (Table 10).

Other GIS Analyses

Spotted frogs were found to not be more highly associated with streams classed as perennial than with streams classed as intermittant (Table 11). Our attempt to use the riparian condition index and the fisheries condition index as predictors of spotted frog presence was a failure: greater than 95% of stream segments are classified as unsatisfactory in one or both measures; thus the majority of spotted frog sightings occured at unsatisfactory sites (Tables 12 and 13).

Incidental Sightings

We made a total of 324 captures or sightings of amphibians and reptiles other than spotted frogs and treefrogs. These included one species of amphibian, 6 species of lizards, and 5 species of snakes. A summary of captures is listed in Table 14; complete data on captures are listed in Appendix D.

DISCUSSION

Historical Sites

Although spotted frogs were only found at two of the 5 historical sites surveyed, this is too few historical sites to be able to confidently discern a pattern of decline. It is likely that few, if any, additional historical records will be found so it will not be possible to infer more from inspection of historical sites. It should be noted that one site without frogs (confluence of South Fork of the Owyhee River and Little Owyhee River) contained bass; this introduced species may be the cause for the lack of frogs at this site. Bradford (1989) identified introduced fish as an important cause of the demise of fish populations in a number of Sierra Nevada lakes.

Population estimates

Our population estimates at Stoneman Creek represent the beginning of a long-term monitoring effort. The time span thus far covered (2 years) is much too short to identify any sort of trend in numbers. The estimated population at Stoneman Creek (ca. 65 - 200) appears reasonably large and dense, and contains a wide variety of sizes, giving some indication that reproduction is occuring within this population.

Habitat Requirements of Spotted Frogs

Several interesting trends were found with regards habitat variables. First, adult spotted frog adults tend to be found in still water (oxbows or pools)with a sand substrate, and with submerged vegetation and algae. Second, they tend to be found in areas with low coverage with sagebrush. Sagebrush near a stream indicates that the water table is not high enough to support riparian vegetation such as willow or cottonwood. This may be because of the lack of permanence of the water supply, or because there has been a lowering of the water table, as is thought to happen as a result of the long term effects of overgrazing (Platts 1991).

Given the large number of sites at which adult frogs were found, it is surprising how few breeding sites were found. It is unclear whether they were breeding at sites undiscovered by us, whether they had failed to breed for some environmental reason, or whether they had attempted to breed but had failed because of egg death due to some environmental factor. Two things can be said about breeding sites (besides their rarity): all were found in slow water situations, and most had a mud substrate. In addition, the water temperature was quite warm at larval sites.

National Wetland Inventory Maps as Predictors of Amphibian Presence

We found several significant associations of the presence of frogs with one or more NWI variables. On the one hand, this gives some indication that NWI maps could be used to identify areas that are more likely to harbor spotted frogs: according to our analysis, higher than expected numbers of sites with palustrine regime, shrubscrub class, and seasonally flooded regime held adult spotted frogs. On the other hand, however, it should be noted that these trends cannot be used to confidently predict the presence or the absence of frogs: no NWI classification guaranteed the presence of spotted frogs and none guaranteed their absence.

We used two methods to conduct analysis of how spotted frog occurrance is related to NWI classification. For the first, NWI classifications were determined by hand from maps. This process undoubtedly led to errors due to (i) the difficulty of knowing exact placement of sample points, (ii) lack of systematic placement of random points (in practice, some streams received more random points per mile than did others), (iii) difficulties in interpreting the maps. The second analysis involved use of a GIS layer containing digitized NWI maps and intersecting this with layers containing the stream segments actually surveyed and the locations of spotted frog sightings. This had the advantage of generating expected frequencies based on the sampling effort in each NWI classification, but still suffered from possible error in specifying the exact location of spotted frog sightings. The optimal way to conduct this portion of the study would be to use a correctable GPS unit to record exact locations of sightings, then use these sightings in conjunction with appropriate GIS layers. In the present study, both methods gave similar results: frogs were

found more often than expected in PSSC classifications.

Effects of Grazing

Munger (1994) found that sites with adult spotted frogs had ratings for grazing pressure that were significantly (but modestly) lower than sites without adult spotted frogs. For this year's data, we found no statistically significant effects. We did observe slightly more evidence of grazing on shrubs and on grass in sites without spotted frogs than at sites with spotted frogs, but this is offset by the opposite trend for observed feces and footprints. Thus, our evidence regarding a short-term negative impact of grazing on the presence of adult spotted frogs is mixed. Because of low sample size, it is difficult to assess the impact of grazing on breeding. However, it is interesting to note that breeding sites tended to have lower overall grazing intensity than did non-breeding sites. In addition, the only 1994 site that had larvae had no evidence of grazing. We also looked for evidence of long-term impacts: do spotted frogs tend to be found in areas not showing evidence of long-term detrimental impact of overgrazing: lack of hydrophilic plants, downcutting, and lateral erosion? Here we found one significant trend: sites with spotted frogs tended to be found in areas relatively low amounts of sagebrush, which would be expected to invade streamsides of heavily degraded streams for which the water table has fallen. In addition, no spotted frog adults were found in areas identified as downcut. The only breeding site found in 1994 had no evidence of downcutting or lateral erosion.

Some caution must be exercised in interpreting these results: this study was designed primarily to identify locations at which spotted frogs occur. This design probably led to some bias in which sites were examined: the more promising the site, the more likely it was examined. To confidently assess the effects of grazing on spotted frogs will require a study focussed on that question, one that uses a design with less possibility of bias, one that uses more quantitative measures of short-term and long-term effects of grazing, and one that makes use of a wider range of grazing intensities (e.g. in and out of exclosures).

Status of the Spotted Frog

Our general impression is that spotted frogs are quite common in some areas of the Owyhee Mountains. However, these areas are fairly limited in number, and are apparently restricted to bodies of water with low gradient and substantial slack water. It appears that breeding sites are even more limiting. More study is needed to determine whether these sites are indeed rare, and if so, to determine the causes of this rarity. More study is also needed to determine the microhabitat requirements of spotted frogs.

The primary threat to this population is from loss of habitat, whether through diversion of water, long-term effects of overgrazing, or other habitat modifications. Another potentially important threat is the introduction of fish or bullfrogs, which may compete with or prey upon spotted frogs.

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QUAD MAPS:

These maps are copies of areas of quadrangle maps that were surveyed by us.

--- Numbers in parentheses refer to site numbers (see Appendixes).

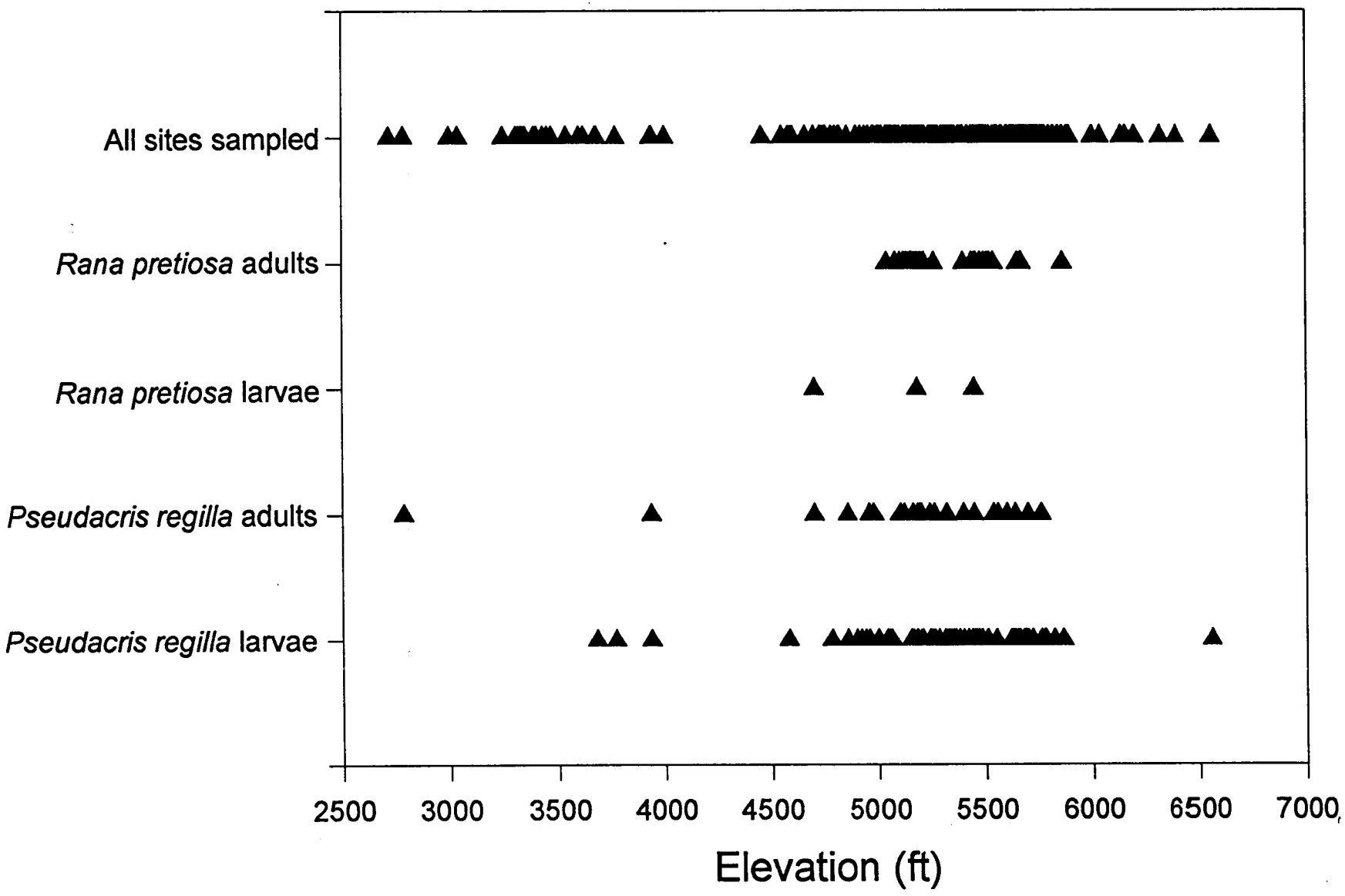
--- Large squares: Spotted frog adult (s)

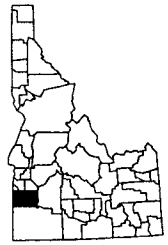
--- Small squares: Spotted frog larva(e)

--- Large circles: Treefrog adult(s)

--- Small circles: Treefrog larva(e)

Figure 1. Elevation at which spotted frogs and Pacific treefrogs were collected.

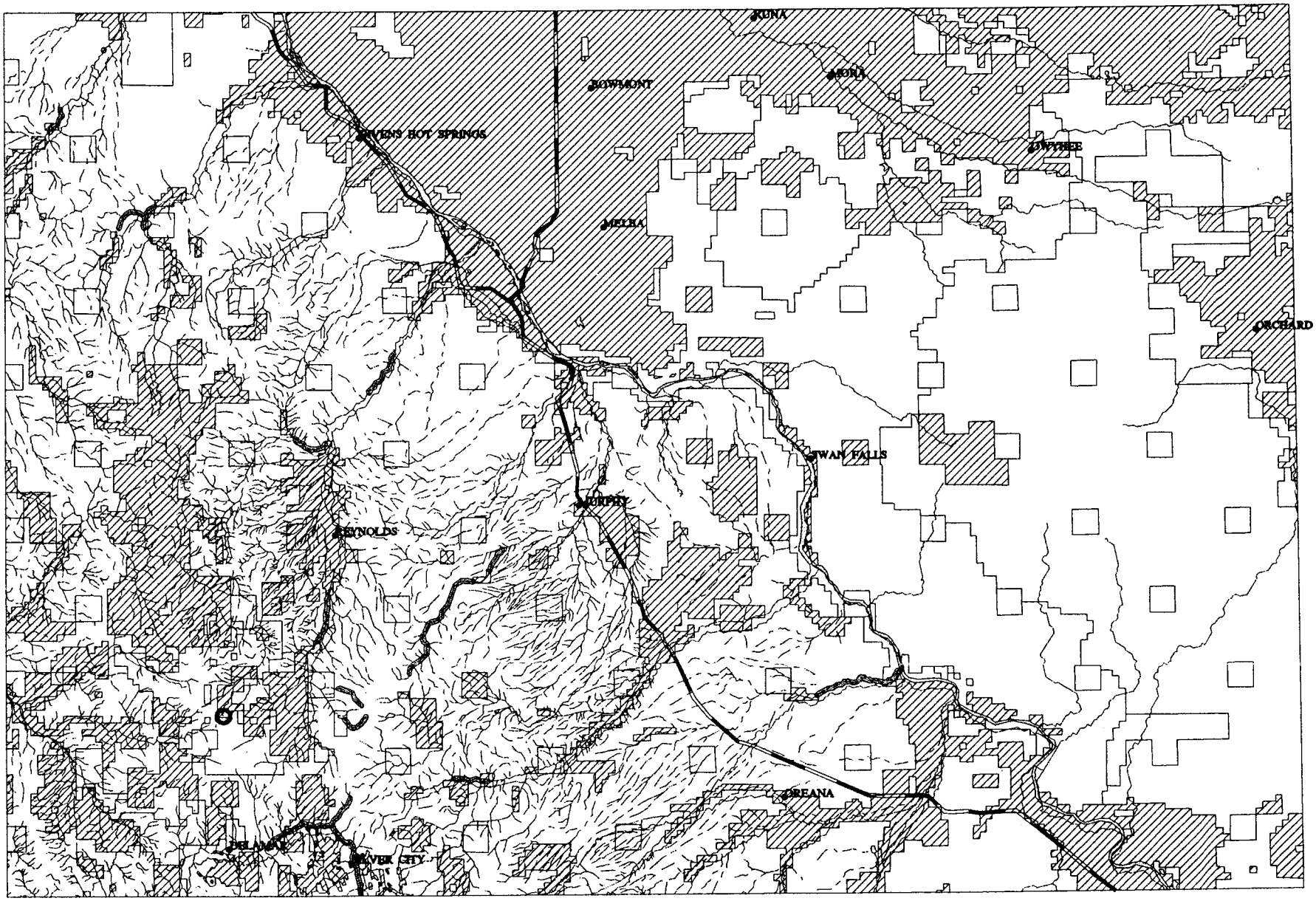




Spotted Frog Inventory
Murphy Quadrangle

Historical Site: Spotted Frogs Found

Frog Location
Inventoried Stream
Federal Lands
State Lands
Private Land



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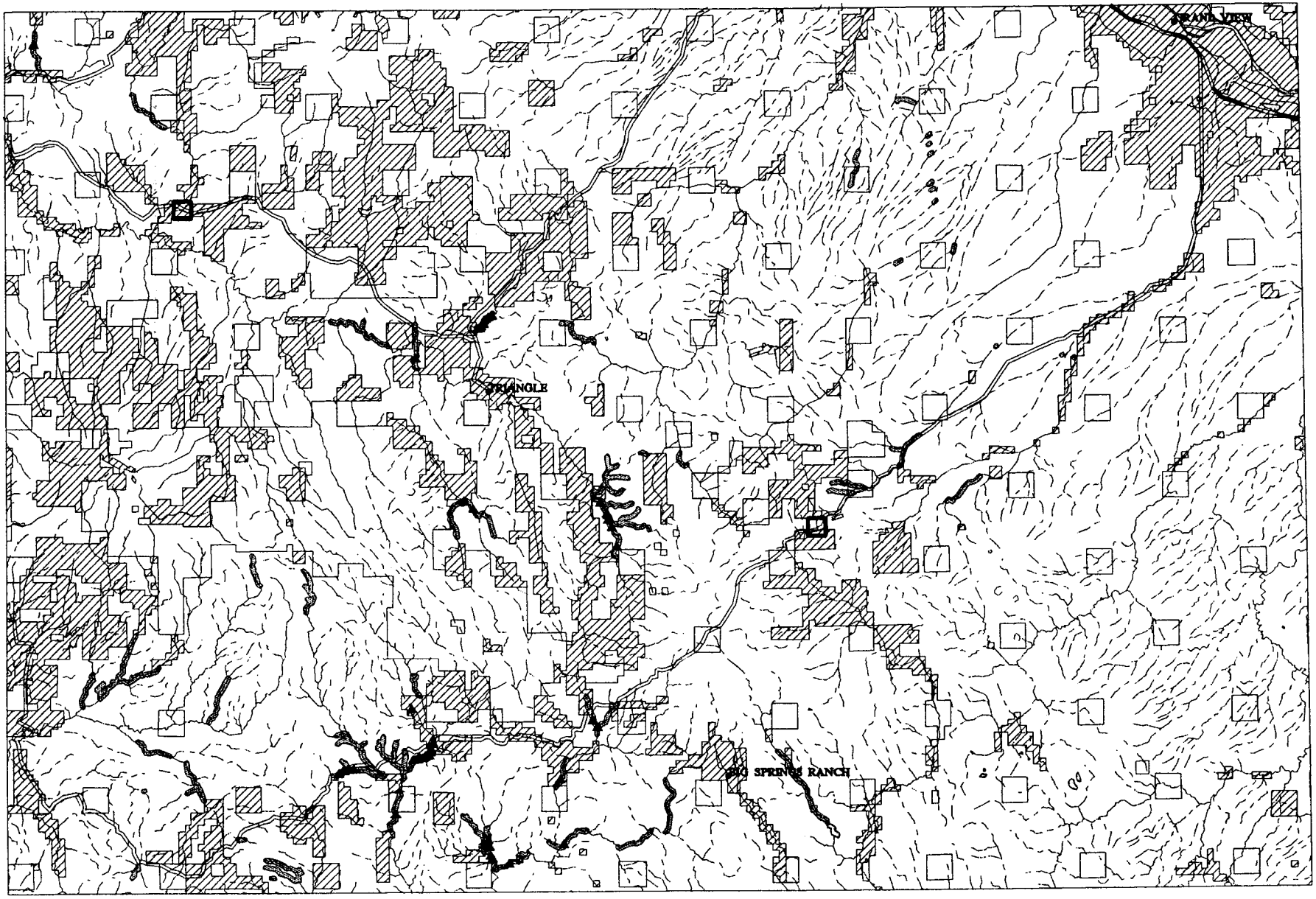
Spotted Frog Inventory
Triangle Quadrangle

Historical Site: No Spotted Frogs Found

Frog Location
Inventoried Stream
Federal Lands
State Lands
Private Land



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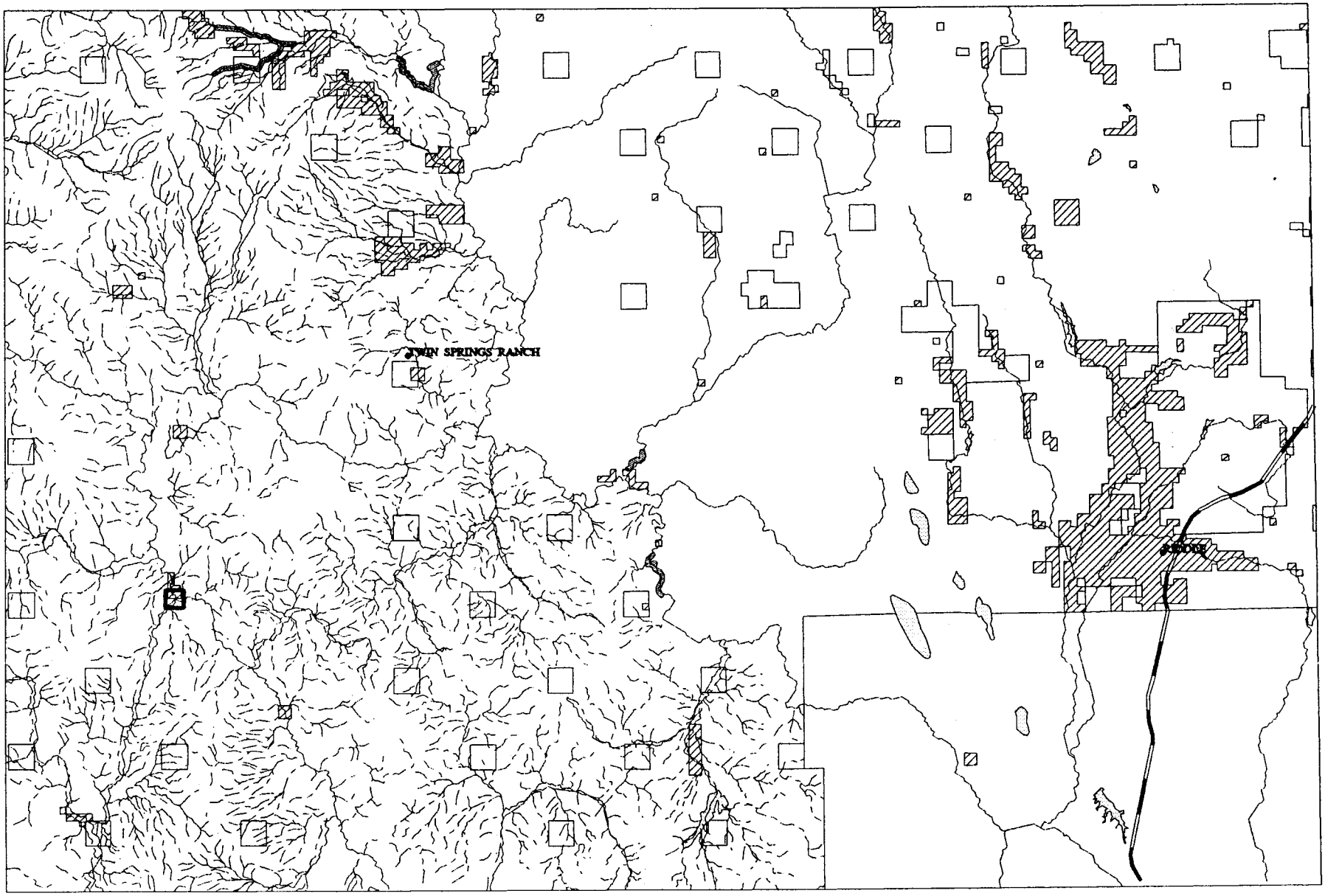
Spotted Frog Inventory
Riddle Quadrangle

Historical Site: No Spotted Frogs Found

Frog Location
Inventoried Stream
Federal Lands
State Lands
Private Land



N

Scale 1:350,000

Table 1. Historical records of spotted frogs in Owyhee County, Idaho. From data base gathered by Dr. Charles Peterson of Idaho State University. Of six locations, two could not be searched (because of poor specification of location or due to lack of permission), two had spotted frogs present, and two did not have spotted frogs present.

Museum*	Cat. #	Locality	Date	Collector	Remarks	Relocated?	Notes
UIM	269	16 miles W of Triangle, T 6S, R 4W, S 19	19 June 1955	P. Dumas	subadult	NO-minor search	1
UCM	9326	16 mi W Triangle	19 Aug. 1955			NO-minor search	1
UIM	92	16 miles W of Triangle	14 April 1956	P. Dumas	adult	NO-minor search	1
UIM	76	6 miles NW of Triangle	30 July 1958	P. Dumas	subadult	no search	2
UIM	376	16 miles W of Triangle	04 April 1964	P. Dumas	adult	NO-minor search	1
UIM	93	16 miles W of Triangle	07 May 1968	P. Dumas	adult	NO-minor search	1
UTACV	17051	47.6 km WSW Hwy 51 on Jordon Valley	29 June 1985		larvae	NO	3
UTACV	17057	47.6 km WSW Hwy 51 on Jordon Valley	29 June 1985		adults	NO	3
UIM	576	Owyhee Mountains--Johnson Lakes	25 May 1987	L. Diller	adult	YES	4
MVZ	24420	2.5 Mi E of Jordan Valley, OR	17 July 1937	Johnson, D. H.		YES	5
MVZ	24418	S fork Owyhee R.; 22 mi N of Nevada line	7 July 1937	Johnson, D. H.		NO	6
MVZ	24419	S fork Owyhee R.; 22 mi N of Nevada line	8 July 1937	Johnson, D. H.		NO	6

MVZ = University of California at Berkeley, Museum of Vertebrate Zoology
UIM = University of Idaho Museum
UTACV = University of Texas at Austin
UCM = University of Colorado Museum
UTACV=University of Texas Austin Museum

Our remarks:

1. Location is where Flint Creek parallels the road; the whole area is private land. Habitat looks very promising. A couple of spots were checked where side creeks crossed road or where Flint Creek came very close to the road; no spotted frogs were found.
2. Road crosses Boulder Ck. and Mammoth Ck. ca. 6.5 mi NW of Triangle on private land:We asked for but were denied permission to survey Boulder Creek, which appears to be promising habitat.
3. Jordan Valley Road (also known as Mud Flat Road) does not intersect Highway 51, but it does intersect Highway 78. 47.6 km wsw of Highway 78 is at the intersection of Battle Creek and Mud Flat Road. This site looks like it could very well support spotted frogs. However, we checked the non-private portion of this site extensively on June 29, 1995 and found no spotted frogs.
4. Probably 5.2 miles N of DeLamar; T4S R4W S5. We checked these 3 lakes and overflow pond from the uppermost lake on July 11, 1995 and found 14 spotted frogs in the upper lake and its overflow pond.
5. This is a bridge across Trout Creek on Jordan Valley Highway. We checked on July 10, 1995 and found 2 adult and 10 larval spotted frogs. One of each were taken as specimens for deposition in the BSU museum.
6. As the crow flies, S Fork goes only to 19 mi N of Nevada line; Examination of field notes of DH Johnson at the Museum of Vertebrate Zoology, University of California at Berkeley, indicated that the collector was referring to the intersection of the South Fork of the Owyhee River and the Little Owyhee River, in the vicinity of the 45 Ranch. No frogs were found in the non-private sections of the area, although the habitat looked appropriate. Bass were seen in these waters. There is also some very promising habitat on the 45 Ranch.

Table 2. Population density estimates of adult spotted frogs, summer 1994 and summer of 1995: Mark and recapture at section of Stoneman Creek described in the text.

	Marking	Recaptures	Population Estimate
1994			
June 13:	20 frogs branded		
July 5:	6 newly branded	2 of 8 had marks	(8/2) x 20 marked = 80
July 12:		8 of 19 had marks	(19/8) x 26 marked = 61.75
July 20:	(metamorphs not included)	2 of 15 had marks	(15/2) x 26 marked = 195
1995			
July 9	40 frogs branded		
July 16		8 of 33 were marked	(33/8) x 40 marked = 165

Table 3. Results from Logistic Regression analysis of 1994 data. Two analyses were run, the first with a reduced number of variables so as to reduce the number of missing cases, the second with most variables present (those removed had many missing values). Both analyses use NWI system, class, and regime combined into a single variable; analyses with these variables treated separately led to singular information matrices and lack of convergence.

SAS Command File:

```
PROC LOGISTIC DESCENDING;
TITLE2 '1994, CUT DOWN TO REDUCING MISSING CASES';
WHERE YEAR = 94;
MODEL SPOTAD =
SILT SAND GRAVEL ROCK SAGE GRASS FORB
  REED BARE WILLOW COTTON EMERGE SUBMERGE ALGAE
  GRAZOVR PSSC PEMC R3UBH OXBOW POND POOL RIFFL HIDEN
  /SELECTION = STEPWISE MAXITER = 100 SLSTAY =.1
  SLENTRY = .1;
```

SAS Listing:

Ordered Value	SPOTAD	Count
1	Y	21
2	N	138

Summary of Stepwise Procedure

Step	Variable Entered	Variable Removed	Number In	Score Chi-Square	Wald Chi-Square	Pr > Chi-Square
1	PSSC		1	10.4122	.	0.0013
2	ALGAE		2	8.5620	.	0.0034
3	OXBOW		3	6.3787	.	0.0116
4	GRASS		4	6.4471	.	0.0111
5	SUBMERGE		5	3.7902	.	0.0516

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Wald Chi-Square	Pr > Chi-Square	Standardized Estimate	Odds Ratio
INTERCPT	1	-3.7966	0.7754	23.9727	0.0001	.	0.022
GRASS	1	-1.6032	0.5943	7.2784	0.0070	-0.582932	0.201
SUBMERGE	1	0.7086	0.3755	3.5611	0.0592	0.321818	2.031
ALGAE	1	1.2835	0.3840	11.1691	0.0008	0.527550	3.609
PSSC	1	2.3061	0.6556	12.3738	0.0004	0.592189	10.035
OXBOW	1	1.9405	0.7913	6.0141	0.0142	0.272354	6.963

Association of Predicted Probabilities and Observed Responses

Concordant = 85.7%	Somers' D = 0.716
Discordant = 14.1%	Gamma = 0.718
Tied = 0.2%	Tau-a = 0.165
(2898 pairs)	c = 0.858

SAS Command File:

```
PROC LOGISTIC DESCENDING;
TITLE2
   '1994 GRAZOVR NOT INCL, ONLY EXCLUDE IF LOTS OF MISSING VALUES';
MODEL SPOTAD =
  SILT SAND GRAVEL ROCK SAGE GRASS FORB REED BARE WILLOW COTTON UROCK
   EMERGE SUBMERGE ALGAE GRAZGRS GRAZSHR GRAZPP DOWNCTN
    LATERALN PSSC PEMC R3UBH OXBOW POND POOL RIFFL
  /SELECTION = STEPWISE MAXITER = 100 SLSTAY =.1
  SLENTRY = .1;
```

SAS Listing:

Response Profile

Ordered Value	SPOTAD	Count
1	Y	18
2	N	121

Summary of Stepwise Procedure

Step	Variable Entered	Variable Removed	Number In	Score Chi-Square	Wald Chi-Square	Pr > Chi-Square
1	PSSC		1	7.7996	.	0.0052
2	ALGAE		2	6.4742	.	0.0109
3	UROCK		3	5.6915	.	0.0170
4	GRASS		4	9.5336	.	0.0020
5	SAND		5	4.9882	.	0.0255

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Wald Chi-Square	Pr > Chi-Square	Standardized Estimate	Odds Ratio
INTERCPT	1	-1.8016	0.6910	6.7979	0.0091	.	0.165
SAND	1	0.0278	0.0138	4.0803	0.0434	0.276160	1.028
GRASS	1	-2.7496	0.9265	8.8068	0.0030	-0.961518	0.064
UROCK	1	-2.3714	0.8391	7.9868	0.0047	-0.929477	0.093
ALGAE	1	1.4695	0.4571	10.3348	0.0013	0.579843	4.347
PSSC	1	2.0949	0.7054	8.8188	0.0030	0.542370	8.125

Association of Predicted Probabilities and Observed Responses

Concordant	= 89.5%	Somers' D	= 0.794
Discordant	= 10.1%	Gamma	= 0.798
Tied	= 0.5%	Tau-a	= 0.180
(2178 pairs)		c	= 0.897

Table 4. Logistic regression analysis of combined 1993 and 1994 data. These analyses only includes variables with a low number of missing values, so as to reduce the number of missing cases. The first analysis combines NWI system, class, and regime into a single variable, the second keeps them separate.

SAS command file statement:

```
PROC LOGISTIC DESCENDING;
TITLE2 'BOTH YEARS; CUT DOWN TO REDUCING MISSING CASES';
MODEL SPOTAD =
SILT SAND GRAVEL ROCK SAGE GRASS FORB
  REED BARE WILLOW COTTON EMERGE SUBMERGE ALGAE
  GRAZOVR PSSC PEMC R3UBH OXBOW POND POOL RIFFL
        HIDEN
  /SELECTION = STEPWISE MAXITER = 100 SLSTAY =.1
  SLENTRY = .1;
```

SAS listing:

Ordered Value	SPOTAD	Count
1	Y	50
2	N	282

Summary of Stepwise Procedure

Step	Variable Entered	Variable Removed	Number In	Score Chi-Square	Wald Chi-Square	Pr > Chi-Square
1	OXBOW		1	26.4620	.	0.0001
2	SAGE		2	10.0698	.	0.0015
3	POOL		3	11.1544	.	0.0008
4	PSSC		4	5.2256	.	0.0223
5	GRASS		5	4.6991	.	0.0302
6	ROCK		6	2.7417	.	0.0978
7		ROCK	5	.	2.6577	0.1030

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Wald Chi-Square	Pr > Chi-Square	Standardized Estimate	Odds Ratio
INTERCPT	1	-2.1119	0.4019	27.6144	0.0001	.	0.121
SAGE	1	-1.1903	0.4914	5.8670	0.0154	-0.434181	0.304
GRASS	1	-0.5223	0.2438	4.5885	0.0322	-0.208978	0.593
PSSC	1	0.9081	0.3748	5.8712	0.0154	0.240441	2.480
OXBOW	1	2.0457	0.4542	20.2906	0.0001	0.337964	7.735
POOL	1	1.4745	0.4108	12.8805	0.0003	0.356689	4.369

Association of Predicted Probabilities and Observed Responses

Concordant = 80.6%	Somers' D = 0.623
Discordant = 18.4%	Gamma = 0.629
Tied = 1.0%	Tau-a = 0.160
(14100 pairs)	c = 0.811

SAS command file statement:

```
PROC LOGISTIC DESCENDING;
TITLE2 'BOTH YEARS, CUT DOWN TO REDUCING MISSING CASES';
MODEL SPOTAD =
SILT SAND GRAVEL ROCK SAGE GRASS FORB
  REED BARE WILLOW COTTON       EMERGE SUBMERGE ALGAE
  GRAZOVR PALUS R3 SB SS UB REGA REGB REGC OXBOW POND POOL RIFFL
        HIDEN
  /SELECTION = STEPWISE MAXITER = 100 SLSTAY =.1
  SLENTRY = .1;
```

SAS listing:

Ordered Value	SPOTAD	Count
1	Y	50
2	N	266

Summary of Stepwise Procedure

Step	Variable Entered	Variable Removed	Number In	Score Chi-Square	Wald Chi-Square	Pr > Chi-Square
1	OXBOW		1	24.2914	.	0.0001
2	REGC		2	11.6761	.	0.0006
3	POOL		3	8.2676	.	0.0040
4	SAGE		4	8.6716	.	0.0032
5	GRASS		5	4.8078	.	0.0283
6	ROCK		6	3.2919	.	0.0696

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Wald Chi-Square	Pr > Chi-Square	Standardized Estimate	Odds Ratio
INTERCPT	1	-2.3839	0.5063	22.1680	0.0001	.	0.092
ROCK	1	-0.0111	0.00622	3.1829	0.0744	-0.192433	0.989
SAGE	1	-1.2796	0.5075	6.3562	0.0117	-0.435114	0.278
GRASS	1	-0.5825	0.2533	5.2905	0.0214	-0.232444	0.558
REGC	1	1.4522	0.4582	10.0473	0.0015	0.387227	4.273
OXBOW	1	1.9044	0.4631	16.9145	0.0001	0.321607	6.716
POOL	1	1.2281	0.3975	9.5465	0.0020	0.301816	3.415

Association of Predicted Probabilities and Observed Responses

Concordant = 80.8%	Somers' D = 0.621
Discordant = 18.8%	Gamma = 0.623
Tied = 0.4%	Tau-a = 0.166
(13300 pairs)	c = 0.810

Table 5. Contingency table analysis to determine association of presence and absence of Spotted Frogs and Pacific Treefrogs with various categorical variables. 1994 Data first.

Spotted Frog Adults by NWI System

	P	R3	R4	Total
N	86 87.09	33 28.455	25 28.455	144
Y	15 13.91	0 4.5449	8 4.5449	23
Total	101	33	33	167

G-test df = 2 G = 12.451 P = 0.002

Spotted Frog Adults by NWI Class

	EM	SB	SS	UB	US	Total
N	34 29.317	25 28.455	46 52.599	36 31.042	3 2.5868	144
Y	0 4.6826	8 4.5449	15 8.4012	0 4.9581	0 0.4132	23
Total	34	33	61	36	3	167

G-test df = 4 G = 29.266 P = 0.000

Spotted Frog Adults by NWI Regime

	A	B	C	CH	F	H	HH	Total
N	25 21.557	2 1.7246	67 77.605	5 4.3114	12 10.347	32 27.593	1 0.8623	144
Y	0 3.4431	0 0.2754	23 12.395	0 0.6886	0 1.6527	0 4.4072	0 0.1377	23
Total	25	2	90	5	12	32	1	167

G-test df = 6 G = 31.567 P = 0.000

Spotted Frog Adults by Wetland Type

	OXBOW	POND	POOL	RIFFLE	RUN	Total
N	7 9.5828	18 15.681	55 54.883	17 15.681	45 46.172	142
Y	4 1.4172	0 2.319	8 8.1166	1 2.319	8 6.8282	21
Total	11	18	63	18	53	163

G-test df = 4 G = 10.155 P = 0.038

Spotted Frog Adults by Presence of Hiding Place

	N	Y	Total
N	1 0.8667	142 142.13	143
Y	0 0.1333	22 21.867	22
Total	1	164	165

G-test df = 1 G = 0.287 P = 0.592

Spotted Frog Adults By Type of Hiding Place

	BANK	TURBID	OVERHANG	ROCK	VEG	Total
N	6 5.1951	1 0.8659	1 0.8659	27 23.378	107 111.7	142
Y	0 0.8049	0 0.1341	0 0.1341	0 3.622	22 17.305	22
Total	6	1	1	27	129	164

G-test df = 4 G = 11.455 P = 0.022

Spotted Frog Adults By Presence of Fish

	N	Y	Total
N	66 65.718	81 81.282	147
Y	10 10.282	13 12.718	23
Total	76	94	170

G-test df = 1 G = 0.016 P = 0.899

Spotted Frog Adults by Presence of Downcutting

	N	Y	Total
N	122 122.9	7 6.1014	129
Y	19 18.101	0 0.8986	19
Total	141	7	148

G-test df = 1 G = 1.974 P = 0.160

Spotted Frog Adults by Presence of Lateral Erosion

	N	Y	Total
N	93 91.867	37 38.133	130
Y	13 14.133	7 5.8667	20
Total	106	44	150

G-test df = 1 G = 0.347 P = 0.556

Spotted Frog Adults by Local Topography

	MESO	NARROW	ROLLING	WIDEVAL	Total
N	61 57.772	9 9.485	31 34.491	43 42.251	144
Y	6 9.2275	2 1.515	9 5.509	6 6.7485	23
Total	67	11	40	49	167

G-test df = 3 G = 3.952 P = 0.267

Spotted Frog Adults by Flow

	CASCADE	DRY	FAST	MEANDER	MODERATE	POND	SEEPING/	TANK	Total
N	2 1.6806	4 4.2014	16 14.285	66 68.903	30 29.41	1 0.8403	1 0.8403	1 0.8403	121
Y	0 0.3194	1 0.7986	1 2.7153	16 13.097	5 5.5903	0 0.1597	0 0.1597	0 0.1597	23
Total	2	5	17	82	35	1	1	1	144

G-test df = 7 G = 4.229 P = 0.753

Spotted Frog Larvae by NWI System

	P	R3	R4	Total
N	101 100.4	33 32.802	32 32.802	166
Y	0 0.6048	0 0.1976	1 0.1976	1
Total	101	33	33	167

G-test df = 2 G = 3.268 P = 0.195

Spotted Frog Larvae by NWI Class

	EM	SB	SS	UB	US	Total
N	34 33.796	32 32.802	61 60.635	36 35.784	3 2.982	166
Y	0 0.2036	1 0.1976	0 0.3653	0 0.2156	0 0.018	1
Total	34	33	61	36	3	167

G-test df = 4 G = 3.268 P = 0.514

Spotted Frog Larvae by NWI Regime

	A	B	C	CH	F	H	HH	Total
N	25 24.85	2 1.988	90 89.461	5 4.9701	11 11.928	32 31.808	1 0.994	166
Y	0 0.1497	0 0.012	0 0.5389	0 0.0299	1 0.0719	0 0.1916	0 0.006	1
Total	25	2	90	5	12	32	1	167

G-test df = 6 G = 5.346 P = 0.500

Spotted Frog Larvae by Wetland Type

	OXBOW	POND	POOL	RIFFLE	RUN	Total
N	11 10.933	17 17.89	63 62.613	18 17.89	53 52.675	162
Y	0 0.0675	1 0.1104	0 0.3865	0 0.1104	0 0.3252	1
Total	11	18	63	18	53	163

G-test df = 4 G = 4.457 P = 0.348

Spotted Frog Larvae by Presence of Hiding Place

	N	Y	Total
N	1 0.9939	163 163.01	164
Y	0 0.0061	1 0.9939	1
Total	1	164	165

G-test df = 1 G = 0.012 P = 0.912

Spotted Frog Larvae By Type of Hiding Place

	BANK	TURBID	OVERHANG	ROCK	VEG	Total
N	6 5.9634	1 0.9939	1 0.9939	27 26.835	128 128.21	163
Y	0 0.0366	0 0.0061	0 0.0061	0 0.1646	1 0.7866	1
Total	6	1	1	27	129	164

G-test df = 4 G = 0.482 P = 0.975

Spotted Frog Larvae By Presence of Fish

	N	Y	Total
N	76 75.553	93 93.447	169
Y	0 0.4471	1 0.5529	1
Total	76	94	170

G-test df = 1 G = 1.190 P = 0.275

Spotted Frog Larvae by Presence of Downcutting

	N	Y	Total
N	140 140.05	7 6.9527	147
Y	1 0.9527	0 0.0473	1
Total	141	7	148

G-test df = 1 G = 0.097 P = 0.755

Spotted Frog Larvae by Presence of Lateral Erosion

	N	Y	Total
N	105 105.29	44 43.707	149
Y	1 0.7067	0 0.2933	1
Total	106	44	150

G-test df = 1 G = 0.697 P = 0.404

Spotted Frog Larvae by Local Topography

	MESO	NARROW	ROLLING	WIDEVAL	Total
N	67	11	39	49	166
	66.599	10.934	39.76	48.707	
Y	0	0	1	0	1
	0.4012	0.0659	0.2395	0.2934	
Total	67	11	40	49	167

