Habitat Utilization by Five Selected Wildlife Species of the MPLP Geothermal Exploration Areas.

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Report to:
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Introduction:

As requested by Mammoth Pacific, L.P. (MPLP), WRM collected field information on the habitat use of five selected wildlife species that may be found within the habitats of the MPLP geothermal exploration and development areas in the Mono-Long Valley Know Geothermal Resource Area near the Town of Mammoth Lakes, California. These species include mule deer, spotted owl, goshawk, pine marten, and sage grouse. The MPLP geothermal areas include the Basalt Canyon, Upper Basalt and Rhyolite Plateau exploration areas located west of U.S. Highway 395 and north of California Route 203 and the Casa Diablo geothermal development area located east of U.S. Highway 395 (see Figure 1). This report summarizes the methods and results of the field investigations conducted by WRM and the U.S. Forest Service for these species in and around these geothermal areas during the 2002 field season.

Mule Deer:

At the request of MPLP, during the 2002 field season WRM began looking at the relative seasonal mule deer use of the sage brush dominated areas of the Basalt Canyon/ Upper Basalt exploration areas, the Casa Diablo development area, and the Sherwin Creek deer holding area (as described by Taylor (1996) in his studies evaluating the potential impacts of the proposed Snowcreek Ski Area development). To evaluate the relative abundance of deer in these areas, WRM established twelve ten-station circle plot transects during the field season.

Circle plot transects (USFS 1969) have been used for years to sample range conditions and deer use through the collection of pellet groups. While recognizing they are not a completely random sample, they do provide a consistent methodology for comparison of one area with another. This method was used as a primary study tool due to its simplicity and ease of surveying over time using a limited amount of financial and manpower resources. These circle plot transects can help provide a general understanding of seasonal deer use of these three areas.

Methods: In the early summer of 2002 four circle plot transects, each transect consisting of ten stations, were established in the Basalt Canyon/Upper Basalt exploration area and the Sherwin Creek Holding area (for a total of eight transects). Transects were positioned perpendicular to anticipated deer movement patterns in order to detect relative deer use between sites. Transects were established using USFS-recommended methodology (USFS 1969). Each transect consisted of 10 stations, each located approximately 75 feet apart and marked by a two-foot length of re-bar painted blue. Four transects were placed in the Sherwin Creek holding area, located south of U.S. Highway 395 and south of California Route 203, in Sections 4-6 and 8 of T3S, R28E. These are identified as Sherwin Creek Transects 1-4 (See Figure 2). Four transects were placed in the Basalt Canyon/Upper Basalt exploration areas located north of California Route 203 and west of U.S. Highway 395; two in the Section 31 and one each in Sections 25 and 36, T3S, R27E. These four transects were identified as Basalt Canyon Transects 5-8 (See Figure 2). These eight transects were run once each month from May 28th to October 29, 2002 by identifying and

counting all pellet groups within a radius of 70.5 inches around the center of each station (each station sampled equals 1/400 of an acre, and all 10 stations together represent 1/40 of an acre). All pellet groups found within each circle were counted, recorded and then removed from the circle. Where pellet groups were indistinct, a minimum of five pellets of similar form, texture, and color were considered one group. With the following running of the transect, one month later, any new pellet group found within each circle then represented the relative number of deer that used the area since the last reading of that circle.

As the data collection process progressed on these eight transects, MPLP and WRM decided to add four additional transects (these in the Casa Diablo geothermal development area) in order to also evaluate deer use patterns around the existing geothermal power plants and well field areas developed and maintained by MPLP in the Casa Diablo area (See Figure 2). These four new transects were established at the beginning of October and, due to the lateness of the year when they were established), were run only twice during 2002, on October 3 and October 31, 2002.

In addition to these twelve circle plot transects, each of the geothermal exploration well sites proposed by MPLP was also surveyed using an adaptation of the circle plot transect method (See Figure 3). Each well site survey consisted of placing four circle plot stations on each proposed well site, with each circle plot station placed out 60 feet in each of the four cardinal directions from the flag marking the center of each well site in the Rhyolite Plateau, Upper Basalt and Rhyolite Plateau geothermal exploration areas. These 27 circle plot surveys were only run once, on September 4, 2002, strictly for the purpose of determining in general the relative deer use which might be occurring at each well site. As was the case with the measurement of the circle plot transects, all deer pellets identified within the 70.5-inch circle were counted. Each pellet group was assumed to represent the relative number of deer using the area of the station over the past year. As these surveys were run only one time (in the fall) it is assumed that any deer pellets found would represent the relative number of deer that visited the site through the spring and summer. Thus, the pellet groups found represent the relative amount of site visitation throughout the spring, summer and fall, not by month.

Results:

Basalt Canyon and Sherwin Creek Circle Plot Transects: The results of the circle plot transects are intended to reflect relative monthly deer use for each of the areas. Transects were established so that the results of each could be consistently compared. However, it was clear from the first run that both Stations 9 and 10 of Transect 8 had abnormally larger numbers of pellet groups than any of the other stations. Following discussions with U.S. Forest Service staff, it was learned that sheep had been bedded in this area and many of the pellet groups were actually sheep pellets, not deer. To handle such discrepancies it was decided to compare the mean number of pellet groups per station per transect.

Plate I provides a table which lists the mean number of pellet groups found per station on each transect by date for the Sherwin Creek area. Plate I also provides two graphs displaying the data from the table in alternative forms. Figure 1 of Plate I provides stacked line plots by transect of the mean number of pellet groups per station found during each survey. Figure 2 of Plate I provides a scatter plot by survey date of the mean number of pellet groups per station found on

each transect. Plate II shows the same data collected for the Basalt Canyon area, and Plate III uses the data presented in Plate I and Plate II to compare the results of the Sherwin Creek and Basalt Canyon surveys, with Figure 2 of Plate III providing a scatter plot by survey date of the mean number of pellet groups per station found for the four Sherwin Creek transects and the four Basalt Canyon transects.