G-test df = 3 G = 2.877 P = 0.411

Spotted Frog Larvae by Flow

	CASCADE	DRY	FAST	MEANDER	MODERATE	POND	SEEPING/	TANK	Total
N	2	5	17	82	35	1	1	1	144
	2	5	17	82	35	1	1	1	
Y	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	
Total	2	5	17	82	35	1	1	1	144

Treefrog Adults by NWI System

	P	R3	R4	Total
N	88	31	27	146
	88.299	28.85	28.85	
Y	13	2	6	21
	12.701	4.1497	4.1497	
Total	101	33	33	167

Likelihood Ratio Chi-Square 2

G-test df = 2 G = 2.390 P = 0.303

Treefrog Adults by NWI Class

	EM	SB	SS	UB	US	Total
N	29	27	55	32	3	146
	29.725	28.85	53.329	31.473	2.6228	
Y	5	6	6	4	0	21
	4.2754	4.1497	7.6707	4.5269	0.3772	
Total	34	33	61	36	3	167

Likelihood Ratio Chi-Square 4

G-test df = 4 G = 2.304 P = 0.680

Treefrog Adults by NWI Regime

	A	B	C	CH	F	H	HH	Total
N	20 21.856	1 1.7485	81 78.683	4 4.3713	10 10.491	30 27.976	0 0.8743	146
Y	5 3.1437	1 0.2515	9 11.317	1 0.6287	2 1.509	2 4.024	1 0.1257	21
Total	25	2	90	5	12	32	1	167

Likelihood Ratio Chi-Square 6

G-test df = 6 G = 9.239 P = 0.161

Treefrog Adults by Wetland Type

	OXBOW	POND	POOL	RIFFLE	RUN	Total
N	11 9.6503	14 15.791	53 55.27	16 15.791	49 46.497	143
Y	0 1.3497	4 2.2086	10 7.7301	2 2.2086	4 6.5031	20
Total	11	18	63	18	53	163

G-test df = 4 G = 6.238 P = 0.182

Treefrog Adults by Presence of Hiding Place

	N	Y	Total
N	1 0.8727	143 143.13	144
Y	0 0.1273	21 20.873	21
Total	1	164	165

G-test df = 1 G = 0.273 P = 0.601

Treefrog Adults By Type of Hiding Place

	BANK	TURBID	OVERHANG	ROCK	VEG	Total
N	6 5.2317	1 0.872	1 0.872	27 23.543	108 112.48	143
Y	0 0.7683	0 0.128	0 0.128	0 3.4573	21 16.518	21
Total	6	1	1	27	129	164

G-test df = 4 G = 10.891 P = 0.028

Treefrog Adults By Presence of Fish

	N	Y	Total
N	65 66.612	84 82.388	149
Y	11 9.3882	10 11.612	21
Total	76	94	170

G-test df = 1 G = 0.568 P = 0.451

Treefrog Adults by Presence of Downcutting

	N	Y	Total
N	121 121.95	7 6.0541	128
Y	20 19.054	0 0.9459	20
Total	141	7	148

G-test df = 1 G = 2.086 P = 0.149

Treefrog Adults by Presence of Lateral Erosion

	N	Y	Total
N	90 91.867	40 38.133	130
Y	16 14.133	4 5.8667	20
Total	106	44	150

G-test df = 1 G = 1.034 P = 0.309

Treefrog Adults by Local Topography

	MESO	NARROW	ROLLING	WIDEVAL	Total
N	59 58.575	11 9.6168	31 34.97	45 42.838	146
Y	8 8.4251	0 1.3832	9 5.0299	4 6.1617	21
Total	67	11	40	49	167

G-test df = 3 G = 6.957 P = 0.073

Treefrog Adults by Flow

	CASCADE	DRY	FAST	MEANDER	MODERATE	POND	SEEPING/	TANK	Total
N	2 1.7639	4 4.4097	17 14.993	69 72.319	32 30.868	1 0.8819	1 0.8819	1 0.8819	127
Y	0 0.2361	1 0.5903	0 2.0069	13 9.6806	3 4.1319	0 0.1181	0 0.1181	0 0.1181	17
Total	2	5	17	82	35	1	1	1	144

G-test df = 7 G = 7.367 P = 0.392

Treefrog Larvae by NWI System

	P	R3	R4	Total
N	70 68.946	23 22.527	21 22.527	114
Y	31 32.054	10 10.473	12 10.473	53
Total	101	33	33	167

Likelihood Ratio Chi-Square 2 0.401 0.818

G-test df = 2 G = 0.013 P = 0.994

Treefrog Larvae by NWI Class

	EM	SB	SS	UB	US	Total
N	17 23.21	21 22.527	53 41.641	22 24.575	1 2.0479	114
Y	17 10.79	12 10.473	8 19.359	14 11.425	2 0.9521	53
Total	34	33	61	36	3	167

G-test df = 4 G = 18.972 P = 0.001

Treefrog Larvae by NWI Regime

	A	B	C	CH	F	H	HH	Total
N	17 17.066	1 1.3653	66 61.437	2 3.4132	6 8.1916	22 21.844	0 0.6826	114
Y	8 7.9341	1 0.6347	24 28.563	3 1.5868	6 3.8084	10 10.156	1 0.3174	53
Total	25	2	90	5	12	32	1	167

G-test df = 6 G = 7.090 P = 0.313

Treefrog Larvae by Wetland Type

	OXBOW	POND	POOL	RIFFLE	RUN	Total
N	5 7.4233	3 12.147	32 42.515	17 12.147	53 35.767	110
Y	6 3.5767	15 5.8528	31 20.485	1 5.8528	0 17.233	53
Total	11	18	63	18	53	163

G-test df = 4 G = 79.183 P = 0.000

Treefrog Larvae by Presence of Hiding Place

	N	Y	Total
N	1 0.6788	111 111.32	112
Y	0 0.3212	53 52.679	53

G-test df = 1 G = 0.778 P = 0.378

Treefrog Larvae By Type of Hiding Place

	BANK	TURBID	OVERHANG	ROCK	VEG	Total
N	6 4.061	0 0.6768	1 0.6768	26 18.274	78 87.311	111
Y	0 1.939	1 0.3232	0 0.3232	1 8.7256	51 41.689	53
Total	6	1	1	27	129	164

G-test df = 4 G = 24.697 P = 0.000

Treefrog Larvae By Presence of Fish

	N	Y	Total
N	34 52.306	83 64.694	117
Y	42 23.694	11 29.306	53
Total	76	94	170

G-test df = 1 G = 38.599 P = 0.000

Treefrog Larvae by Presence of Downcutting

	N	Y	Total
N	96 97.176	6 4.8243	102
Y	45 43.824	1 2.1757	46
Total	141	7	148

G-test df = 1 G = 1.108 P = 0.293

Treefrog Larvae by Presence of Lateral Erosion

	N	Y	Total
N	70 72.787	33 30.213	103
Y	36 33.213	11 13.787	47
Total	106	44	150

G-test df = 1 G = 1.191 P = 0.275

Treefrog Larvae by Local Topography

	MESO	NARROW	ROLLING	WIDEVAL	Total
N	52 46.539	11 7.6407	17 27.784	36 34.036	116
Y	15 20.461	0 3.3593	23 12.216	13 14.964	51
Total	67	11	40	49	167

G-test df = 3 G = 23.028 P = 0.000

Treefrog Larvae by Flow

	CASCADE	DRY	FAST	MEANDER	MODERATE	POND	SEEPING/	TANK	Total
N	2 1.5278	5 3.8194	17 12.986	50 62.639	34 26.736	0 0.7639	1 0.7639	1 0.7639	110
Y	0 0.4722	0 1.1806	0 4.0139	32 19.361	1 8.2639	1 0.2361	0 0.2361	0 0.2361	34
Total	2	5	17	82	35	1	1	1	144

G-test df = 7 G = 38.634 P = 0.000

Combined Data for 1993 and 1994: Contingency Table Analysis.

Spotted Frog Adults by NWI System

	P	R3	R4	Total
N	191 193.33	42 43.418	57 53.249	290
Y	45 42.667	11 9.5819	8 11.751	64
Total	236	53	65	354

G-test df = 2 G = 2.009 P = 0.366

Spotted Frog Adults by NWI Class

	EM	FO	SB	SS	UB	US	Total
N	70 63.079	1 0.8192	57 53.249	111 121.24	48 48.333	3 3.2768	290
Y	7 13.921	0 0.1808	8 11.751	37 26.757	11 10.667	1 0.7232	64
Total	77	1	65	148	59	4	354

G-test df = 5 G = 11.479 P = 0.043

Spotted Frog Adults by NWI Regime

	A	B	C	CH	F	H	HH	J	Total
N	51 42.599	4 3.2768	162 175.31	5 4.096	23 18.842	42 43.418	1 0.8192	2 1.6384	290
Y	1 9.4011	0 0.7232	52 38.689	0 0.904	0 4.1582	11 9.5819	0 0.1808	0 0.3616	64
Total	52	4	214	5	23	53	1	2	354

G-test df = 7 G = 33.251 P = 0.000

Spotted Frog Adults by Wetland Type

	DRY	OXBOW	POND	POOL	RIFFLE	RUN	Total
N	12 9.9728	21 38.229	29 25.763	73 77.289	52 44.877	118 108.87	305
Y	0 2.0272	25 7.7711	2 5.2371	20 15.711	2 9.1226	13 22.131	62
Total	12	46	31	93	54	131	367

G-test df = 5 G = 56.461 P = 0.000

Spotted Frog Adults by Presence of Hiding Place

	N	Y	Total
N	61 54.343	226 232.66	287
Y	3 9.6568	48 41.343	51
Total	64	274	338

G-test df = 1 G = 8.294 P = 0.004

Spotted Frog Adults By Type of Hiding Place

	BANK	BRANCH	TURBID	OVERHANG	ROCK	VEG	Total
N	12 9.8978	1 3.2993	1 0.8248	1 0.8248	30 24.745	181 186.41	226
Y	0 2.1022	3 0.7007	0 0.1752	0 0.1752	0 5.2555	45 39.591	48
Total	12	4	1	1	30	226	274

G-test df = 5 G = 24.152 P = 0.000

Spotted Frog Adults By Presence of Fish

	N	Y	Total
N	174 164.12	136 145.88	310
Y	24 33.882	40 30.118	64
Total	198	176	374

G-test df = 1 G = 7.418 P = 0.006

Spotted Frog Larvae by NWI System

	P	R3	R4	Total
N	233 233.33	53 52.401	64 64.266	350
Y	3 2.6667	0 0.5989	1 0.7345	4
Total	236	53	65	354

G-test df = 2 G = 1.332 P = 0.514

Spotted Frog Larvae by NWI Class

	EM	FO	SB	SS	UB	US	Total
N	75 76.13	1 0.9887	64 64.266	147 146.33	59 58.333	4 3.9548	350
Y	2 0.8701	0 0.0113	1 0.7345	1 1.6723	0 0.6667	0 0.0452	4
Total	77	1	65	148	59	4	354

G-test df = 5 G = 2.947 P = 0.708

Spotted Frog Larvae by NWI Regime

	A	B	C	CH	F	H	HH	J	Total
N	52 51.412	4 3.9548	211 211.58	5 4.9435	22 22.74	53 52.401	1 0.9887	2 1.9774	350
Y	0 0.5876	0 0.0452	3 2.4181	0 0.0565	1 0.2599	0 0.5989	0 0.0113	0 0.0226	4
Total	52	4	214	5	23	53	1	2	354

G-test df = 7 G = 4.030 P = 0.776

Spotted Frog Larvae by Wetland Type

	DRY	OXBOW	POND	POOL	RIFFLE	RUN	Total
N	12 11.869	45 45.499	29 30.662	92 91.986	54 53.411	131 129.57	363
Y	0 0.1308	1 0.5014	2 0.3379	1 1.0136	0 0.5886	0 1.4278	4
Total	12	46	31	93	54	131	367

G-test df = 5 G = 8.588 P = 0.127

Spotted Frog Larvae by Presence of Hiding Place

	N	Y	Total
N	64 63.243	270 270.76	334
Y	0 0.7574	4 3.2426	4
Total	64	274	338

G-test df = 1 G = 1.690 P = 0.194

Spotted Frog Larvae By Type of Hiding Place

	BANK	BRANCH	TURBID	OVERHANG	ROCK	VEG	Total
N	12 11.825	4 3.9416	1 0.9854	1 0.9854	30 29.562	222 222.7	270
Y	0 0.1752	0 0.0584	0 0.0146	0 0.0146	0 0.438	4 3.2993	4
Total	12	4	1	1	30	226	274

G-test df =-Square 5 1.553 0.907

Spotted Frog Larvae By Presence of Fish

	N	Y	Total
N	197 195.88	173 174.12	370
Y	1 2.1176	3 1.8824	4
Total	198	176	374

G-test df = 1 G = 1.309 P = 0.252

Treefrog Adults by NWI System

	P	R3	R4	Total
N	217 215.33	50 48.359	56 59.308	323
Y	19 20.667	3 4.6412	9 5.6921	31
Total	236	53	65	354

G-test df = 2 G = 2.689 P = 0.261

Treefrog Adults by NWI Class

	EM	FO	SB	SS	UB	US	Total
N	70 70.257	1 0.9124	56 59.308	138 135.04	54 53.833	4 3.6497	323
Y	7 6.7429	0 0.0876	9 5.6921	10 12.96	5 5.1667	0 0.3503	31
Total	77	1	65	148	59	4	354

G-test df = 5 G = 3.551 P = 0.616

Treefrog Adults by NWI Regime

Col Pct	A	B	C	CH	F	H	HH	J	Total
N	45	3	198	4	21	50	0	2	323
	47.446	3.6497	195.26	4.5621	20.986	48.359	0.9124	1.8249	
Y	7	1	16	1	2	3	1	0	31
	4.5537	0.3503	18.74	0.4379	2.0141	4.6412	0.0876	0.1751	
Total	52	4	214	5	23	53	1	2	354

G-test df = 7 G = 9.194 P = 0.239

Treefrog Adults by Wetland Type

	DRY	OXBOW	POND	POOL	RIFFLE	RUN	Total
N	12	46	23	80	52	123	336
	10.986	42.114	28.381	85.144	49.439	119.93	
Y	0	0	8	13	2	8	31
	1.0136	3.8856	2.6185	7.8556	4.5613	11.065	
Total	12	46	31	93	54	131	367

G-test df = 5 G = 24.534 P = 0.000

Treefrog Adults by Presence of Hiding Place

	N	Y	Total
N	61	245	306
	57.941	248.06	
Y	3	29	32
	6.0592	25.941	
Total	64	274	338

G-test df = 1 G = 2.445 P = 0.118

Treefrog Adults By Type of Hiding Place

	BANK	BRANCH	TURBID	OVERHANG	ROCK	VEG	Total
N	12	4	1	1	30	197	245
	10.73	3.5766	0.8942	0.8942	26.825	202.08	
Y	0	0	0	0	0	29	29
	1.2701	0.4234	0.1058	0.1058	3.1752	23.92	
Total	12	4	1	1	30	226	274

G-test df =-Square 5 11.878 0.036

Treefrog Adults By Presence of Fish

	N	Y	Total
N	180 181.06	162 160.94	342
Y	18 16.941	14 15.059	32
Total	198	176	374

G-test df = 1 G = 0.154 P = 0.695

Treefrog Larvae by NWI System

Col Pct	P	R3	R4	Total
N	174 176	41 39.525	49 48.475	264
Y	62 60	12 13.475	16 16.525	90
Total	236	53	65	354

G-test df = 2 G = 0.333 P = 0.847

Treefrog Larvae by NWI Class

	EM	FO	SB	SS	UB	US	Total
N	44 57.424	1 0.7458	49 48.475	127 110.37	41 44	2 2.9831	264
Y	33 19.576	0 0.2542	16 16.525	21 37.627	18 15	2 1.0169	90
Total	77	1	65	148	59	4	354

Likelihood Ratio Chi-Square 5 0.000

G-test df = 5 G = 24.669 P = 0.000

Treefrog Larvae by NWI Regime

	A	B	C	CH	F	H	HH	J	Total
N	41 38.78	2 2.9831	161 159.59	2 3.7288	15 17.153	41 39.525	0 0.7458	2 1.4915	264
Y	11 13.22	2 1.0169	53 54.407	3 1.2712	8 5.8475	12 13.475	1 0.2542	0 0.5085	90
Total	52	4	214	5	23	53	1	2	354

G-test df = 7 G = 9.462 P = 0.221

Treefrog Larvae by Wetland Type

	DRY	OXBOW	POND	POOL	RIFFLE	RUN	Total
N	12 8.9591	27 34.343	7 23.144	50 69.433	53 40.316	125 97.804	274
Y	0 3.0409	19 11.657	24 7.8556	43 23.567	1 13.684	6 33.196	93
Total	12	46	31	93	54	131	367

G-test df = 5 G =132.909 P = 0.000

Treefrog Larvae by Presence of Hiding Place

	N	Y	Total
N	56 46.58	190 199.42	246
Y	8 17.42	84 74.58	92
Total	64	274	338

G-test df = 1 G = 9.772 P = 0.002

Treefrog Larvae By Type of Hiding Place

	BANK	BRANCH	TURBID	OVERHANG	ROCK	VEG	Total
N	10 8.3212	4 2.7737	0 0.6934	1 0.6934	28 20.803	147 156.72	190
Y	2 3.6788	0 1.2263	1 0.3066	0 0.3066	2 9.1971	79 69.285	84
Total	12	4	1	1	30	226	274

G-test df =-Square 5 19.717 0.001

Treefrog Larvae By Presence of Fish

	N	Y	Total
N	126 148.76	155 132.24	281
Y	72 49.235	21 43.765	93
Total	198	176	374

G-test df = 1 G = 31.275 P = 0.000

Table 6. Contingency table analysis to determine association of frog species with various categorical variables for both years of data combined. This analysis is to allow an easier comparison of spotted frogs with pacific treefrogs. Adults and larvae are lumped, so that "spotted frog" means presence of either larvae or adults (or both) of spotted frogs. "None" means that neither species was present.

Frog Species by NWI System

	P	R3	R4	Total
NONE	122 126	28 28.297	39 34.703	189
Spotted Frog	46 44	11 9.8814	9 12.119	66
Pacific Treefrog	68 66	14 14.822	17 18.178	99
Total	236	53	65	354

G-test df = 4 G = 1.921 P = 0.750

Frog Species by NWI Class

	EM	FO	SB	SS	UB	US	Total
NONE	33 41.11	1 0.5339	39 34.703	87 79.017	28 31.5	1 2.1356	189
Spotted Frog	8 14.356	0 0.1864	9 12.119	37 27.593	11 11	1 0.7458	66
Pacific Treefrog	36 21.534	0 0.2797	17 18.178	24 41.39	20 16.5	2 1.1186	99
Total	77	1	65	148	59	4	354

G-test df = 10 G = 30.655 P = 0.001

Frog Species by NWI Regime

	A	B	C	CH	F	H	HH	J	Total
NONE	37 27.763	1 2.1356	106 114.25	1 2.6695	14 12.28	28 28.297	0 0.5339	2 1.0678	189
Spotted Frog	1 9.6949	0 0.7458	53 39.898	0 0.9322	1 4.2881	11 9.8814	0 0.1864	0 0.3729	66
Pacific Treefrog	14 14.542	3 1.1186	55 59.847	4 1.3983	8 6.4322	14 14.822	1 0.2797	0 0.5593	99
Total	52	4	214	5	23	53	1	2	354

G-test df = 14 G = 40.884 P = 0.000

Frog Species by Type of Water Body

	DRY	OXBOW	POND	POOL	RIFFL	RUN	Total
NONE	12 6.6049	5 25.319	3 17.063	29 51.188	49 29.722	104 72.104	202
Spotted Frog	0 2.0926	26 8.0218	3 5.406	20 16.218	2 9.4169	13 22.845	64
Pacific Treefrog	0 3.3025	15 12.659	25 8.5313	44 25.594	3 14.861	14 36.052	101
Total	12	46	31	93	54	131	367

G-test df = 10 G = 195.490 P = 0.000

Frog Species by Presence of Hideaway

	N	Y	Total
NONE	52 34.651	131 148.35	183
Spotted Frog	3 10.036	50 42.964	53
Pacific Treefrog	9 19.314	93 82.686	102
Total	64	274	338

G-test df = 2 G = 25.669 P = 0.000

Table 7. Results of Multivariate Analysis of Variance of effects of various variables on presence or absence of spotted frog larvae or adults or pacific treefrog larvae or adults. *significant P-values for univariate test when evaluated against a Bonferroni adjusted α of .00256 for 1994 and .00320 for 1993/1994.

Larvae, 1994 only

Dependent Variable: WIDTH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.65518531	0.65518531	0.00	0.9596
TREELA	1	2491.55464662	2491.55464662	9.80	0.0021*
Error	138	35079.16421053	254.19684211		

Dependent Variable: SILT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	634.21326754	634.21326754	0.43	0.5132
TREELA	1	17941.75543024	17941.75543024	12.16	0.0007*
Error	138	203681.63742690	1475.95389440		

Dependent Variable: SAND

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	53.72807018	53.72807018	0.17	0.6831
TREELA	1	393.68838764	393.68838764	1.23	0.2700
Error	138	44299.88304094	321.01364522		

Dependent Variable: GRAVEL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	799.34210526	799.34210526	1.04	0.3097
TREELA	1	1412.45718463	1412.45718463	1.84	0.1775
Error	138	106110.93567251	768.91982371		

Dependent Variable: ROCK

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.52355373	0.52355373	1.05	0.3071
TREELA	1	2.64001504	2.64001504	5.30	0.0228
Error	138	68.74384211	0.49814378		

Dependent Variable: SAGEBRUSH

SPOTLA	1	0.46255510	0.46255510	1.76	0.1863
TREELA	1	1.10641447	1.10641447	4.22	0.0419
Error	138	36.19021053	0.26224790		

Dependent Variable: GRASS

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	1.85022039	1.85022039	4.68	0.0322
TREELA	1	0.00080869	0.00080869	0.00	0.9640
Error	138	54.50461988	0.39496101		

Dependent Variable: FORB

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	1.91487089	1.91487089	9.55	0.0024
TREELA	1	0.06666677	0.06666677	0.33	0.5651
Error	138	27.67067251	0.20051212		

Dependent Variable: REED

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.15625685	0.15625685	0.32	0.5712
TREELA	1	5.09505274	5.09505274	10.51	0.0015*
Error	138	66.93128655	0.48500932		

Dependent Variable: BARE

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.01232018	0.01232018	0.04	0.8445
TREELA	1	0.01421898	0.01421898	0.04	0.8331
Error	138	44.03026316	0.31905988		

Dependent Variable: WILLOW

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	1.10198054	1.10198054	2.05	0.1548
TREELA	1	10.38021094	10.38021094	19.28	0.0001*
Error	138	74.30014620	0.53840686		

Dependent Variable: COTTONWOOD

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.00068531	0.00068531	0.03	0.8634
TREELA	1	0.02114662	0.02114662	0.92	0.3401
Error	138	3.18421053	0.02307399		

Dependent Variable: EMERGENT VEG.

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.09000247	0.09000247	0.19	0.6601
TREELA	1	3.20158406	3.20158406	6.91	0.0096
Error	138	63.96004094	0.46347856		

Dependent Variable: SUBMERGENT VEG.

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	3.60612089	3.60612089	6.08	0.0149
TREELA	1	13.25896241	13.25896241	22.37	0.0001*
Error	138	81.78989474	0.59268040		

Dependent Variable: ALGAE

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.26326754	0.26326754	0.50	0.4802
TREELA	1	0.18057905	0.18057905	0.34	0.5586
Error	138	72.49576023	0.52533160		

Dependent Variable: GRAZING OVERALL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.47517422	0.47517422	0.79	0.3749
TREELA	1	0.86352082	0.86352082	1.44	0.2322
Error	138	82.74861918	0.59962768		

Dependent Variable: GRAZING ON GRASS

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.24739583	0.24739583	0.23	0.6303
TREELA	1	0.00376984	0.00376984	0.00	0.9526
Error	138	146.74444444	1.06336554		

Dependent Variable: GRAZING ON SHRUBS

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.04126754	0.04126754	0.13	0.7159
TREELA	1	0.03911278	0.03911278	0.13	0.7231
Error	138	42.80631579	0.31019069		

Dependent Variable: GRAZING: FECES & PRINTS

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.41135554	0.41135554	0.78	0.3793
TREELA	1	2.33240142	2.33240142	4.41	0.0375
Error	138	72.97481287	0.52880299		

Dependent Variable: HYDROPHILIC PLANTS

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	1.76853070	1.76853070	3.71	0.0562
TREELA	1	0.77259816	0.77259816	1.62	0.2052
Error	138	65.79883041	0.47680312		

Multivariate Analyses:

Dependent Variable: SPOTLA

Statistic	Value	F	Num DF	Den DF	Pr > F
Wilks' Lambda	0.86876980	0.8988	20	119	0.5891

Dependent Variable: TREELA

Statistic	Value	F	Num DF	Den DF	Pr > F
Wilks' Lambda	0.69065252	2.6650	20	119	0.0005

Level of SPOTLA	N	WIDTH Mean	WIDTH SD	SILT Mean	SILT SD	SAND Mean	SAND SD	GRAVEL Mean	GRAVEL SD
N	140	5.71714286	16.4405882	33.1071429	39.9301002	6.21428571	17.9314385	19.3928571	27.8127595
Y	1	2.00000000	.	0.0000000	.	0.00000000	.	50.0000000	.

Level of SPOTLA	N	ROCK Mean	ROCK SD	SAGEBRUSH Mean	SAGEBRUSH SD	GRASS Mean	GRASS SD	FORB Mean	FORB SD
N	140	0.63285714	0.71662607	0.37750000	0.51799715	0.63428571	0.62619916	0.59392857	0.44670931
Y	1	0.00000000	.	1.00000000	.	2.00000000	.	2.00000000	.

Level of SPOTLA	N	REED Mean	REED SD	BARE Mean	BARE SD	WILLOW Mean	WILLOW SD	COTTONWOOD Mean	COTTONWOOD SD
N	140	1.23392857	0.71984380	0.60464286	0.56290921	0.86785714	0.78051983	0.01785714	0.15185560
Y	1	1.50000000	.	0.50000000	.	0.00000000	.	0.00000000	.

Level of SPOTLA	N	EMERGENT VEG. Mean	EMERGENT VEG. SD	SUBMERGENT VEG. Mean	SUBMERGENT VEG. SD	ALGAE Mean	ALGAE SD	GRAZING OVERALL Mean	GRAZING OVERALL SD
N	140	0.80250000	0.69510946	0.80285714	0.82692486	0.50892857	0.72308462	0.74700000	0.77558119
Y	1	1.00000000	.	2.50000000	.	1.00000000	.	0.00000000	.

Level of SPOTLA	N	GRAZING ON GRASS Mean	GRAZING ON GRASS SD	GRAZING ON SHRUBS Mean	GRAZING ON SHRUBS SD	GRAZING: FECES & PRINTS Mean	GRAZING: FECES & PRINTS SD	HYDROPHILIC PLANTS Mean	HYDROPHILIC PLANTS SD
N	140	0.50357143	1.02749333	0.21571429	0.55519410	0.73357143	0.73605606	1.71428571	0.69204851
Y	1	0.00000000	.	0.00000000	.	0.00000000	.	3.00000000	.

Level of TREELA	N	WIDTH Mean	WIDTH SD	SILT Mean	SILT SD	SAND Mean	SAND SD	GRAVEL Mean	GRAVEL SD
N	96	2.8052083	3.0735671	25.0520833	36.1320298	7.29166667	18.7211767	21.8750000	28.5827515
Y	45	11.8466667	27.8724253	49.5555556	42.7176542	3.77777778	15.8528588	14.7777778	25.8042358

Level of TREELA	N	ROCK Mean	ROCK SD	SAGEBRUSH Mean	SAGEBRUSH SD	GRASS Mean	GRASS SD	FORB Mean	FORB SD
N	96	0.71979167	0.77898311	0.32343750	0.52239092	0.64687500	0.64493217	0.62343750	0.45606747
Y	45	0.43333333	0.51389776	0.50666667	0.49377949	0.63777778	0.61866384	0.56222222	0.47256019

Level of TREELA	N	REED Mean	REED SD	BARE Mean	BARE SD	WILLOW Mean	WILLOW SD	COTTONWOOD Mean	COTTONWOOD SD
N	96	1.10677083	0.68991303	0.61041667	0.59040203	1.04427083	0.76174556	0.02604167	0.18309893
Y	45	1.51111111	0.70500555	0.59000000	0.49836095	0.47222222	0.67886566	0.00000000	0.00000000

Level of TREELA	N	EMERGENT VEG. Mean	EMERGENT VEG. SD	SUBMERGENT VEG. Mean	SUBMERGENT VEG. SD	ALGAE Mean	ALGAE SD	GRAZING OVERALL Mean	GRAZING OVERALL SD
N	96	0.70156250	0.64336505	0.61093750	0.70446707	0.48958333	0.70236131	0.68572917	0.75762335
Y	45	1.02222222	0.74966322	1.25000000	0.93237234	0.56111111	0.76714412	0.86111111	0.80755586

Level of TREELA	N	GRAZING ON GRASS Mean	GRAZING ON GRASS SD	GRAZING ON SHRUBS Mean	GRAZING ON SHRUBS SD	GRAZING: FECES & PRINTS Mean	GRAZING: FECES & PRINTS SD	HYDROPHILIC PLANTS Mean	HYDROPHILIC PLANTS SD
N	96	0.49479167	1.00392596	0.20208333	0.48231441	0.63802083	0.65581387	1.67708333	0.68816754
Y	45	0.51111111	1.07918787	0.24000000	0.68669167	0.92111111	0.85980236	1.82222222	0.71633185

Adults: 1994 only

Dependent Variable: WIDTH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	312.07383362	312.07383362	1.16	0.2841
TREEAD	1	4.15563067	4.15563067	0.02	0.9014
Error	138	37250.55561610	269.93156244		

Dependent Variable: SILT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	345.12733447	345.12733447	0.21	0.6437
TREEAD	1	568.84281581	568.84281581	0.35	0.5527
Error	138	221645.47987616	1606.12666577		

Dependent Variable: SAND

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	991.33155469	991.33155469	3.15	0.0779
TREEAD	1	212.02197272	212.02197272	0.67	0.4128
Error	138	43365.40468819	314.24206296		

Dependent Variable: GRAVEL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	29.35979061	29.35979061	0.04	0.8436
TREEAD	1	4546.29299261	4546.29299261	6.05	0.0151
Error	138	103668.96800826	751.22440586		

Dependent Variable: ROCK

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	2.19777275	2.19777275	4.38	0.0382
TREEAD	1	0.66151537	0.66151537	1.32	0.2528
Error	138	69.21991582	0.50159359		

Dependent Variable: SAGEBRUSH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.97493415	0.97493415	3.70	0.0565
TREEAD	1	0.18774322	0.18774322	0.71	0.4001
Error	138	36.36558293	0.26351872		

Dependent Variable: GRASS

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	2.42356088	2.42356088	6.25	0.0136
TREEAD	1	0.18111751	0.18111751	0.47	0.4954
Error	138	53.49802831	0.38766687		

Dependent Variable: FORB

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.01423891	0.01423891	0.07	0.7950
TREEAD	1	0.65594987	0.65594987	3.12	0.0794
Error	138	28.98668495	0.21004844		

Dependent Variable: REED

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	1.56392594	1.56392594	3.09	0.0810
TREEAD	1	1.02410829	1.02410829	2.02	0.1571
Error	138	69.83004939	0.50601485		

Dependent Variable: BARE

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.09580646	0.09580646	0.30	0.5841
TREEAD	1	0.05822088	0.05822088	0.18	0.6695
Error	138	43.92026920	0.31826282		

Dependent Variable: WILLOW

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.02554875	0.02554875	0.04	0.8365
TREEAD	1	2.97388328	2.97388328	4.98	0.0273
Error	138	82.44563246	0.59743212		

Dependent Variable: COTTONWOOD

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.00912058	0.00912058	0.39	0.5310
TREEAD	1	0.00829430	0.00829430	0.36	0.5502
Error	138	3.19047619	0.02311939		

Dependent Variable: EMERGENT VEG.

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.42069189	0.42069189	0.88	0.3487
TREEAD	1	1.29866942	1.29866942	2.73	0.1008
Error	138	65.66420374	0.47582756		

Dependent Variable: SUBMERGENT VEG.

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.25022815	0.25022815	0.35	0.5523
TREEAD	1	0.27981321	0.27981321	0.40	0.5297
Error	138	97.28810202	0.70498625		

Dependent Variable: ALGAE

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	2.97931219	2.97931219	5.88	0.0166
TREEAD	1	0.26837059	0.26837059	0.53	0.4678
Error	138	69.86425991	0.50626275		

Dependent Variable: GRAZING OVERALL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.02131807	0.02131807	0.03	0.8519
TREEAD	1	0.03137565	0.03137565	0.05	0.8209
Error	138	84.12007111	0.60956573		

Dependent Variable: GRAZING ON GRASS

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.57301419	0.57301419	0.54	0.4624
TREEAD	1	1.01221587	1.01221587	0.96	0.3291
Error	138	145.60760725	1.05512759		

Dependent Variable: GRAZING ON SHRUBS

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.20102272	0.20102272	0.65	0.4213
TREEAD	1	0.07880332	0.07880332	0.26	0.6144
Error	138	42.64328468	0.30900931		

Dependent Variable: GRAZING: FECES & PRINTS

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.00065199	0.00065199	0.00	0.9726
TREEAD	1	0.00884975	0.00884975	0.02	0.8992
Error	138	75.83109848	0.54950071		

Dependent Variable: HYDROPHILIC PLANTS

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.68950198	0.68950198	1.42	0.2355
TREEAD	1	0.32491160	0.32491160	0.67	0.4149
Error	138	67.03488132	0.48576001		

Multivariate Analysis.

Variable	Wilks' Lambda	F	Num DF	Den DF	Pr > F
SPOTAD	0.76255186	1.8527	20	119	0.0223
TREEAD	0.83749576	1.1545	20	119	0.3062

Level of SPOTAD	N	WIDTH Mean	WIDTH SD	SILT Mean	SILT SD	SAND Mean	SAND SD	GRAVEL Mean	GRAVEL SD
N	122	6.29426230	17.5440664	32.1311475	39.1749521	5.0409836	14.5666877	20.1229508	27.2383352
Y	19	1.81578947	0.8029551	37.6315789	45.0422154	13.4210526	31.5371312	16.3157895	32.0087707

Level of SPOTAD	N	ROCK Mean	ROCK SD	SAGEBRUSH Mean	SAGEBRUSH SD	GRASS Mean	GRASS SD	FORB Mean	FORB SD
N	122	0.67418033	0.73956190	0.41721311	0.54015496	0.69836066	0.64166411	0.61188525	0.47625664
Y	19	0.33421053	0.45339847	0.15526316	0.26346765	0.29473684	0.46304989	0.55263158	0.34939379

Level of SPOTAD	N	REED Mean	REED SD	BARE Mean	BARE SD	WILLOW Mean	WILLOW SD	COTTONWOOD Mean	COTTONWOOD SD
N	122	1.19877049	0.72509512	0.61311475	0.57437725	0.85860656	0.79447193	0.02049180	0.16259188
Y	19	1.47368421	0.63407159	0.54473684	0.47489611	0.88157895	0.70891359	0.00000000	0.00000000

Level of SPOTAD	N	EMERGENT VEG. Mean	EMERGENT VEG. SD	SUBMERGENT VEG. Mean	SUBMERGENT VEG. SD	ALGAE Mean	ALGAE SD	GRAZING OVERALL Mean	GRAZING OVERALL SD
N	122	0.78770492	0.70160122	0.79549180	0.87263267	0.45696721	0.66703103	0.74573770	0.78861309
Y	19	0.90789474	0.64123647	0.93947368	0.54913542	0.86842105	0.95149160	0.71578947	0.70317783

Level of SPOTAD	N	GRAZING ON GRASS Mean	GRAZING ON GRASS SD	GRAZING ON SHRUBS Mean	GRAZING ON SHRUBS SD	GRAZING: FECES & PRINTS Mean	GRAZING: FECES & PRINTS SD	HYDROPHILIC PLANTS Mean	HYDROPHILIC PLANTS SD
N	122	0.52049180	1.04525204	0.22786885	0.57211544	0.72704918	0.74982498	1.75409836	0.71940604
Y	19	0.36842105	0.89508077	0.12631579	0.41612245	0.73684211	0.65866913	1.52631579	0.51298918

Level of TREEAD	N	WIDTH Mean	WIDTH SD	SILT Mean	SILT SD	SAND Mean	SAND SD	GRAVEL Mean	GRAVEL SD
N	124	5.54516129	16.2683860	33.7096774	40.1261779	6.77419355	18.8079030	17.4596774	27.3080587
Y	17	6.75294118	17.6942829	26.7647059	38.6870932	1.76470588	7.2760688	35.2941176	27.3559059

Level of TREEAD	N	ROCK Mean	ROCK SD	SAGEBRUSH Mean	SAGEBRUSH SD	GRASS Mean	GRASS SD	FORB Mean	FORB SD
N	124	0.64717742	0.72944189	0.36370968	0.52985420	0.62338710	0.62966747	0.57782258	0.44490350
Y	17	0.49117647	0.61089977	0.51470588	0.41898863	0.79411765	0.66869330	0.79411765	0.53935214

Level of TREEAD	N	REED Mean	REED SD	BARE Mean	BARE SD	WILLOW Mean	WILLOW SD	COTTONWOOD Mean	COTTONWOOD SD
N	124	1.20967742	0.72301529	0.61008065	0.56543313	0.91532258	0.78792146	0.02016129	0.16128541
Y	17	1.42647059	0.66593863	0.55882353	0.54147810	0.47058824	0.61797523	0.00000000	0.00000000

Level of TREEAD	N	EMERGENT VEG. Mean	EMERGENT VEG. SD	SUBMERGENT VEG. Mean	SUBMERGENT VEG. SD	ALGAE Mean	ALGAE SD	GRAZING OVERALL Mean	GRAZING OVERALL SD
N	124	0.77096774	0.68775873	0.83387097	0.84796620	0.50403226	0.72623869	0.74661290	0.79817871
Y	17	1.04411765	0.70286964	0.67647059	0.75397232	0.57352941	0.70580576	0.70588235	0.60101018

Level of TREEAD	N	GRAZING ON GRASS Mean	GRAZING ON GRASS SD	GRAZING ON SHRUBS Mean	GRAZING ON SHRUBS SD	GRAZING: FECES & PRINTS Mean	GRAZING: FECES & PRINTS SD	HYDROPHILIC PLANTS Mean	HYDROPHILIC PLANTS SD
N	124	0.52822581	1.05403294	0.22096774	0.56356504	0.73145161	0.76004032	1.70161290	0.69819557
Y	17	0.29411765	0.77174363	0.16470588	0.48597991	0.70588235	0.54654665	1.88235294	0.69663055

Larvae: 1993 & 1994

Dependent Variable: WIDTH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	11.61894709	11.61894709	0.10	0.7542
TREELA	1	3300.71874785	3300.71874785	27.90	0.0001*
Error	358	42356.45589501	118.31412261		

Dependent Variable: SILT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	8469.95418508	8469.95418508	6.24	0.0129
TREELA	1	73710.67792064	73710.67792064	54.32	0.0001*
Error	358	485772.20163118	1356.90559115		

Dependent Variable: SAND

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	950.51183140	950.51183140	1.16	0.2824
TREELA	1	5223.35453590	5223.35453590	6.37	0.0120
Error	358	293575.52501593	820.04336597		

Dependent Variable: GRAVEL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	877.08084272	877.08084272	0.88	0.3494
TREELA	1	20003.47432146	20003.47432146	20.02	0.0001*
Error	358	357651.91783540	999.02770345		

Dependent Variable: ROCK

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	387.06142832	387.06142832	0.83	0.3628
TREELA	1	2880.57439885	2880.57439885	6.18	0.0134
Error	358	166920.29191768	466.25779865		

Dependent Variable: SAGEBRUSH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.01308110	0.01308110	0.02	0.8747
TREELA	1	0.21283492	0.21283492	0.41	0.5248
Error	358	188.05848160	0.52530302		

Dependent Variable: GRASS

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.00151755	0.00151755	0.00	0.9578
TREELA	1	0.19520236	0.19520236	0.36	0.5482
Error	358	193.49109316	0.54047791		

Dependent Variable: FORB

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.00002578	0.00002578	0.00	0.9940
TREELA	1	0.17394643	0.17394643	0.38	0.5356
Error	358	161.94901576	0.45237155		

Dependent Variable: REED

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.02057291	0.02057291	0.02	0.8795
TREELA	1	20.77557856	20.77557856	23.26	0.0001*
Error	358	319.77921135	0.89323802		

Dependent Variable: BARE

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.69764312	0.69764312	0.99	0.3214
TREELA	1	6.87231934	6.87231934	9.71	0.0020*
Error	358	253.32162324	0.70760230		

Dependent Variable: WILLOW

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.00000075	0.00000075	0.00	0.9992
TREELA	1	13.92119612	13.92119612	17.63	0.0001*
Error	358	282.62795654	0.78946357		

Dependent Variable: COTTONWOOD

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.19952296	0.19952296	5.41	0.0205
TREELA	1	0.03324666	0.03324666	0.90	0.3429
Error	358	13.19479255	0.03685696		

Dependent Variable: EMERGENT VEG.

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	0.00461371	0.00461371	0.01	0.9323
TREELA	1	11.48113192	11.48113192	17.98	0.0001*
Error	358	228.65768460	0.63870862		

Dependent Variable: SUBMERGENT VEG.

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTLA	1	4.76153098	4.76153098	7.93	0.0051
TREELA	1	28.87139591	28.87139591	48.07	0.0001*
Error	358	215.02349205	0.60062428		

Dependent Variable: ALGAE

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SPOTLA	1	2.36368485	2.36368485	2.98	0.0854
TREELA	1	8.15304475	8.15304475	10.26	0.0015*
Error	358	284.43486842	0.79451081		

Dependent Variable: GRAZING OVERALL

Source	DF	Type III SS	Mean Square	F Value	Pr > F
SPOTLA	1	0.19218389	0.19218389	0.31	0.5779
TREELA	1	2.88833144	2.88833144	4.66	0.0315
Error	358	221.79213467	0.61953110		

Multivariate Analysis.

Variable	Wilks' Lambda	F	Num DF	Den DF	Pr > F
SPOTLA	0.92864165	1.6473	16	343	0.0554
TREELA	0.73967145	7.5450	16	343	0.0001

Level of SPOTLA	N	WIDTH Mean	WIDTH SD	SILT Mean	SILT SD	SAND Mean	SAND SD	GRAVEL Mean	GRAVEL SD
N	357	4.06428571	11.3224555	28.6106443	39.3765629	15.5322129	28.9710665	27.4509804	32.4894275
Y	4	2.37500000	2.4958299	75.0000000	50.0000000	0.0000000	0.0000000	12.5000000	25.0000000

Level of SPOTLA	N	ROCK Mean	ROCK SD	SAGEBRUSH Mean	SAGEBRUSH SD	GRASS Mean	GRASS SD	FORB Mean	FORB SD
N	357	9.91484594	21.8396137	0.55770308	0.72625582	0.89439776	0.73438577	0.87226891	0.67131320
Y	4	0.00000000	0.0000000	0.50000000	0.40824829	0.87500000	0.75000000	0.87500000	0.75000000

Level of SPOTLA	N	REED Mean	REED SD	BARE Mean	BARE SD	WILLOW Mean	WILLOW SD	COTTONWOOD Mean	COTTONWOOD SD
N	357	1.32016807	0.97627012	0.95616246	0.85296318	0.87703081	0.90931764	0.02549020	0.18721825
Y	4	1.25000000	0.64549722	1.37500000	0.62915287	0.87500000	0.85391256	0.25000000	0.50000000

Level of SPOTLA	N	EMERGENT VEG. Mean	EMERGENT VEG. SD	SUBMERGENT VEG. Mean	SUBMERGENT VEG. SD	ALGAE Mean	ALGAE SD	GRAZING OVERALL Mean	GRAZING OVERALL SD
N	357	0.90770308	0.81755891	0.65056022	0.82046316	0.72577031	0.89957529	0.96969188	0.78955696
Y	4	0.87500000	0.85391256	1.75000000	1.19023807	1.50000000	1.22474487	0.75000000	0.95742711

Level of TREELA	N	WIDTH Mean	WIDTH SD	SILT Mean	SILT SD	SAND Mean	SAND SD	GRAVEL Mean	GRAVEL SD
N	272	2.31599265	3.3311916	20.9485294	34.4883145	17.5367647	30.2846052	31.5441176	32.9206510
Y	89	9.33146067	21.1490468	54.1123596	44.1977576	8.7078652	22.8573652	14.2696629	27.1417843

Level of TREELA	N	ROCK Mean	ROCK SD	SAGEBRUSH Mean	SAGEBRUSH SD	GRASS Mean	GRASS SD	FORB Mean	FORB SD
N	272	11.4213235	22.9621581	0.57095588	0.78819836	0.88088235	0.72355107	0.85974265	0.62878868
Y	89	4.8651685	16.6582296	0.51460674	0.47327451	0.93483146	0.76587014	0.91067416	0.78914770

Level of TREELA	N	REED Mean	REED SD	BARE Mean	BARE SD	WILLOW Mean	WILLOW SD	COTTONWOOD Mean	COTTONWOOD SD
N	272	1.18216912	0.97275813	1.03970588	0.87980872	0.98933824	0.91694600	0.03345588	0.21395547
Y	89	1.73876404	0.84855334	0.71966292	0.70909746	0.53370787	0.78894259	0.01123596	0.10599979

Level of TREELA	N	EMERGENT VEG. Mean	EMERGENT VEG. SD	SUBMERGENT VEG. Mean	SUBMERGENT VEG. SD	ALGAE Mean	ALGAE SD	GRAZING OVERALL Mean	GRAZING OVERALL SD
N	272	0.80533088	0.75976975	0.50091912	0.71711360	0.64834559	0.84387692	0.91610294	0.78199024
Y	89	1.21910112	0.90596212	1.15730337	0.95597851	0.99719101	1.03249366	1.12359551	0.79961247

Adults: 1993 & 1994

Dependent Variable: WIDTH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	152.68946728	152.68946728	1.21	0.2722
TREEAD	1	288.41065942	288.41065942	2.28	0.1316
Error	358	45201.79666162	126.26200185		

Dependent Variable: SILT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	3752.97981489	3752.97981489	2.39	0.1234
TREEAD	1	1236.01081846	1236.01081846	0.79	0.3760
Error	358	563237.48141371	1573.28905423		

Dependent Variable: SAND

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	8086.68093264	8086.68093264	10.05	0.0017*
TREEAD	1	2917.42951504	2917.42951504	3.62	0.0577
Error	358	288154.70879546	804.90142122		

Dependent Variable: GRAVEL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	4090.74418696	4090.74418696	3.92	0.0486
TREEAD	1	342.33380061	342.33380061	0.33	0.5674
Error	358	373955.96024405	1044.56972135		

Dependent Variable: ROCK

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	1340.93532941	1340.93532941	2.86	0.0914
TREEAD	1	1382.31930185	1382.31930185	2.95	0.0866
Error	358	167613.96213560	468.19542496		

Dependent Variable: SAGEBRUSH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	10.88583594	10.88583594	21.97	0.0001*
TREEAD	1	0.05257301	0.05257301	0.11	0.7448
Error	358	177.39701904	0.49552240		

Dependent Variable: GRASS

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	2.71421875	2.71421875	5.09	0.0247
TREEAD	1	0.00115932	0.00115932	0.00	0.9628
Error	358	190.95702495	0.53339951		

Dependent Variable: FORB

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	1.93938328	1.93938328	4.34	0.0380
TREEAD	1	0.15796784	0.15796784	0.35	0.5526
Error	358	160.08234381	0.44715738		

Dependent Variable: REED

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	1.61868683	1.61868683	1.71	0.1912
TREEAD	1	1.11655716	1.11655716	1.18	0.2775
Error	358	337.98450930	0.94409081		

Dependent Variable: BARE

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	1.25534524	1.25534524	1.74	0.1878
TREEAD	1	1.40956702	1.40956702	1.96	0.1629
Error	358	258.06132520	0.72084169		

Dependent Variable: WILLOW

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	1.49781004	1.49781004	1.86	0.1730
TREEAD	1	7.04344003	7.04344003	8.77	0.0033
Error	358	287.60657062	0.80337031		

Dependent Variable: COTTONWOOD

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.00176193	0.00176193	0.05	0.8284
TREEAD	1	0.02630106	0.02630106	0.70	0.4024
Error	358	13.40005076	0.03743031		

Dependent Variable: EMERGENT VEG.

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.24312062	0.24312062	0.36	0.5464
TREEAD	1	1.16826202	1.16826202	1.75	0.1865
Error	358	238.78826282	0.66700632		

Dependent Variable: SUBMERGENT VEG.

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.04056586	0.04056586	0.06	0.8092
TREEAD	1	0.02446437	0.02446437	0.04	0.8512
Error	358	248.60752074	0.69443442		

Dependent Variable: ALGAE

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	0.23379003	0.23379003	0.28	0.5939
TREEAD	1	0.94802930	0.94802930	1.16	0.2832
Error	358	293.82746374	0.82074711		

Dependent Variable: GRAZING OVERALL

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
SPOTAD	1	2.75541398	2.75541398	4.45	0.0356
TREEAD	1	0.51422195	0.51422195	0.83	0.3628
Error	358	221.72777610	0.61935133		

Multivariate Analysis.

Variable	Wilks' Lambda	F	Num DF	Den DF	Pr > F
SPOTAD	0.83436055	4.2558	16	343	0.0001
TREEAD	0.93856001	1.4033	16	343	0.1372

Level of SPOTAD	N	WIDTH Mean	WIDTH SD	SILT Mean	SILT SD	SAND Mean	SAND SD	GRAVEL Mean	GRAVEL SD
N	299	4.36555184	12.2335131	27.7023411	38.6938816	13.1270903	25.7146950	28.8461538	32.3740162
Y	62	2.50241935	3.8237226	35.9838710	44.0385420	26.1290323	39.2597420	19.7580645	31.8735645

Level of SPOTAD	N	ROCK Mean	ROCK SD	SAGEBRUSH Mean	SAGEBRUSH SD	GRASS Mean	GRASS SD	FORB Mean	FORB SD
N	299	10.6329431	22.4338586	0.63595318	0.74450110	0.93377926	0.71912706	0.90518395	0.67805848
Y	62	5.8120968	17.6576893	0.17661290	0.44856033	0.70322581	0.77723084	0.71370968	0.61711713

Level of SPOTAD	N	REED Mean	REED SD	BARE Mean	BARE SD	WILLOW Mean	WILLOW SD	COTTONWOOD Mean	COTTONWOOD SD
N	299	1.29030100	0.99739909	0.93227425	0.84098267	0.84397993	0.89211528	0.02876254	0.19397504
Y	62	1.45967742	0.83616213	1.09838710	0.89360055	1.03629032	0.97072600	0.02419355	0.19050019

Level of SPOTAD	N	EMERGENT VEG. Mean	EMERGENT VEG. SD	SUBMERGENT VEG. Mean	SUBMERGENT VEG. SD	ALGAE Mean	ALGAE SD	GRAZING OVERALL Mean	GRAZING OVERALL SD
N	299	0.89698997	0.82676959	0.65769231	0.85607248	0.72408027	0.90066460	1.00612040	0.80372392
Y	62	0.95725806	0.77098228	0.68709677	0.70408268	0.78387097	0.93246431	0.77983871	0.69826833

Level of TREEAD	N	WIDTH Mean	WIDTH SD	SILT Mean	SILT SD	SAND Mean	SAND SD	GRAVEL Mean	GRAVEL SD
N	331	3.76480363	10.8470653	28.6223565	39.6421032	16.2990937	29.4233153	26.9335347	32.6650837
Y	30	7.14333333	15.0023833	34.6666667	40.8515676	5.0000000	19.0733611	31.1666667	29.9045416

Level of TREEAD	N	ROCK Mean	ROCK SD	SAGEBRUSH Mean	SAGEBRUSH SD	GRASS Mean	GRASS SD	FORB Mean	FORB SD
N	331	10.3617825	22.4516186	0.55770393	0.74005089	0.89214502	0.73547465	0.87734139	0.68679109
Y	30	3.6616667	9.4869937	0.55000000	0.51023997	0.91666667	0.72317944	0.81666667	0.46855120

Level of TREEAD	N	REED Mean	REED SD	BARE Mean	BARE SD	WILLOW Mean	WILLOW SD	COTTONWOOD Mean	COTTONWOOD SD
N	331	1.30377644	0.99379557	0.98066465	0.85900974	0.92024169	0.91871020	0.03051360	0.20152308
Y	30	1.49166667	0.68695773	0.74166667	0.73836765	0.40000000	0.60386685	0.00000000	0.00000000

Level of TREEAD	N	EMERGENT VEG. Mean	EMERGENT VEG. SD	SUBMERGENT VEG. Mean	SUBMERGENT VEG. SD	ALGAE Mean	ALGAE SD	GRAZING OVERALL Mean	GRAZING OVERALL SD
N	331	0.89063444	0.82544013	0.66540785	0.84037585	0.71933535	0.90660247	0.97712991	0.79966427
Y	30	1.09166667	0.69939424	0.63333333	0.73324190	0.90000000	0.88716907	0.85833333	0.68128724

Table 8. Analysis of water chemistry and temperature variables for 1994 data.

Dependent Variable: Conductance

Source	DF	Type III SS	Mean Square	F Value	Pr > F
S.f. Larvae	1	444.68180899	444.68180899	0.07	0.7978
T.f. Larvae	1	3396.62612778	3396.62612778	0.50	0.4792
Error	129	870059.96623863	6744.65090107		

Level of S.f. Larvae	N	Conductance Mean	Conductance SD
N	131	118.707634	81.9688774
Y	1	101.000000	.

Level of T.f. Larvae	N	Conductance Mean	Conductance SD
N	90	121.970000	90.4193320
Y	42	111.295238	59.0310582

Dependent Variable: Conductance

Source	DF	Type III SS	Mean Square	F Value	Pr > F
S.f. Adults	1	5368.04384959	5368.04384959	0.80	0.3713
T.f. Adults	1	5914.18083840	5914.18083840	0.89	0.3481
Error	129	860406.43625298	6669.81733529		

Level of S.f. Adults	N	Conductance Mean	Conductance SD
N	111	121.840541	87.1347383
Y	21	101.304762	39.4650032

Level of T.f. Adults	N	Conductance Mean	Conductance SD
N	117	115.787179	74.936135
Y	15	140.306667	123.746645

Dependent Variable: Hardness

Source	DF	Type III SS	Mean Square	F Value	Pr > F
S.f. Larvae	1	727.12010101	727.12010101	1.24	0.2674
T.f. Larvae	1	0.01927367	0.01927367	0.00	0.9954
Error	137	80333.76489899	586.37784598		

Level of S.f. Larvae	N	Hardness Mean	Hardness SD
N	139	32.0935252	24.1273469
Y	1	5.0000000	.

Level of T.f. Larvae	N	Hardness Mean	Hardness SD
N	100	31.8300000	26.1742626
Y	40	32.0750000	18.4229337

Dependent Variable: Hardness

Source	DF	Type III SS	Mean Square	F Value	Pr > F
S.f. Adults	1	8795.03061506	8795.03061506	16.78	0.0001
T.f. Adults	1	36.67873806	36.67873806	0.07	0.7917
Error	137	71791.76421995	524.02747606		

Level of S.f. Adults	N	Hardness Mean	Hardness SD
N	117	28.2991453	22.5152305
Y	23	50.2173913	24.3309689

Level of T.f. Adults	N	Hardness Mean	Hardness SD
N	123	32.5853659	23.8010631
Y	17	26.9411765	26.7802880

Dependent Variable: Alkalinity

Source	DF	Type III SS	Mean Square	F Value	Pr > F
S.f. Larvae	1	1158.70947389	1158.70947389	0.89	0.3469
T.f. Larvae	1	30.24609310	30.24609310	0.02	0.8790
Error	144	187344.41144114	1301.00285723		

Level of S.f. Larvae	N	Alkalinity Mean	Alkalinity SD
N	146	48.9041096	35.9477262
Y	1	15.0000000	.

Level of T.f. Larvae	N	Alkalinity Mean	Alkalinity SD
N	102	48.8725490	40.0859649
Y	45	48.2222222	24.4055591

Dependent Variable: Alkalinity

Source	DF	Type III SS	Mean Square	F Value	Pr > F
S.f. Adults	1	0.49610177	0.49610177	0.00	0.9845
T.f. Adults	1	361.64578684	361.64578684	0.28	0.5996
Error	144	188148.98710236	1306.59018821		

Level of S.f. Adults	N	Alkalinity Mean	Alkalinity SD
N	124	48.5887097	38.2150552
Y	23	49.1304348	20.0936542

Level of T.f. Adults	N	Alkalinity Mean	Alkalinity SD
N	129	49.2635659	36.0614752
Y	18	44.4444444	35.7231548

Dependent Variable: Air Temp.

Source	DF	Type III SS	Mean Square	F Value	Pr > F
S.f. Larvae	1	43.75363690	43.75363690	0.82	0.3677
T.f. Larvae	1	1.48033409	1.48033409	0.03	0.8683
Error	166	8903.39371353	53.63490189		

Level of S.f. Larvae	N	Air Temp. Mean	Air Temp. SD
N	168	22.2940476	7.30223247
Y	1	29.0000000	.

Level of T.f. Larvae	N	Air Temp. Mean	Air Temp. SD
N	117	22.4136752	7.21731522
Y	52	22.1538462	7.54691111

Dependent Variable: Air Temp.

Source	DF	Type III SS	Mean Square	F Value	Pr > F
S.f. Adults	1	18.12261718	18.12261718	0.34	0.5590
T.f. Adults	1	136.81664042	136.81664042	2.59	0.1096
Error	166	8775.86618269	52.86666375		

Level of S.f. Adults	N	Air Temp. Mean	Air Temp. SD
N	146	22.5191781	7.29060156
Y	23	21.1565217	7.40244592

Level of T.f. Adults	N	Air Temp. Mean	Air Temp. SD
N	148	21.9722973	7.46877237
Y	21	24.8809524	5.44955219

Dependent Variable: Water Temp.

Source	DF	Type III SS	Mean Square	F Value	Pr > F
S.f. Larvae	1	72.95964053	72.95964053	2.22	0.1381
T.f. Larvae	1	173.97993315	173.97993315	5.30	0.0227
Error	159	5222.55646436	32.84626707		

Level of S.f. Larvae	N	Water Temp. Mean	Water Temp. SD
N	161	19.1372671	5.80761160
Y	1	27.0000000	.

Level of T.f. Larvae	N	Water Temp. Mean	Water Temp. SD
N	110	18.4972727	5.37297791
Y	52	20.6423077	6.49102989

Dependent Variable: Water Temp.

Source	DF	Type III SS	Mean Square	F Value	Pr > F
S.f. Adults	1	23.20662428	23.20662428	0.70	0.4053
T.f. Adults	1	116.06837262	116.06837262	3.48	0.0639
Error	159	5300.41402349	33.33593725		

Level of S.f. Adults	N	Water Temp. Mean	Water Temp. SD
N	140	19.3864286	6.03417379
Y	22	17.9090909	4.11338224

Level of T.f. Adults	N	Water Temp. Mean	Water Temp. SD
N	143	18.8538462	5.66650362
Y	19	21.6842105	6.51538889

Dependent Variable: pH

Source	DF	Type III SS	Mean Square	F Value	Pr > F
S.f. Larvae	0	0.00000000	.	.	.
T.f. Larvae	1	0.43917978	0.43917978	0.97	0.3272
Error	125	56.74790526	0.45398324		

Level of S.f. Larvae	N	pH Mean	pH SD
N	127	7.09842520	0.67369559

Level of T.f. Larvae	N	pH Mean	pH SD
N	89	7.06000000	0.58939491
Y	38	7.18842105	0.84113670

Dependent Variable: pH

Source	DF	Type III SS	Mean Square	F Value	Pr > F
S.f. Adults	1	0.00026459	0.00026459	0.00	0.9809
T.f. Adults	1	0.00692325	0.00692325	0.02	0.9027
Error	124	57.18015973	0.46113032		

Level of S.f. Adults	N	pH Mean	pH SD
N	104	7.09836538	0.72047599
Y	23	7.09869565	0.41127633

Level of T.f. Adults	N	pH Mean	pH SD
N	111	7.09567568	0.64596597
Y	16	7.11750000	0.86719855

Table 9. Logistic regression analysis of treefrog adults and larvae for both years, using a reduced variable set to give few missing variables.

Treefrog Larvae:

```
PROC SORT;
  BY YEAR;
PROC LOGISTIC DESCENDING;
TITLE2 'BOTH YEARS; CUT DOWN TO REDUCING MISSING CASES';
MODEL TREELA =
SILT SAND GRAVEL ROCK SAGE GRASS FORB
  REED BARE WILLOW COTTON        EMERGE SUBMERGE ALGAE
  GRAZOVR PSSC PEMC R3UBH OXBOW POND POOL RIFFL
        HIDEN
  /SELECTION = STEPWISE MAXITER = 100 SLSTAY =.1
  SLENTRY = .1;
```

Ordered Value	TREELA	Count
1	Y	88
2	N	244

Summary of Stepwise Procedure

Step	Variable Entered	Variable Removed	Number In	Score Chi-Square	Wald Chi-Square	Pr > Chi-Square
1	SILT		1	40.6465	.	0.0001
2	POOL		2	24.6898	.	0.0001
3	POND		3	27.3168	.	0.0001
4	OXBOW		4	48.5242	.	0.0001
5		SILT	3	.	2.1859	0.1393
6	SUBMERGE		4	10.9461	.	0.0009
7	WILLOW		5	10.6912	.	0.0011
8	ALGAE		6	3.7508	.	0.0528

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Wald Chi-Square	Pr > Chi-Square	Standardized Estimate	Odds Ratio
INTERCPT	1	-3.3569	0.4753	49.8913	0.0001	.	0.035
WILLOW	1	-0.6933	0.2164	10.2623	0.0014	-0.348208	0.500
SUBMERGE	1	0.5986	0.1853	10.4329	0.0012	0.277707	1.820
ALGAE	1	0.3299	0.1718	3.6902	0.0547	0.166894	1.391
OXBOW	1	3.9777	0.5889	45.6264	0.0001	0.657135	53.395
POND	1	3.5594	0.6097	34.0820	0.0001	0.554907	35.141
POOL	1	2.8023	0.4596	37.1721	0.0001	0.677879	16.482

Association of Predicted Probabilities and Observed Responses

Concordant	= 89.4%	Somers' D	= 0.790
Discordant	= 10.4%	Gamma	= 0.792
Tied	= 0.2%	Tau-a	= 0.309
(21472 pairs)			

Treefrog Adults

```
PROC SORT;
  BY YEAR;
PROC LOGISTIC DESCENDING;
TITLE2 'BOTH YEARS; CUT DOWN TO REDUCING MISSING CASES';
MODEL TREEAD =
SILT SAND GRAVEL ROCK SAGE GRASS FORB
  REED BARE WILLOW COTTON        EMERGE SUBMERGE ALGAE
  GRAZOVR PSSC PEMC R3UBH OXBOW POND POOL RIFFL
        HIDEN
  /SELECTION = STEPWISE MAXITER = 100 SLSTAY =.1
  SLENTRY = .1;
 Ordered
```

c = 0.895

Ordered Value	TREEAD	Count
1	Y	30
2	N	302

Summary of Stepwise Procedure

Step	Variable Entered	Variable Removed	Number In	Score Chi-Square	Wald Chi-Square	Pr > Chi-Square
1	WILLOW		1	11.0487	.	0.0009
2	POND		2	2.9936	.	0.0836
3	POOL		3	5.5897	.	0.0181
4	SUBMERGE		4	3.3452	.	0.0674
5	GRAVEL		5	3.2599	.	0.0710

Analysis of Maximum Likelihood Estimates

Variable	DF	Parameter Estimate	Standard Error	Wald Chi-Square	Pr > Chi-Square	Standardized Estimate	Odds Ratio
INTERCPT	1	-2.6560	0.4841	30.0962	0.0001	.	0.070
GRAVEL	1	0.0102	0.00571	3.1663	0.0752	0.200103	1.010
WILLOW	1	-0.6764	0.3063	4.8776	0.0272	-0.339738	0.508
SUBMERGE	1	-0.5289	0.2890	3.3503	0.0672	-0.245377	0.589
POND	1	2.1830	0.6809	10.2783	0.0013	0.340328	8.873
POOL	1	1.3100	0.4758	7.5801	0.0059	0.316885	3.706

Association of Predicted Probabilities and Observed Responses

Concordant	= 76.0%	Somers' D	= 0.529
Discordant	= 23.2%	Gamma	= 0.533
Tied	= 0.8%	Tau-a	= 0.087
(9060 pairs)		c	= 0.764

Table 10. Comparison of NWI classifications in miles surveyed (GIS generated) with locations of spotted frogs. Includes data from 1993 and 1994.

NWI designation	Stream miles surveyed	Reservoir miles surveyed	Total miles surveyed	**Percent of total miles surveyed**	Points with Spotted frogs	**Percent of points with Spotted Frogs**
PABFh		.75	0.75	**0.5**		**0**
PABHx	.03		0.03	**0**		**0**
PEMA	4.96		4.96	**3.3**		**0**
PEMB	.58		0.58	**0.4**		**0**
PEMC	14.65		14.65	**9.7**	2	**3.3**
PEMCh	.50	1.81	2.31	**1.5**	1	**1.7**
PEMCx	.06		0.06	**0**		**0**
PEMFh		.18	0.18	**0.1**		**0**
PFOC	.47		0.47	**0.3**		**0**
PFOCh		.44	0.44	**0.3**		**0**
PSSA	5.85		5.85	**3.9**		**0**
PSSB	.04		0.04	**0**		**0**
PSSC	49.15		49.15	**32.4**	38	**63.3**
PSSCh		.49	0.49	**0.3**		**0**
PSSCx	.34		0.34	**0.2**		**0**
PUBF	.02		0.02	**0**		**0**
PUBFh	.44	.35	0.79	**0.5**	1	**1.7**
PUBGh		.08	0.08	**0.1**	1	**1.7**
PUBH		.06	0.06	**0**		**0**
PUBHh		1.03	1.03	**0.7**	1	**1.7**
PUSCh	.06	.11	0.17	**0.1**	1	**1.7**
R3UBH	32.81		32.81	**21.6**	6	**10**
R3USA	.66		0.66	**0.4**	1	**1.7**
R4SBA	16.14		16.14	**10.6**	2	**3.3**
R4SBC	10.68		10.68	**7**	5	**8.3**
R4SBF	8.60		8.6	**5.7**	1	**1.7**
R4SBJ	.39		0.39	**0.3**		**0**
Total	146.43	5.3	151.73	**99.9**	60	**100**

Table 11. Comparison of GIS layer stream designations of miles of stream surveyed with points where spotted frogs found.

Stream Type	Miles Surveyed	**Percent Miles Surveyed**	Points with Spotted Frogs	**Percent of Points with Spotted Frogs**
Intermittent	60.37	**43.2**	31	**45.6**
Perennial	79.11	**56.7**	37	**54.4**
Reservoir	Not included	Not included	4	Not included
Spring	Not included	Not included	2	Not included

Table 12. Comparison of riparian condition of miles of stream surveyed with condition at points where spotted frogs were found.

Riparian Condition	Miles Surveyed	**Percent Miles Surveyed**	Points with Spotted Frogs	**Percent of Points with Spotted Frogs**
Satisfactory	1.96	**3.5**	1	**3.6**
Unsatisfactory	54.46	**96.5**	28	**96.6**

Table 13. Comparison of fisheries condition of miles of stream surveyed with condition at points where spotted frogs were found.

Fisheries Condition	Miles Surveyed	**Percent Miles Surveyed**	Points with Spotted Frogs	**Percent of Points with Spotted Frogs**
Satisfactory	2.61	**5.3**	0	**0**
Unsatisfactory	46.29	**94.7**	14	**100**

Table 14. Summary of incidental captures or sightings of reptiles and amphibians

	# Captures
Amphibians	
Western Toad: *Bufo boreas*	6
Snakes	
Rubber Boa: *Charina bottae*	2
Racer: *Coluber constrictor*	18
Western Rattlesnake: *Crotalus viridis*	13
Gopher Snake: *Pituophis catenifer*	12
Western Terrestrial Garter Snake: *Thamnophis elegans*	216
Lizards	
Western Whiptail: *Cnemidophoris tigris*	6
Longnose Leopard Lizard: *Gambelia wislizenii*	3
Desert Horned Lizard: *Phrynosoma platyrhinos*	3
Sagebrush Lizard: *Sceloporus graciosus*	22
Western Fence Lizard: *Sceloporus occidentalis*	11
Side-blotched lizard: *Uta stansburiana*	12

Appendix A. Raw data forTransects: locations, captures, and environmental variables. Description of variables given below.

trans #	quadrangle	location name	location by section 1/4of	1/4of	1/4of	Sec	TS	RA	Elev.	Date	Time	Weather	NWI	F, R or D	Larvae and Adults Observed at Transect Rp Ad	Rp La	Pr Ad	Pr La	BB Ad	cond.	pH	Hard	Alkalinity pt.	Alkalinity total	Ta	Tw
B1	WBxBa	CCC Spring Pond	NW	SE	SE	26	9S	2W	5775	18-May-1994	925	prtlycldy	PEMC	F	0	0	0	600	0	70.6	7.34	40	0	45	8.8	9.9
B2	WBxBa	CCC Spring	SW	NE	SE	26	9S	2W	5800	18-May-1994	1020	prtlycldy		R	0	0	0	0	0	52.9	7.63	20	0	40	8.2	9.1
B3	WBxBa	Pole Creek Trib	SE	NE	NE	34	9S	2W	5680	18-May-1994	1100	prtlycldy	PEMC	F	0	0	0	30	0	69.4	7.43	40	0	45	10.2	11
B4	WBxBa	Pole Creek Trib	NW	SW	NW	35	9S	2W	5660	18-May-1994	1120	prtlycldy	PEMC	F	0	0	0	70	0	70.2	6.31	40	0	45	8.5	11.5
B5	WBxBa	Pole Creek Trib	SE	NW	SW	35	9S	2W	5660	18-May-1994	1148	prtlycldy	PEMC	R	0	0	0	0	0	77.3	6.91	40	0	45	13.5	10.2
B6	WBxBa	Pole Creek Trib	SE	NW	SW	35	9S	2W	5660	18-May-1994	1225	prtlycldy	PEMC	R	0	0	0	0	0	.	6.91	40	0	45	13.4	14.5
B7	WBxBa	Pole Creek Trib	SE	NW	SW	35	9S	2W	5640	18-May-1994	1305	prtlycldy	PEMC	F	?	0	0	0	0	.	6.91	40	0	45	10.7	14.5
B8	SlaMt	Stoneman Creek	SW	SW	NW	7	10S	3W	5240	18-May-1994	1500	prtlycldy	PSSC	R	0	0	0	0	0	94.7	7.48	40	0	40	13	12
B9	SlaMt	Stoneman Creek	SW	SW	NW	7	10S	3W	5200	18-May-1994	1505	prtlycldy	PSSC	F	1	0	0	0	0	.	7.48	40	0	40	12.8	13.5
B10	SlaMt	Stoneman Creek	SW	SW	NE	7	10S	3W	5200	18-May-1994	1536	Cloudy	PSSC	R	0	0	0	0	0	.	7.48	40	0	40	13.8	14
B11	SlaMt	Stoneman Creek	NE	SW	NE	7	10S	3W	5200	18-May-1994	1545	cloudy	PSSC	F	2	0	0	0	0	154	7.16	80	0	85	11	17
B12	SlaMt	Stoneman Creek	NE	SW	NE	7	10S	3W	5200	18-May-1994	1600	rain	PSSC	F	2	0	0	0	0	.	7.16	80	0	85	8.8	11.5
B13	SlaMt	Current Creek	NW	SW	NE	8	10S	3W	5160	18-May-1994	1620	prtlycldy	PSSA	R	0	0	0	0	0	40.1	7.39	20	0	15	9.1	11.5
B14	SlaMt	Current Creek	NW	NE	NW	8	10S	3W	5160	18-May-1994	1644	prtlysun	PSSA	R	0	0	0	0	0	.	7.39	20	0	15	9.7	12.5
B15	PleVa	Nickel Creek Trib	NE	SE	SE	14	10S	4W	5400	18-May-1994	1733	prtlysun	PEMC	F	0	0	0	20	0	.	6.88	8	0	90	12.5	14
B16	PleVa	Nickel Creek Trib	NE	SE	SE	14	10S	4W	5400	18-May-1994	1725	prtlycldy	PEMC	F	0	0	1	0	0	.	6.88	8	0	90	12.5	15
B17	SlaMt	Stoneman Trib	SW	NE	NW	7	10S	3W	5280	18-May-1994	1830	sun	PEMA	R	0	0	0	0	0	189.9	7.29	80	0	100	11.9	17
B18	SlaMt	Sunshine Valley Cr	NE	NW	NE	25	10S	3W	5260	23-May-94	1623	sunny	R4SBA	F	0	0	1	0	0	55.8	6.27	20	0	20	26	22
B19	SlaMt	Sunshine Valley Cr	SE	NE	SW	24	10S	3W	5260	23-May-94	1643	sunny	R4SBA	F	0	0	1	0	0	62.5	6.87	20	0	30	26	31
B20	SlaMt	Sunshine Valley Cr	SW	SE	NW	24	10S	3W	5400	23-May-94	1712	sunny	R4SBA	R	0	0	0	0	0	35.2	7.08	20	0	20	25	29
B21	WBxBa	Pole Creek	NE	SW	SW	29	10S	3W	5180	24-May-94	941	sunny	R3UBH	F	0	0	0	20	0	111.8	6.51	60	0	55	23	16
B22	WBxBa	Pole Creek	NW	SW	SW	29	10S	2W	5180	24-May-94	957	sunny	R3UBH	F	0	0	0	10	0	114	6.67	60	0	60	20	15
B23	WBxBa	Pole Creek	SE	NW	SW	29	10S	2W	5180	24-May-94	1039	sunny	PSSC	R	0	0	0	0	0	114	6.67	60	0	60	25	18
B24	WBxBa	Pole Creek	SE	NE	SW	29	10S	2W	5160	24-May-94	1113	sunny	PSSC	R	0	0	0	0	0	114	6.67	60	0	60	18	25
B25	WBxBa	Pole Creek Trib.	NW	NW	SW	29	10S	2W	5160	24-May-94	1148	sunny	R4SBC	F	0	0	0	200	0	69.3	6.75	40	0	35	25	19
B26	SlaMt	Camel Creek	NE	SE	NE	25	10S	3W	5200	24-May-94	1257	sunny	R4SBC	F	3	0	0	20	0	66.5	6.78	40	0	30	26	21
B27	SlaMt	Camel Creek	NE	SE	NE	25	10S	3W	5200	24-May-94	1317	sunny	R4SBC	F	3	0	0	0	0	66.5	6.78	40	0	30	24	23
B28	SlaMt	Camel Creek	NE	SE	NE	25	10S	3W	5200	24-May-94	1334	sunny	PSSC	F	0	0	1	10	0	77.7	6.35	40	0	40	25	23
B29	SlaMt	Camel Creek	NE	SE	NE	25	10S	3W	5200	24-May-94	1350	sunny	R4SBC	F	4	0	0	0	0	64	6.83	40	0	25	25	19
B30	SlaMt	Camel Creek	SW	SE	NE	25	10S	3W	5200	24-May-94	1409	sunny	PSSC	F	0	0	0	0	1	64	6.83	40	0	25	29	22
B31	SlaMt	Camel Creek	NE	SW	NE	25	10S	3W	5200	24-May-94	1429	sunny		F	2	0	0	0	0	84	6.73	40	0	45	29	24
B32	SlaMt	Camel Creek	SE	NE	NE	25	10S	3W	5200	24-May-94	1539	sunny	R4SBC	F	2	0	0	100	0	47.4	6.88	20	0	25	28	19
B33	SlaMt	Camel Creek	SE	NE	NE	25	10S	3W	5200	24-May-94	1607	prtlycld	R4SBC	F	1	0	0	10	0	47.4	6.88	20	0	25	25	23
B34	SlaMt	Camel Creek	NE	NE	NE	25	10S	3W	5200	24-May-94	1628	prtlysun	R4SBC	F	0	0	1	0	0	81.5	6.76	40	0	40	25	17
B35	SlaMt	Camel Creek	NE	NE	NE	25	10S	3W	5200	24-May-94	1636	prtlysun	R4SBC	F	1	0	0	10	0	84.4	6.76	40	0	40	24	25
B36	PleVa	Minks Drink	SW	NW	NW	34	10S	4W	5620	25-May-94	1247	prtlysun	PUBFh	F	0	0	0	1000	0	71.5	6.53	40	0	35	27	23
B37	PleVa	Nickel Cr. Trib.	NE	SW	NE	34	10S	4W	5500	25-May-94	1333	prtlysun	PEMA	D	0	0	0	0	0	60	6.7	20	0	30	28	.
B38	PleVa	Nickel Cr. Trib.	SW	NE	SW	35	10S	4W	5400	25-May-94	1405	prtlysun	PEMA	F	0	0	1	25	0	60	6.7	20	0	30	30	30
B39	PleVa	NickelCR.TRibFRREs	SE	SE	NW	35	10S	4W	5360	25-May-94	1432	prtlysun	R4SBA	R	0	0	0	0	0	60	6.7	20	0	30	28	25
B40	PleVa	NickelCR.TRibFRREs	SE	SE	NW	35	10S	4W	5400	25-May-94	1443	prtlysun	R4SBA	F	0	0	2	200	0	62.9	6.64	20	0	35	22	29
B41	PleVa	NickelCR.TRibFRREs	SE	NW	NW	35	10S	4W	5440	25-May-94	1503	prtlysun	PEMC	F	0	0	0	0		62.5	6.61	20	0	30	23	25
B42	PleVa	NickelCR.TRibFRREs	SW	SW	SE	27	10S	4W	5560	25-May-94	1550	prtlysun	PEMC	D	0	0	0	0	0	62.5	6.61	20	0	30	22	.
B43	PleVa	Twin Resevoirs	NE	SW	SW	27	10S	4W	5640	25-May-94	1611	prtlysun	PEMCh	F	0	0	0	200	0	65.5	6.74	40	0	30	27	28
B44	Wicki	Josephine Cr. Trib.	NW	SW	NW	30	8S	2W	5800	26-May-94	846	sunny		R	0	0	0	0	0	76.3	6.35	20	0	20	18	11
B45	Wicki	Josephine Cr. Trib.	SE	NE	SE	24	8S	3W	5740	26-May-94	923	sunny	PEMC	R	0	0	0	0	0	76.3	6.35	20	0	20	20	12
B46	Wicki	Josephine Cr. Trib.	SW	NE	SE	24	8S	3W	5660	26-May-94	937	sunny	R4SBA	F	0	0	0	20	0	76.3	6.35	20	0	20	22	12
B47	Wicki	Josephine Cr. Trib.	SE	SW	NE	24	8S	3W	5600	26-May-94	1008	sunny	R4SBA	D	0	0	0	0	0	76.3	6.35	20	0	20	20	.
B48	Wicki	Josephine Creek	NW	SE	NW	24	8S	3W	5540	26-May-94	1048	sunny	R4SBC	F	1	0	0	0	0	60.3	6.36	20	0	25	26	13
B49	Wicki	Josephine Creek	SE	NW	NW	24	8S	3W	5540	26-May-94	1108	sunny	R4SBC	F	0	0	4	0	0	57.3	6.5	20	0	25	25	15
B50	Wicki	Josephine Creek	NE	NE	NE	23	8S	3W	5400	26-May-94	1148	sunny	PSSC	F	1	0	0	0	0	57	6.57	20	0	25	25	14
B51	Wicki	Wickiup Creek	NE	NE	NE	23	8S	3W	5440	26-May-94	1241	prtlysun	PSSC	F	1	0	0	0	0	54.9	6.56	20	0	25	26	14
B52	Wicki	Wickiup Creek	SE	SE	NW	23	8S	3W	5680	26-May-94	1307	sunny	PSSC	R	0	0	0	0	0	54.9	6.56	20	0	25	26	16
B53	Wicki	Wickiup Creek	SW	SE	NW	23	8S	3W	5520	26-May-94	1352	sunny	PSSC	R	0	0	0	0	0	54.9	6.56	20	0	25	26	19

Appendix A. Raw data forTransects: locations, captures, and environmental variables. Description of variables given below.