Since deer pellets are removed from the circle plots after they are counted, the first set of data collected (in these cases, the data collected on May 28, 2002) is expected to have a greater number of pellets than those found on subsequent surveys. That is due to the fact that the first survey counts all of the deer pellets that were deposited within the plot from previous years. Subsequent surveys count only the pellets which were dropped since the last survey. The Basalt Canyon data presented in Plate II are consistent with this premise as the number of pellet groups per station counted in May were not exceeded in any subsequent month. Although this is also true for the Sherwin Creek four-transect average of the mean number of pellet groups per station counted, it is true of only one of the individual transects (Sherwin Creek Transect 2). For the three other Sherwin Creek transects the mean number of pellet groups per station counted in May was exceeded in at least two other months. The reason for this anomaly is not understood. The possibility exists that more deer utilized those areas after May than prior to May. The high number of pellets counted in May on Transect 2 caused the May average for the Sherwin Creek area to be the highest.

The average mean number of deer pellet groups per station for all the transects in the Basalt Canyon area starts high in May (1.43 groups per station, or 195 percent of the Basalt Canyon area average mean), decreases to 0.45 groups per station (a decrease to 61 percent of the average mean) in June, but then increases to 0.94 groups per station (an increase to 127 percent of the average mean) in July (see Plate III). There is a gradual reduction through the rest of the summer, to 0.85 groups per station in August and 0.56 groups per station in September, but then a sharp decline, to 0.18 groups per station, by the end of October.

The trends in use through time are similar in the Sherwin Creek area, although the overall mean numbers of pellet groups here average nearly 62 percent higher that in the Basalt Canyon area. The obvious exception in the Sherwin Creek area to the trends shown in the Basalt Canyon area is an anomalously low value for the mean number of pellet groups counted in early September for the month of August. However, this sharp reduction in the mean number of deer pellet groups may be attributed to the cattle that were grazed throughout the Sherwin Creek area during this August time period, which may have either displaced the deer or destroyed the evidence of deer use by trampling the pellets. If the assumption is made that the mean number of pellet groups counted in the Sherwin Creek area for the month of August would have demonstrated only a small decline from the values measured in July, in proportion similar to the numbers measured in the Basalt Canyon area, the plots of the average mean number of pellet groups for the two areas would have been very similar (see Plate IV), although the overall mean numbers of pellet groups in Sherwin Creek would have then averaged over 84 percent higher that in the Basalt Canyon area.

The data collected for the Basalt Canyon area indicates a relatively consistent use through the summer time period (from July through the end of September), although the mean number of deer pellets measured per station would suggest that substantially fewer deer use the Basalt Canyon area than the Sherwin Creek area during the same time periods. The relatively greater value measured for the mean number of deer pellet groups during the summer months of July and September (and probably August) in the Sherwin Creek area is also consistent with the telemetry results of Taylor (1996), which found that about 33 percent of the radio-collared deer which migrated into the Sherwin Creek area in May and June remained there in July, rather than migrating with the rest of the herd to the higher elevations in or over the Sierra crest. Thus, this data is also consistent with the interpretation that the Sherwin Creek area being used as both summer range and a holding area during the migratory process.

Casa Diablo Circle Plot Transects: The circle plot transects established late in the Casa Diablo area and were run only two times, at the beginning and end of October. Table 1 displays the results of those surveys.

Table 1.
Casa Diablo Deer Transect: Pellet groups found by month.

Transect Number	**Date of Survey**	
	10/3	10/30
T9	4	2
T10	3	2
T11	23	1
T12	13	5

As with the first reading of the other transects, the run on 10/3 read all pellets deposited over the previous months. Though limited the data shows two things. More pellets were found on those transects north of the Casa Diablo plant site than found to the south (T9, 10 were SE of the plant site while T11, 12 were NW). Second, as with the other areas, deer use appears to have dropped off sharply by late October. This may be a preliminary finding in that all pellets found in the circle plot were tallied on the first run and removed, thus run one would represent deer that utilized the areas through the summer months.

Well Site Transects: In addition to the circle plot transects, the well site transects yielded some interesting information. Table 2 displays the number of deer pellets collected on September 9th and October 3rd at the well sites.

Table 2.

Well site deer pellet groups collected on September 9, 2002

Rhyolite Plateau

Well site #'s	North	East	South	West	Understory
68/22	0	0	0	0	needles
86/22	0	0	0	0	scattered sage
12/23	0	2	0	0	scattered sage
28/14	0	1	1	0	scattered sage
86/15	0	0	0	0	scattered sage
22/14	2	0	0	0	scattered sage
45/15	0	0	0	0	snow brush
26/15	1	0	0	0	needles/grass
42/16	0	0	0	0	thick sage
54/16	0	0	0	0	needles
52/16	0	0	0	0	needles

Upper Basalt

Well site #'s	North	East	South	West	Understory/pine
84/26	0	0	0	0	needles/grass
14/25	0	0	0	0	needles/grass
34/25	0	0	0	0	needles/grass
25/25	0	0	0	0	needles/grass
38/25	0	0	0	0	needles/grass
31/36	0	0	0	0	needles/grass
58/25	0	0	0	0	needles/grass
66/25	0	0	0	0	needles/grass
77/25	1	4	2	0	sage/bitterbrush
64/31	0	0	3	1	sage/bitterbrush

Basalt Canyon

Well site #'s	North	East	South	West	Understory/pine
81/36	3	3	1	1	sage/bitterbrush
12/31	1	5	0	0	sage/bitterbrush
66/31	2	2	0	0	sage/bitterbrush
35/31	2	2	1	1	sage/bitterbrush
23/31	2	3	0	0	sage/bitterbrush
55/31	1	1	1	0	sage/bitterbrush

The data shows that use is associated with browse, whether there is an overstory canopy or not. Where the over story excludes understory vegetation there was no indication of deer use. In

addition, deer use was more prevalent in the Upper Basalt Exploration area than the Rhyolite Plateau area. The reasons for this are unclear at this time as there is ample browse available in much of the Rhyolite area.

Spotted Owl

Introduction:

The Inyo National Forest in the 1980's conducted California spotted owl (CSO) surveys in suitable habitat through the Rhyolite exploration areas. There were no CSO contacts on these surveys (Perloff pers com., F.S wildlife files). Since that time, no additional owl surveys have been conducted. Because much of the area is considered suitable habitat by the Forest Service, a two-year survey of the areas around the proposed well sites within the mixed conifer, red fir, and pine habitat types was conducted by WRM.

Methods:

Habitat maps of the exploration area were obtained from the USDA Forest Service to determine which well site locations fell within conifer stands that could be considered suitable spotted owl habitat. Maps of the well site locations were supplied to WRM by MPLP and were plotted on 1½ inches to the mile in scale. These maps showed well site locations, roads, topography and stream courses. By comparing the Forest Service habitat maps with the well site maps the areas to be surveyed were determined. Once determined, survey routes (transects) and call stations were chosen by WRM in consultation with the Forest Service. Call stations were chosen in order to survey out 1/4 mile from all well sites and plotted on the survey maps (Figure 4).

CSO surveys were conducted following the "Protocol For Surveying Proposed Management Activities That May Impact Northern Spotted Owls," endorsed by the U.S. Fish and Wildlife Service, March 7, 1991 and revised March 17, 1992 (NSO protocol). The first three runs of a two year survey were begun May 27th and completed on July 24th. All surveys were conducted by WRM personnel that meet the "Spotted Owl Surveyor Credentials/Qualifications," revised March 1992. Survey personnel for each transect are identified in the transect report.

Transect routes and survey stations were established prior to running each transect. Roads or trails were opened up for ATV or 4X4 truck access when necessary by cutting away down timber and brush and by removing rocks and mud-slides. Call station locations were flagged and labeled as to transect and station number and plotted on the transect maps. A small strip of reflective tape was placed at the station to aid in locating the station at night.

For safety and transportation efficiency, transects were usually run by a crew of two or more. Crews would divide the transect in order to call separate areas while staying in touch by radio. This approach facilitates the running of the transect and the locating of any detected owls by triangulation. At the conclusion of each transect field notes were transposed onto the transect data form.

Table 3. lists the dates and results of the transect runs.

Table 3.
2002 CSO Survey Results by Transect Run

Date	Stations Run	Results	Surveyors
5/27	1-16	No Contact	SK, DK
6/28	1-16	No Contact	SK, NK
7/24	1-16	No Contact	SK, AK

Surveyors: SK: Steve Kerns, DK: Dan Kerns, AK: Drew Kerns, NK: Anne Kerns

Results:

No CSO or other owls were contacted on any of the transect runs conducted in 2002. As this is the first half of a two year survey these results are not conclusive.

Goshawk

The Inyo National Forest wildlife staff have identified two goshawk nesting territories within the Rhyolite and Upper Basalt Exploration areas (Figure 5). These territories are located as follows:

Territory 1: Five nest sites in Sections 25 and 26 of T3S, R27E
Territory 2: Four nest sites in Section 10 of T3S, R27E

There is an additional nesting territory with two nest sites just west on the Rhyolite Exploration area in Section 21 of T3S, R27E. In addition there are scattered nest locations in Section 11 of T3S, R27E. Of these sites only Territory 1 was known to be active in 2002 (Perloff pers com.).

At the request of the Inyo National Forest, WRM surveyed each well site area, with the exception of those well sites within Territory 1, for the presence of goshawks during the 2002 goshawk nesting season. Territory 1 was surveyed by Forest Service personnel. Surveys were conducted by following USFS 2000 Goshawk survey protocol. At each well site a 200 acre area around the site was traversed on foot while playing a tape of goshawk territorial calls and looking for nests, plucking posts, and feathers. Tapes were played using a Realistic "Stereo Mate" Model 14-1070 tape player with amplification by a Radio Shack Powerhorn. Surveys were run on June 30th and

July 25th. There were no detections of the birds on either survey, nor were any nests, plucking posts or feathers found.

The Forest Service did locate an active nest in Territory 1 that produced two young in 2002. The nest site is located near well site 14-25 in Section 25 of T3S, R27E.

The results of the WRM surveys are consistent with what is known of Goshawks in the area. Territory 1 is active while territory 2 appears to be inactive at this time. No other territories were found during the 2002 survey.

Pine Marten

"American marten tend to associate with mature coniferous forests and seldom venture into large openings." Such is the summary of marten habitat use by Buskirk, Harestad, Raphael and Powell (1994). However, marten show seasonal variation in their use of habitats as they use a wide range of cover types in the summer and tend to prefer conifer dominated habitats during the winter (Buskirk and Powell (1994). In areas where martens limit their use of non-forested habitats in summer, they generally avoid those types completely in winter (Koehler and Hornocker 1977, Simon 1979). This behavior is probably most strongly associated with foraging habits. Buskirk and Powell propose that prey availability, not prey density, is likely the foremost factor in the selection of foraging habitat, and prey availability depends strongly on habitat structure (Buskirk and Powell 1994). Standing and dead trees are beneficial to the marten because they provide access to subnivean areas where the animals forage and seek thermal cover during winter. Koehler and Hornocker (1977) found that marten in the Sierra Nevada preferred forests with 40-60% canopy closure and avoided those with less than 30% canopy cover. Snow cover effects marten use of habitats as martens hunt under the snow rather than over the top. Where deep snow accumulates, American martens prefer cover types that prevent snow from packing hard and that have structures near the ground that provide access to subnivean spaces (Hargis and McCullough 1984, Corn and Raphael 1992). Marten were found to use mixed conifer and true fur habitats with understory of litter, down logs and brush in northern California on managed timberlands (Self and Kerns 1992).

Habitats within the geothermal exploration area are diverse but do contain elements of suitable habitat for marten. Paulus (2001) identified conifer stands of Sierran White Fir, Sierran Mixed conifer, Jeffery Pine and Lodgepole Pine. Jeffery pine stands predominate the area at the lower elevations with the fir stands at the higher elevations. Understory vegetation varies from only needles to dense stands of snowbrush or sage.