trans #	quadrangle	location name	location by section 1/4of	1/4of	1/4of	Sec	TS	RA	Elev.	Date	Time	Weather	NWI	F, R or D	Larvae and Adults Observed at Transect Rp Ad	Rp La	Pr Ad	Pr La	BB Ad	cond.	pH	Hard	Alkalinity pt.	total	Ta	Tw
B54	Wicki	Wickiup Creek	NW	NW	NE	26	8S	3W	5560	26-May-94	1436	prtlycld	PSSC	R	0	0	0	0	0	54.9	6.56	20	0	25	24	21
B55	TriRe	Antelope Spring	NE	SW	NW	28	7S	2W	5700	31-May-94	1147	cloudy	PSSB	D	0	0	1	0	1	.	.	.	.	.	16	.
B56	TriFl	Meadow Creek	SE	NW	SW	7	7S	2W	5160	31-May-94	1308	rain	PSSC	F	4	0	0	0	0	168.5	6.9	60	0	65	14	15
B57	TriFl	Meadow Creek	NW	SW	SW	7	7S	2W	5160	31-May-94	1327	rain	PSSC	F	5	0	0	0	0	128.9	7.1	80	0	60	13	15
B58	TriFl	Meadow Creek	NE	SE	SE	12	7S	3W	5140	31-May-94	1354	rain	PSSC	F	6	0	0	0	0	124.1	7.61	60	0	60	18	17
B59	TriFl	Meadow Creek	NW	SE	SE	12	7S	3W	5140	31-May-94	1420	rain	PSSC	F	2	0	0	0	0	125.3	7.67	60	0	60	16	16
B60	TriFl	Meadow Creek	SE	NW	NE	13	7S	3W	5120	31-May-94	1437	rain	PSSC	F	1	0	0	0	0	125.1	7.66	60	0	65	14	16
B61	TriFl	Meadow Creek	SE	NW	NE	13	7S	3W	5120	31-May-94	1514	cloudy	PSSC	R	0	0	0	0	0	125.1	7.66	60	0	65	13	16
B62	TriFl	Meadow Creek	SW	NW	NE	13	7S	3W	5120	31-May-94	1530	cloudy	PSSC	F	1	0	0	0	0	136.1	7.57	80	0	65	14	17
B63	TriFl	Meadow Creek	NW	NE	SE	13	7S	3W	5100	31-May-94	1549	cloudy	PSSC	D	1	0	0	0	0	136.1	7.57	80	0	65	16	.
B64	TriFl	Rock Creek Trib.	NW	NW	NW	15	7S	3W	5040	1-June-94	912	cloudy	R4SBC	F	0	0	0	20	0	271	6.97	80	0	110	8	11
B65	Fairy	Cottonwood Cr. Trib	NE	NE	SE	34	10S	5W	5680	1-June-94	1450	prtlysun	PEMC	F	0	0	0	4000	0	55.9	7.23	20	0	25	11	21
B66	Fairy	Cottonwood Cr. Trib	SE	SE	NE	34	10S	5W	5720	1-June-94	1526	prtlycld	PEMC	F	0	0	0	200	0	.	7.16	20	0	25	16	25
B67	Fairy	Cottonwood Cr. Trib	SW	NW	NW	35	10S	5W	5640	1-June-94	1547	prtlysun	PEMC	F	0	0	2	0	0	.	7.18	20	0	20	18	15
B68	Fairy	Cottonwood Cr. Trib	SE	NW	NW	35	10S	5W	5640	1-June-94	1604	prtlysun	PSSC	F	0	0	0	300	0	.	6.75	40	0	35	17	26
B69	Fairy	Res. above grave cr.	NW	SW	NE	17	10S	5W	5160	1-June-94	1720	prtlysu	PUBHh	F	0	0	2	1000	0	339	9.49	40	0	35	21	25
B70	Fairy	Juniper Creek	NW	NE	SW	21	9S	5W	5120	2-June-94	956	sunny	PEMA	R	0	0	0	0	0	196	6.82	120	0	85	23	12
B71	Fairy	Juniper Creek	NW	NE	SW	21	9S	5W	5120	2-June-94	1001	sunny	PEMA	F	0	0	1	0	0	196	6.82	120	0	85	23	12
B72	Fairy	Juniper Creek	NE	SW	NW	28	9S	5W	4920	2-June-94	1114	sunny	PSSC	R	0	0	0	0	0	196	6.82	120	0	85	20	15
B73	Cliff	Cabin Creek	NW	SE	SE	15	9S	5W	5320	2-June-94	1403	sunny	R3UBH	R	0	0	0	0	0	150.9	7.02	20	0	80	25	20
B74	Cliff	Cabin Creek	NE	SE	NE	15	9S	5W	5400	2-June-94	1441	sunny	R3UBH	R	0	0	0	0	0	150.9	7.02	20	0	80	26	23
B75	Cliff	Cabin Creek	NW	NW	NW	14	9S	5W	5440	2-June-94	1517	prtlycld	R3UBH	R	0	0	0	0	0	150.9	7.02	20	0	80	25	24
B76	Fairy	Res.on Trib.N.F.Owyhe	NE	SE	NW	4	10S	5W	5240	2-June-94	1723	cloudy	PUBFh	F	0	0	3	2500	0	97.5	7.18	40	0	20	22	22
B77	SilCy	Jordan Creek	NE	SW	NE	6	5S	3W	6140	6-June-94	1228	cloudy	PSSC	R	0	0	0	0	0	52.1	5.71	40	0	30	12	11
B78	SilCy	Jordan Creek	NW	SW	SE	31	4S	3W	6000	6-June-94	1305	cloudy	PSSC	F	0	0	0	0	0	52.1	5.71	40	0	30	11	15
B79	SilCy	Jordan Creek	NW	NW	SE	31	4S	3W	6200	6-June-94	1457	prtlycld	PSSC	R	0	0	0	0	0	52.1	5.71	40	0	30	11	8
B80	SilCy	Jordan Creek	SE	NE	SW	31	4S	3W	6160	6-June-94	1538	prtlycld	PSSC	R	0	0	0	0	0	52.1	5.71	40	0	30	15	13
B81	SilCy	Jordan Creek	SE	SE	SE	25	4S	3W	5820	6-June-94	1713	prtlysun	PSSC	R	0	0	0	0	0	52.1	5.71	40	0	30	19	13
B82	SilCy	Presby Creek	SE	SW	NW	30	4S	3W	6200	6-June-94	1818	prtlysun		R	0	0	0	0	0	.	.	.	.	.	10	13
B83	WilPk	Reynolds Creek	NE	NE	NW	5	2S	3W	2980	7-June-94	1337	prtlysun	R3UBH	R	0	0	0	0	0	.	.	.	.	.	20	16
B84	WilPk	Reynolds Creek	NE	NE	SW	28	2S	3W	2720	7-June-94	1417	rain	R3UBH	R	0	0	0	0	0	.	.	.	.	.	17	17
B85	PleVa	PondOffPleas.Val.Trib	NE	SW	NW	18	10S	4W	5460	8-June-94	903	sunny	PEMA	F	0	0	0	50	0	135.5	7	20	0	45	11	13
B86	PleVa	Pleasant Valley Cr.	SW	NW	NE	18	10S	4W	5440	8-June-94	938	sunny	R3UBH	F	0	0	0	50	0	85.9	6.99	40	0	45	9	9
B87	PleVa	Pleasant Valley Cr.	NE	SW	SE	18	10S	4W	5420	8-June-94	957	sunny	R3UBH	R	0	0	0	0	0	85.9	6.99	40	0	45	11	11
B88	PleVa	Pleasant Valley Cr.	NE	NW	SE	18	10S	4W	5420	8-June-94	1015	sunny	R3UBH	R	0	0	0	0	0	85.9	6.99	40	0	45	10	12
B89	PleVa	Pleasant Valley Cr.	NE	SE	SW	7	10S	4W	5420	8-June-94	1048	sunny	R3UBH	F	0	0	0	10	0	175.7	6.9	80	0	85	21	12
B90	PleVa	Pleasant Valley Cr.	NW	SE	SW	7	10S	4W	5420	8-June-94	1110	sunny	R3UBH	F	0	0	0	15	0	101	7.32	40	0	40	12	14
B91	PleVa	Pleasant Valley Cr.	SW	NE	SW	7	10S	4W	5420	8-June-94	1123	sunny	R3UBH	R	0	0	0	0	0	101	7.32	40	0	40	17	20
B92	PleVa	Pleasant Valley Cr.	NW	NE	SW	7	10S	4W	5420	8-June-94	1221	sunny	R3UBH	F	0	0	0	10	0	101	7.32	40	0	40	19	18
B93	PleVa	Pleasant Valley Cr.	NE	NW	SW	7	10S	4W	5500	8-June-94	1343	sunny	R3UBH	R	0	0	0	0	0	101	7.32	40	0	40	19	18
B94	Fairy	PondonCottnwodTrib.	NE	NE	NW	14	10S	5W	5360	8-June-94	1525	sunny	PEMC	F	0	0	0	200	0	101.2	10.42		6	25	22	25
B95	Fairy	Three Mile Resevoir	NW	NW	NW	15	10S	5W	5340	8-June-94	1557	sunny	PUSCh	F	0	0	0	10000	0	42.1	9.06	20	0	20	21	24
B96	Fairy	Grasshopper Springs	SE	SE	NE	10	10S	5W	5380	8-June-94	1630	sunny	PEMB	F	0	0	0	500	0	132.7	8.3	60	0	60	21	25
B97	TriFl	Rock Creek	SW	NE	SW	15	7S	3W	5000	9-June-94	1020	sunny	R3UBH	F	0	0	0	250	0	212	6.76	15	0	70	19	16
B98	TriFl	Josephine Creek	SE	NW	NW	22	7S	3W	5020	9-June-94	1104	sunny	PSSC	R	0	0	0	0	0	124.6	7.12	15	0	55	20	18
B99	TriFl	Josephine Creek	SW	SW	NW	22	7S	3W	5040	9-June-94	1121	sunny	PSSC	F	1	0	0	0	0	124.6	7.12	15	0	55	22	15
B100	TriFl	Josephine Creek	SW	NW	SW	22	7S	3W	5100	9-June-94	1156	sunny	PSSC	F	0	0	1	0	0	126.4	7.23	10	0	50	22	16
B101	CasTa	Camp springs Res	SE	SE	SW	4	11S	3W	5248	14-June-94	1050	prtlycld	PUSCh	R	0	0	0	5000	0	154.8	7.22	20	0	100	14	11
B102	CasTa	Nickel Creek	SW	SW	NE	16	11S	3W	4960	14-June-94	1221	prtlycld	PSSA	F	0	0	0	20	0	115.1	7.33	10	0	45	16	13
B103	CasTa	Nickel Creek	NE	NE	NW	16	11S	3W	4960	14-June-94	1258	prtlycld	R3UBH	R	0	0	0	0	0	115.1	7.33	10	0	45	17	
B104	CasTa	Nickel Cr. Oxbow	SW	NE	SE	16	11S	3W	4920	21-June-94	946	sunny	R3UBH	F	0	0	0	100	0	176.8	7.31	20	0	70	27	21
B105	CasTa	Nickel Cr. Oxbow	SW	SW	SW	15	11S	3W	4920	21-June-94	1018	sunny	R3UBH	F	0	0	0	100	0	122.7	7.47	15	0	55	27	20
B106	CasTa	Nickel Creek	NE	NW	NW	22	11S	3W	4920	21-June-94	1039	sunny	R3UBH	R	0	0	0	0	0	115.8	7.53	10	0	55	27	20

Appendix A. Raw data forTransects: locations, captures, and environmental variables. Description of variables given below.

trans #	quadrangle	location name	location by section 1/4of	1/4of	1/4of	Sec	TS	RA	Elev.	Date	Time	Weather	NWI	F, R or D	Larvae and Adults Observed at Transect Rp Ad	Rp La	Pr Ad	Pr La	BB Ad	cond.	pH	Hard	Alkalinity pt.	total	Ta	Tw
B107	CasTa	Nickel Cr. Oxbow	NW	NE	NW	22	11S	3W	4854	21-June-94	1114	sunny	R3UBH	F	0	0	0	250	0	111	7.47	20	0	50	29	22
B108	CasTa	Nickel Creek	NW	NE	NW	22	11S	3W	4854	21-June-94	1131	sunny	R3UBH	R	0	0	0	0	0	130.6	7.48	10	0	55	30	23
B109	CasTa	Nickel Creek	NE	NE	NW	22	11S	3W	4854	21-June-94	1147	sunny	R3UBH	F	0	0	1	0	0	129.8	7.62	10	0	40	30	27
B110	CasTa	Deep Creek	NE	SE	SE	15	11S	3W	4920	21-June-94	1323	sunny	R3UBH	R	0	0	0	0	0	133.4	8	10	0	45	31	24
B111	CasTa	Deep Creek	NW	NE	SE	15	11S	3W	4986	21-June-94	1419	sunny	R3UBH	R	0	0	0	0	0	127.1	8.68	5	0	40	29	22
B112	CasTa	Deep Creek	NE	SE	NE	15	11S	3W	5051	21-June-94	1507	sunny	R3UBH	R	0	0	0	0	0	73.5	8.32	5	0	35	32	26
B113	OxLak	W. F. Shoofly	NW	NE	NE	9	8S	2E	4000	22-June-94	954	sunny	PSSC	R	0	0	0	0	0	102.8	8.03	10	0	35	29	16
B114	OxLak	W.F. Shoofly	SW	NW	NE	9	8S	2E	4000	22-June-94	1016	sunny	PSSC	R	0	0	0	0	0	94.8	8.01	10	0	35	27	19
B115	OxLak	W.F. Shoofly	NE	SE	NW	9	8S	2E	4000	22-June-94	1116	sunny	PEMC	R	0	0	0	0	0	94.7	7.94	10	0	35	27	19
B116	CasBu	Foremans Reservoir	NW	NW	NW	3	5S	1E	2788	22-June-94	1509	prtlycld	PSSCh	F	0	0	1	0	0	501	8.72	0	0	155	35	34
B117	CasBu	Foremans Reservoir	SW	SW	SW	34	4S	1E	2788	22-June-94	1533	prtlycld	PEMCh	R	0	0	0	0	0	620	7.73	10	0	355	34	31
B118	JCkCy	Little Squaw Cr.	SW	NW	NW	35	1N	5W	3772	23-June-94	1234	sunny	PEMC	F	0	0	0	20	0	143.4	.	.	0	80	30	23
B119	JCkCy	Little Squaw Cr.	NW	NE	SE	34	1N	5W	3772	23-June-94	1253	sunny	PEMC	F	0	0	0	50	0	143.4	.	.	0	80	31	24
B120	JCkCy	Little Squaw Cr.	SE	SW	SW	26	1N	5W	3936	23-June-94	1342	sunny	PEMC	F	0	0	0	75	0	143.4	.	.	0	80	31	25
B121	JCkCy	Little Squaw Cr.	SW	SW	SE	26	1N	5W	3680	23-June-94	1407	sunny	PEMC	R	0	0	0	0	0	143.4	.	.	0	80	32	28
B122	JCkCy	Little Squaw Cr.	SW	SW	SE	26	1N	5W	3680	23-June-94	1428	sunny	PEMC	F	0	0	0	75	0	143.4	.	.	0	80	32	30
B123	JCkCy	Squaw Creek	SE	SE	SE	26	1N	5W	3600	23-June-94	1457	sunny	R3UBH	R	0	0	0	0	0	.	.	.	.	.	33	23
B126	Delam	Jordan Creek	SW	SW	SW	25	4S	4W	5880	27-June-94	1655	prtlycld	R4SBF	R	0	0	0	0	0	56.6	7.18	5	0	15	27	17.4
B127	Delam	Jordan Creek	SE	SW	SE	25	4S	4W	5880	27-June-94	1721	prtlycld	R4SBF	R	0	0	0	0	0	56.6	7.18	5	0	15	29	20
B128	Delam	Jordan Creek	NE	NE	NW	35	4S	4W	5750	28-June-94	912	prtlycld	R4SBF	R	0	0	0	0	0	56.6	7.18	5	0	15	21	12
B129	Delam	Jordan Creek	SE	NW	NW	35	4S	4W	5760	28-June-94	952	sunny	R4SBF	R	0	0	0	0	0	56.6	7.18	5	0	15	26	14
B130	Delam	Jordan Creek	NW	SE	NE	34	4S	4W	5750	28-June-94	1037	sunny	R4SBF	R	0	0	0	0	0	56.6	7.18	5	0	15	24	15
B131	SilCy	Sinker Creek	SW	NW	NW	24	4S	3W	3936	28-June-94	1404	prtlycld	PSSC	R	0	0	0	0	0	105.8	7.01	15	0	50	31	19
B132	Fairy	Corral Creek	NW	NW	SE	23	9S	5W	5270	29-June-94	1118	sunny	R3UBH	R	0	0	0	0	0	143.3	6.96	15	0	70	27	18
B133	Fairy	Corral Creek	NW	SW	WE	22	9S	5W	5260	29-June-94	1211	sunny	PSSC	F	0	0	2	0	0	143.3	6.96	15	0	70	30	.
B134	Fairy	Corral Creek	SE	SW	SW	22	9S	5W	5190	29-June-94	1424	sunny	R3UBH	R	0	0	0	0	0	142.3	6.96	15	0	70	31	22
B135	Cliff	Cabin Creek	NW	SW	NE	22	9S	5W	5180	30-June-94	857	sunny	R3UBH	R	0	0	0	0	0	150.9	7.02	20	0	80	20	14
B136	Cliff	Cabin Creek	NW	NW	SE	22	9S	5W	5150	30-June-94	941	sunny	R3UBH	R	0	0	0	0	0	150.9	7.02	20	0	80	20	13
B137	PleVa	Rays Resevoir	NE	NW	NW	28	10S	4W	5630	30-June-94	1202	sunny	PUBFH	F	0	0	0	200	0	129.3	7.03	35	0	90	35	26
B138	PleVa	Sandy Resevoir	NW	NE	SW	34	10S	4W	5470	30-June-94	1257	sunny	PEMFH	F	0	0	0	100	0	73.9	.	10	0	45	37	33
B139	TriRe	N.F. Castle Cr.	SE	NW	SE	15	7S	2W	5000	6-July-94	1314	prtlycld	PSSC	R	0	0	0	0	0	.	.	10	0	15	26	19
B140	TriRe	N.F. Castle Cr.	NW	NE	SW	15	7S	2W	5040	6-July-94	1358	prtlycld	PSSC	R	0	0	0	0	0	.	.	10	0	15	23	19
B141	TriRe	N.F. Castle Cr.	NW	SE	SE	15	7S	2W	4960	6-July-94	1508	prtlysun	PSSA	R	0	0	0	0	0	.	.	10	0	15	22	22
B142	TriRe	N.F. Castle Cr.	NW	SW	SW	14	7S	2W	4960	6-July-94	1527	prtlycld	PSSC	F	0	0	1	0	0	.	.	10	0	15	25	22
B143	Stone	Jordan Creek	SW	NE	NW	1	6S	5W	4800	7-July-94	928	sunny	PSSC	R	0	0	0	0	0	294	.	25	0	40	13	13
B144	Stone	Jordan Creek	NW	SW	SW	36	5S	5W	4820	7-July-94	1015	sunny	PSSC	R	0	0	0	0	0	294	.	25	0	40	15	13
B145	Stone	Jordan Creek	NW	NW	SE	35	5S	5W	4900	7-July-94	1111	sunny	PSSC	R	0	0	0	0	0	294	.	25	0	40	24	16
B146	Stone	Jordan Creek	SW	NE	NW	35	5S	5W	4980	7-July-94	1156	sunny	PSSC	R	0	0	0	0	0	294	.	25	0	40	24	20
B147	Stone	Trout Cr. Trib.	SE	SE	NW	19	5S	5W	4580	7-July-94	1703	sunny	R4SBF	F	0	0	0	10	0	101.1	.	5	0	15	31	33
B148	Stone	Trout Cr. Trib.	SE	SE	SW	18	5S	5W	4700	7-July-94	1731	sunny	R4SBF	F	0	50	1	0	0	101.1	.	5	0	15	29	27
B149	Stone	Trout Cr. Trib.	NE	NE	SW	18	5S	5W	4780	7-July-94	1751	sunny	R4SBF	F	0	0	0	20	0	101.1	.	5	0	15	30	28
B150	SmiCk	Smith Creek	SW	SW	SW	15	11S	4W	5440	11-July-94	1504	sunny	PSSC	R	0	0	0	0	0	78.4	.	10	0	15	29	23
B151	SmiCk	Little Thomas Creek	NW	SE	SE	5	11S	4W	5051	12-July-94	908	sunny	PSSC	F	0	0	0	20	0	.	.	.	.	.	14	13
B152	TriFl	Rock Creek Trib	SE	NE	NE	18	7S	3W	4940	13-July-94	1101	sunny	R4SBA	F	0	0	0	30	0	.	.	.	.	.	26	18
B153	TriFl	Rock Creek	SE	SE	SW	7	7S	3W	4900	13-July-94	1146	sunny	PEMA	R	0	0	0	0	0	.	.	.	.	.	26	20
B154	TriFl	Rock Creek	SW	SW	SW	7	7S	3W	4900	13-July-94	1229	sunny	PSSA	R	0	0	0	0	0	.	.	.	.	.	26	22
B155	TriFl	Rock Cr. Oxbow	SW	SE	SE	12	7S	4W	4900	13-July-94	1254	sunny	PSSC	F	0	0	0	50	0	.	.	.	.	.	27	27
B156	TriFl	Rock Cr. Oxbow	NE	NE	NW	18	7S	4W	4900	13-July-94		sunny	PSSA	F	0	0	0	20	0	.	.	.	.	.	.	.
B157	TriFl	Rock Cr. Oxbow	NW	SW	NW	17	7S	3W	4940	13-July-94	1406	sunny	PEMA	F	0	0	0	20	0	.	.	.	.	.	29	28
B158	TriFl	Rock Creek	SE	NW	SE	17	7S	3W	4940	13-July-94	1421	sunny	R3USA	R	0	0	0	0	0	.	.	.	.	.	30	22
B159	PiBuE	Owyhee Creek	SE	NE	SW	30	14S	1S	4592	19-July-94	1149	sunny	R3UBH	R	0	0	0	0	0	.	.	.	.	.	27	22
B160	JCkCy	Jump Creek	NE	NE	SW	8	1N	5W	3936	25-July-94	1512	sunny	PEMC	F	0	0	20	0	0	.	.	.	.	.	33	25
B161	IndMe	Current Creek	NE	SE	NE	2	9S	4W	6560	26-July-94	1425	prtlycld	R4SBC	F	0	0	0	10	0	.	.	.	.	.	32	27

Appendix A. Raw data forTransects: locations, captures, and environmental variables. Description of variables given below.

trans #	quadrangle	location name	location by section 1/4of	1/4of	1/4of	Sec	TS	RA	Elev.	Date	Time	Weather	NWI	F, R or D	Larvae and Adults Observed at Transect Rp Ad	Rp La	Pr Ad	Pr La	BB Ad	cond.	pH	Hard	Alkalinity pt.	Alkalinity total	Ta	Tw
B162	IndMe	Current Creek	NE	SW	SE	35	8S	4W	6400	26-July-94	1503	prtlycld	R4SBC	R	0	0	0	0	0	.	.	.	.	.	31	21
B163	IndMe	Current Creek	NE	SE	SE	2	9S	4W	6320	26-July-94	1612	prtlycld	R4SBC	R	0	0	0	0	0	.	.	.	.	.	32	28
B164	PleVa	Big Springs Creek	SE	NW	SW	29	9S	4W	5550	26-July-94	1938	cloudy	R4SBC	R	0	0	0	0	0	.	.	.	.	.	29	23
B165	PleVa	Big Springs Creek	SW	SE	SW	29	9S	4W	5450	26-July-94	1955	cloudy	PSSC	F	0	0	1	0	0	.	.	.	.	.	27	22
B166	TriFl	Meadow Creek (2)	NW	NE	NE	13	7S	3W	5100	27-July-94	1034	prtlycld	PSSC	F	9	0	0	0	0	136.1	7.57	80	0	65	35	22
B167	TriFl	Meadow Creek (2)	NW	SE	SE	12	7S	3W	5140	27-July-94	1101	prtlycld	PSSC	F	1	0	0	0	0	136.1	7.57	80	0	65	34	24
B168	SilCy	N.F. Peter's Gulch	SW	NW	SE	31	3S	3W	5576	27-July-94	1614	prtlysun	R4SBA	R	0	0	0	0	0	274	.	25	0	95	33	27
B169	SilCy	Peter's Gulch	SW	SW	SE	6	4S	3W	5248	27-July-94	1703	prtlysun	PSSA	R	0	0	0	0	0	236	.	30	0	110	34	26
b170	SolCp	Salmon Creek	NW	SW	NW	13	2S	4W	3936	28-July-94	756	prtlysun	PSSC	F	0	0	0	20	0	.	.	.	.	.	21	18
B171	SolCp	Salmon Creek	SW	NW	NE	13	2S	4W	3772	28-July-94	817	prtlysun	PSSC	F	0	0	0	50	0	.	.	.	.	.	19	18
B172	DicRi/PiBuE	Battle Creek	SE	NW	NW	1	14S	2W	4756	1-Aug.-94	1735	cloudy	PSSC	R	0	0	0	0	0	.	.	.	.	.	29	24

Quadrangle names: WBxBa=Wagon box basin; SlaMt= Slack Mountain; PleVa = Pleasant Valley; Wicki = Wickiup; TriRe = Triangle Reservoir;
TriFl = Triangle Flat; Fairy = Fairylawn; Cliff = Cliffs; SilCy = Silver City; WilPk = Wilson Peak; CasTa = Castro Table; OxLak = O X Lake;
CasBu = Castro Butte; JCkCy = Jump Creek Canyon; Delam = DeLamar; Stone = Stonehouse; SmiCk = Smith Creek; PiBuE = Piute Butte East;
IndMe = Indian Meadows; SolCp = Soldier's Cap; DicRi = Dickshooter Ridge

Variable Names in order: Transect number, Quadrangle name, location name, location by section (section, township, range), Elevation, date, time,
weather; National Wetland Inventory classification; Frog, Random, or Dry transect; Rana pretiosa adults and larvae; Pseudacris regilla adults and larvae;
Bufo boreas adults; conductance; pH; hardness; phenopthlalein alkalinity, total alkalinity; air temperature; water temperature; depth (cm); width(m); ength (m);
water body type; %substrate:silt, sand, gravel, cobble, rock; 0-3 ratings of streamside environment: sagebrush, grass, forbs, reeds, bare, willow, cottonwood, and rock;
0-3 ratings of aquatic vegetation: emergent vegetation, submerged vegetation, and algae; hideaway present or not; hideaway type; fish seen or not;
Grazing impacts (0-3 ratings): overall, on grass, on shrubs, presence of feces and footprints, loss of hydrophilic plants; downcutting present or not;
lateral erosion present or not; general topography of area (rolling, wide valley, meso [intermediate], narrow); general flow pattern in area.

len.	water	substrate					Streamside environment								aquatic veg.			Hideaway		fish	Grazing							Topo
	body	silt	sand	grav	cobb	rock	sage	gras	forb	reed	bare	willo	cotw	rock	emer	subm	alga		type	seen	ovrall	grass	shrub	P&P	hydr	dnct	Latrl	
15	pond	98	0	0	0	2	1	1	0	2.5	0	0	0	0	2.5	2.5	0.5	Y	veg	N	0.5	0	0	0.75	.	.	.	rolling
.	riffle	90	0	0	0	10	0	0.5	2	0	2	0	0	0	0.5	0	2	Y	Rock/algae	N	3	0	0	2	.	.	.	rolling
.	pool	100	0	0	0	0	1.5	2	2	1.5	0	0.75	0	0	1.5	0	2	Y	veg	N	0.25	0	0	0.25	.	.	.	meso
.	pool	100	0	0	0	0	1	2	2	2.25	0	0	0	0	2	0	2.5	Y	veg	N	0.5	0	0	0.5	.	.	.	meso
.	pool	100	0	0	0	0	1	1.5	1.5	2	0	1	0	0	1	0	0	Y	veg	N	0.1	0	0	0.1	.	.	.	meso
.	pool	0	0	60	0	0	1	2	1.5	1	1	1.75	0	0	1.5	0	2	Y	veg	N	1	0	0	1	.	.	.	meso
.	pool	50	0	0	0	50	1	2	1	2	0	0	0	0	1	0.5	1.5	Y	veg	Y	0.75	0	0	0.5	.	.	.	meso
.	run	0	0	30	0	70	0.5	0.5	0.5	2	0.5	1	0	1.5	0.1	0.5	0.25	Y	veg	sd	1	0	0	0.75	.	.	.	wideval
.	run	0	0	40	0	60	0	0.5	0.25	2	0.25	1.5	0	0	0.5	1	0.1	Y	veg	sd	0.5	0	0	0	.	.	.	wideval
.	riffle	25	0	50	0	30	1	1	1	1	1	2	0	1	0.5	0.5	0	Y	rock	sd	0.75	10	0	0	.	.	.	wideval
.	oxbow	100	0	0	0	0	0	2	0.5	0	2	2	0	0	0.1	0.25	1.5	Y	veg	N	1.25	0	0	1	.	.	.	wideval
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.5	0	0	2	.	.	.	wideval
.	riffle	0	0	30	0	70	1	0.5	0.5	1.5	1	1.5	0	0	0	0.25	0.5	N		N	1	0	0	1	.	.	.	meso
.	run	0	0	100	0	0	1.5	1	0.5	0	1.5	1.5	0	0	0	0.1	0.25	Y	bank	N	0.25	0	0	0.25	.	.	.	meso
.	pool	100	0	0	0	0	0.25	0.25	0.5	2	0.5	0.5	0	0	0	0	2	Y	veg/bank	N	.	.	.	.	.	.	.	meso
.	pool	50	0	0	0	50	1.5	0.5	1	2	1	0	0	0	1	0	1.5	Y	veg/bank	N	0.5	0	0	0.25	.	.	.	meso
.	pool	0	20	40	0	40	2	2	1	1	0	0	0	0	0.5	0	0	Y	rock	N	0	0	0	0	.	.	.	rolling
.	pool	0	0	50	0	50	1	1	0.5	2	0.5	0	0	0.5	0.75	0.5	0	Y	veg/bank/rock	N	0.5	0	0	0.25	2	N	N	rolling
.	pool	0	0	50	0	50	1.5	1	1	0.5	2	0	0	1.5	0.25	0	0.5	Y	veg/bank/rock	N	0.75	0	0	0.75	3	N	Y	rolling
.	pool	0	0	80	0	20	1.5	1.5	0.5	0.75	0.25	0	0	0.5	0.25	0	0	Y	veg/bank/rock	N	1	0	0	2	2	N	N	rolling
.	pool	0	0	0	75	25	0	0	0.5	2	0.1	2	0	2	1	0.5	0.5	Y	veg/rock	N	0	0	0	0	1	.	.	meso
.	pool	0	20	0	80	0	0.25	0	0.5	1.5	1.5	0.75	0	0.25	1.5	0.5	2	Y	veg	N	0.25	0	0	0.25	2	N	N	meso
.	pool	0	70	0	0	30	0	0	0.5	2	0.5	2	0	1.5	1	1	1	Y	veg/rock	Y	0	0	0	0	1	N	N	meso
7	pool	0	0	20	0	80	0	0	0.5	2	0	2	0	1.5	2	0.5	1	Y	veg/rock	sd.	0	0	0	0	1	N	N	meso
.	pool	0	0	0	0	100	0.25	0	1	2	0.5	0	0	2	1.75	1	2	Y	veg	N	0.25	0	0	0.1	1	N	N	rolling
.	pool	0	0	30	20	50	0	0	1	2	0.1	0	0	0.25	1	1.5	0.5	Y	veg/rock	N	0	0	0	0	1	N	Y	rolling
.	pool	0	0	30	70	0	0	0.25	0.75	2	0	0.5	0	0.25	2	1	1.5	Y	veg/rock	N	0.5	0	0	0.5	1	N	N	rolling
.	pool	0	0	50	30	20	0.5	0.25	0.25	2	1	0.75	0	1	0.75	0.5	0.75	Y	veg/rock	sd.	0.5	0	0	0.5	1	N	N	rolling
.	oxbo	100	0	0	0	0	0.25	0	0.75	0.5	1	2.5	0	1.5	2	0	0	Y	veg/rock	N	0	0	0	0	2	N	N	meso
.	run	0	0	80	20	0	0.1	0	0	1.5	1.5	1.5	0	0.5	1.5	1	0.25	Y	veg/bank	ct/sd.	0.25	0	0	0.25	1	n	y	wideval
2.5	oxbo	100	0	0	0	0	0	0	0.75	1.5	0.75	1	0	0	0.75	0.1	1.5	Y	veg	N	0.25	0	0	0.25	1	N	N	narrow
.	pool	0	0	100	0	0	0.25	0	0.25	1.75	1	0	0	0.25	2	0.25	2	Y	veg/bank	N	0.5	0	0	0.75	2	.	Y	rolling
.	pool	0	0	0	0	100	0.1	0	0.25	2	0	1.5	0	0.25	1	0.5	2	Y	veg/rocks	Y	0.25	0	0	0.5	1	N	N	rolling
.	pool	0	0	0	0	100	0.25	0	1	2	0.25	0	0	1.5	2	1.5	0.25	Y	veg/rock	Ytiny	0.25	0	0		2	N	N	wideval
.	pool	0	0	0	100	0	0.25	0	0.5	2.5	0.25	0.5	0	1	2	1	2.5	Y	veg	N	0.25	0	0	0.25	2	N	N	rolling
15	pond	85	0	0	0	15	0.5	0.5	0.75	2.5	0.25	0	0	0.25	1.5	2.75	0	Y	veg	N	1.5	0	0	2	2	N	N	rolling
.	.	0	0	50	0	50	1	1.25	0.5	0.25	1.5	0	0	0.25	.	.	.	.	.	.	0.75	0	0	1.25	.	.	.	wideval
	pool	50	0	30	0	20	0.5	0.25	0.25	1.5	0.75	0	0	0.5	0.25	0.75	0	Y	Veg/rock	N	0.5	0	0	0.75	2	N	N	wideval
	pool	20	0	30	40	10	1	0	1	1.5	0.5	0	0	0.5	0.75	2	0	Y	veg/rock	N	0.5	0	0	1.25	3	N	N	meso
	pool	50	0	50	0	0	1	0.25	1	1.5	0.25	0	0	1	0.25	0.25	0	Y	veg	N	0.75	0	0	1.5	2	N	N	meso
	pool	0	0	0	0	100	0	0.25	0.75	1.5	1	0	0	0.25	1	1	0	Y	veg/rock	N	0.25	0	0	0.5	1	N	N	meso
.	.	0	0	90	0	10	1.25	0	1	2	0.25	0	0	0.25	.	.	.	.	.	.	0.5	0	0	1	2	N	N	meso
15	pond	100	0	0	0	0	0.1	1	0.5	1.5	0.5	0.25	0	0.1	2	1	0	Y	veg	N	2	0.5	0	2	2	N	N	rolling
	run	0	60	20	0	20	0.5	0.75	0.5	0	0.75	0	0	0.25	0.25	1.5	0	Y	veg/rock	N	0	0	0	0	3	N	N	.
	run	40	0	20	40	0	0.25	0.5	1.5	0.5	1	0	0	0.25	0.25	0.25	0	Y	veg	N	0.75	0	0	0.5	2	N	Y	wideval
	pool	10	0	60	20	10	0.75	0.5	1	0.75	0.75	0	0	0.1	0.5	0.5	0	Y	veg	N	0.75	0	0	0.5	3	N	N	wideval
.	.	0	0	70	10	20	1.5	0.75	0.5	0.25	0.5	0	0	2.5	.	.	.	.	.	.	0.5	0	0	0.5	4	N	N	narrow
	run	20	0	0	50	30	1	0.5	0.5	0.5	1.5	1.5	0	0.5	0.5	1	2.5	Y	veg/rock	N	0.1	0	0	0.25	2	N	Y	meso
	run	0	30	20	10	40	0.5	0.25	0.5	1	1	0.5	0	0.5	1.5	1.5	2	Y	veg/rock/bran	Y	1	0	0	1.5	2	N	Y	meso
	run	0	30	40	0	30	0	0.25	1	0.25	1	0.5	0	1	0.5	1.5	2	Y	veg/rock	N	0.5	0	0	0.5	1	N	N	meso
	riffle	0	0	100	0	0	0	0.25	1.5	2	0.25	1.5	0	1	1.25	0.5	1	Y	veg	ra	0	0	0	0	1	N	Y	narrow
	run	0	0	0	0	100	0	0	0	0	0	3	0	3	0	0	0	Y	rock		0	0	0	0	1	N	N	narrow
	run	95	0	0	0	5	0	0	0.75	0.5	2	2	0	0.5	0.5	0	0.25	Y	rock	ra	0.25	0	0	0.25	1	N	N	meso

len.	water	substrate					Streamside environment								aquatic veg.				Hideaway	fish	Grazing							Topo
	body	silt	sand	grav	cobb	rock	sage	gras	forb	reed	bare	willo	cotw	rock	emer	subm	alga		type	seen	ovrall	grass	shrub	P&P	hydr	dnct	Latrl	
	run	0	0	100	0	0	0	0.5	0.5	0.25	2	1.5	0	0	0.1	0.1	0.5	Y	veg/branches	bt	1.5	0	0	1	2	N	N	wideval
.	.	90	0	0	0	10	0.1	0.5	1	1.5	0	0	0	0.25	.	.	.	Y	Veg/rock	N	0	0	0	0	2	N	N	rolling
	run	100	0	0	0	0	0	0	0.25	2.5	0.25	0	0	0	0.5	1	0.25	Y	veg	Y	1.75	0	0	2	1	N	N	rolling
	run	50	0	0	50	0	0	0	0.5	1	0	0	0	0	0.25	0.5	0	Y	veg	Y	0.5	0	0	1	2	N	Y	rolling
	run	100	0	0	0	0	0.5	0.5	0.5	1.5	1	0	0	0	0.25	1.5	0	Y	veg	Y	1.25	0	0	1	2	N	N	rolling
	run	75	20	0	30	0	0	0.25	0.25	1	1	1	0	0	0.5	1.25	0	Y	veg	Y	1.5	0	0	1	2	N	N	rolling
	run	0	5	0	0	95	0.1	0.25	0.5	1.25	0	1	0	0	0.5	0.5	0	Y	veg/rock	Y	0.5	0	0	0.75	2	N	N	wideval
	run	50	10	40	0	0	0	0.1	0.25	0.5	1	1.5	0	0	0	0.5	0	Y	ov'rhangbranc	Y	0.5	0	0	0.5	2	N	N	wideval
6	oxbo	100	0	0	0	0	0	0.1	0.5	1.5	0.25	1.5	0	0.1	0.5	2	0	Y	veg	N	0.25	0	0	0.25	2	N	N	wideval
.	.	100					2	0	0.5	0.5	0	2	0	0	.	.	.	Y	veg		0	0	0	0	2	N	N	wideval
	pool	100	0	0	0	0	1	0.5	0.75	1.5	0.5	0	0	0	3	0	0	Y	veg	N	2.75	2	0	3	2	N	N	rolling
15	pond	100	0	0	0	0	0.5	1.5	0.5	1.5	0.25	0	0	0	1.75			Y	veg	N	0.75	0	0	0.5	3	N	N	rolling
.	pool	100	0	0	0	0	0	0.25	1	2.5	0.5	1	0	0	3	1.5	0.5	Y	Veg/branches	N	1	0	0	1.5	1	N	N	rolling
.	riffle	50	0	50	0	0	0	0.5	0.5	1.5	1	0	0	0	1.5	0.5	0	Y	veg/rock	N	0.5	0	0	0.5	2	N	N	rolling
3	oxbo	70	0	30	0	0	0	0.25	0.25	2	0.25	0	0	0	2	0	0	Y	veg	N	1	0	0	1.25	1	N	N	rolling
75	pond	100	0	0	0	0	0.5	0.5	0.25	1	0.25	0	0	0	1	0	0	Y	veg/murkywte	N	1.5	0	0	2	2	N	N	rolling
.	run	50	0	0	0	50	0	0.1	0.25	1.5	0.1	2	0	0.25	0.5	0.25	0	Y	veg	Y	0.25	0	0	0.5	1	N	N	wideval
.	run	30	0	0	0	70	0	0	1	1.5	0	2	0	0	0.5	0.25	0.5	Y	veg/branches	Y	0.25	0	0	0.25	1	N	N	wideval
.	run	10	0	20	0	70	0	0.25	0.25	1.5	0	1.5	0	0.5	0.5	0.25	0	Y	veg/rock	Y	0.25	0	0	0.5	1	N	N	wideval
.	run	30	0	50	0	20	0.5	1	0.25	0.5	1.5	1.5	0	0	0.25	0.1	0	Y	banks/rock	Y	0.5	0	0	0.5	2	N	Y	wideval
.	riffle	10	0	90	0	0	0.5	1	0.5	1	0.75	1.5	0	0.25	0.5	1.5	0	Y	veg/branch	Y	0.5	0	0	0.75	2	N	N	wideval
.	run	0	0	0	0	100	0.25	0.25	0.5	0.5	1	0.75	0	0.5	0.5	1	0	Y	veg/rock	Y	0.5	0	0	0.25	2	N	Y	wideval
.	pond	100	0	0	0	0	0	0.5	0.5	1.5	1	0	0	0	.	.	.	Y	veg	N	1	0	0	1	2	N	N	rolling
.	riffle	0	0	10	0	90	0	1	0.75	0.1	0.5	1	0	1.5	0.5	0.5	0	Y	rock/ov'rhang	Y	0	0	0	0		N	N	wideval
4.5	oxbo	25	30	0	0	50	0	0.5	0.25	2	2	1	0	0.5	2.5	0	0	Y	veg	N	0.28	0	0	0.5	2	N	N	wideval
.	run	0	5	5	0	90	0	0.25	0.25	1	0.25	1.5	0	1	0	0	0	Y	rock/branch	Y	0.25	0	0	0.25	2	N	N	wideval
.	run	0	10	0	40	50	0.1	0.1	0.5	0.75	1	1	0	1	0	0	0	Y	bank/rock	Y	0	0	0	0	2	N	Y	wideval
.	riffle	5	10	5	0	80	0.25	0.25	0.1	0.25	1	0.75	0	2	0	0	0	Y	rock/branch	Y	0.1	0	0	0.25	2	N	N	wideval
.	riffle	10	40	0	40	20	0	0.1	1.5	0.75	0.5	1	0	0.25	0.5	0	0	Y	rock/branch	Y	0	0	0	0	2	N	N	meso
.	riffle	10	0	0	0	90	0	0.25	2	1.5	0	1.5	0	1.5	0.5	1	0.5	Y	veg/rock/ov'rh	Y	0	0	0	0	2	N	N	wideval
.	run	0	30	0	30	30	0.25	0.1	0.25	1.5	0.25	1.5	0	1	0.5	0.5	1	Y	veg/rock	Y	0.1	0	0	0.25	2	N	N	wideval
12	pond	100	0	0	0	0	0	1	1.5	2.5	0	0.25	0	0	0.5	2.5	0	Y	veg	N	0.25	0	0	0.5	2	N	N	rolling
.	pool	90	10	0	0	0	1.5	0.25	0.25	1.5	0.5	0	0	0	.	.	.	Y	veg	N	0.75	0	0	1	2	N	Y	rolling
.	pool	100	0	0	0	0	1.5	0.25	0.5	2	1.5	0	0	0	1.5	1.5	0	Y	veg/bank	N	1	0	0	1.25	2	N	Y	wideval
.	pool	90	10	0	0	0	0.5	0.5	0.25	1.5	0.5	0	0	0	1	1.5	0	Y	veg	Y	0.75	0	0	1	2	N	Y	rolling
.	pool	100	0	0	0	0	1	0.5	0.1	1	0.75	0	0	0	0.5	0	0	Y	veg/murky wte	N	0.5	0	0	1	2	N	Y	rolling
.	pool	100	0	0	0	0	0	0.5	0.25	2	0.1	0	0	0	0.25	0.5	0	Y	veg/murkywte	Y	0.25	0	0	0.5	1	N	N	wideval
.	pool	50	0	50	0	0	0	0.5	0.25	1.75	0.75	0	0	0	0.5	1	0	Y	veg	N	1	0	0	1.5	2	N	Y	rolling
.	pool	10	0	0	0	90	0.25	0.1	0.25	1.5	0.25	0	0	0.5	0.5	0.25	0	Y	veg/rock	N	0.25	0	0	0.5	2	N	N	wideval
.	run	0	0	0	0	100	0	0.25	0.25	1.5	0.25	2	0	1	0.25	0.1	0	Y	veg/rock	Y	0	0	0	0	2	N	N	meso
12	pond	100	0	0	0	0	0.1	0.25	0.25	1.75	0.25	0	0	0	1	2	0	Y	veg	N	0.5	0	0	1	2	N	N	wideval
40	pond	100	0	0	0	0	1	0.5	0.25	0.5	1	0	0	0.2	0.25	2	0	Y	veg	N	1.75	2.5	0	2	3	N	N	rolling
30	pond	100	0	0	0	0	0	0.5	0.25	0.5	1.5	0	0	0.1	0.25	1.5	0	Y	veg/murky wte	N	1	0	0	1.25	2	N	N	wideval
2	oxbo	70	20	0	10	0	0	0.1	0.2	1	1.5	0	0	1	1.25	1	0	Y	veg	N	1.75	2	0	1	1	N	N	wide va
.	run	0	50	0	50	0	0	0.75	0	2	0	1	0	0	1	1.5	0	Y	veg	Y	1.75	2	0	1.5	1	N	N	meso
.	pool	70	0	10	20	0	0	0.25	0	1.5	0.25	1.25	0	0.25	1	1.5	0	Y	veg/cobble	Y	1.5	1.5	0.25	1	1	N	N	meso
.	pool	100	0	0	0	0	0.5	0.25	2	2	0	0.5	0	0	1.5	0	0	Y	veg	Y	1	0	0	1.5	2	N	N	meso
.	pond	30	30	20	10	10	1	0.25	0	2	1.5	0.25	0	0.25	2	2.5	0	Y	veg	N	1.75	0	0	2	1	N	N	rolling
.	oxbo	0	100	0	0	0	1	1	0	1.5	0.5	0	0	0	1	1.75	0	Y	veg	Y	2.5	2.5	1	2.5	2	N	N	wideval
.	riffle	0	10	0	90	0	0.5	0.5	0.5	1	0.25	0.75	0	0.75	0.5	0	2.75	Y	rock	Y	0.5	0.5	0	0.75	2	N	N	meso
.	oxbo	85	0	15	0	0	0.75	1	0	2	0.5	0.5	0	0	1.5	1.5	0.75	Y	veg	Y	2.5	3	2	3	1	N	Y	meso
.	oxbo	95	0	0	0	5	0	0.5	0	1	0.75	1.5	0	0	0.5	1	1	Y	veg/bank	Y	2	3	2	2	1	N	Y	meso
.	pool	0	0	75	0	25	0.25	1	0	1.5	0	1.75	0	1.5	0.25	0	2	Y	veg/bank	Y	1.5	3	2	1.5	1	N	Y	meso