Within a study area that includes the geothermal exploration area there has been three studies that looked at the habitat utilization of marten. Hargis (1980) used hair snares and live trapping to determine locations of habitat utilization by marten. She found that marten were most commonly found in red fir complexes (red fir, red fir/ white fir, red fir/lodgepole pine, red fir/ aspen) but were also found in lodgepole pine, mixed conifer, lodgepole pine/aspen and Jeffrey pine. Hargis concluded that down logs, standing snags, riparian areas and overstory canopy were important

components of marten habitat. Marten were detected in this study in Section 16 and 21 of T3S R27E (Figure 5 USFS data).

Strehl (1995) used trailmaster cameras over five years to detect marten within the same general area that Hargis studied. The focus of this study was to gain an understanding as to the habitat components that constitute suitable marten habitat within the area. Hagris found that marten use mature forest stands with a mean basal area of 80m2/ha, a canopy cover of 44% and 2.3 logs and 3.8 snags per 0.04 ha plot. Also, marten use tree species associations in proportion to their availability except for pure Jeffrey pine stands which were used less than expected. Unfortunately the report does not give the locations of the marten detections.

Kucera (1997) captured and radio collared marten in the same study area in an effort to establish a baseline understanding of the ecology and distribution of the species. Eight males and six females were captured and tracked using radio telemetry. In his conclusions Kucera found that marten occupied all coniferous forest types present in the study area from Jeffrey pine to sub-alpine fir. They seem to prefer mesic and riparian forests over xeric ones. Marten home ranges were found in Sections 9, 10, 14, 15 and 16 of T3S, R27E (Figure 5 USFS data).

From these studies it is known that marten are using the Rhyolite Plateau exploration area, principally in the northern half of the area (USFS wildlife files, Figure 5). To date there is no information to indicate that marten are using the Upper Basalt exploration area although suitable habitat is available in the area. Forest Service data indicates that there have been 9 confirmed marten detections to the east of the Scenic Loop road and west of Highway 395. There have been 93 detections west of the Scenic Loop road. This data would indicate that the majority of marten use is west of the Loop road. WRM did not collect any marten data during the 2002 field season.

Greater Sage Grouse

The sage grouse is North America's largest grouse with males weighting up to 8 pounds. The sage grouse is found in parts of eleven western states including central and northeastern California. They are found on prairies and mountain foothills dominated by sagebrush (*Artemesia spp.*), forbs, and grasses in habitat known as "sage steppe." The best sage grouse habitats are in mature sagebrush stands, often 30 to 100 years old, with a dense understory of native perennial grasses such as blue bunch wheat grass and native forbs. They are both herbivorous and insectivorous: chicks eat primarily insects and forbs while adults eat sagebrush during winter and forbs during other seasons. They nest under sagebrush as well as surviving winter and escaping from predators by using mature sagebrush. Some populations are migratory, flying and walking 100 miles or more between breeding and wintering grounds.

A limited amount of suitable grouse habitat exists on the Basalt Canyon exploration area west of Highway 395 and north of Highway 203. WRM examined the Sherwin Creek and Basalt Canyon areas for grouse leks and nesting evidence by walking the areas around the established deer transects. These areas were searched once a month from May until October. On 10/2 six grouse were flushed near Transect 2 in the Sherwin Creek area. No other grouse were found during these

surveys. On 5/28 an early morning survey was done between 0530 and 0700 on the Basalt Canyon area in the sagebrush area north of the junction of Highways 395 and 203. Two observers took up listening stations on the south and north end of the area. No grouse were heard. While more surveys will be conducted this coming spring, it appears that a limited number of grouse are using the general area south of Highway 203 for foraging. Presently it is not known if grouse are using the Basalt Canyon area, but none were located there this past survey season.

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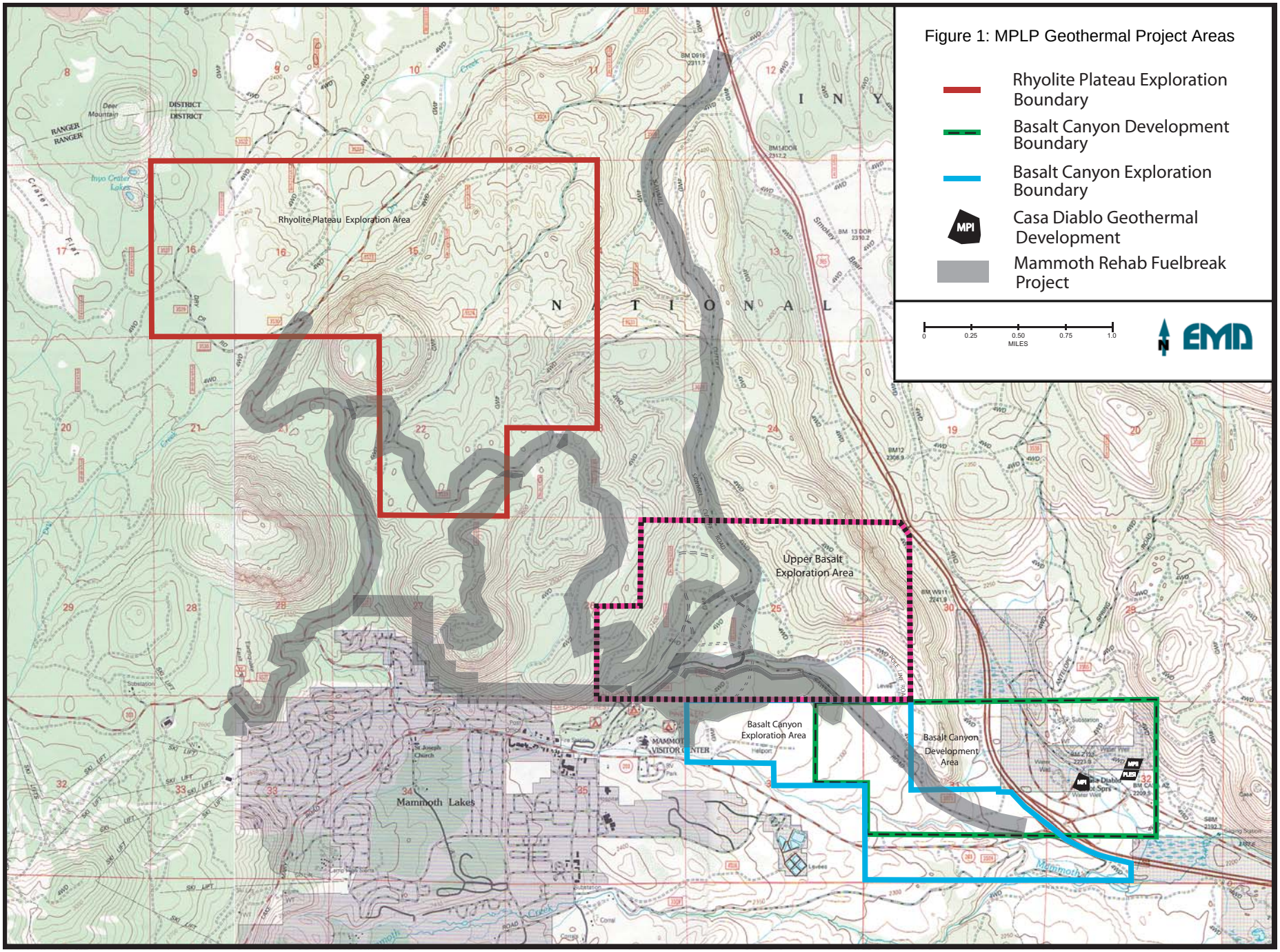


Figure 1: MPLP Geothermal Project Areas
Rhyolite Plateau Exploration Boundary
Basalt Canyon Development Boundary
Basalt Canyon Exploration Boundary
MPI
Casa Diablo Geothermal Development
Mammoth Rehab Fuelbreak Project
0
0.25
0.50
MILES
0.75
1.0
N
EMD
Rhyolite Plateau Exploration Area
Upper Basalt Exploration Area
Basalt Canyon Exploration Area
Basalt Canyon Development Area
Mammoth Lakes
NATIONAL
INY

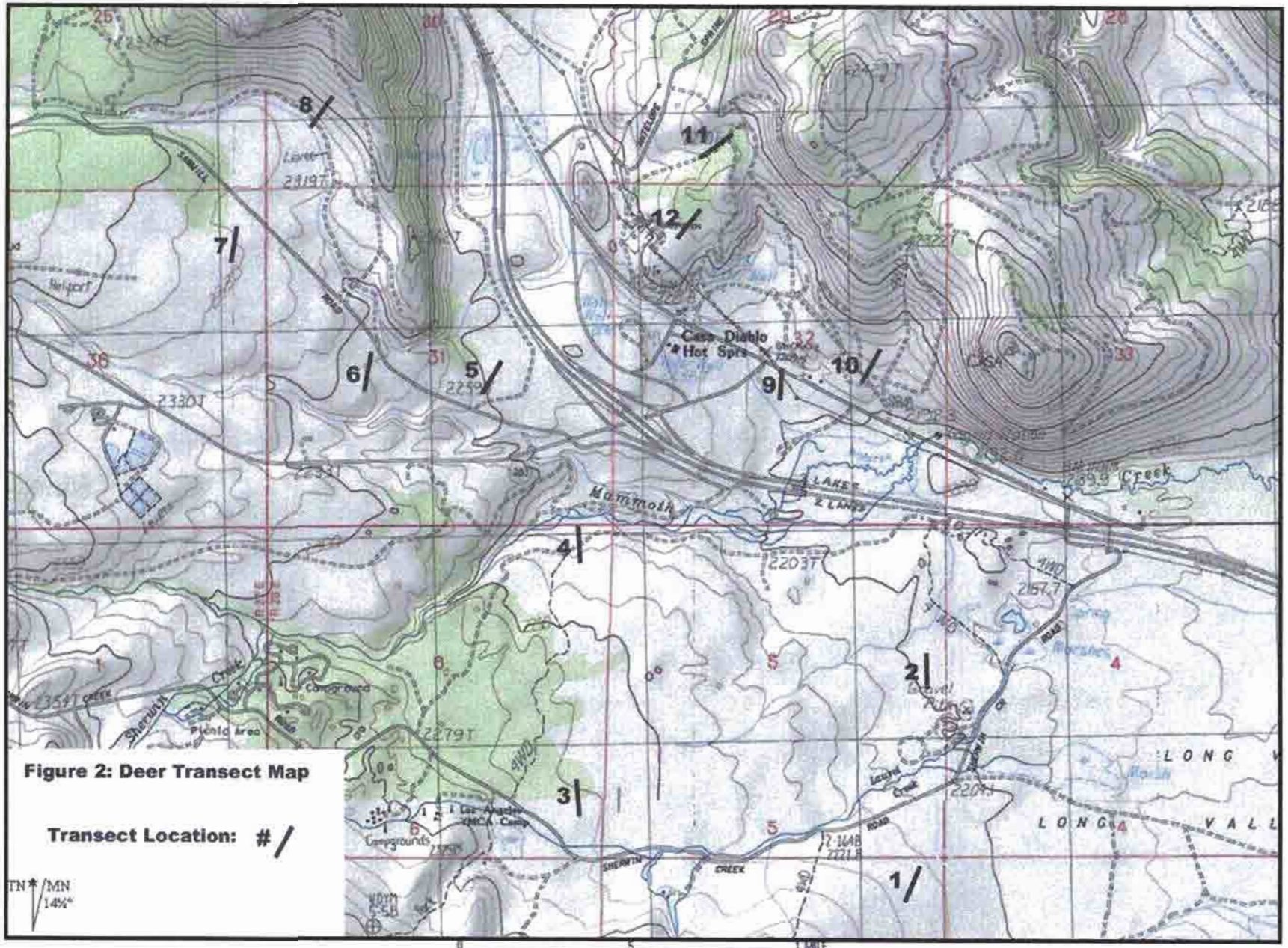