len.	water	------substrate					------		Streamside environment						----aquatic veg.---			Hideaway	fish	------			Grazing				Topo
	body	silt	sand	grav	cobb	rock	sage	gras	forb	reed	bare	willo	cotw	rock	emer	subm	alga		type	seen	ovrall	grass	shrub	P&P	hydr	dnct	Latrl	
.	oxbo	0	0	75	0	25	0.75	0.25	0	1.5	0.5	2	0	1	1	2	0.25	Y	veg	sd	0.5	0	0	0.5	1	N	Y	meso
.	pool	95	0	5	0	0	0.25	0.5	0.75	2	0.75	1	0	0.5	0.75	1.5	0.5	Y	veg/bank	rs	1	1	1	1	1	N	N	meso
.	pool	0	0	80	0	20	0.75	0.25	1	2	1	1	0	0.25	2	2	0.25	Y	veg	su/rs	0.5	1	1	0.5	1	N	N	meso
.	run	0	0	0	0	100	0.25	0.25	1	1.5	0	2	0	2	0.25	0	1.5	Y	rock	sd/rs	0.25	0	0.25	0	1	N	N	narrow
.	pool	0	0	10	90	0	0	0	1	1	0.5	0.5	0	1.5	0.25	0.25	2	Y	bank	Y	1	0	0.5	0.5	1	N	Y	narrow
.	pool	10	0	60	0	30	0.25	0.5	0.5	0.75	0.25	0.25	0	2.75	0.25	0	0	Y	rock	sd/rs	1	1	1.5	1	1	N	Y	narrow
.	riffle	95	0	0	0	5	0.75	1	0.5	2	0.5	0.5	0	0.25	1.5	3	0	Y	veg	N	1.75	2.75	2	1	2	N	N	meso
.	run	40	0	45	0	5	2.75	0.5	0.25	0.25	1.5	0	0	0	0.5	0.25	0	Y	rock	N	2.75	3	0.25	3	4	Y	Y	meso
.	run	0	0	10	0	90	1	0.25	0.5	0	1	0	1.5	0.5	0	0.25	0	Y	rock	Y	1.5	3	0	1.75	2	Y	Y	meso
.	pond	100	0	0	0	0	0	1	1	2.5	0	0	0	0	3	0	2	Y	veg	N	0.5	0	0	1	1	N	N	rolling
.	pond	100	0	0	0	0	0	2.5	2	0	0.25	0	0	0	3	0	2	Y	veg	N	2.5	0	0.5	1.25	1	N	N	rolling
.	pool	0	0	0	0	100	0.75	1.5	1	2.5	0	0	0	0	2	2.5	1	Y	veg/bank	N	0	0	0	0	2	Y	N	wideval
.	pool	0	0	0	0	100	0.5	0.75	0.5	1.5	0.25	2	0	0.5	0.25	2.5	1.5	Y	veg	N	0.5	0	0	0.25	1	N	N	wideval
.	pool	0	0	0	0	100	1	1	0.75	3	0	0	0	0	1	3	1	Y	veg	N	1	0	0	0.5	1	N	N	wideval
.	run	100	0	0	0	0	0	1	0.5	3	0	0	0	0	1	0	0	Y	veg	N	0.75	0	0	1	1	N	N	wideval
.	pool	0	0	0	0	100	0.5	1	0.75	2	0	1	0	1.5	0.5	0.75	1	Y	veg/rock	N	1	.	.	.	.	.	.	.
.	riffl	0	0	0	100	0	0.25	0.5	1.5	1.5	0.5	1.5	0	1.25	0.5	0	0.25	Y	veg/rock	N	1.5	0	0	0.25	1	N	N	wideval
.	run	0	0	5	95	0	0	0.5	0.25	0	0.25	2.75	0	0.75	0.25	0	0	Y	rock	rb/sd	0	0	0	0	1	N	N	wideval
.	run	0	0	5	95	0	0.25	0.75	0.5	0.5	0.25	1.25	0	0.5	0.75	0	0	Y	rock	rb/sd	0	0	0	0	2	N	N	wideval
.	run	0	0	5	95	0	0	1	0.5	0.25	0	2	0	2	0	0	0.25	Y	rock	rb/sd	0	0	0	0	1	N	N	meso
.	run	0	0	0	0	100	0	0.75	0.5	0.25	0.25	1	0	2	0	0	0.25	Y	rock	rb/sd	0	0	0	0	1	Y	N	meso
.	run	0	10	0	20	70	0	0.5	0.25	0.5	0.25	2.25	0	0.5	0.25	0	1	Y	bank/rock	rb/sd	0	0	0	0	1	N	N	meso
.	riffl	0	0	5	95	0	0.25	0.25	0.25	0	0	1	1	0.5	0	0	1.5	Y	veg/rock	rb/sd	0	0	0	0	2	N	N	meso
.	run	0	25	0	75	0	0.25	1	0.75	1	0	2	0	0.5	0.75	0.5	0.75	Y	bank/rock	rb/sd	1.5	2.75	1.5	1	1	N	N	meso
.	riffle	10	0	50	40	0	0.25	1.5	0.25	0.5	0.25	1.5	0	0	0.5	0.5	0.5	Y	veg/rock	rb/sd/	2.25	2.75	1.75	1	1	N	Y	meso
.	run	50	0	40	10	0	0	0.25	0.25	0	1.5	1	0	0.5	0	0	0	Y	rock/ovrhangd	rb/sd	3	1.5	0.5	1.5	1	Y	N	meso
.	pool	10	0	70	10	10	0	2.5	0.5	1.25	0	1.75	0	0.5	0.75	0.25	0.5	Y	veg/rock		2	2.75	1.5	1.75	1	N	Y	meso
.	run	0	0	50	50	0	0.25	2.5	1	1	1	1	0	0	0.75	1	0.25	Y	rock		2.5	2.5	1	1.75	2	N	Y	meso
.	pond	95	0	0	0	5	0.25	0.75	0.25	0	1	0	0	0.75	0	0	0	Y	murky water	N	0	0	0	0	2	N	N	.
.	pond	100	0	0	0	0	1.75	0.25	0.75	2.5	0.75	0.25	0	0	1.75	2	0	Y	veg	N	0.25	0	0	0.1	3	N	N	wideval
.	run	30	0	20	50	0	1	1.5	0.5	0.5	0.5	2	0	1	0.5	1	1	Y	veg	rb/sd	0	0	0	0	2	N	Y	meso
.	pool	90	0	10	0	0	0.25	1.5	0.5	1.25	0.75	1	0	0	1	1.25	0.5	Y	veg/dead tree	rb	0	0	0	0	2	N	Y	meso
.	run	0	0	45	50	5	1.5	2	1	1	0.5	1	0	0.5	1	1	1.75	Y	veg/rock	rb/sd/	0	0	0	0	3	N	Y	meso
.	run	0	0	35	60	5	0.75	1.5	0.75	1.5	0	0.75	0	1	0.75	1.5	0.25	Y	veg/rock	rb/sd/	0	0	0	0	2	N	N	meso
.	run	0	10	10	70	10	0	0	0.25	1	0.25	0.5	0	2.75	0.25	0	0	Y	rock	rb/su	0	0	0	0	1	N	N	narrow
.	run	0	15	10	50	25	0	0	0.5	1	0.75	0.25	0	2.75	0.25	0	0.5	Y	rock	rb/su	0	0	0	0	1	N	N	narrow
.	run	0	10	5	65	20	0	0.25	0.25	0.75	0.5	1.5	0	1	0	0	0.5	Y	rock	rb/sd/	0.75	1	0	0.5	1	N	N	meso
.	run	0	10	5	70	15	0	0.25	1.5	0.75	0.25	1.25	0	1.5	0.25	0	0.25	Y	rock	rb/sd/	0.25	0	0.25	0.75	1	N	N	meso
5	pond	0	0	0	95	5	1	1	2	0.5	0.5	0	0	0.25	0.25	2.5	1	Y	veg/rock	sd/rs	0	0	0	0	3	N	Y	rolling
30	pond	0	0	50	50	0	1	2	2	1.5	0.5	0	0	0	1	2.5	1	Y	veg	rs	0	0	0	0	3	N	N	rolling
.	pond	50	0	25	25	0	1.5	1	1.5	1	1	0	0	0.5	0.5	1.5	1.5	Y	veg	N	0	0	0	0	3	N	Y	rolling
.	riffle	20	0	80	0	0	0.25	0.75	1.25	0	1.25	2.25	0	0	0.25	0	0.25	Y	veg	rb/sd/	0.25	0	0	0.25	1	N	Y	wideval
.	pool	20	0	80	0	0	0.25	2	1.5	1.5	0.25	1.5	0	0	1	2.5	1.75	Y	veg	Y	0.5	0	0	0.75	2	N	Y	meso
.	pool	60	0	0	0	40	0.5	2.25	0.75	0.25	1	0.25	0	0.75	0.75	0	0	Y	veg	N		0	0	0.25	3	N	N	meso
.	run	0	0	20	40	40	0	1.25	0.25	1.5	0.5	2	0	1	0.5	0.25	2.25	Y	veg/rock	su	0.25	0	0	0.25	1	N	N	meso
.	pool	50	0	40	0	10	0.25	1.5	0.75	1.5	0.25	1	0	2	0.5	0.25	0	Y	rock	su	0.25	0	0	0.25	2	N	N	meso
.	pool	0	0	50	40	10	0	1	0.5	1.5	0.75	1.75	0	0.75	0.25	1.5	2	Y	veg/rock	N	0.25	0	0	0	1	N	N	meso
.	pool	60	0	5	10	15	0	1.5	1	1	0.5	1.5	0	1.5	0.25	1	0	Y	veg/rock	su	0	0	0	0	2	N	N	meso
.	pool	60	0	0	20	20	0	1.75	1	1.5	0.25	1.5	0	0.5	0.5	2.25	0.25	Y	veg/rock	Y	0.75	0	0	0.5	2	N	N	meso
.	run	0	0	80	0	20	0.5	2.25	1.25	1.5	0	0.75	0	0.5	0.75	2.5	0	Y	veg	su	0	0	0	0	3	N	N	meso
.	run	0	0	0	0	100	0.25	1	0.75	1	0	0.75	0	2.75	0.75	0.5	0.75	Y	veg/rock	su/rs	0	0	0	0	3	N	N	narrow
.	pool	0	0	0	0	100	0.25	2.25	0.5	2.25	0	0	0	1	1.25	0.5	1.75	Y	veg	N	0.25	0	0	0.5	2	N	N	meso
.	riffle	50	0	45	0	5	1.5	0.25	0.25	0.25	2.25	0	0	0.5	0.25	0.25	0.5	Y	rock	N	1.25	0	0.5	0.75	3	N	N	meso

len.	water	----substrate----					----------		Streamside environment----------						-----aquatic veg.—				Hideaway	fish	----------			Grazing----------				Topo
	body	silt	sand	grav	cobb	rock	sage	gras	forb	reed	bare	willo	cotw	rock	emer	subm	alga		type	seen	ovrall	grass	shrub	P&P	hydr	dnct	Latrl	
.	pool	40	0	40	20	0	0.5	1.5	0.5	2	1.5	1.5	0	0.25	1.5	0.25	0.25	Y	veg/rock	rb	0	0	0	0	2	N	Y	wideval
.	riffle	20	0	50	30	0	0.25	0.5	0.5	0.75	2.25	1.5	0	0.5	0.5	0.5	0.25	Y	veg/rock	rb	1.75	2.5	0.25	1	2	N	Y	meso
.	run	50	0	50	0	0	0	1	0.75	0.25	2.25	1	0	1.5	0.5	0	0.25	Y	veg	rb	1.5	1	0.5	1	3	N	Y	meso
.	run	5	0	75	20	0	0	0.5	0.75	0.25	0.5	1	0	2	0.75	0	0.25	Y	veg/rock	rb	1	0.75	0	0.5	2	N	Y	meso
15	pool	0	100	0	0	0	0.5	1.25	0.25	1.25	1	1.5	0	0	0.5	1	0.5	Y	veg	rb/sd/	2	2.5	1.75	2	2	N	Y	meso
.	pool	0	100	0	0	0	0	1.75	0.5	1.5	0.75	1	0	0	0.25	1.25	0.25	Y	veg	rs	2	2	0.25	2	1	N	Y	meso
.	run	0	0	0	0	100	2.75	0.5	0.5	0.5	0.5	1.5	0	0.5	0	0	0	Y	rock	N	2	3	0.5	2.25	3	Y	Y	wideval
.		50	0	0	50	0	1.5	1.5	0.5	1	1	1.5	0	0	.	.	.	.	.	.	2.5	2.25	0	2.75	3	Y	Y	wideval
.	pool	90	0	0	0	10	1.5	0.5	0.25	0.75	0.5	1	0	0.75	0.75	1	0	Y	veg/rock	N	2	2.75	2.5	1.75	3	N	Y	wideval
4	pool	90	0	0	0	10	0.5	2.5	0.25	1	0	0.25	0	0.75	1.5	2.75	0	Y	veg	N	2.5	3	2.75	2	2	N	N	wideval

Appendix B: UTM coordinates of 1993 and 1994 spotted frog sites						
	1993				**1994**	
A3	526635	4714047		B7	537150	4715700
A4	526635	4714066		B9	520882	4712714
A5	526649	4714080		B11	521776	4712969
A6	526557	4713849		B12	521789	4712965
A7	526576	4713857		B26	530357	4708068
A9	526314	4713735		B27	530357	4708088
A10	526325	4713746		B29	530357	4708128
A11	526138	4713702		B31	529986	4708194
A12	526143	4713701		B32	530284	4708228
A13	525916	4713736		B33	530212	4708300
A14	525922	4713737		B35	530284	4708519
A16	525551	4713589		B48	529376	4729332
A17	526693	4714192		B50	528798	4729830
A47	538424	4726939		B51	528790	4729813
A50	538100	4728153		B56	530621	4741425
A51	537869	4728625		B57	530544	4741390
A52	537976	4728683		B58	530367	4741321
A53	537836	4728947		B59	530233	4741221
A55	537770	4729022		B60	529921	4740744
A56	537389	4729725		B62	529833	4740644
A66	526685	4714228		B63	529690	4740617
A67	526696	4714247		B99	525750	4738764
A68	526847	4714597		B148	501822	4758571
A70	520858	4712677		B166	530086	4740898
A71	521111	4712858		B167	530098	4741144
A72	521182	4712883				
A74	521193	4712885				
A75	521196	4712889				
A77	521501	4712947				
A101	535000	4712800				
A102	534900	4712400				
A112	524472	4710125				
A144	536900	4716200				
A145	536900	4716100				
A147	536900	4716100				
A151	530444	4707525				
A152	530556	4707326				
A155	531700	4707000				
A159	535000	4708300				
A193	525458	4716742				
A204	525914	4713736				

Appendix C. Revised locations and National Wetland Inventory designations for summer 1993 data

tran-sect #	Location by Section ¼of	¼of	¼of	sec	TS	RA	Date	Time	NWI
1	SE	SW	SW	26	8S	1W	18-May-93	1350	
2	SE	SE	SE	8	8S	1W	18-May-93		PEMCH
3	NW	SE		3	10S	3W	19-May-93	0815	R3UBH
4	NW	SE		3	10S	3W	19-May-93	0815	PSSC
5	NW	SE		3	10S	3W	19-May-93	0850	R3UBH
6	NW	SW	NE	3	10S	3W	19-May-93	0910	R3UBH
7	NW	SW	SE	3	10S	3W	19-May-93	0915	REUBH
8	NE	SE	SW	3	10S	3W	19-May-93	0930	PSSC
9	NE	SE	SW	3	10S	3W	19-May-93	1015	R3UBH
10	NE	SE	SW	3	10S	3W	19-May-93	1023	R3UBH
11	NE	SE	SW	3	10S	3W	19-May-93	1030	PSSC
12	NE	SE	SW	3	10S	3W	19-May-93	1035	PSSC
13	NE	SE	SW	3	10S	3W	19-May-93	1040	PSSC
14	NE	SE	SW	3	10S	3W	19-May-93	1100	PSSC
15	NE	SE	SE	4	10S	3W	19-May-93		PSSC
16	NE	SE	SE	4	10S	3W	19-May-93	1545	PSSC
17	SE	SW	NE	4	10S	3W	20-May-93	0830	PSSC
18	SE	NE	SE	8	10S	3W	20-May-93	1000	PSSA
19	SE	NE	SE	8	10S	3W	20-May-93	1035	PSSA
20	SE	NE	SE	8	10S	3W	20-May-93	1315	PSSA
21	SW	NE	SE	8	10S	3W	20-May-93	1435	PSSA
22	NW	SW	SW	6	10S	3W	20-May-93	1700	PSSC
23	NE	SE	SW	26	9S	2W	20-May-93	0800	
24	NW	SW	SW	11	8S	1E	21-May-93	0923	R4SBF
25	NW	SW	SW	11	8S	1E	21-May-93	0923	R4SBF
26	NE	SW	NW	11	8S	1E	21-May-93	1000	R4SBF
27	NW	NE	NW	11	8S	1E	21-May-93	1050	R4SBF
28	SW	SE	SW	2	8S	1E	21-May-93	1130	R4SBF
29	NW	SE	SW	2	8S	1E	21-May-93	1200	R4SBF
30	NW	NW	NE	10	8S	1E	21-May-93	1040	R4SBF
31	SW	NE	NE	10	8S	IE	21-May-93	1050	R4SBF
32	SW	NE	NW	11	8S	1E	21-May-93	1100	R4SBF
33	NW	NW	SW	13	8S	2W	24-May-93	1430	
34	SW	NW	NE	14	8S	2W	24-May-93	1500	R4SBA
35	SW	NW	SW	14	8S	2W	24-May-93	1540	PSSC
36	SW	NW	SW	14	8S	2W	24-May-93	1603	R3UBH
37	SE	SE	NW	14	8S	2W	24-May-93	1647	PSSC
38	SE	NW	NW	30	8S	2W	24-May-93	1847	PEMC
39	NE	NE	NE	14	8S	2W	25-May-93	0935	
40	NW	NW	NE	14	8S	2W	25-May-93	1000	R4SBA
41	NE	SW	SE	11	8S	2W	25-May-93	1035	
42	NE	NE	NE	12	8S	2W	25-May-93	1440	R4SBA
43	NE	NE	NE	12	8S	2W	25-May-93	1450	PUBFH
44	SE	NE	NE	23	8S	2W	25-May-93	1700	R4SBA
45	NW	NE	NE	35	8S	2W	26-May-93	0900	PSSC
46	NE	SE	SE	26	8S	2W	26-May-93	0935	PSSC
47	NE	SE	SE	26	8S	2W	26-May-93	1057	PSSC
48	NE	NE	SE	26	8S	2W	26-May-93	1025	PSSC
49	NW	NE	NE	26	8S	2W	26-May-93	1200	PSSC
50	NE	NW	NE	26	8S	2W	26-May-93	1305	PSSC
51	NW	SW	SE	23	8S	2W	26-May-93	1314	PEMC
52	NW	SW	SE	23	8S	2W	26-May-93	1400	PEMC
53	NW	NW	SE	23	8S	2W	26-May-93	1434	PEMC
54	NW	NW	SE	23	8S	2W	26-May-93	1452	PEMC

Appendix D. Incidental sightings of reptiles and amphibians during the course of the spotted frog survey.

GENUS	SPECIES	STATUS	DATE	TIME	LOCATION	LEGAL LOCATION	
Amphibans							
Bufo	boreas	Alive	24-May-94	1409	Camel cr. on gravel bank	SW 1/4 of SE 1/4 of NE 1/4 ofS25 T10S R3W	
Bufo	boreas	Alive	31-May-94	1504	On grassy bank-jumped in	SE NW NE S13 T7S R3W	
Bufo	boreas	Kept	02-Jun-94	922	On gravel bank	SE SE SW S21 T9S R5W	
Bufo	boreas	Alive	20-Jun-94	1243	On grassy bank-jumped in	SE NW S8 T10S R3W	
Bufo	boreas	Alive	20-Jun-94	1327	On grassy bank-jumped in	SW NE S7 T10S R3W	
Bufo	boreas	Alive	31-May-94	1132	On grassy bank	SE NE SE S26 T5S R1W	
Lizards							
Cnemidophoris	tigris	Alive	03-Jun-94	1025	At Fossil Butte rest stop	NE SE S4 T4S R1W	
Cnemidophoris	tigris	Alive	03-Jun-94	1026	At Fossil Butte rest stop	NE SE S4 T4S R1W	
Cnemidophoris	tigris	Alive	03-Jun-94	1039	On road	NW NW S20 T4S R1E	
Cnemidophoris	tigris	Alive	03-Jun-94	1049	On road	SW SW S17 T4S R1E	
Cnemidophoris	tigris	Alive	03-Jun-94	1053	On road	NE SW S17 T4S R1E	
Cnemidophoris	tigris	Alive	03-Jun-94	1216	On road	SW SW S32 T4S R1E	
Gambelia	wislizenii	Alive	03-Jun-94	1004	On plateau road	NE SE S28 T4S R1E	
Gambelia	wislizenii	Alive	03-Jun-94	1009	On plateau road	NE SE S28 T4S R1E	
Gambelia	wislizenii	Alive	03-Jun-94	1004	On plateau road	NE SE S28 T4S R1E	
Phrynosoma	platyrhinos	Alive	03-Jun-94	1105	On road	SW NE S17 T4S R1E	
Phrynosoma	platyrhinos	Alive	03-Jun-94	1115	On road	NW NW S16 T4S R1E	
Phrynosoma	platyrhinos	Alive	03-Jun-94	1117	On road	NW NW S16 T4S R1E	
Sceloporus	graciosus	Alive	23-May-94	1740	Sunshine valley in rocks	NE SW NW S24 T10S R3W	
Sceloporus	graciosus	Alive	24-May-94	1659	Camel cr. plateau	NE NE NE S25 T10S R3W	
Sceloporus	graciosus	Alive	24-May-94	1659	Camel cr. plateau	NE NE NE S25 T10S R3W	
Sceloporus	graciosus	Alive	24-May-94	1704	Camel cr. plateau	NE NE NE S25 T10S R3W	
Sceloporus	graciosus	Alive	24-May-94	2046	At Mudflat guard station		
Sceloporus	graciosus	Alive	25-May-94	845	Rocks above Current cr.	NW NW S8 T10S R3W	
Sceloporus	graciosus	Alive	25-May-94	845	Rocks above Current cr.	NW NW S8 T10S R3W	
Sceloporus	graciosus	Alive	25-May-94	845	Rocks above Current cr.	NW NW S8 T10S R3W	
Sceloporus	graciosus	Alive	25-May-94	924	Rocks above Current cr.	NW NW S8 T10S R3W	
Sceloporus	graciosus	Alive	25-May-94	924	Rocks above Current cr.	NW NW S8 T10S R3W	
Sceloporus	graciosus	Alive	25-May-94	924	Rocks above Current cr.	NW NW S8 T10S R3W	
Sceloporus	graciosus	Alive	25-May-94	924	Rocks above Current cr.	NW NW S8 T10S R3W	
Sceloporus	graciosus	Alive	25-May-94	1623	Sagebrush flat	SW SW S35 T10S R4W	
Sceloporus	graciosus	Alive	26-May-94	951	Under log near dry creek bed	NE SE S24 T10S R3W	
Sceloporus	graciosus	Alive	01-Jun-94	1630	On talus slope	SE NE NE S34 T10S R5W	
Sceloporus	graciosus	Alive	02-Jun-94	1610	On rocky plateau	NE SW SE S15 T9S R5W	
Sceloporus	graciosus	Alive	20-Jun-94	1651	On rocks near stream	SW NW S8 T10S R3W	
Sceloporus	graciosus	Alive	20-Jun-94	1705	On rocks near stream	SW NW S8 T10S R3W	

Sceloporus	graciosus	Alive	20-Jun-94	1717	On rocks near stream	SW NW S8 T10S R3W	
Sceloporus	graciosus	Alive	30-Jun-94	1603	In rocks and sage	SE SW S22 T10S R5W	
Sceloporus	graciosus	Alive	30-Jun-94	1730	In rocks and sage	SE SW S22 T10S R5W	
Sceloporus	grasiosus	Alive	30-Jun-94	1730	In rocks and sage	SE SW S22 T10S R5W	
Sceloporus	occidentalis	Alive	24-May-94	924	Camas cr. on N cliffs	NE NE SW S29 T10S R3W	
Sceloporus	occidentalis	Alive	24-May-94	1121	Camas cr. on N cliffs	SE NE SW S29 T10S R3W	
Sceloporus	occidentalis	Alive	02-Jun-94	1344	In rocks on talus	NW SE SE S15 T9S R5W	
Sceloporus	occidentalis	Alive	02-Jun-94	1532	On large lava rock	NW NW NW 14 T9S R5W	
Sceloporus	occidentalis	Alive	07-Jun-94	1357	On rocks along stream	NW NW NW S33 T2S R3W	
Sceloporus	occidentalis	Alive	07-Jun-94	1359	On rocks along stream	NW NW NW S33 T2S R3W	
Sceloporus	occidentalis	Alive	08-Jun-94	1321	On rocks near water	NE SW S7 T10S R4W	
Sceloporus	occidentalis	Alive	28-Jun-94	1359	On talus rocks	NE NE S24 T4S R3W	
Sceloporus	occidentalis	Alive	28-Jun-94	1413	On rocks next to stream	NW NW S24 T4S R3W	
Sceloporus	occidentalis	Alive	29-Jun-94	1115	On rocks along stream	NE SW S23 T10S R5W	
Sceloporus	occidentalis	Alive	29-Jun-94	1326	In rocks along stream	SE SE S22 T10S R5W	
Uta	stansburiana	Alive	03-Jun-94	1037	On road	NW NW S20 T4S R1E	
Uta	stansburiana	Alive	03-Jun-94	1038	On road	NW NW S20 T4S R1E	
Uta	stansburiana	Alive	03-Jun-94	1041	On road	SW SW S17 T4S R1E	
Uta	stansburiana	Alive	03-Jun-94	1043	On road	SW SW S17 T4S R1E	
Uta	stansburiana	Alive	03-Jun-94	1045	On road	SW SW S17 T4S R1E	
Uta	stansburiana	Alive	03-Jun-94	1052	On road	NE SW S17 T4S R1E	
Uta	stansburiana	Alive	03-Jun-94	1052	On road	NE SW S17 T4S R1E	
Uta	stansburiana	Alive	03-Jun-94	1059	On road	NE SW S17 T4S R1E	
Uta	stansburiana	Alive	03-Jun-94	1107	On road	SW NE S17 T4S R1E	
Uta	stansburiana	Alive	03-Jun-94	1110	On road	NE NE S17 T4S R1E	
Uta	stansburiana	Alive	07-Jun-94	1349	On rocks along stream	NW NW S32 T2S R3W	
Uta	stansburiana	Alive	03-Jun-94	1107	On road	NE NE S17 T4S R1E	
Snakes							
Charina	bottae	Alive	02-Jun-94	1830	On mud flat road	NE SE S16 T8S R1E	
Charina	bottae	Dead	28-Jun-94	1105	On road outside Silver City	SW SW S32 T4S R4W	
Coluber	constrictor	Dead	24-May-94	2100	At Mudflat guard station		
Coluber	constrictor	Alive	02-Jun-94	1148	In high grass on bank	NE SW NW S28 T9S R5W	
Coluber	constrictor	Kept	02-Jun-94	1420	In brush along streamside	SE NE NE S15 T9S R5W	
Coluber	constrictor	Alive	02-Jun-94	1420	In brush along streamside	SE NE NE S15 T9S R5W	
Coluber	constrictor	Alive	02-Jun-94	1420	In brush along streamside	SE NE NE S15 T9S R5W	
Coluber	constrictor	Alive	02-Jun-94	1640	On mud flat road	SW NW NW S36 T9S R5W	
Coluber	constrictor	Alive	02-Jun-94	1844	On mud flat road	SW NW S1 T8S R1E	
Coluber	constrictor	Alive	07-Jun-94	1325	In reeds on stream bank	NW SE S32 T2S R3W	
Coluber	constrictor	Dead	08-Jun-94	1730	On road	SE SW NW S7 T10S R3W	
Coluber	constrictor	Dead	20-Jun-94		On road at Stoneman cr.	SE NW S8 T10S R3W	
Coluber	constrictor	Alive	13-Jul-94	1212	In grassy meadow	NE NE S18 T7S R3W	

Coluber	constrictor	Alive	13-Jul-94	1302	In rocks near talus	SE SE S12 T7S R4W	
Coluber	constrictor	Alive	19-Jul-94	1930	In grass and rocks near stream	SW SW S19 T14S R1W	
Coluber	constrictor	Alive	25-Jul-94	1724	In bush next to pathway	NE SW S27 T2N R5W	
Coluber	constrictor	Alive	25-Jul-94	1726	In undergrowth next to stream	NE SW S27 T2N R5W	
Coluber	constrictor	Alive	01-Jun-94	1740	In brush at streamside	NW SW NE S17 T10S R5W	
Coluber	constrictor	Dead	28-Jun-94	am	On Silver City Road	SW SW S18 T4S R2W	
Coluber	constrictor	Alive	13-Jul-94	1155	In grassy meadow	NE NE S18 T7S R3W	
Crotalus	viridis	Dead	25-May-94	1507	Mudflat rd. west of Stoneman	NE SW S12 T10S R3W	
Crotalus	viridis	Alive	25-May-94	1715	At Deep Creek bridge	SE NW S8 T10S R3W	
Crotalus	viridis	Alive	02-Jun-94	1848	On mud flat road	NE NW S1 T8S R1E	
Crotalus	viridis	Alive	07-Jun-94	1310	Curled up on stream bank	NW SE S32 T2S R3W	
Crotalus	viridis	Alive	08-Jun-94	1145	Between ponds in reeds	NE SW S7 T10S R4W	
Crotalus	viridis	Alive	09-Jun-94	1210	In thick brush and willow	SE NW SW S22 T7S R3W	
Crotalus	viridis	Alive	20-Jun-94	1500	In high grass near slow water	SE NE S7 T10S R3W	
Crotalus	viridis	Dead	27-Jun-94	am	On Silver City Rd.	SW SW S18 T4S R2W	
Crotalus	viridis	Alive	12-Jul-94	901	Drinking from creek	SE NE S10 T11S R4W	
Crotalus	viridis	Dead	12-Jul-94	906	In creek	SW NW S11 T11S R4W	
Crotalus	viridis	Alive	13-Jul-94	1221	Next to stream	SW SE S7 T7S R3W	
Crotalus	viridis	Alive	13-Jul-94	1414	In rocks next to stream	SE SE S17 T7S R3W	
Crotalus	viridis	Alive	13-Jul-94	1414	In rocks next to stream	SE SE S17 T7S R3W	
Pituophis	catenifer	Alive	25-May-94	1657	Mudflat rd. west of Deep cr.	SE SE S14 T10S R4W	
Pituophis	catenifer	Alive	25-May-94	1717	100 m east of Deep cr.	SW NE S8 T10S R3W	
Pituophis	catenifer	Alive	02-Jun-94	1646	On mud flat road	SE NE SE S36 T9S R6W	
Pituophis	catenifer	Alive	02-Jun-94	1850	On mud flat road	SW NE S31 T7S R2E	
Pituophis	catenifer	Alive	22-Jun-94	943	On Mud Flat road	NW SW S21 T2E R8S	
Pituophis	catenifer	Alive	28-Jun-94	1420	In brush next to stream	NE NE S23 T4S R3W	
Pituophis	catenifer	Alive	28-Jun-94	1423	Lying next to stream	NW NE S23 T4S R3W	
Pituophis	catenifer	Alive	29-Jun-94	1149	In dry grass and willow	NW SW S23 T10S R5W	
Pituophis	catenifer	Alive	11-Jul-94	1521	Near creek in willow and grass	SE NE S16 T11S R4W	
Pituophis	catenifer	Alive	13-Jul-94	1224	In high grass near stream	SE SW S7 T7S R3W	
Pituophis	catenifer	Alive	13-Jul-94	1317	In willow stand	SW SE S12 T7S R4W	
Pituophis	catenifer	Kept	13-Jul-94	1358	On high grassy bank	NW SW S17 T7S R3W	
Thamnophis	elegans	Alive	24-May-94	1443	Camel cr. on grassy bank	NE NE NE S25 T10S R3W	
Thamnophis	elegans	Alive	26-May-94	1130	Base of talus near stream bed	NW NW S24 T10S R3W	
Thamnophis	elegans	Alive	26-May-94	1136	Base of talus near stream bed	NW NW S24 T10S R3W	
Thamnophis	elegans	Alive	26-May-94	1246	Grassy bank	NE NE S23 T10S R3W	
Thamnophis	elegans	Alive	26-May-94	1317	In deep pool	SW NE S23 T10S R3W	
Thamnophis	elegans	Alive	31-May-94	1521	In grass on bank	SE NW NE S13 T7S R3W	
Thamnophis	elegans	Alive	01-Jun-94	1539	In brushy willow stand	SE SW NE S34 T10S R5W	
Thamnophis	elegans	Alive	01-Jun-94	1720	In stream flow	NW SW NE S17 T10S R5W	
Thamnophis	elegans	Alive	01-Jun-94	1720	In emergent vegetation	NW SW NE S17 T10S R5W	

Thamnophis	elegans	Alive	01-Jun-94	1721	Swimming in pool	NW SW NE S17 T10S R5W	
Thamnophis	elegans	Alive	01-Jun-94	1723	In grass on bank	NW SW NE S17 T10S R5W	
Thamnophis	elegans	Alive	01-Jun-94	1724	In rocks along bank	NW SW NE S17 T10S R5W	
Thamnophis	elegans	Alive	01-Jun-94	1725	In rocks along bank	NW SW NE S17 T10S R5W	
Thamnophis	elegans	Alive	01-Jun-94	1727	In riffles	NW SW NE S17 T10S R5W	
Thamnophis	elegans	Alive	01-Jun-94	1727	On bottom of stream	NW SW NE S17 T10S R5W	
Thamnophis	elegans	Alive	02-Jun-94	1325	In riffles of stream	SE SW SE S15 T9S R5W	
Thamnophis	elegans	Alive	02-Jun-94	1325	On rocks along stream	SE SW SE S15 T9S R5W	
Thamnophis	elegans	Alive	02-Jun-94	1349	In riffles of stream	NW SE SE S15 T9S R5W	
Thamnophis	elegans	Alive	02-Jun-94	1351	In submergent vegetation	NW SE SE S15 T9S R5W	
Thamnophis	elegans	Alive	02-Jun-94	1415	On rocks along stream	SE NE NE S15 T9S R5W	
Thamnophis	elegans	Alive	02-Jun-94	1723	On banks of pond	NE SE NW S4 T10S R5W	
Thamnophis	elegans	Alive	02-Jun-94	1723	On banks of pond	NE SE NW S4 T10S R5W	
Thamnophis	elegans	Alive	06-Jun-94	1318	In riffles of stream	SE SE S31 T4S R3W	
Thamnophis	elegans	Alive	06-Jun-94	1328	On rocks on edge of stream	NE SW S31 T4S R3W	
Thamnophis	elegans	Alive	06-Jun-94	1731	On grassy bank	NE SW S31 T4S R3W	
Thamnophis	elegans	Alive	06-Jun-94	1519	On rocks in stream	NE SW S31 T4S R3W	
Thamnophis	elegans	Alive	06-Jun-94	1519	On rocks in stream	NE SW S31 T4S R3W	
Thamnophis	elegans	Dead	07-Jun-94		In water on rock	NE SW S28 T2S R3W	
Thamnophis	elegans	Alive	08-Jun-94	1015	On muddy bank	SE SE S18 T10S R4W	
Thamnophis	elegans	Alive	08-Jun-94	1123	In grass on bank	SE SW S7 T10S R4W	
Thamnophis	elegans	Alive	08-Jun-94	1244	In water	NE SW S7 T10S R4W	
Thamnophis	elegans	Alive	08-Jun-94	1246	In water	NE SW S7 T10S R4W	
Thamnophis	elegans	Alive	08-Jun-94	1246	In water	NE SW S7 T10S R4W	
Thamnophis	elegans	Alive	08-Jun-94	1323	On rocks in water	SW NW S7 T10S R4W	
Thamnophis	elegans	Alive	08-Jun-94	1330	On rocks in water	NW NW S7 T10S R4W	
Thamnophis	elegans	Alive	08-Jun-94	1336	On rocks in water	NW NW S7 T10S R4W	
Thamnophis	elegans	Alive	08-Jun-94	1340	On rocks in water	NE SE S2 T10S R5W	
Thamnophis	elegans	Alive	08-Jun-94	1347	In grass on bank	NE SE S2 T10S R5W	
Thamnophis	elegans	Alive	08-Jun-94	1352	In grass and rocks on bank	NE SE S2 T10S R5W	
Thamnophis	elegans	Alive	08-Jun-94	1359	In brush on bank	NW SE S2 T10S R5W	
Thamnophis	elegans	Alive	08-Jun-94	1401	On rocks in water	NW SE S2 T10S R5W	
Thamnophis	elegans	Alive	08-Jun-94	1402	On rocks in water	SE NW S2 T10S R5W	
Thamnophis	elegans	Alive	08-Jun-94	1405	On rocks in water	NW NW S2 T10S R5W	
Thamnophis	elegans	Alive	08-Jun-94	1409	On rocks in water	NW NW S2 T10S R5W	
Thamnophis	elegans	Alive	08-Jun-94	1525	In grass	NE NE NW S14 T10S R5W	
Thamnophis	elegans	Alive	08-Jun-94	1525	In brush	NE NE NW S14 T10S R5W	
Thamnophis	elegans	Alive	08-Jun-94	1630	In water flow	SE SE NE S10 T10S R5W	
Thamnophis	elegans	Alive	08-Jun-94	1631	On rocks in water	SE SE NE S10 T10S R5W	
Thamnophis	elegans	Alive	09-Jun-94	1049	In water	NW SE SW S15 T7S R3W	
Thamnophis	elegans	Alive	09-Jun-94	1101	In water	NW NE NW S22 T7S R3W	