Figure 2: Deer Transect Map

Transect Location: # /

Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

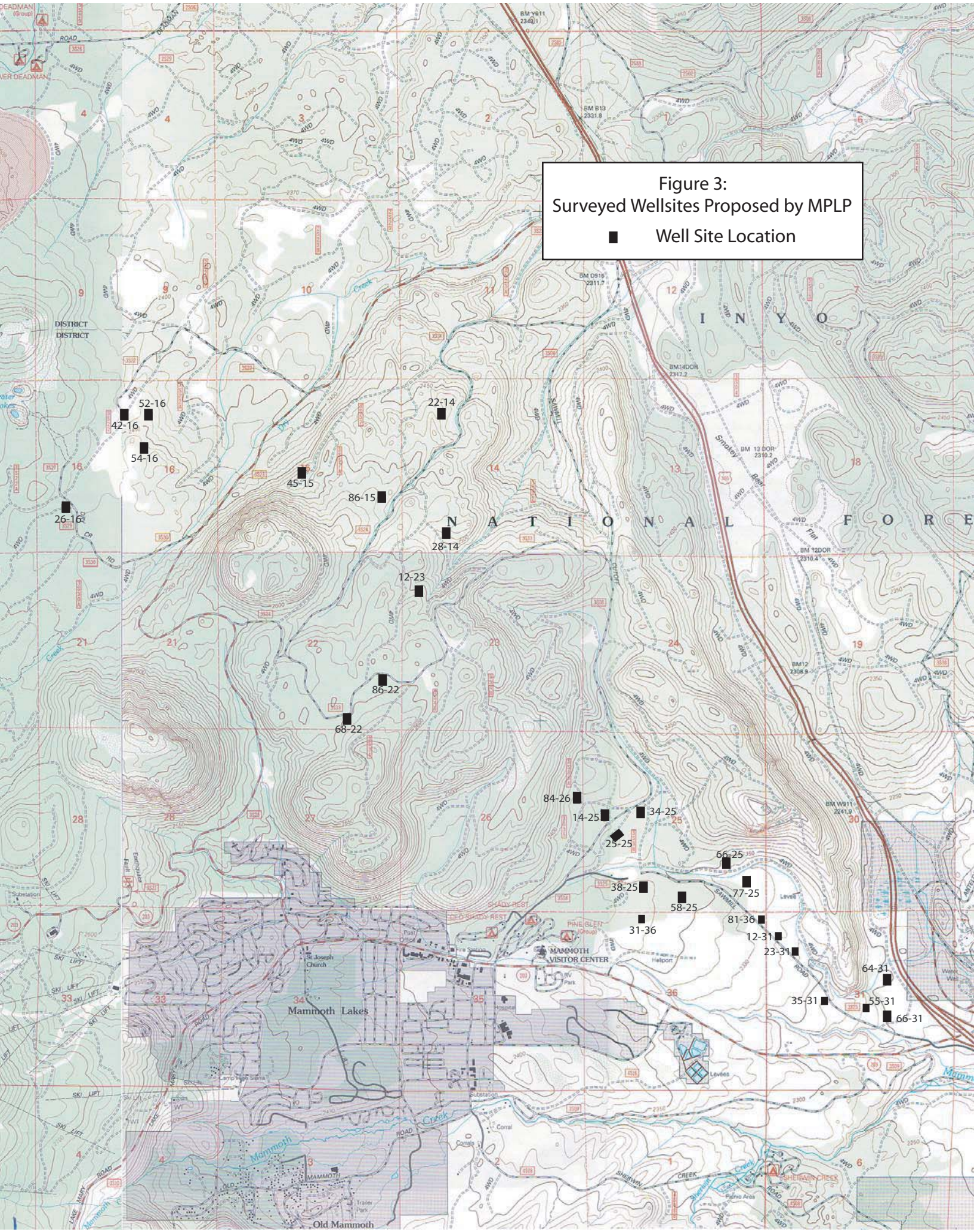


Figure 3:
Surveyed Wellsites Proposed by MPLP
Well Site Location
52-16
42-16
54-16
22-14
45-15
86-15
26-16
28-14
12-23
86-22
68-22
84-26
14-25
34-25
25-25
66-25
38-25
77-25
58-25
81-36
31-36
12-31
23-31
64-31
35-31
55-31
66-31
Mammoth Lakes
Old Mammoth
MAMMOTH VISITOR CENTER
I N Y O
N A T I O N A L F O R E