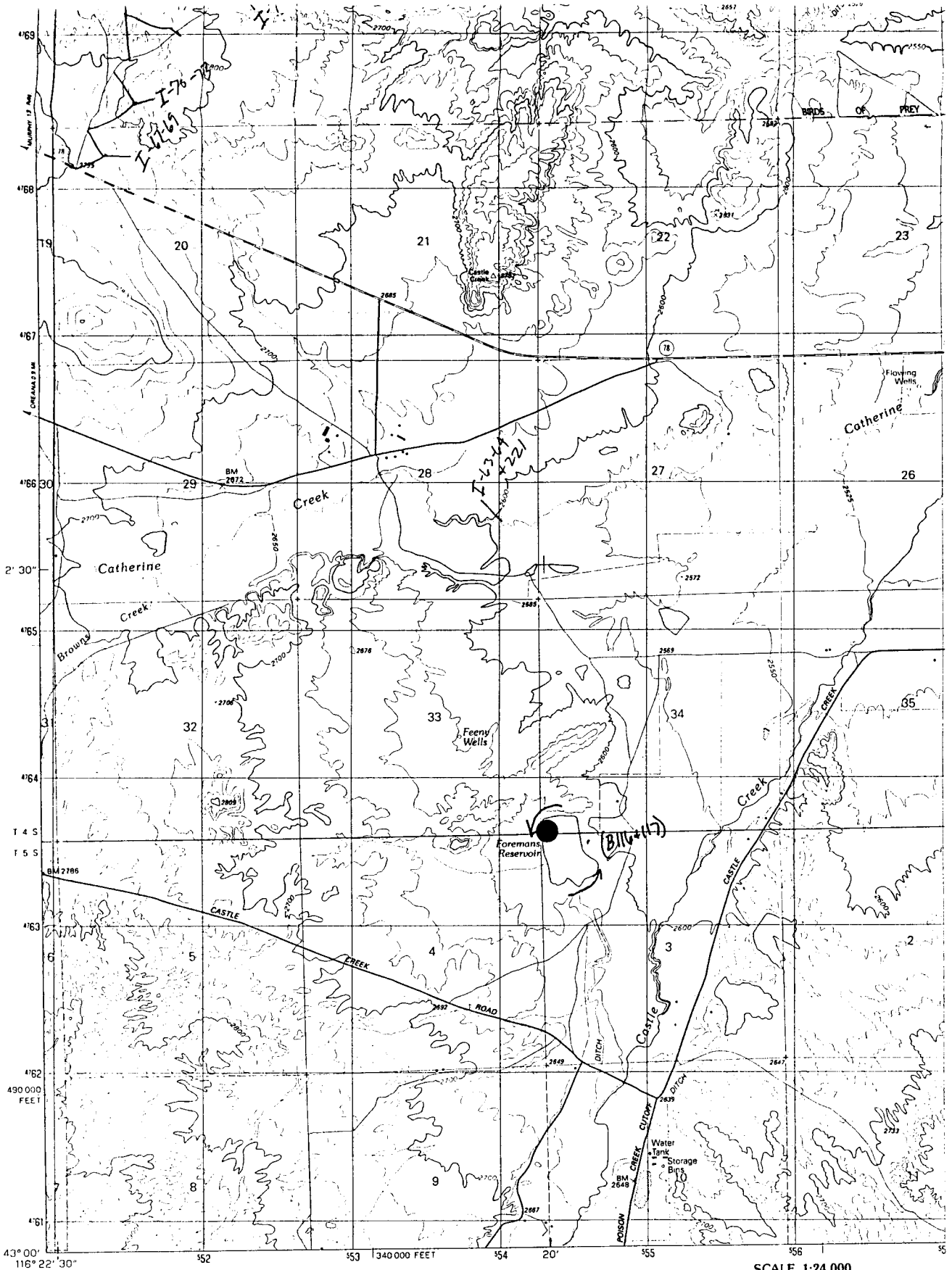
Thamnophis	elegans	Alive	09-Jun-94	1120	In water	SW NW S22 T7S R3W	
Thamnophis	elegans	Alive	09-Jun-94	1149	On grassy bank	NW SW S22 T7S R3W	
Thamnophis	elegans	Alive	09-Jun-94	1225	In beaver pond	SW SW S22 T7S R3W	
Thamnophis	elegans	Alive	09-Jun-94	1226	In beaver pond	SW SW S22 T7S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1140	In stream	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1146	Brushy bank	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1148	In stream	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1154	On willow bank	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1159	On willow bank	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1159	In riffles of stream	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1201	In pool	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1202	In riffles of stream	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1210	On grassy bank	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1210	On rocks in stream	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1210	On willow bank	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1212	On rocks in stream	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1225	On rocks in stream	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1227	In stream flow	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1230	On grassy bank	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1239	On rocks in stream	SW NW S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1250	On brushy bank	SW NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1259	In emergent vegetation	SW NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1310	On grassy bank	SW NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1312	In riffles of stream	SW NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1330	In brushy area near stream	SW NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1347	On willow bank	SW NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1356	On stick overhanging stream	SW NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1410	In stream flow	SW NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1414	In deep pool	SW NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1428	On willow bank	SE NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1440	In emergent vegetation	SE NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1445	On grassy bank	SE NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1501	On grassy bank	SE NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1515	On grassy bank	SE NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1532	On grassy bank	SE NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1546	In submergent veg. near bank	SE NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1550	On bottom of pool	SE NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1613	On brushy bank	SW NW S8 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1627	Swimming in pool	SE NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1659	In emergent vegetation	SE NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1721	In riffles of stream	SE NE S7 T10S R3W	

Thamnophis	elegans	Alive	20-Jun-94	1735	On grassy bank	SE NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1745	On brushy bank	SE NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1751	Swimming in riffles	SE NE S7 T10S R3W	
Thamnophis	elegans	Alive	20-Jun-94	1753	On rocks in stream	SE NE S7 T10S R3W	
Thamnophis	elegans	Alive	21-Jun-94	953	In main stream channel	NW SE S16 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1007	In riffles in stream	SE SE S16 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1011	On grassy bank	SE SE S16 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1016	On grassy bank	SE SE S16 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1023	On cobble on side of stream	SE SE S16 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1027	In brush overhang	SW SW S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1034	In willow stand	SW SW S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1047	On rock in middle of stream	SW SW S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1115	Swimming in pool	NW NW S22 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1139	In submergent vegetation	NW NW S22 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1201	In riffle of stream	NE NW S22 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1226	On grassy bank	NE NW S22 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1243	On rocks in stream	NW NE S22 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1246	On rock in middle of stream	NW NE S22 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1252	Swimming in stream run	NW NE S22 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1304	In grass on rocky bar	NE NE S22 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1313	In emergent vegetation	NE NE S22 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1321	On rocks on stream bank	NE NE S22 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1327	On grassy bank	NE NE S22 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1332	In pool	NE NE S22 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1345	In main stream flow	NE NE S22 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1353	In pool in stream	SE SE S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1402	On grassy bank	SE SE S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1412	On rocky bar	SE SE S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1414	Swimming in stream	SE SE S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1422	On stream bottom	SE SE S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1430	In reeds on stream side	SE SE S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1439	In main stream flow	SE SE S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1457	In willow stand	NE SE S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1507	In brush on stream bank	NE SE S15 T11S R3W	
Thamnophis	elegans	Dead	21-Jun-94	1516	In main stream flow	NE SE S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1522	In riffles	NE SE S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1534	On grassy bank	NE SE S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1601	On grassy bank	NE SE S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1603	On grassy bank	NE SE S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1611	On rock in stream	NE SE S15 T11S R3W	
Thamnophis	elegans	Alive	21-Jun-94	1616	In rocks on stream bank	SE NE S15 T11S R3W	

Thamnophis	elegans	Alive	21-Jun-94	1621	On gravel bar	SE NE S15 T11S R3W	
Thamnophis	elegans	Alive	22-Jun-94	1005	In stream flow	SE SE S4 T2E R8S	
Thamnophis	elegans	Alive	22-Jun-94	1031	In stream flow	NE NE S9 T2E R8S	
Thamnophis	elegans	Alive	22-Jun-94	1052	On rock in stream	NW NE S9 T2E R8S	
Thamnophis	elegans	Alive	22-Jun-94	1101	In overhanging brush	NE NW S9 T2E R8S	
Thamnophis	elegans	Alive	27-Jun-94	1659	On rocks in stream	NW SW S8 T5S R3W	
Thamnophis	elegans	Alive	27-Jun-94	1703	On grassy bank	NE SE S7 T5S R3W	
Thamnophis	elegans	Alive	27-Jun-94	1710	On rocks in stream	SE NE S7 T5S R3W	
Thamnophis	elegans	Alive	27-Jun-94	1713	In main stream flow	SE NE S7 T5S R3W	
Thamnophis	elegans	Alive	27-Jun-94	1714	In main stream flow	NE NE S7 T5S R3W	
Thamnophis	elegans	Alive	27-Jun-94	1719	On bottom of stream	NE NE S7 T5S R3W	
Thamnophis	elegans	Alive	27-Jun-94	1722	Swimming in stream	NE NE S7 T5S R3W	
Thamnophis	elegans	Alive	27-Jun-94	1728	In emergent vegetation	SE SE S6 T5S R3W	
Thamnophis	elegans	Alive	27-Jun-94	1731	In overhanging brush	SE SE S6 T5S R3W	
Thamnophis	elegans	Alive	27-Jun-94	1733	On grassy bank	NE SE S6 T5S R3W	
Thamnophis	elegans	Alive	27-Jun-94	1740	On rocks in stream	NE SE S6 T5S R3W	
Thamnophis	elegans	Alive	27-Jun-94	1743	Swimming in stream	NE SE S6 T5S R3W	
Thamnophis	elegans	Alive	28-Jun-94	915	On rocks in stream	SE SE S26 T4S R4W	
Thamnophis	elegans	Alive	28-Jun-94	921	In oxbow	SE SE S26 T4S R4W	
Thamnophis	elegans	Alive	28-Jun-94	924	In creek	NE NW S35 T4S R4W	
Thamnophis	elegans	Alive	28-Jun-94	935	On grassy bank	NE NE S35 T4S R4W	
Thamnophis	elegans	Alive	28-Jun-94	948	On bottom of stream	NW NW S35 T4S R4W	
Thamnophis	elegans	Alive	28-Jun-94	952	Swimming in stream	NW NW S35 T4S R4W	
Thamnophis	elegans	Alive	28-Jun-94	1003	On gravel bar	NW NW S35 T4S R4W	
Thamnophis	elegans	Alive	28-Jun-94	1009	On rocks in stream	SE NE S34 T4S R4W	
Thamnophis	elegans	Alive	28-Jun-94	1016	On rocks in stream	NW NW S34 T4S R4W	
Thamnophis	elegans	Alive	28-Jun-94	1022	In overhanging brush	NW NW S34 T4S R4W	
Thamnophis	elegans	Alive	28-Jun-94	1028	On bottom of stream	NE SW S34 T4S R4W	
Thamnophis	elegans	Alive	28-Jun-94	1036	On rocks in stream	SW SW S34 T4S R4W	
Thamnophis	elegans	Alive	28-Jun-94	1039	On grassy bank	SW SW S34 T4S R4W	
Thamnophis	elegans	Alive	28-Jun-94	1044	In emergent vegetation	SE SE S33 T4S R4W	
Thamnophis	elegans	Alive	28-Jun-94	1055	In overhanging brush	SE SE S33 T4S R4W	
Thamnophis	elegans	Alive	28-Jun-94	1351	In stagnant pool	SE NE S24 T4S R3W	
Thamnophis	elegans	Alive	28-Jun-94	1409	In small riffle	NW NE S24 T4S R3W	
Thamnophis	elegans	Alive	29-Jun-94	1051	On grassy bank	NE SW S23 T10S R5W	
Thamnophis	elegans	Alive	29-Jun-94	1104	In oxbow	NE SW S23 T10S R5W	
Thamnophis	elegans	Alive	29-Jun-94	1110	On gravel bar	NE SW S23 T10S R5W	
Thamnophis	elegans	Alive	29-Jun-94	1117	On rocks in stream	NW SE S23 T10S R5W	
Thamnophis	elegans	Alive	29-Jun-94	1123	On grassy bank	NW SE S23 T10S R5W	
Thamnophis	elegans	Alive	29-Jun-94	1135	In overhanging brush	NW SW S23 T10S R5W	
Thamnophis	elegans	Alive	29-Jun-94	1157	On rocks in stream	NW SW S23 T10S R5W	

Thamnophis	elegans	Alive	29-Jun-94	1225	In creek	NE SE S22 T10S R5W	
Thamnophis	elegans	Alive	29-Jun-94	1234	On bottom of stream	NE SE S22 T10S R5W	
Thamnophis	elegans	Alive	29-Jun-94	1246	Swimming in stream	NE SE S22 T10S R5W	
Thamnophis	elegans	Alive	29-Jun-94	1254	On rocks in stream	SE SE S22 T10S R5W	
Thamnophis	elegans	Alive	29-Jun-94	1318	On grassy bank	SE SE S22 T10S R5W	
Thamnophis	elegans	Alive	29-Jun-94	1339	In emergent vegetation	SW SE S22 T10S R5W	
Thamnophis	elegans	Alive	29-Jun-94	1348	In riffles	SW SE S22 T10S R5W	
Thamnophis	elegans	Alive	29-Jun-94	1359	Lying next to stream	SW SE S22 T10S R5W	
Thamnophis	elegans	Alive	07-Jul-94	1125	Among large boulders	NE NW S1 T6S R5W	
Thamnophis	elegans	Alive	07-Jul-94	1135	In gravel/grass bar	NW NW S1 T6S R5W	
Thamnophis	elegans	Alive	07-Jul-94	1725	In stagnant pool	SE NW S19 T5S R5W	
Thamnophis	elegans	Alive	07-Jul-94	1746	In stagnant pool-fish in mouth	SE SW S18 T5S R5W	
Thamnophis	elegans	Alive	13-Jul-94	1249	In emergent vegetation	SW SW S7 T7S R3W	
Thamnophis	elegans	Alive	13-Jul-94	1327	On rocks in creek	NW NW S17 T7S R3W	
Thamnophis	elegans	Alive	25-Jul-94	1458	In high grass next to stream	SE NW S8 T1N R5W	
Thamnophis	elegans	Alive	25-Jul-94	1507	In deep pool	NW NE S8 T1N R5W	
Thamnophis	elegans	Alive	25-Jul-94	1529	In deep pool	NW NE S8 T1N R5W	
Thamnophis	elegans	Alive	26-Jul-94	1437	In main riffle of stream	SE NE S2 T9S R4W	
Thamnophis	elegans	Alive	26-Jul-94	1459	In rocks next to stream	SE NE S2 T9S R4W	
Thamnophis	elegans	Alive	26-Jul-94	1518	On gravel bar next to stream	NE NE S2 T9S R4W	
Thamnophis	elegans	Alive	26-Jul-94	1537	In pool	NE NE S2 T9S R4W	
Thamnophis	elegans	Alive	26-Jul-94	1601	In oxbow	SE SE S2 T9S R4W	
Thamnophis	elegans	Alive	26-Jul-94	1612	In high grass next to stream	SE SE S2 T9S R4W	
Thamnophis	elegans	Alive	26-Jul-94	1930	In main stream channel	NE SW S29 T9S R4W	
Thamnophis	elegans	Alive	26-Jul-94	1944	In high grass next to stream	NW NW S32 T9S R4W	
Thamnophis	elegans	Alive	28-Jul-94	1000	In rocks next to pool	SE SW S14 T2S R4W	
Thamnophis	elegans	Alive	30-Jun-94	900	On grassy bank	SW SE S15 T10S R5W	
Thamnophis	elegans	Alive	30-Jun-94	910	On gravel bar	SW SE S15 T10S R5W	
Thamnophis	elegans	Alive	30-Jun-94	916	On rocks in stream	NW NE S22 T10S R5W	
Thamnophis	elegans	Alive	30-Jun-94	918	On bottom of stream	NW NE S22 T10S R5W	
Thamnophis	elegans	Alive	30-Jun-94	926	In overhanging brush	SW NE S22 T10S R5W	
Thamnophis	elegans	Alive	30-Jun-94	933	In oxbow	SW NE S22 T10S R5W	
Thamnophis	elegans	Alive	30-Jun-94	944	In emergent vegetation	SW NE S22 T10S R5W	
Thamnophis	elegans	Alive	30-Jun-94	946	On rocks in stream	SW NE S22 T10S R5W	
Thamnophis	elegans	Alive	30-Jun-94	952	On grassy bank	NE SW S22 T10S R5W	
Thamnophis	elegans	Alive	30-Jun-94	1002	In creek	NE SW S22 T10S R5W	
Thamnophis	elegans	Alive	30-Jun-94	1005	Swimming in stream	NE SW S22 T10S R5W	
Thamnophis	elegans	Alive	30-Jun-94	1010	On rocks in stream	NE SW S22 T10S R5W	
Thamnophis	elegans	Alive	11-Jul-94	1510	In grass	NW NW S15 T11S R4W	
Thamnophis	elegans	Alive	11-Jul-94	1517	In beaver pond	SW NW S15 T11S R4W	
Thamnophis	elegans	Alive	11-Jul-94	1522	Swimming in stream	SW NE S16 T11S R4W	

Thamnophis	elegans	Alive	11-Jul-94	1531	On grass on bank	SW NW S16 T11S R4W	
Thamnophis	elegans	Alive	12-Jul-94	845	Lower end of Smith cr	NE SE S10 T11S R4W	



CASTLE BUTTE QUAD

Produced by the United States Geological Survey

Control by USGS and NOS/NOAA

Compiled from aerial photographs taken 1946. Revised from aerial photographs taken 1987. Field checked 1989. Map edited 1992

North American Datum of 1927 (NAD 27). Projection and 10 000-foot grid ticks: Idaho Coordinate System, west zone (Transverse Mecator). 1000-meter Universal Transverse Mercator grid, zone 11

The difference between NAD 27 and North American Datum of 1983 (NAD 83) for 7.5 minute intersections is given in USGS Bulletin 1875. The NAD 83 is shown by dashed corner ticks

There may be private inholdings within the boundaries of the National or State reservations shown on this map

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

GN MN 0°28' 8 MILS 16° 284 MILS

UTM GRID AND 1992 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

KILOMETERS 1 .5 0 1

METERS 1000 0 1000

MILES 1 .5 0

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

CONTOUR INTERVAL 25 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

TO CONVERT FEET TO METERS MULTIPLY BY 0.3048

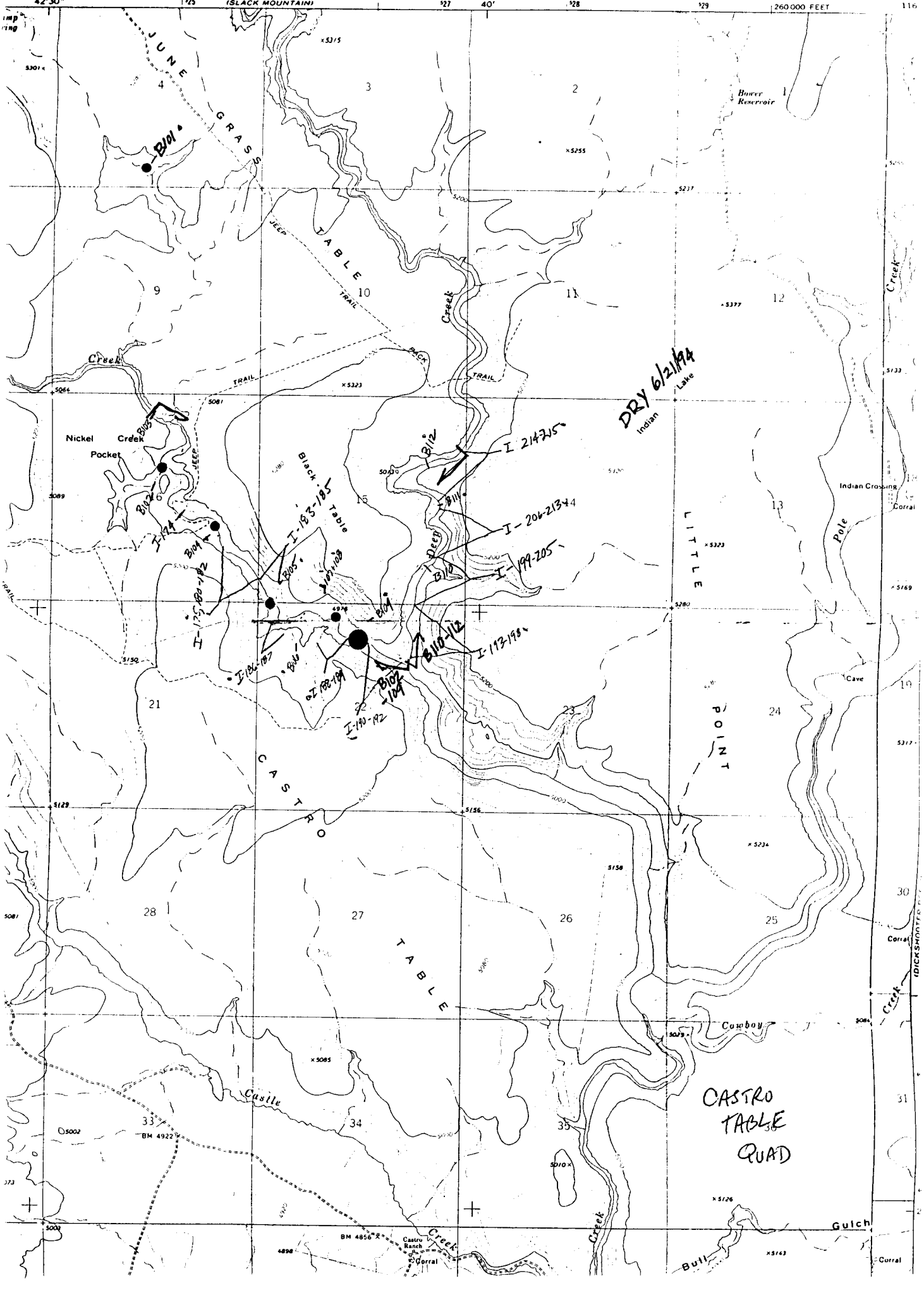
TO CONVERT METERS TO FEET MULTIPLY BY 3.2808

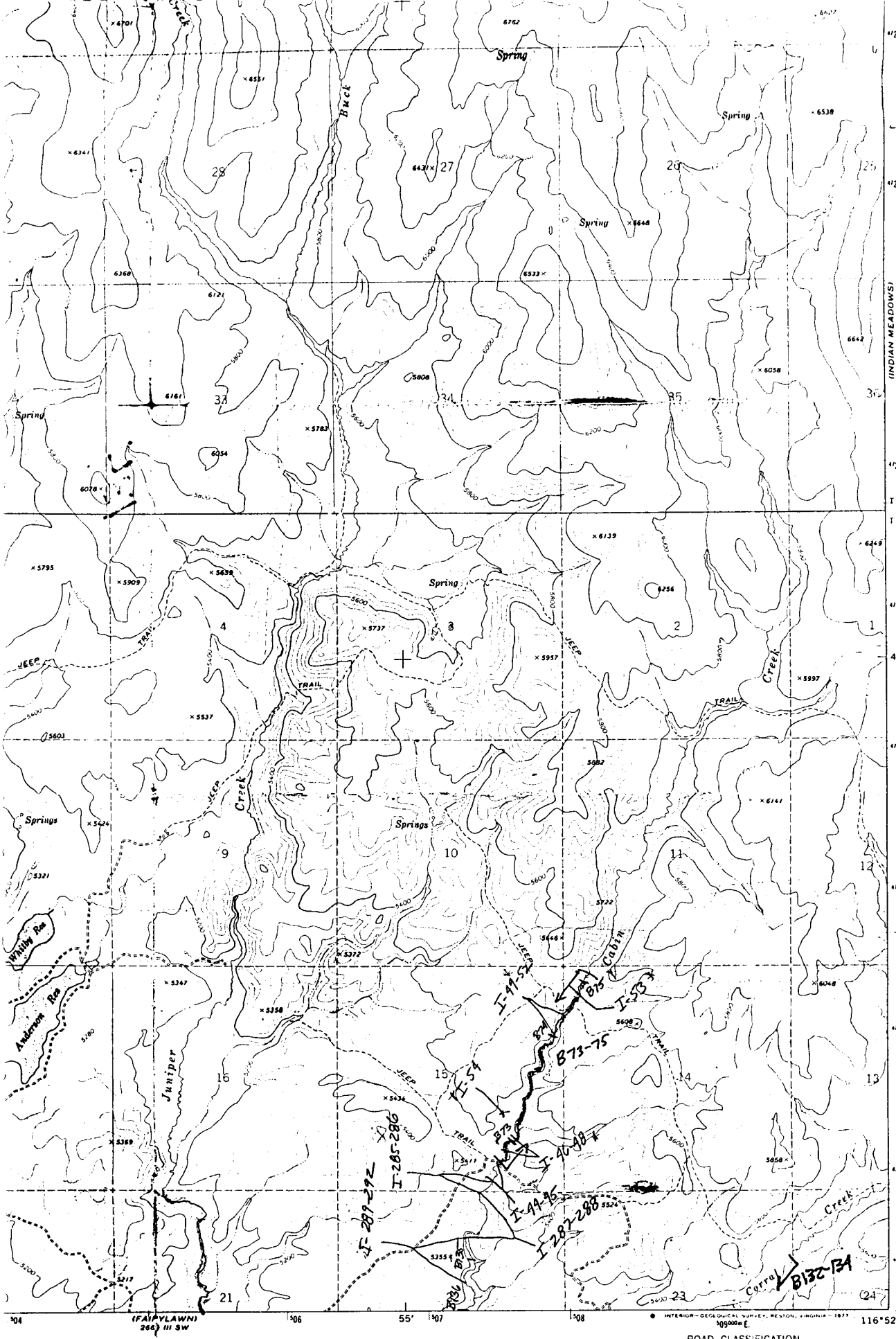
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARD

FOR SALE BY U.S. GEOLOGICAL SURVEY

DENVER, COLORADO 80225 OR RESTON, VIRGINIA 22092

A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE O


42°30"
2669 II SW
(SLACK MOUNTAIN)
40'
260 000 FEET
JUNE GRASS
TABLE
JEEP TRAIL
BACK TRAIL
Creek
Nickel Creek
Pocket
Black Table
Deep Creek
Bower Reservoir
Indian Lake
Indian Crossing
Corral
LITTLE POINT
Pole Creek
Cave
CASTRO
TABLE
Cowboy
Castle Creek
Castro Ranch
Bull Gulch
DICKSHOOTER
BM 4922
BM 4856
DRY 6/21/94
CASTRO TABLE QUAD



SCALE 1:24 000

1 MILE

0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETRE

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Primary highway, hard surface

Light-duty road, hard or improved surface

Secondary highway, hard surface

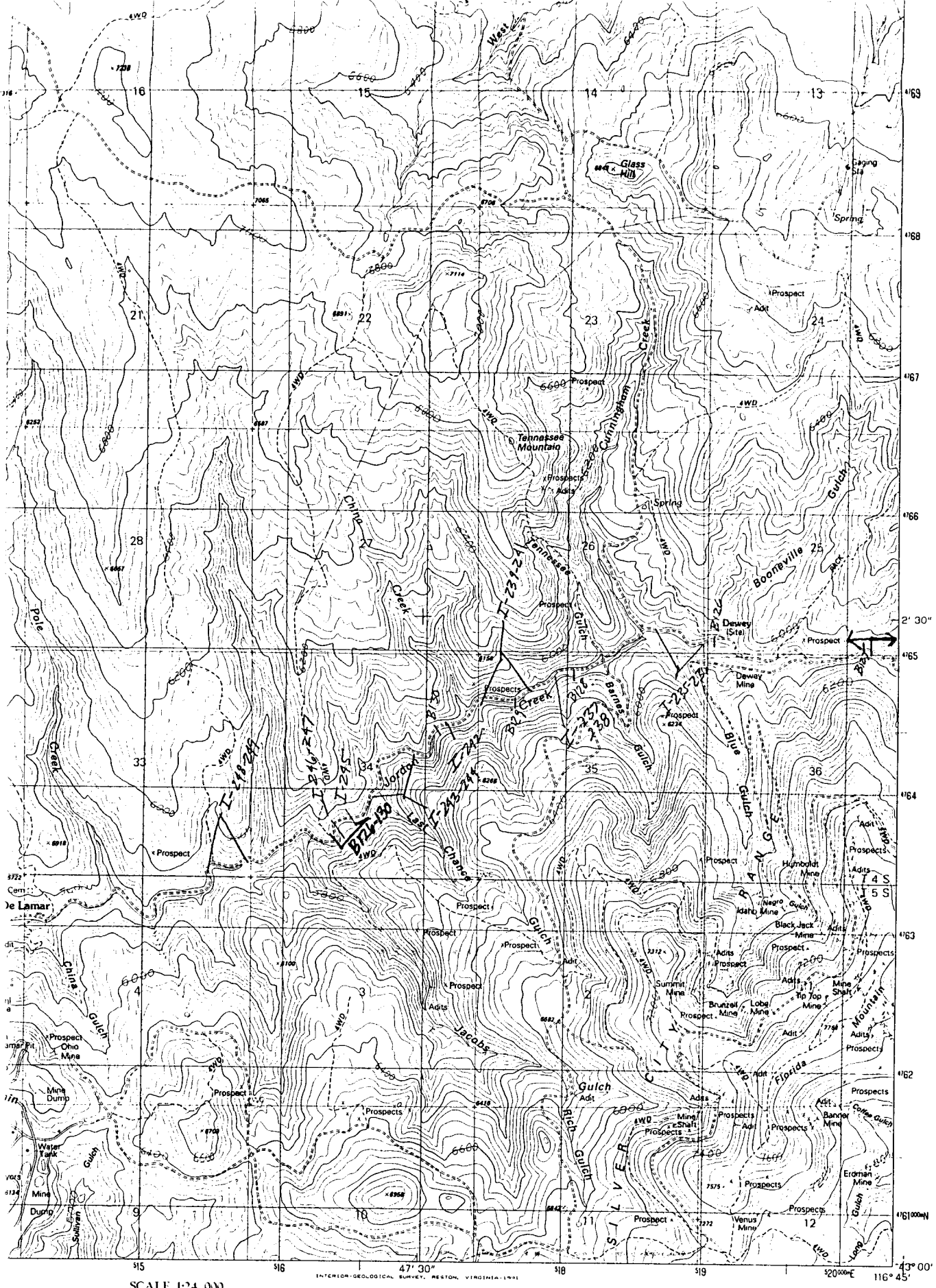
Unimproved road

Interstate Route

U. S. Route

State Route

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1977



SCALE 1:24 000

KILOMETERS 0 1 2
METERS 0 1000 2000
MILES 0 1
FEET 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL 40 FEET

To convert feet to meters multiply by .3048
To convert meters to feet multiply by 3.2808

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS

IDAHO

QUADRANGLE LOCATION

1	2	3
4		5

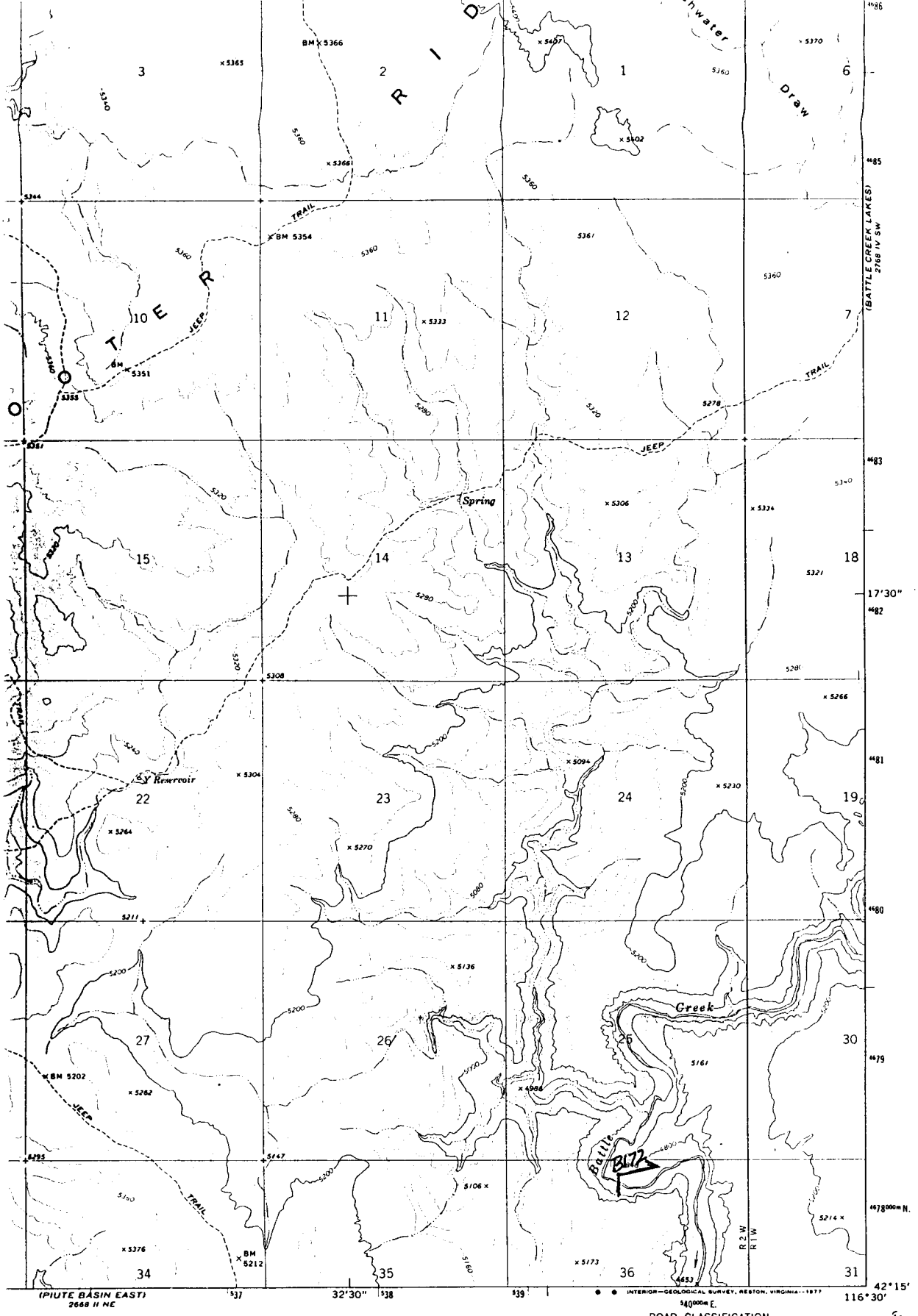
1 Captain Butte
2 Rooster Comb Peak
3 Reynolds
4 Swisher Mountain
5 Silver City
6 Stonehouse Creek

ROAD LEGEND

Improved Road
Unimproved Road
Trail

Interstate Route
U.S. Route
State Route

DE LAMAR, IDAHO



SCALE 1:24 000

1 MILE

2000 3000 4000 5000 6000 7000 FEET

.5 0 1 KILOMETRE

CONTOUR INTERVAL 40 FEET
D LINES REPRESENT 20-FOOT CONTOURS
NAL GEODETIC VERTICAL DATUM OF 1929

PLIES WITH NATIONAL MAP ACCURACY STANDARDS
L SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

IDAHO

QUADRANGLE LOCATION

ROAD CLASSIFICATION

Primary highway, hard surface

Light-duty road, hard or improved surface

Secondary highway, hard surface

Unimproved road

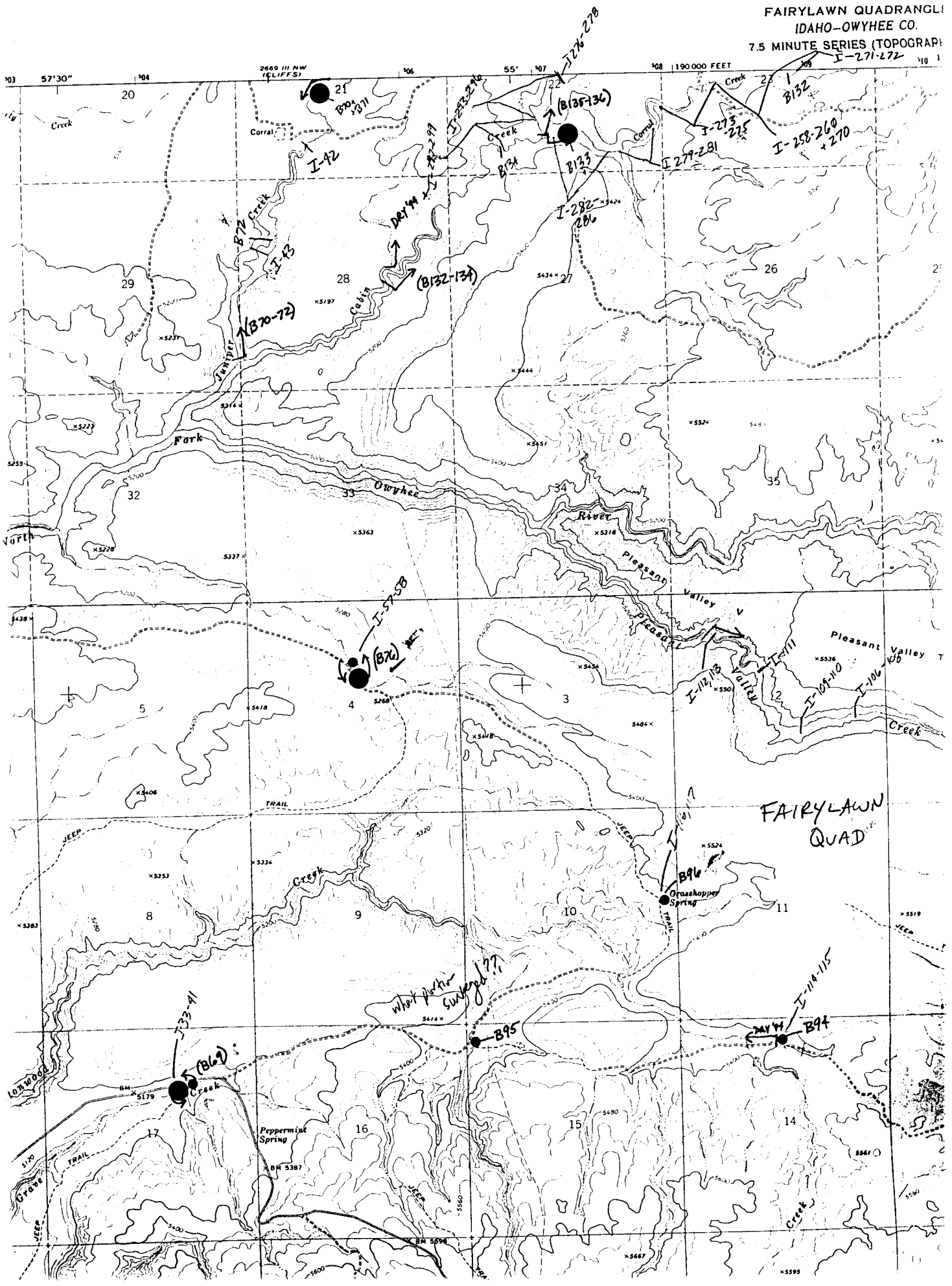
Interstate Route U. S. Route State Route

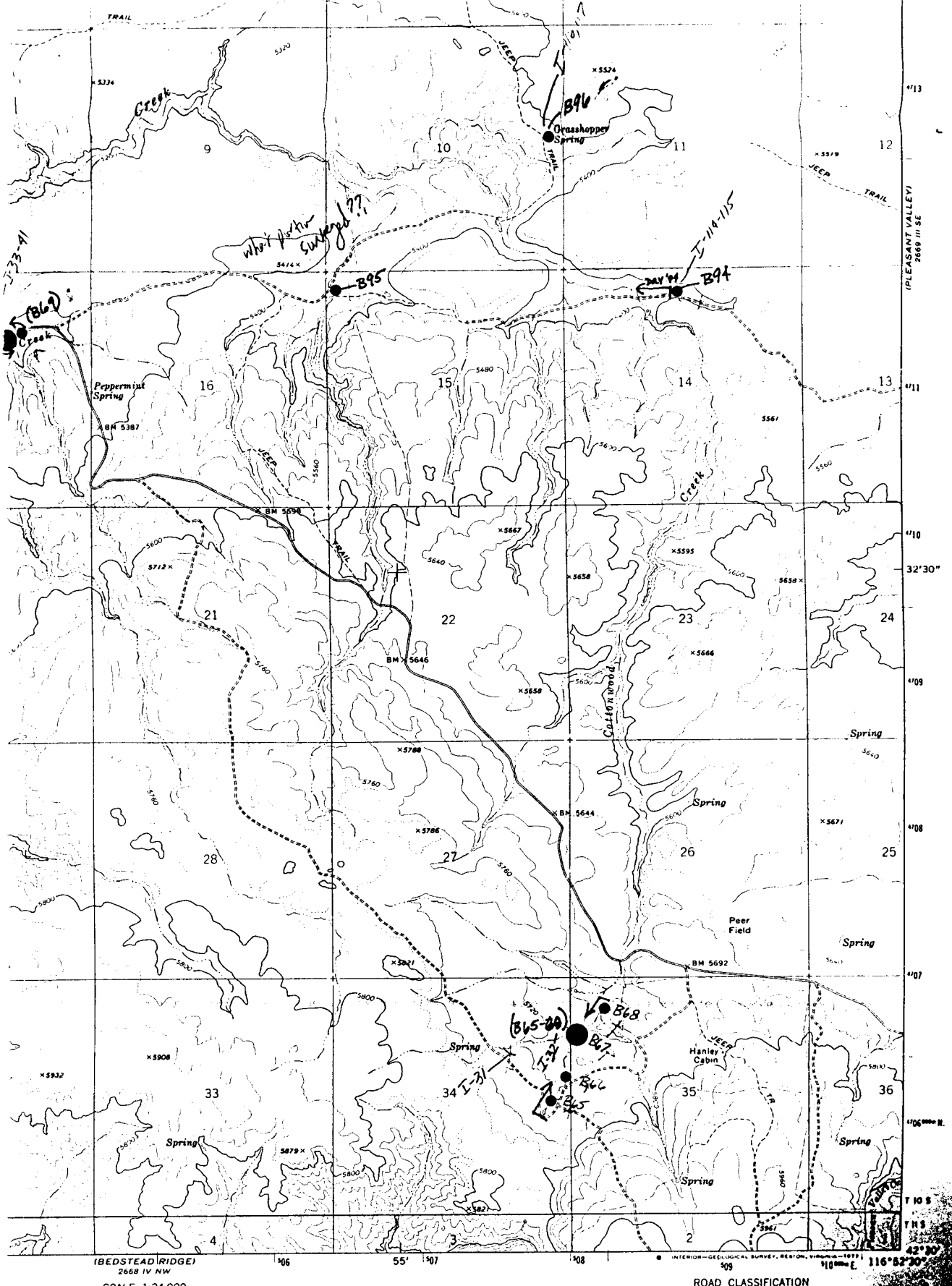
DICKSHOOTER RIDGE, IDAHO
N4215—W11630/7.5

1973

AMS 2668 I SE—SERIES V893

Yes Kirby map
Need spur
added!