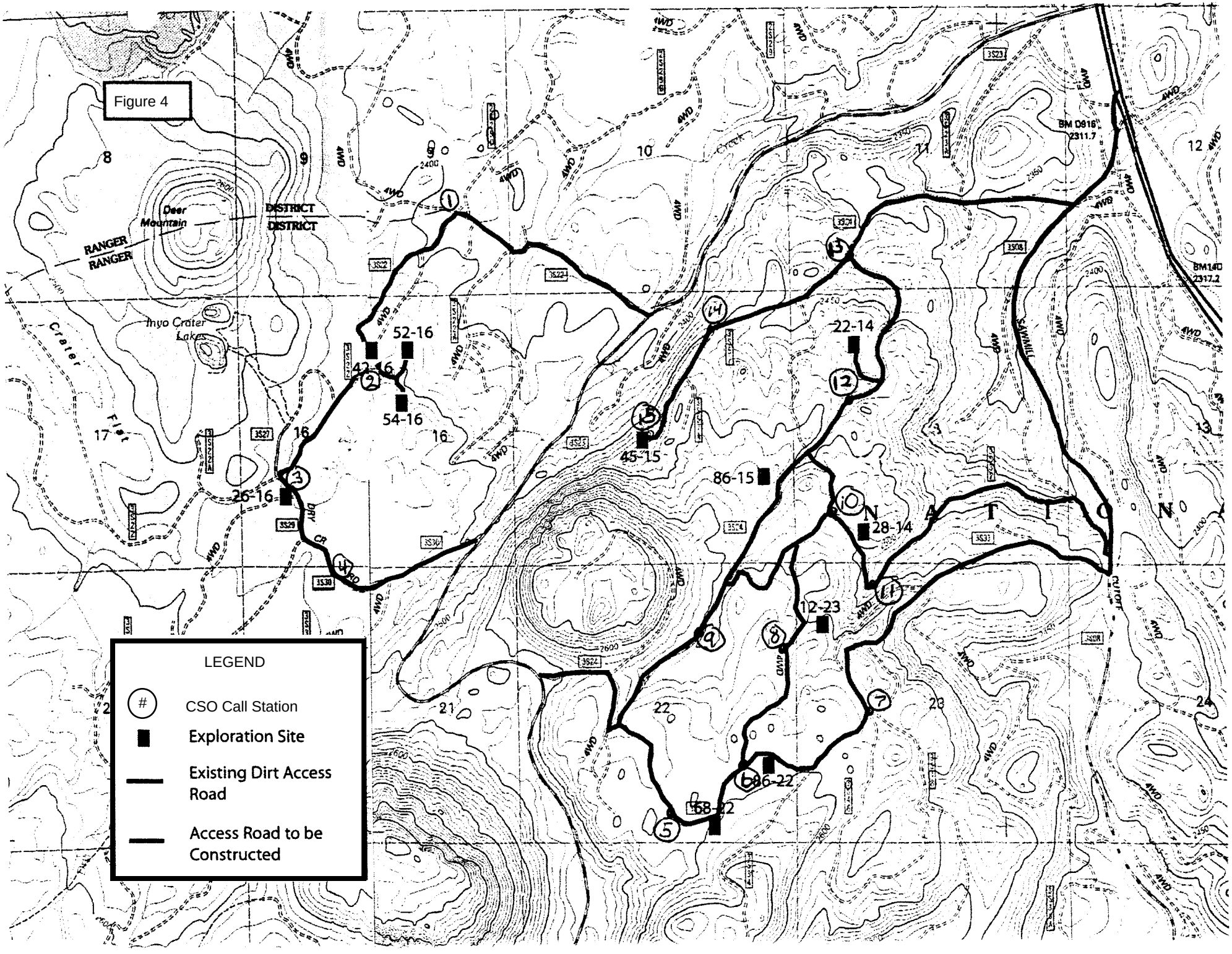
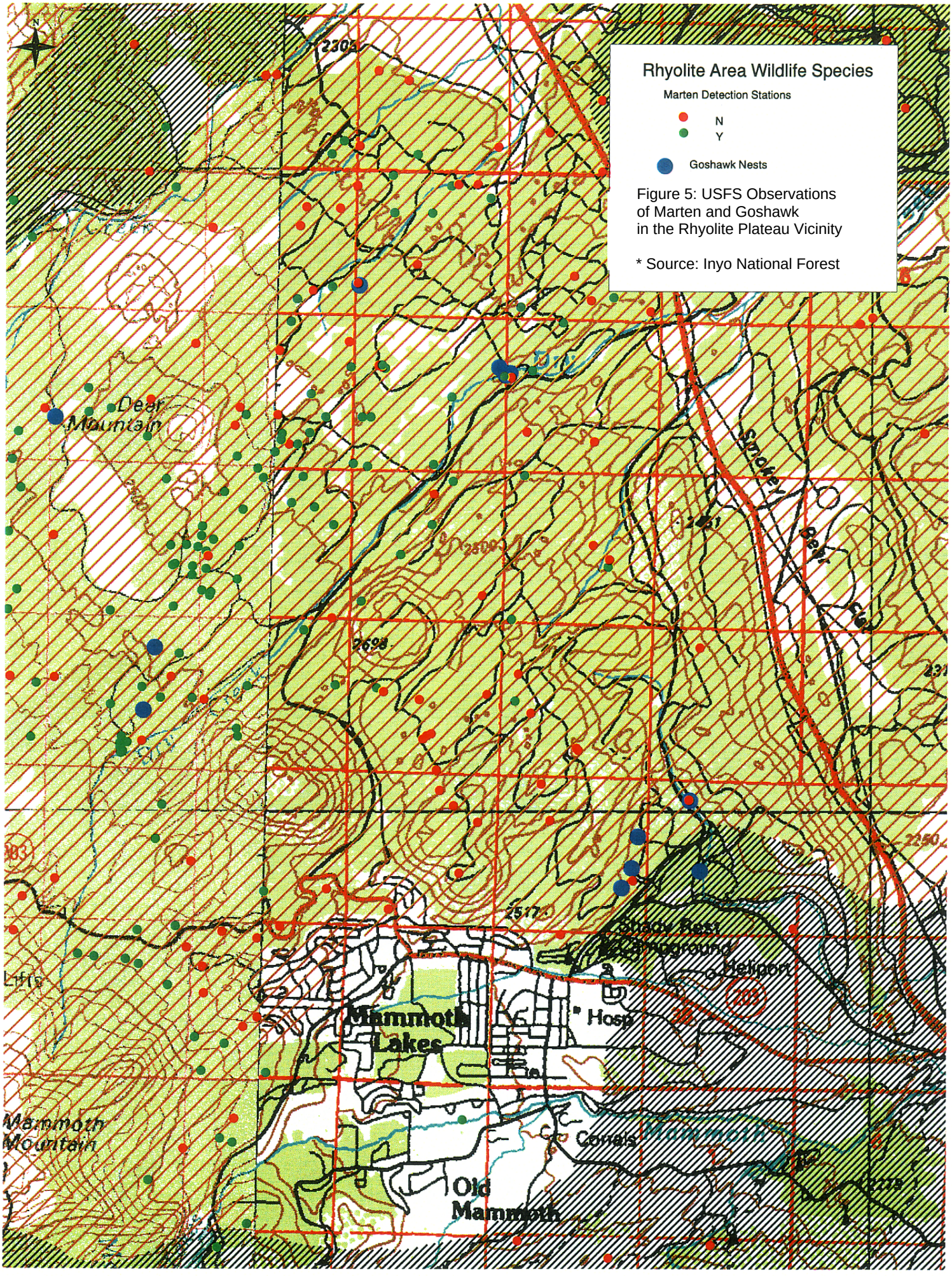