FAIRYLAWN QUADRANGLE
IDAHO–OWYHEE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
57'30"
55'
190 000 FEET
2669 III NW (CLIFFS)
Corral
Creek
Cabin
Juniper
Fork
Owyhee
River
North
Pleasant Valley
Pleasant Valley Creek
TRAIL
JEEP
Grasshopper Spring
Peppermint Spring
LONGWOOD
Grove
FAIRYLAWN QUAD
I-42
I-43
I-57-58
I-111
I-112-113
I-105-110
I-106
I-114-115
I-133-41
I-258-260
I-270
I-271-272
I-273-275
I-276-278
I-279-281
I-282-286
I-293-299
B132
B133
B134
B94
B95
B96
B70
B71
B72
B76
B69
(B132-134)
(B135-136)
(B70-72)
(B69)
DRY 94
water photo surveyed??



SCALE 1:24 000

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 20-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Primary highway, hard surface — Light-duty road, hard or improved surface

Secondary highway, hard surface — Unimproved road

Interstate Route — U. S. Route — State Route

IDAHO
QUADRANGLE LOCATION

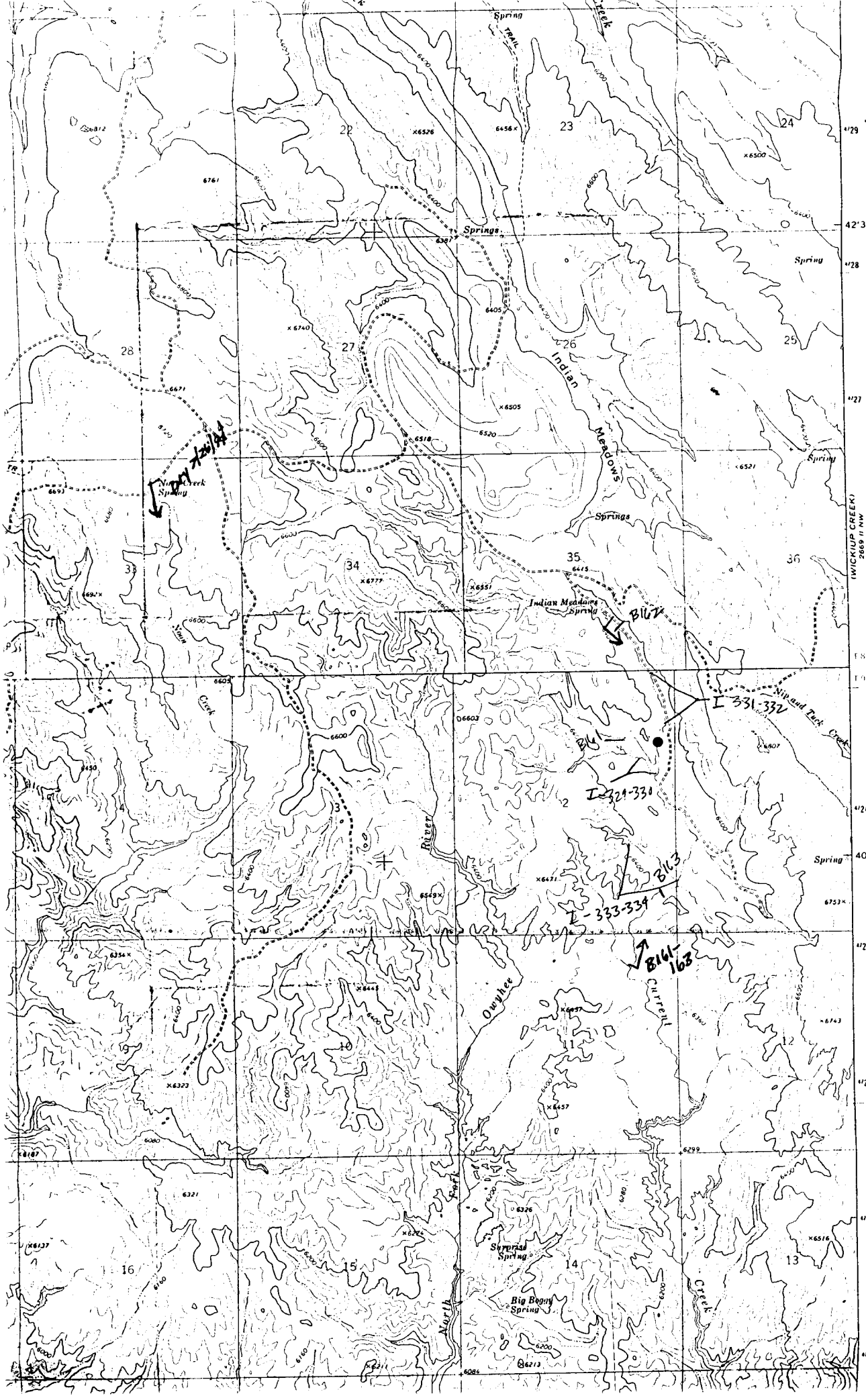
FAIRYLAWN, IDAHO

N4230—W11652.5/7.5

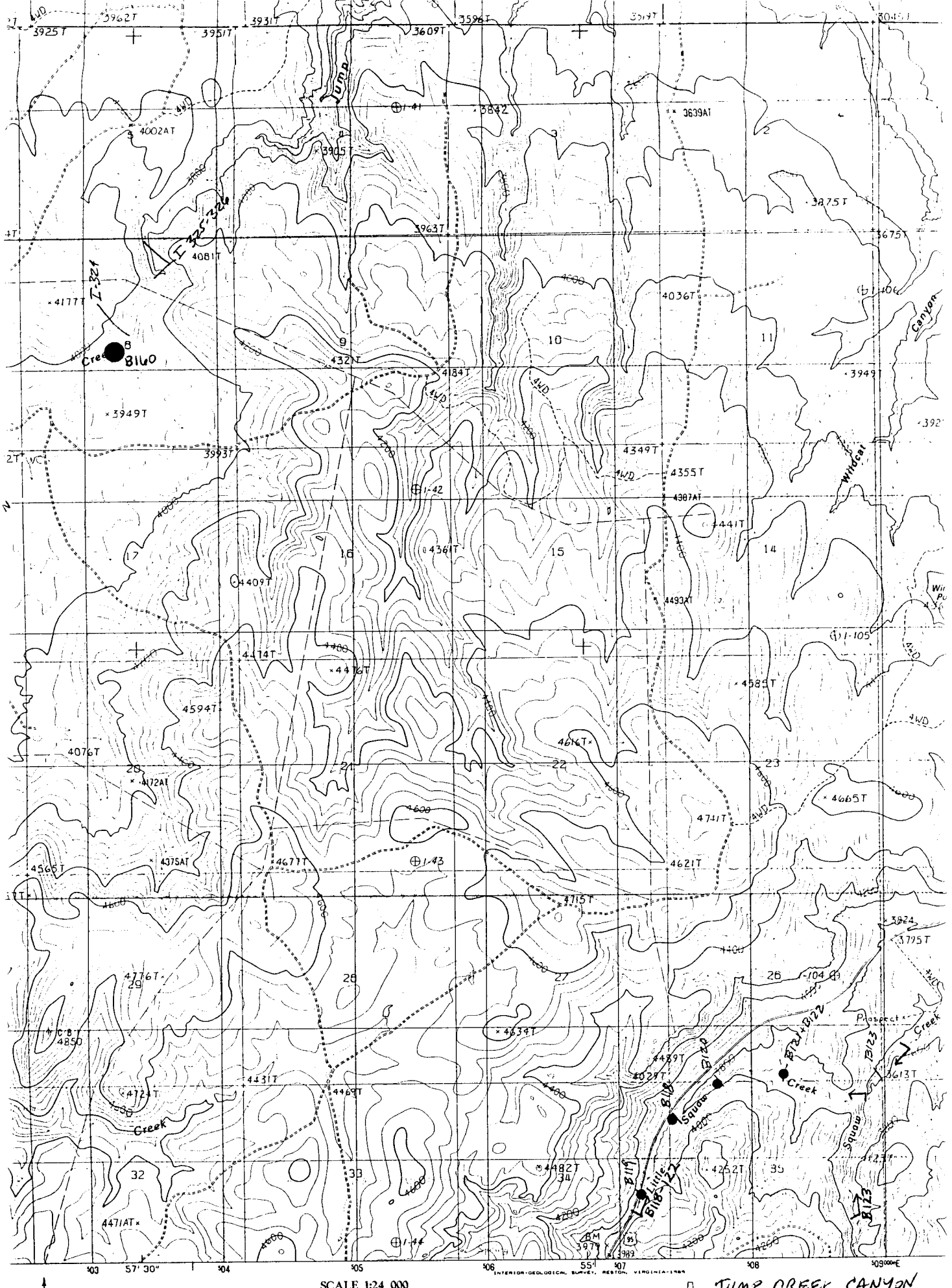
1973

AMS 2669 III SW—SERIES V893

S MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
LOGICAL SURVEY, DENVER, COLORADO 80225, OR WASHINGTON, D. C. 20242
SCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

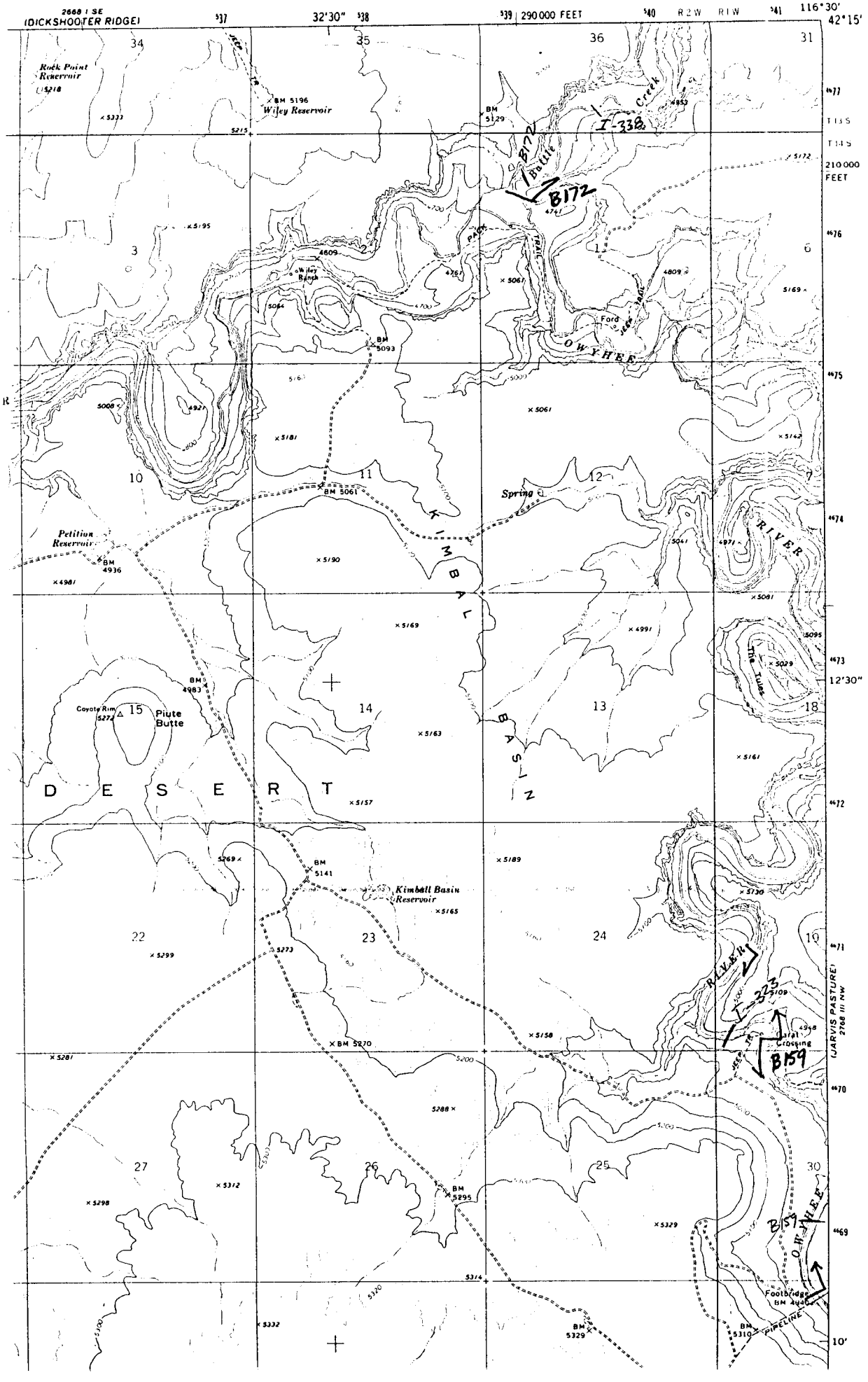


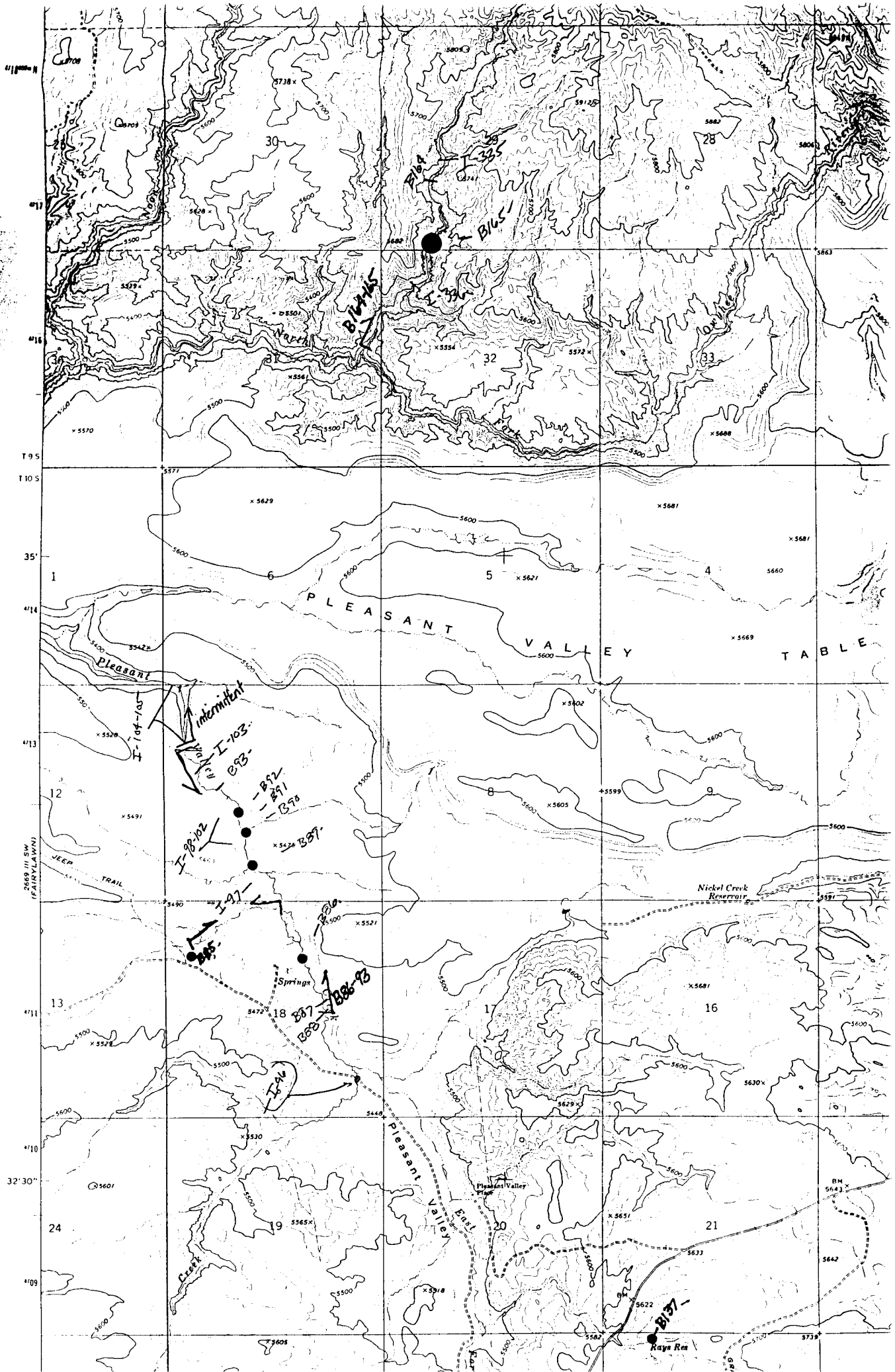
INDIAN MEADOWS QUAD


JUMP
Creek
Squaw
Little
Prospect
Canyon
Wildcat
I-325-326
I-324
B160
B118
B119
B122
B123
B124
B125
I-41
I-42
I-43
I-44
I-105
I-104
BM 3979
3989
4850
4471AT
4472T
4431T
4469T
4482T
4252T
4639T
4489T
4029T
4613T
4566T
4437SAT
4677T
4621T
4715T
4776T
4665T
4741T
4585T
4616T
4594T
4476T
4414T
4076T
4472AT
4409T
4361T
4493AT
4441T
4387AT
4355T
4349T
4036T
4432T
4484T
4081T
4177T
4002AT
3842
3639AT
3905T
3963T
3875T
3675T
3949T
3993T
3925T
3962T
3931T
3951T
3609T
3596T
3824
3795T
57' 30"
55'
503
504
505
506
507
508
509000mE
INTERIOR-GEOLOGICAL SURVEY, RESTON, VIRGINIA-1983
SCALE 1:24 000
KILOMETERS
METERS
MILES
NORTH
IDAHO
JUMP CREEK CANYON QUAD
ROAD LEG
Improved Road
Unimproved Road

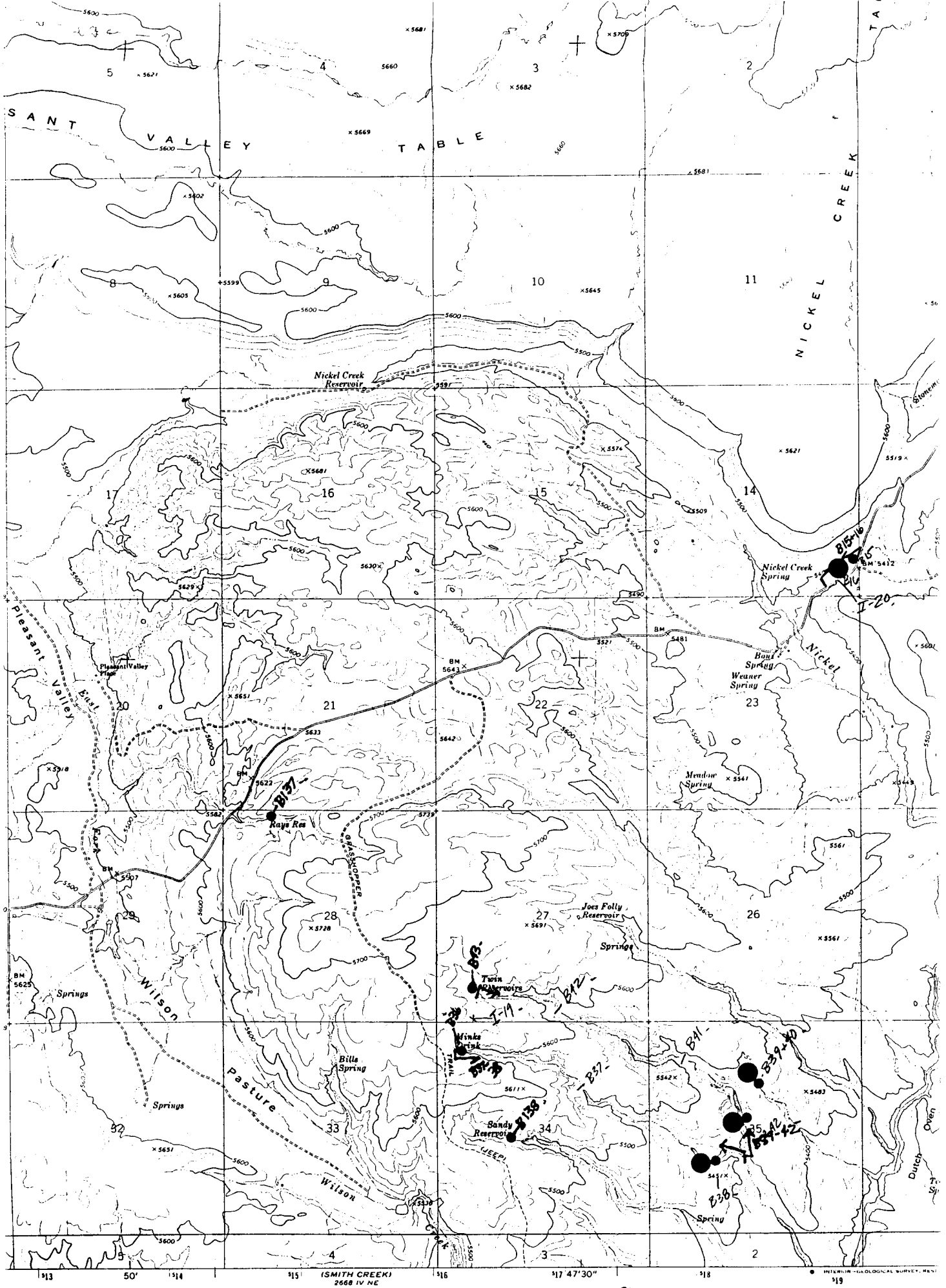
PIUTE BASIN EAST QUADRANGLE
IDAHO–OWYHEE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

2768 IV SW (BATTLE CREEK LAKES)

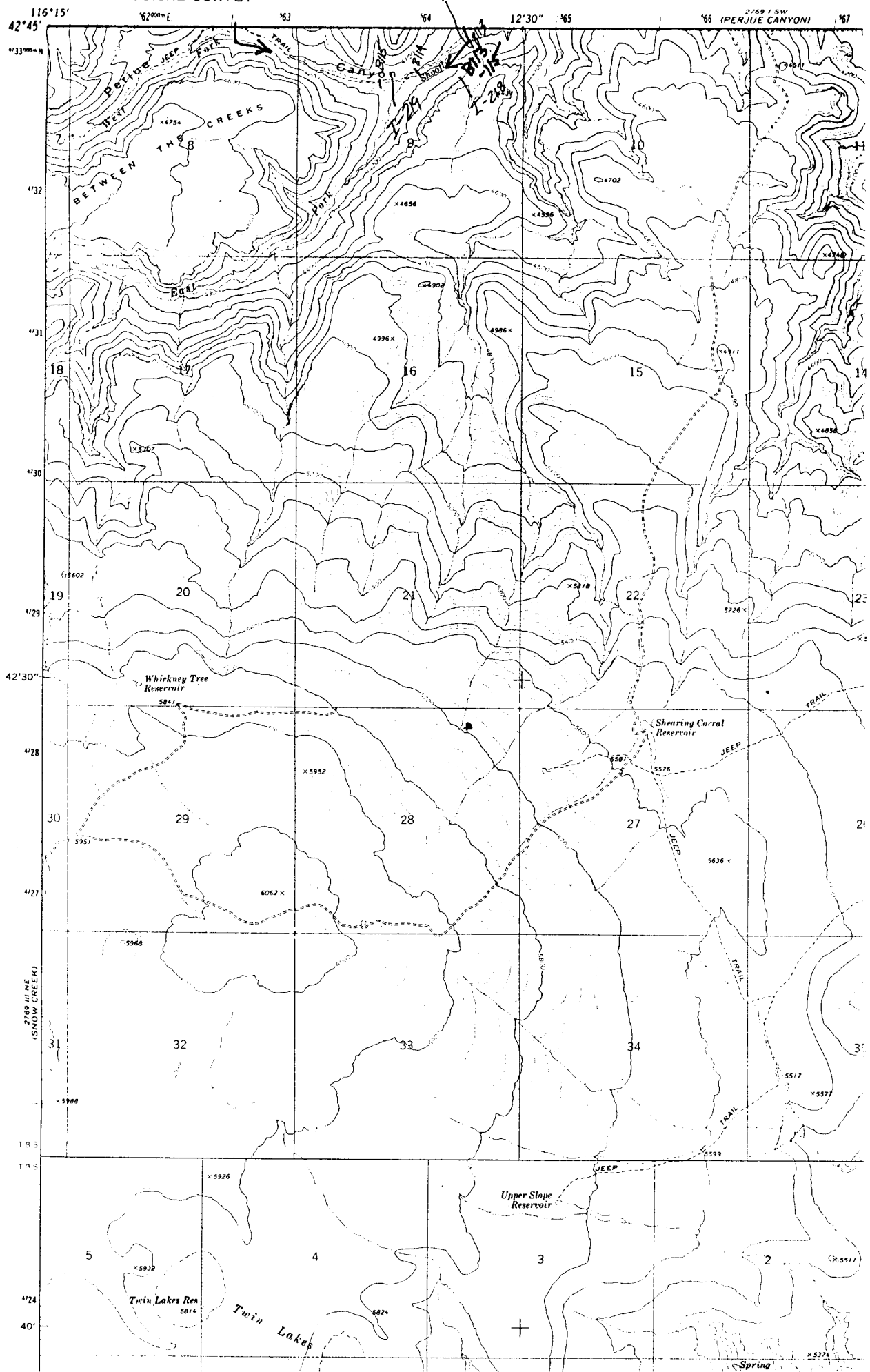


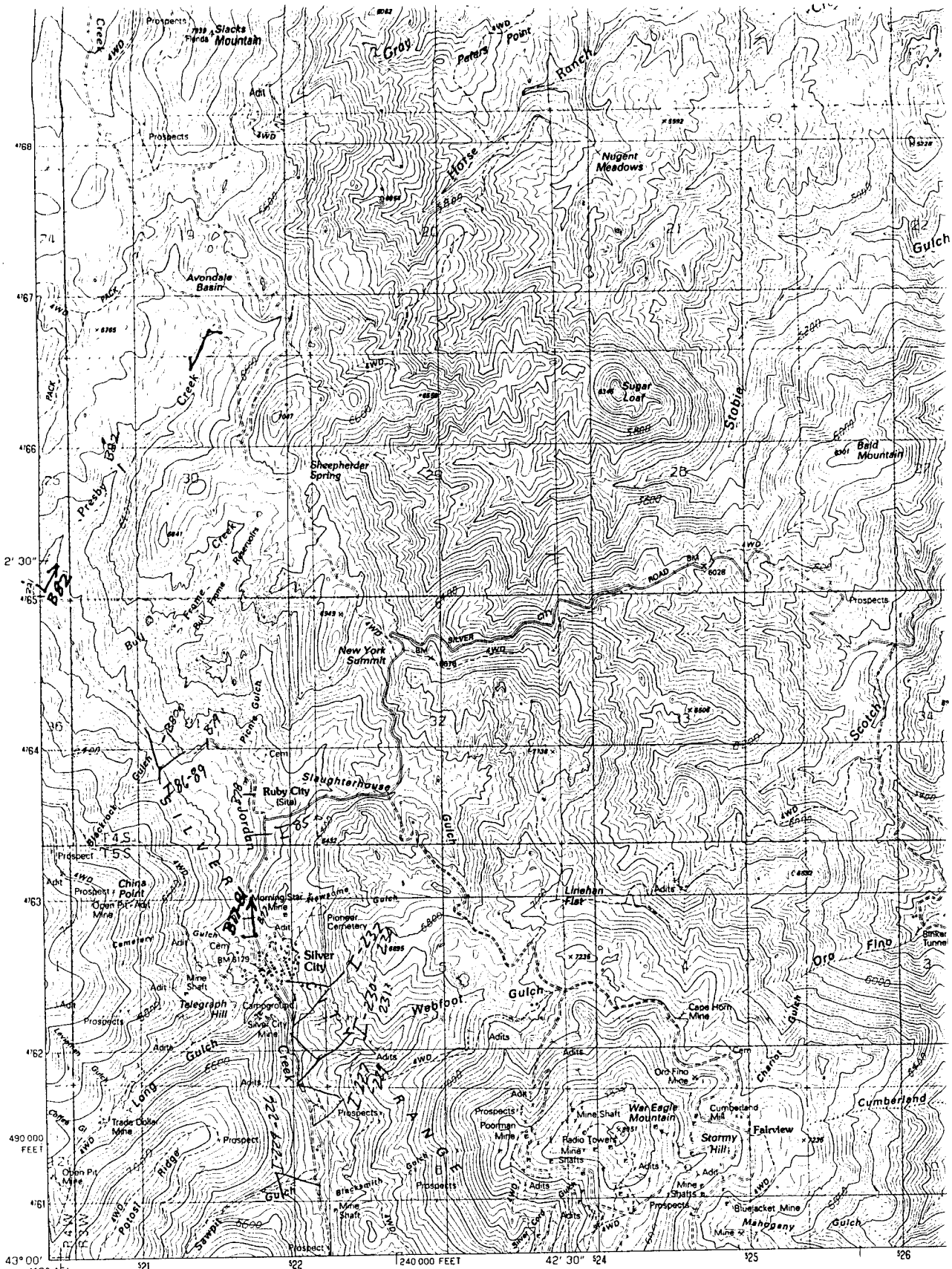


PLEASANT VALLEY QUAD


SANT VALLEY TABLE
NICKEL CREEK
Nickel Creek Reservoir
Nickel Creek Spring
Bone Spring
Weaner Spring
Meadow Spring
Pleasant Valley
Pleasant Valley Flat
East Fork
Rays Res
GRASSHOPPER
Joes Folly Reservoir
Springs
Twin Reservoirs
Hinks Drink
Bills Spring
Wilson Pasture
Sandy Reservoir
JEEP
Wilson Creek
Spring
Dutch Oven
I-20
I-19
B15
B16
B37
B38
B39
B41
B42
B43
(SMITH CREEK)
2668 IV NE
SCALE 1:24 000
PLEASANT VALLEY QUAD
ROAD CLASSIFICATIO
Primary highway, hard surface
Light duty improved
Secondary highway, hard surface

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY





PRODUCED BY THE UNITED STATES GEOLOGICAL SURVEY
CONTROL BY . . . . . USGS, NOS/NOAA
COMPILED FROM AERIAL PHOTOGRAPHS TAKEN 1963
FIELD CHECKED 1965
LIMITED REVISION FROM AERIAL PHOTOGRAPHS TAKEN 1984
FIELD CHECKED . . . . . 1987 MAP EDITED 1990
PROJECTION . . . . . ? ? TRANSVERSE MERCATOR
GRIDS: 1000-METER UNIVERSAL TRANSVERSE MERCATOR . . . . . ZONE 11
10,000-FOOT STATE GRID TICKS . . . . . IDAHO, WEST ZONE
UTM GRID DECLINATION . . . . . 0°13' EAST
1990 MAGNETIC NORTH DECLINATION . . . . . 16°30' EAST
VERTICAL DATUM . . . . . NATIONAL GEODETIC VERTICAL DATUM OF 1929
HORIZONTAL DATUM . . . . . 1927 NORTH AMERICAN DATUM

To place on the predicted North American Datum of 1983, move the projection lines as shown by dashed corner ticks (16 meters north and 78 meters east)

There may be private inholdings within the boundaries of any Federal and State Reservations shown on this map

Public Land Survey System is shown as published in 1965 and verified or supplemented in 1987

NORTH

PROVISIONAL MAP
Produced from original manuscript drawings. Information shown as of date of field check. T

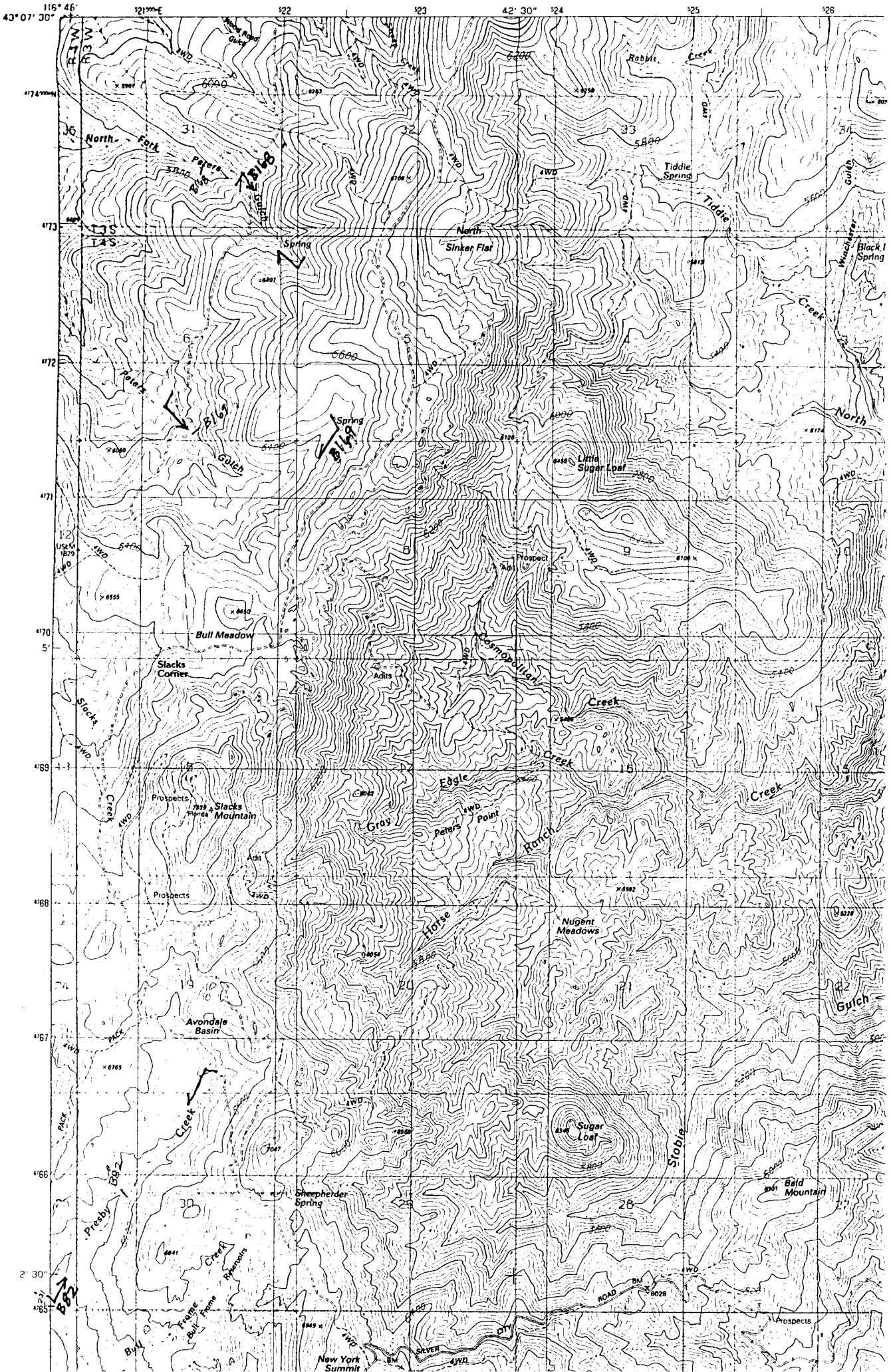
SCALE 1:24 000

CONTOUR INTERVAL 40 FEET

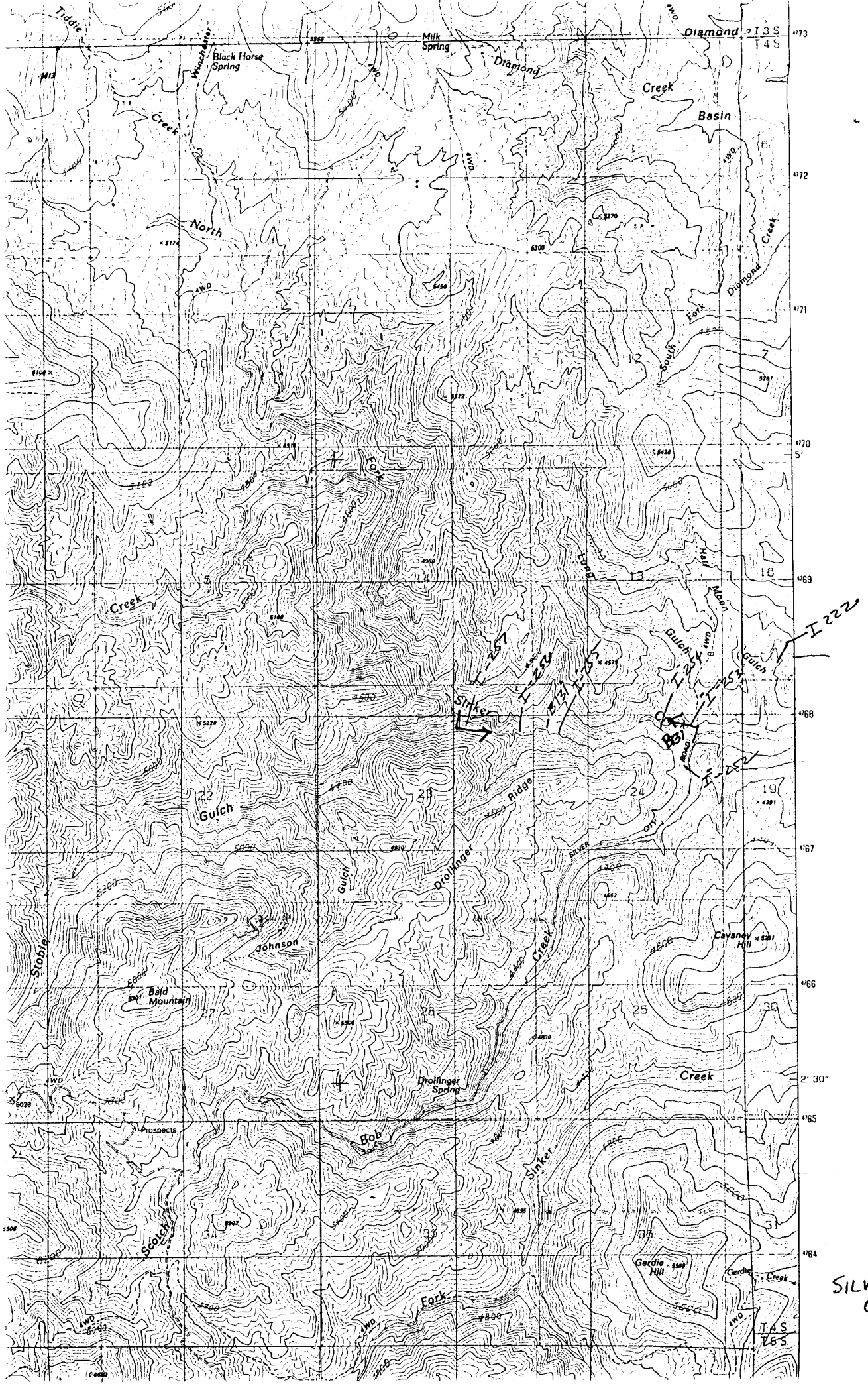
To convert feet to meters multiply by .3048
To convert meters to feet multiply by 3.2808

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STA
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLOR
OR RESTON, VIRGINIA 22092

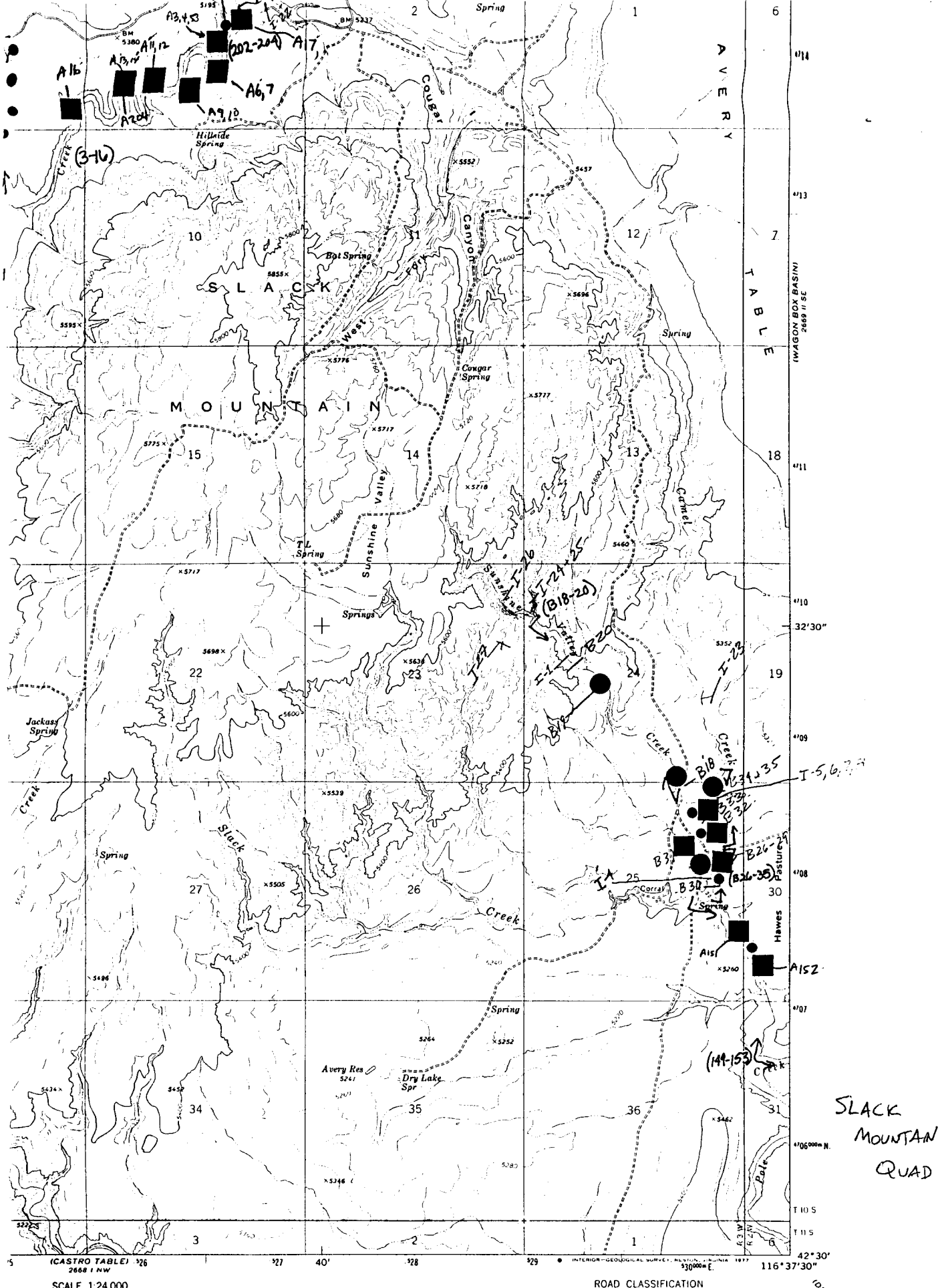
SILVER CITY QUAD



SILVER CITY QUAD



SILVER CITY QUAD



SLACK MOUNTAIN QUAD

SCALE 1:24 000

1 MILE

7000 FEET

1 KILOMETRE

CONTOUR INTERVAL 40 FEET
ED LINES REPRESENT 20-FOOT CONTOURS
ONAL GEODETIC VERTICAL DATUM OF 1929

IDAHO

ROAD CLASSIFICATION

Primary highway, hard surface

Light-duty road, hard or improved surface

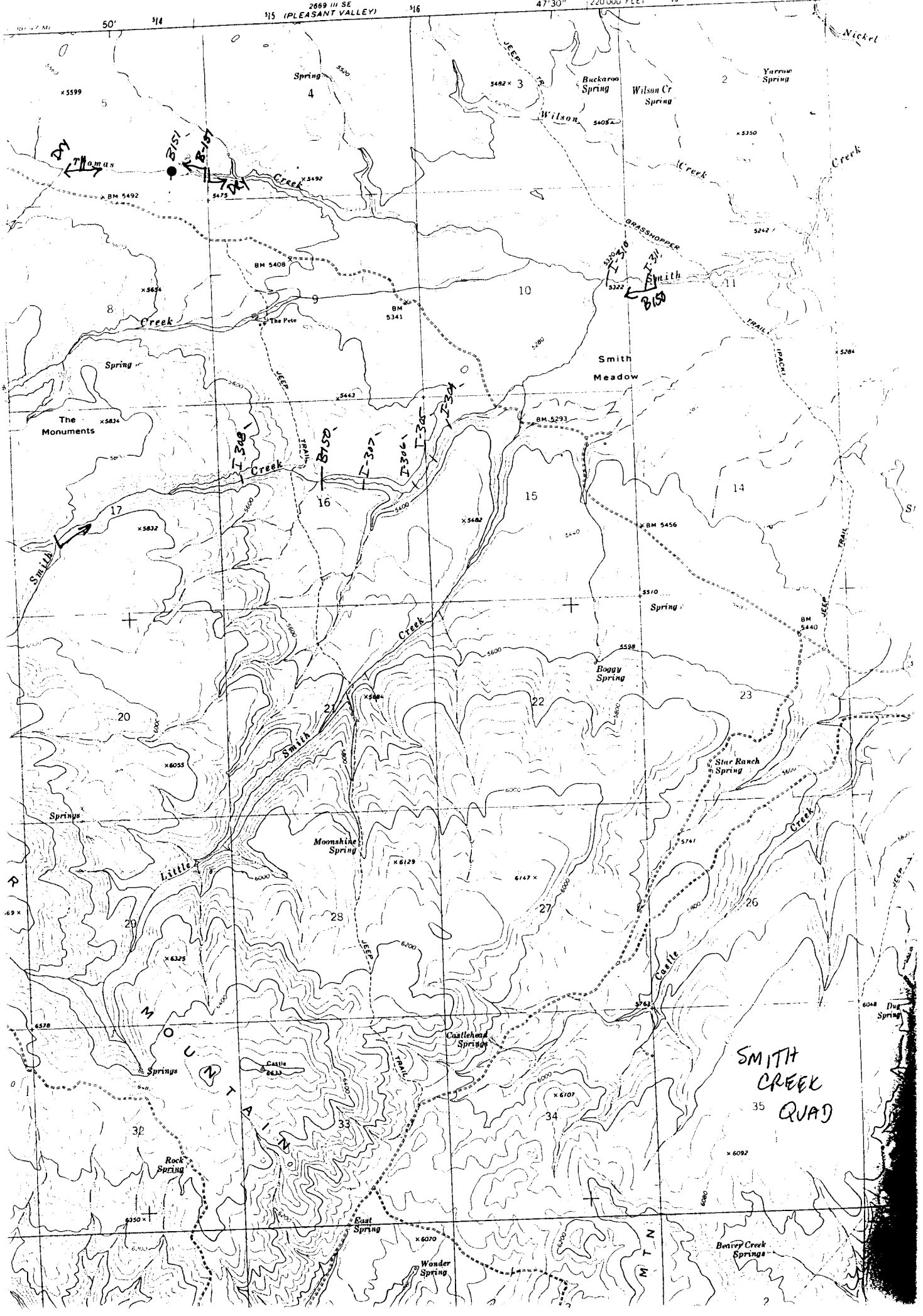
Secondary highway, hard surface

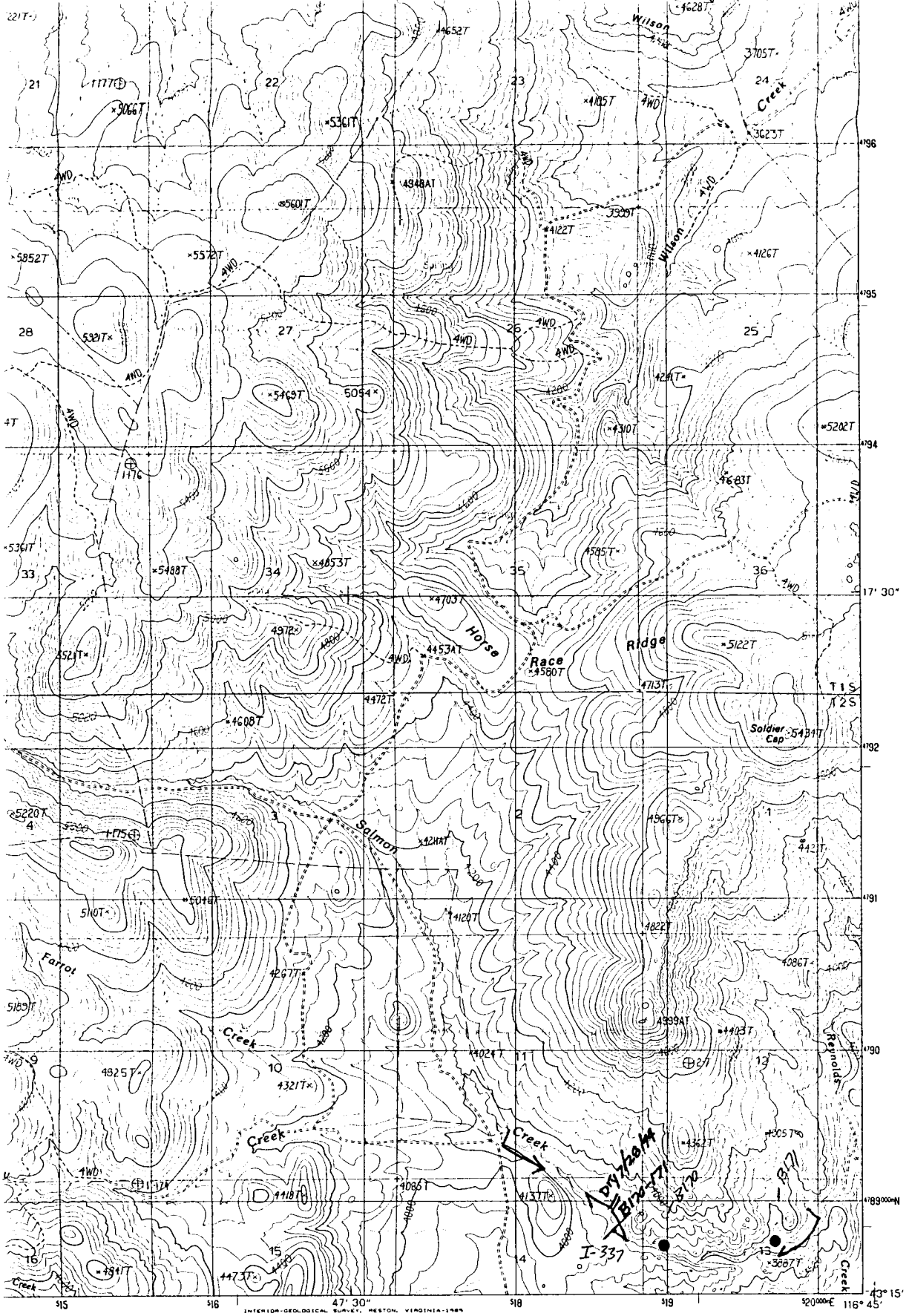
Unimproved road

Interstate Route

U. S. Route

State Route


2669 III SE
(PLEASANT VALLEY)
Spring
Buckaroo Spring
Wilson Cr Spring
Yarrow Spring
Wilson
Creek
Thomas
Creek
GRASSHOPPER
Smith
TRAIL
JEEP
Smith Meadow
The Pete
The Monuments
Creek
Smith
Creek
Boggy Spring
Star Ranch Spring
Springs
Moonshine Spring
Little
Creek
Castle
Castlehead Springs
Springs
Castle
Rock Spring
East Spring
Wonder Spring
Beaver Creek Springs
Dug Spring
MOUNTAIN
MTN
SMITH CREEK QUAD



INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1989

SCALE 1:24 000

KILOMETERS 0 1 2
METERS 0 1000 2000
MILES 0 1
FEET 3000 4000 5000 6000 7000 8000 9000 10 000

CONTOUR INTERVAL 40 FEET

To convert feet to meters multiply by .3048
To convert meters to feet multiply by 3.2808

MPLIES WITH NATIONAL MAP ACCURACY STANDARDS
.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225
OR RESTON, VIRGINIA 22092

QUADRANGLE LOCATION

1	2	3	1 Jump Creek Canyon 2 Opalene Gulch 3 Givens Hot Springs 4 Plum Butte 5 Wilson Peak 6 Captain Butte 7 Rooster Comb Peak 8 Reynolds
4		5	
6	7	8	

ADJOINING 7.5' QUADRANGLE NAMES

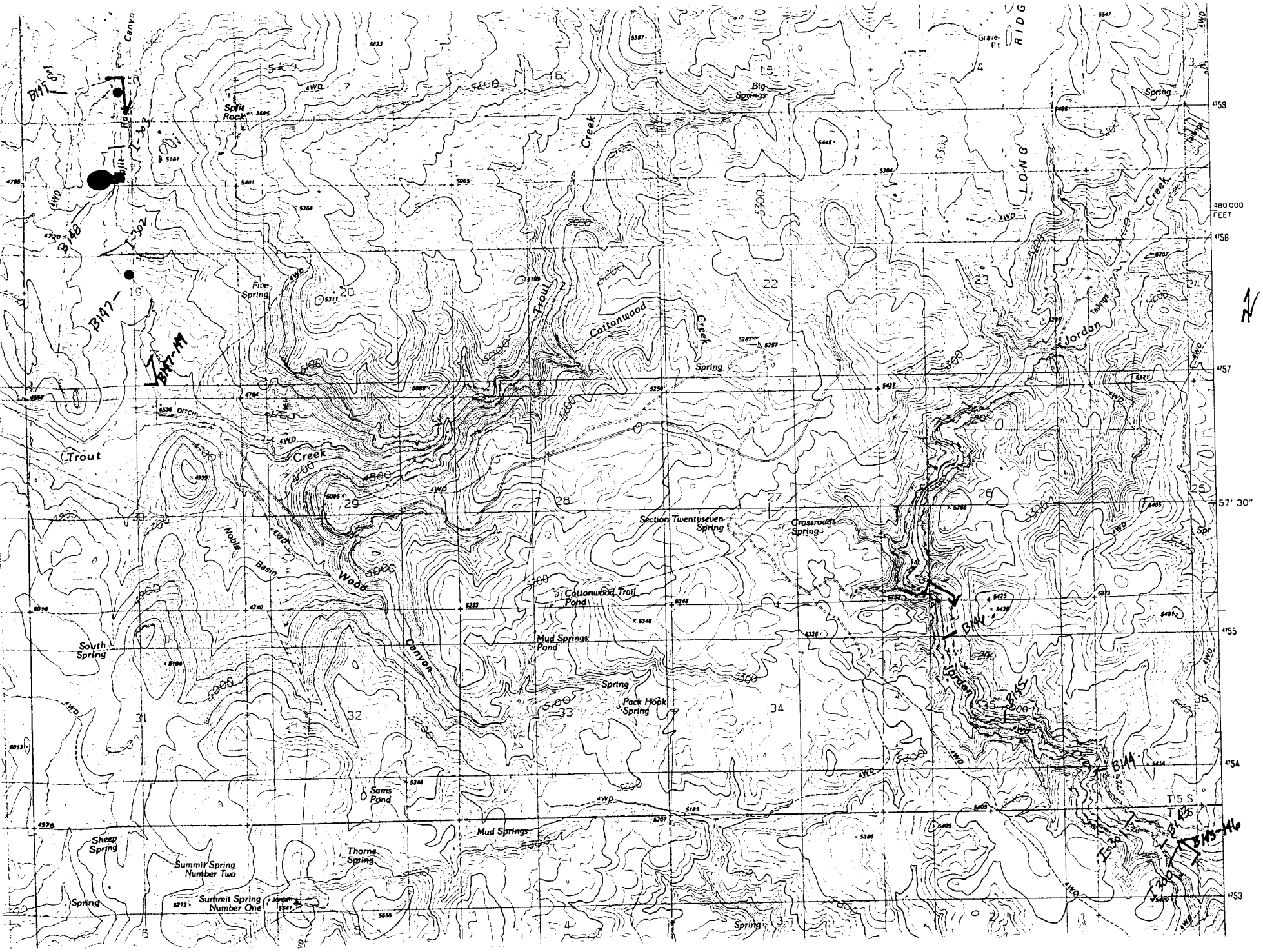
ROAD LEGEND

Improved Road . . . . . .
Unimproved Road . . . . . .
Trail . . . . . .

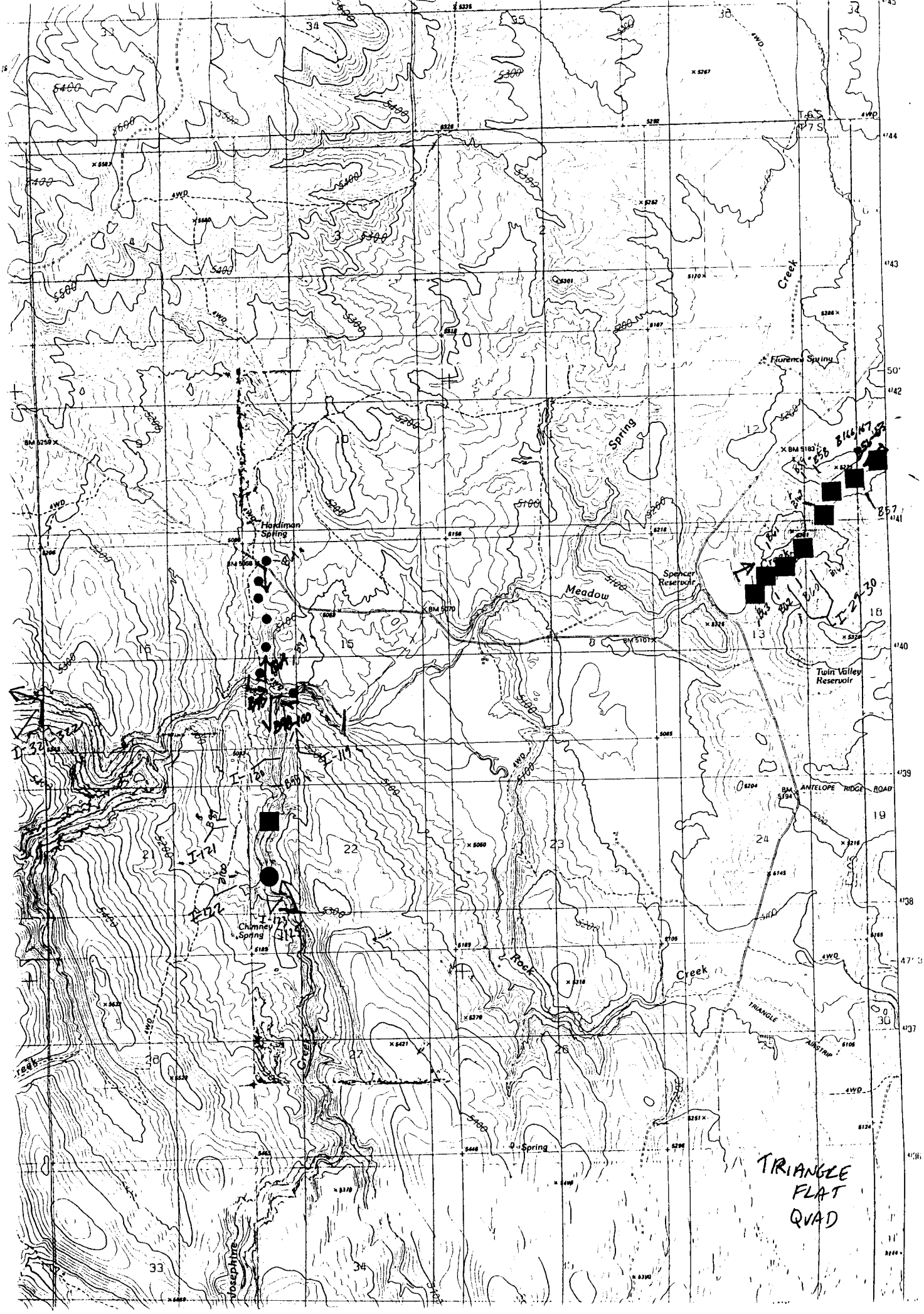
Interstate Route U.S. Route State Route

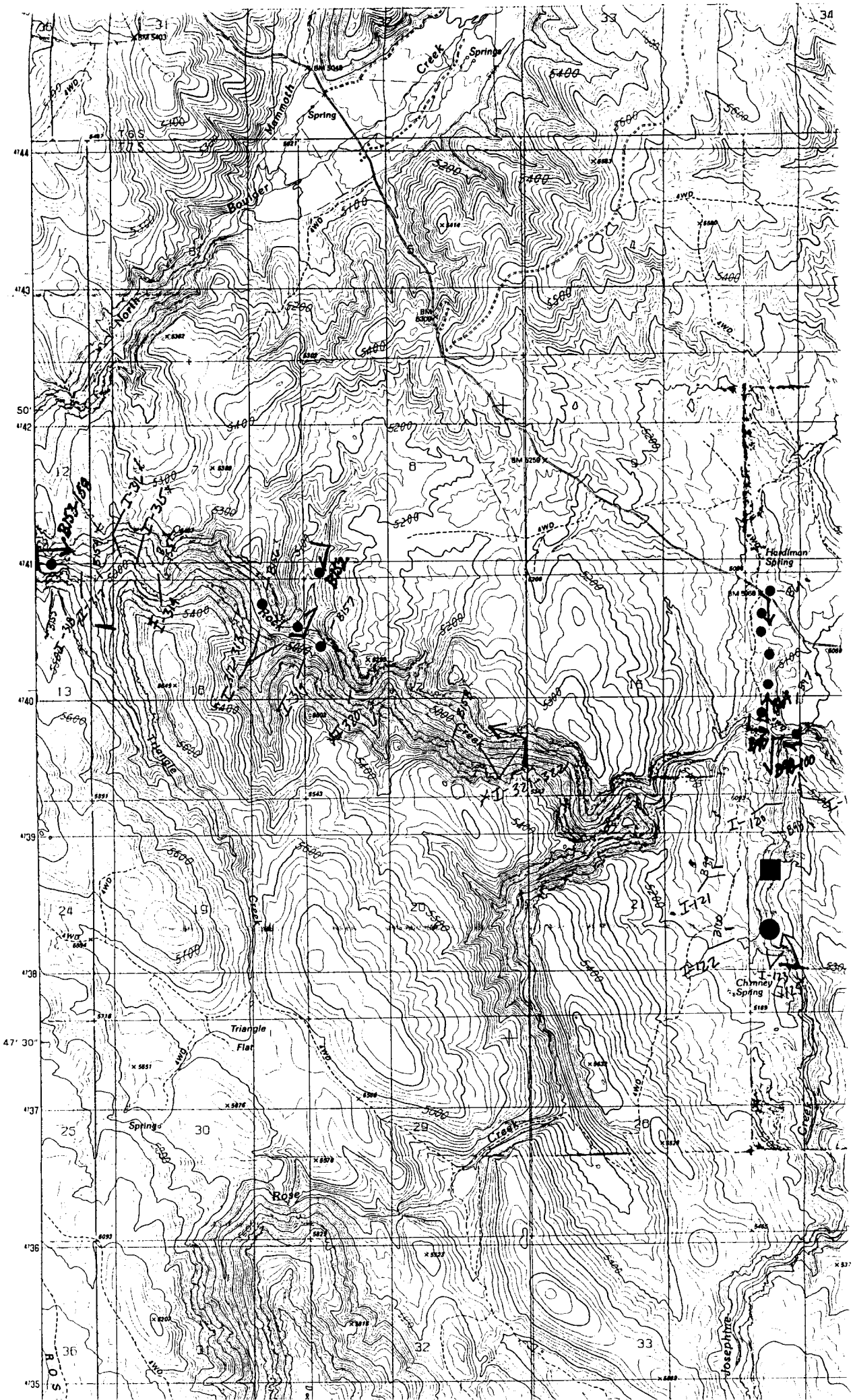
SOLDIER CAP, IDAHO
PROVISIONAL EDITION 1989

43116-C7-TF-024

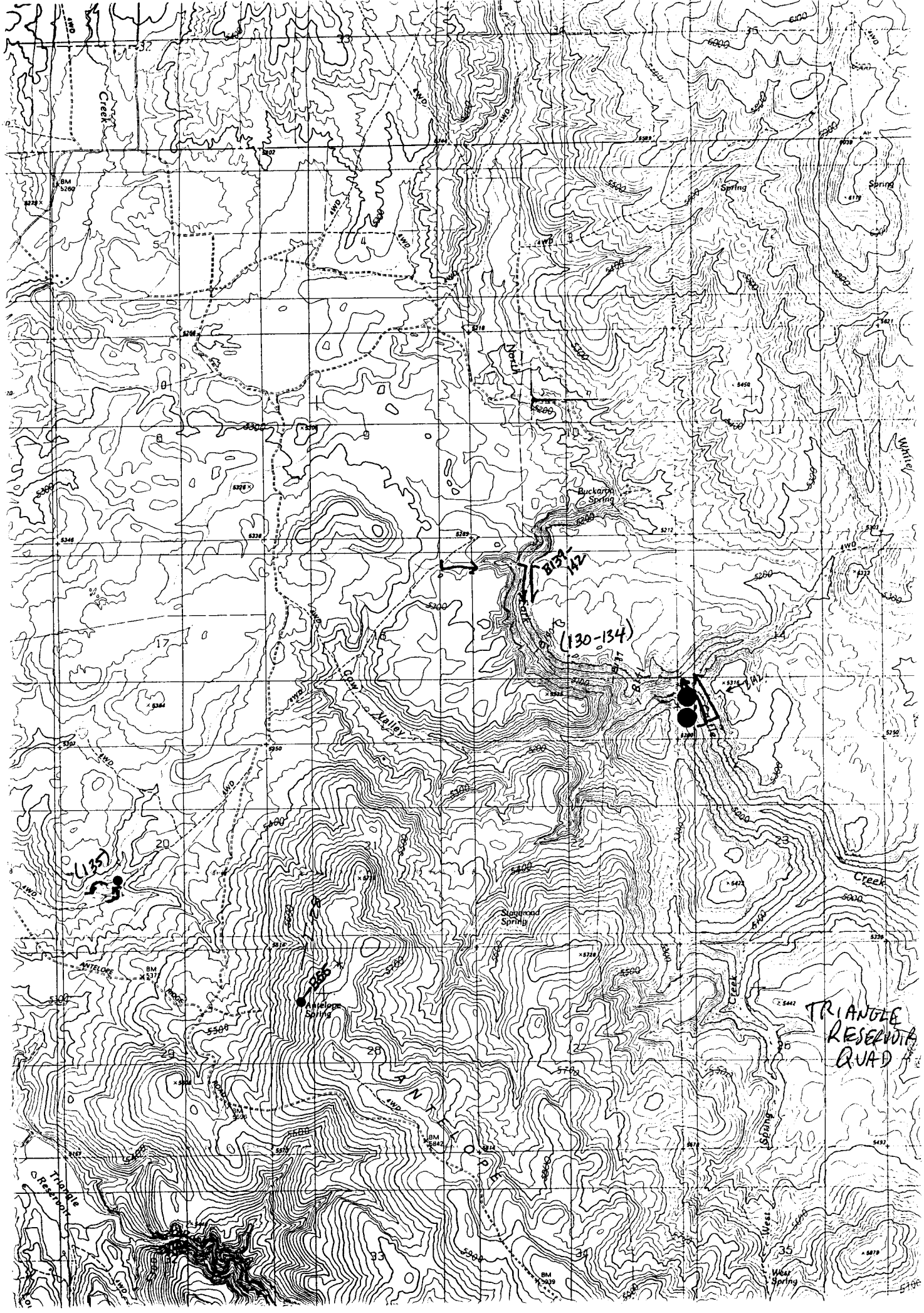


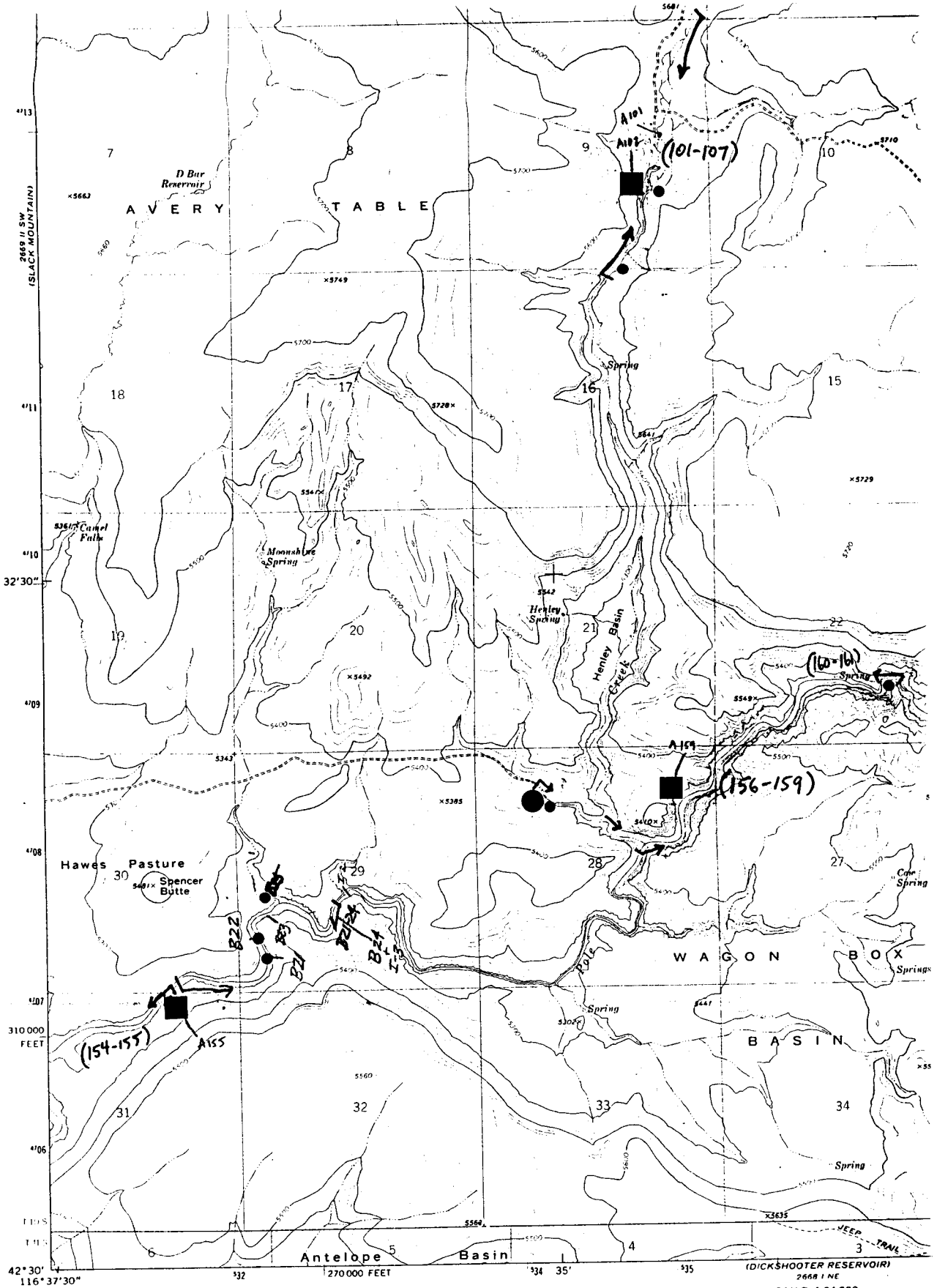
STONEHOUSE CREEK QUAD


Florence Spring
Spring
Hardiman Spring
Meadow
Spencer Reservoir
Twin Valley Reservoir
ANTELOPE RIDGE ROAD
Chimney Spring
Rock
Creek
TRIANGLE AIRSTRIP
Spring
Josephine
TRIANGLE FLAT QUAD



TRIANGLE FLAT QUAD


Buckarroo Spring
(130-134)
(135)
Antelope Spring
Sagebrush Spring
ANTELOPE
Triangle Reservoir
Creek
Valley
Spring
West Spring
TRIANGLE RESERVOIR QUAD



Mapped, edited, and published by the Geological Survey

Control by USGS and NOS/NOAA

Topography by photogrammetric methods from aerial photographs taken 1972. Field checked 1973

Projection and 10,000-foot grid ticks: Idaho coordinate system, west zone (transverse Mercator)
1000-metre Universal Transverse Mercator grid ticks, zone 11, shown in blue. 1927 North American datum

Fine red dashed lines indicate selected fence lines

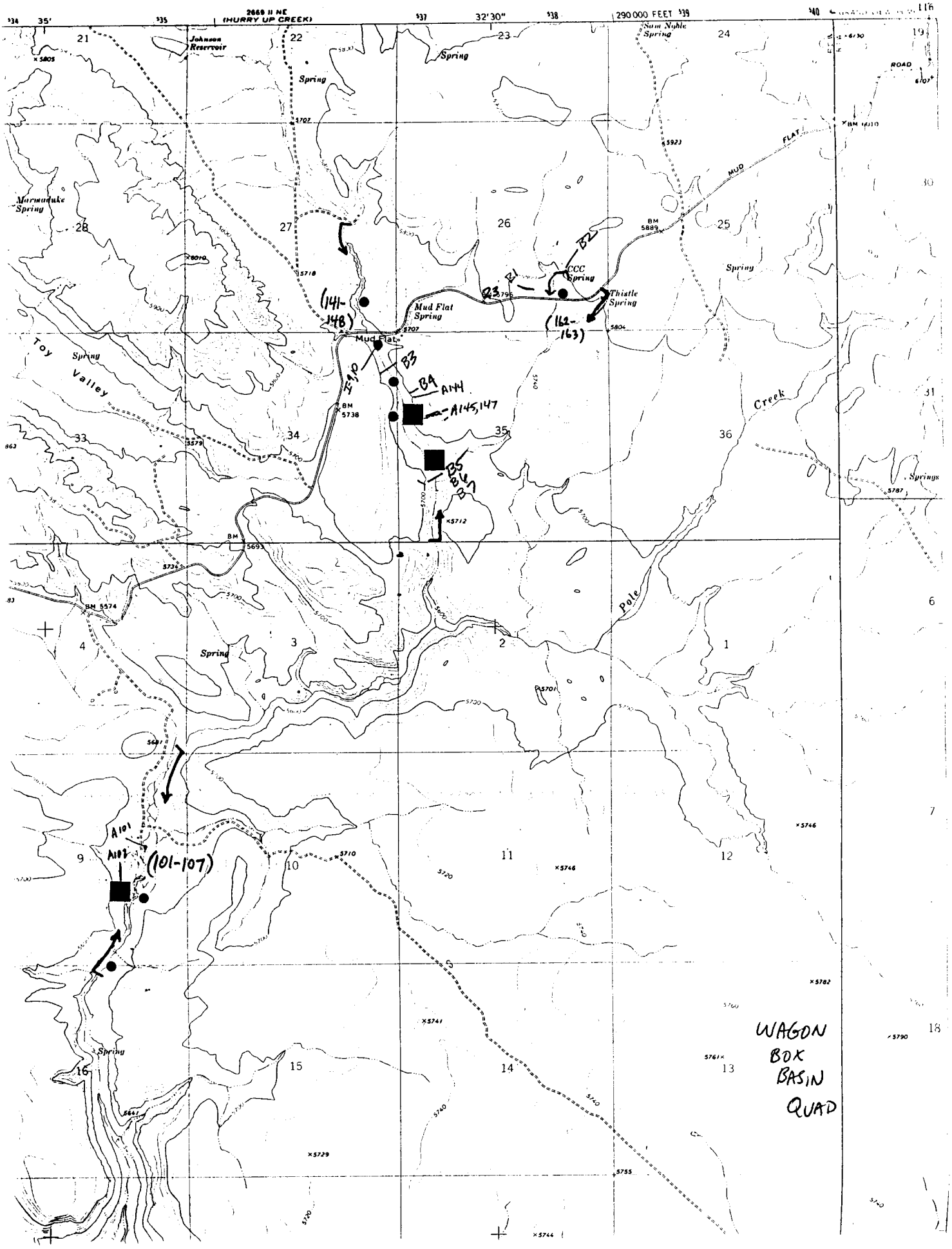
UTM GRID AND 1973 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

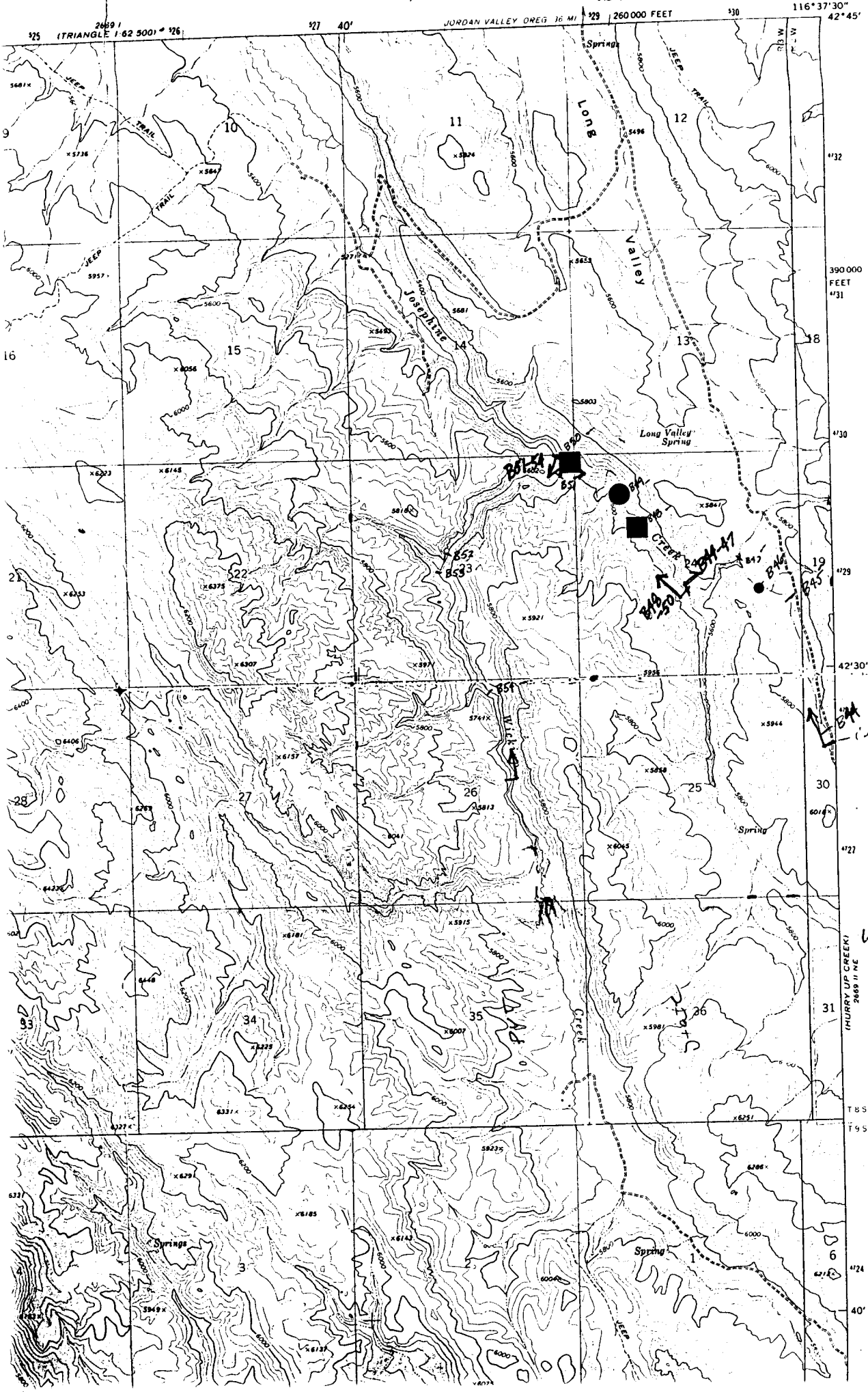
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STA
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILAB

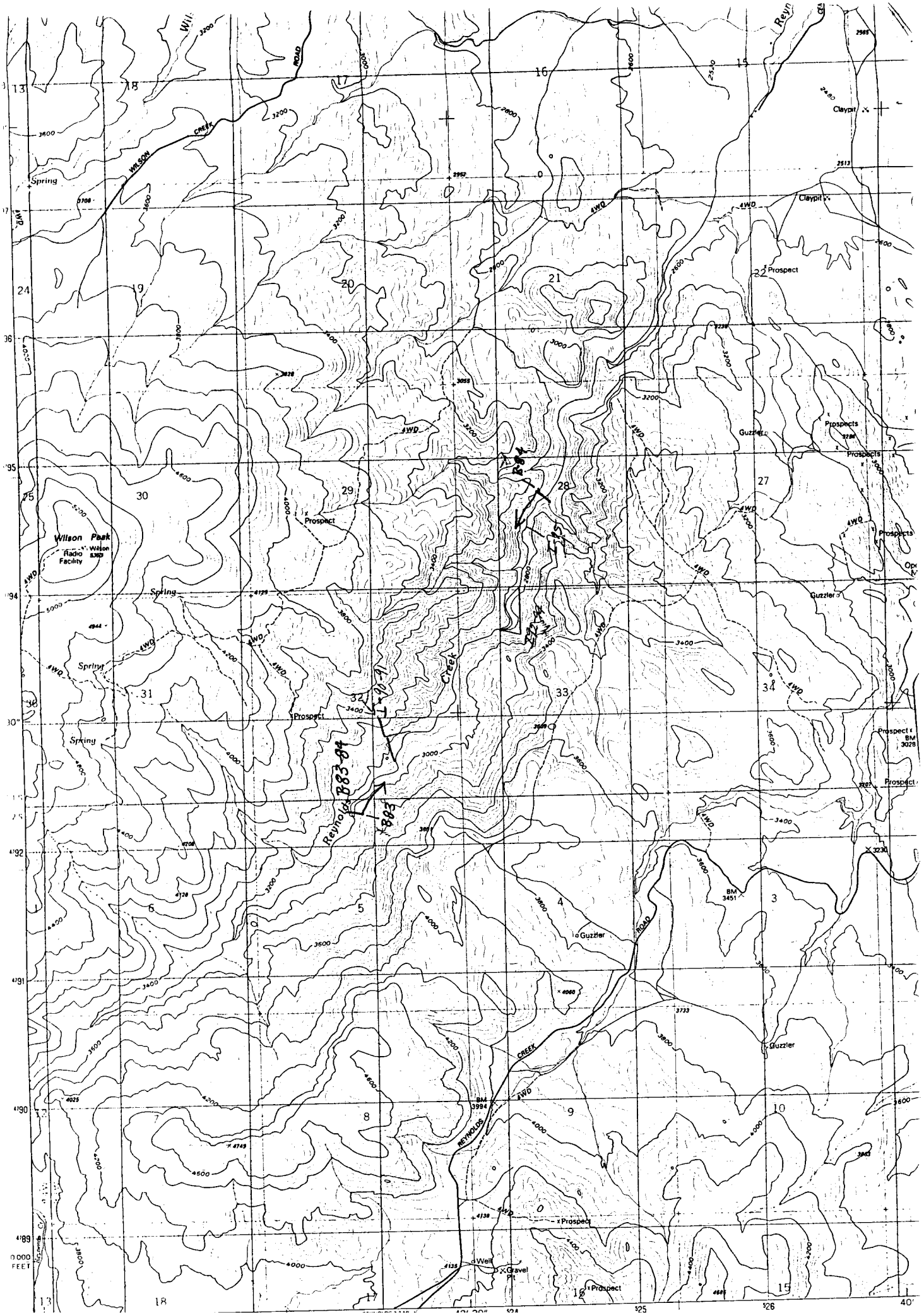
WAGON BOX BASIN QUADRANGLE
IDAHO–OWYHEE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



WICKIUP CREEK QUADRANGLE
IDAHO–OWYHEE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



WICKIUP CREEK QUAD



WILSON PEAK QUAD