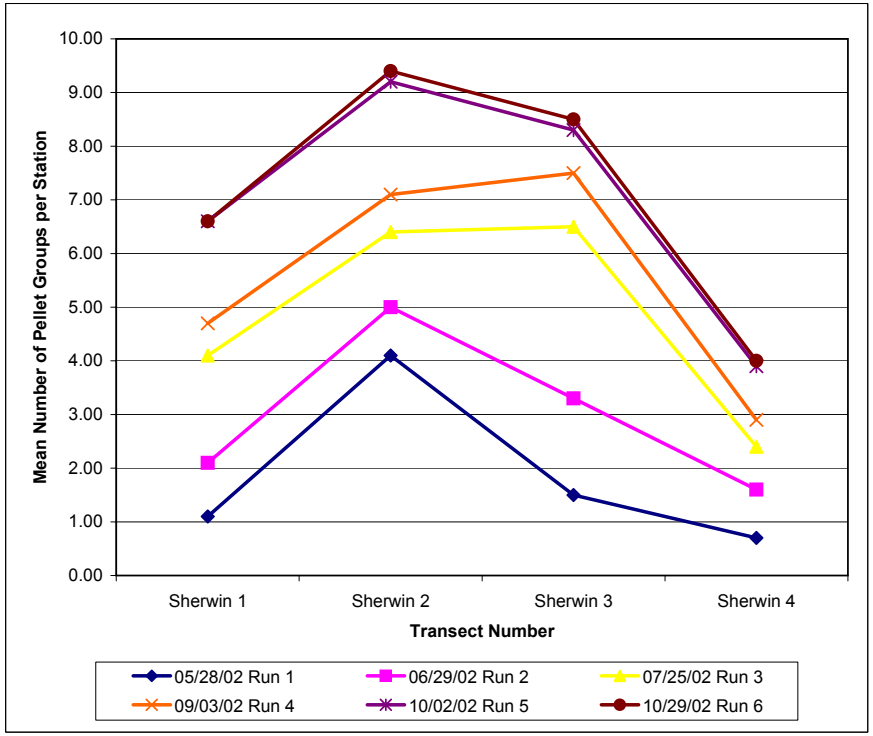
Figure 4
Deer Mountain
DISTRICT
DISTRICT
RANGER
RANGER
Inyo Crater Lakes
Crater
Flat
Creek
SAWMILL
CUTOFF
BM 0918
2311.7
BM1410
2317.2
52-16
42-16
54-16
26-16
45-15
86-15
22-14
28-14
12-23
86-22
68-22
LEGEND
CSO Call Station
Exploration Site
Existing Dirt Access Road
Access Road to be Constructed

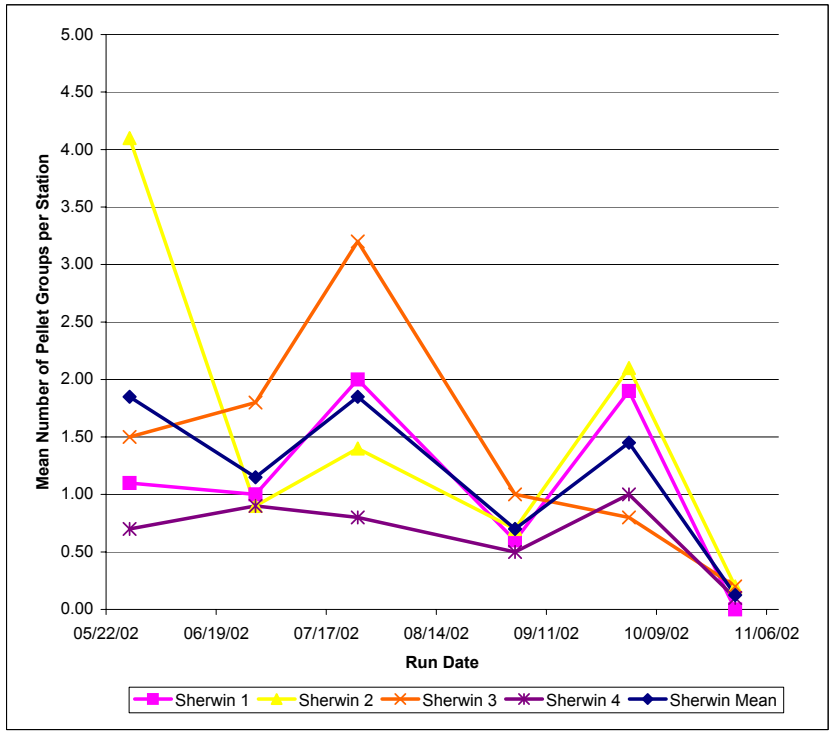

Rhyolite Area Wildlife Species
Marten Detection Stations
N
Y
Goshawk Nests
Figure 5: USFS Observations of Marten and Goshawk in the Rhyolite Plateau Vicinity
* Source: Inyo National Forest
Dear Mountain
Mammoth Lakes
Hosp
Heliport
Sheep Rest Campground
Mammoth Mountain
Old Mammoth
Coreis
Mammoth
2305
2517
2150

Sherwin Creek Transect Summary

PLATE I

Transect Number	Mean Number of Pellet Groups per Station										
	05/28/02	06/29/02	07/25/02	09/03/02	10/02/02	10/29/02					Annual
	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6	Run 7	Run 8	Run 9	Run 10	Mean
Sherwin 1	1.10	1.00	2.00	0.60	1.90	0.00					**1.10**
Sherwin 2	4.10	0.90	1.40	0.70	2.10	0.20					**1.57**
Sherwin 3	1.50	1.80	3.20	1.00	0.80	0.20					**1.42**
Sherwin 4	0.70	0.90	0.80	0.50	1.00	0.10					**0.67**
Sherwin Total	**7.40**	**4.60**	**7.40**	**2.80**	**5.80**	**0.50**					**4.75**
Sherwin Mean	**1.85**	**1.15**	**1.85**	**0.70**	**1.45**	**0.13**					**1.19**
Percent of Mean	**155.8%**	**96.8%**	**155.8%**	**58.9%**	**122.1%**	**10.5%**					

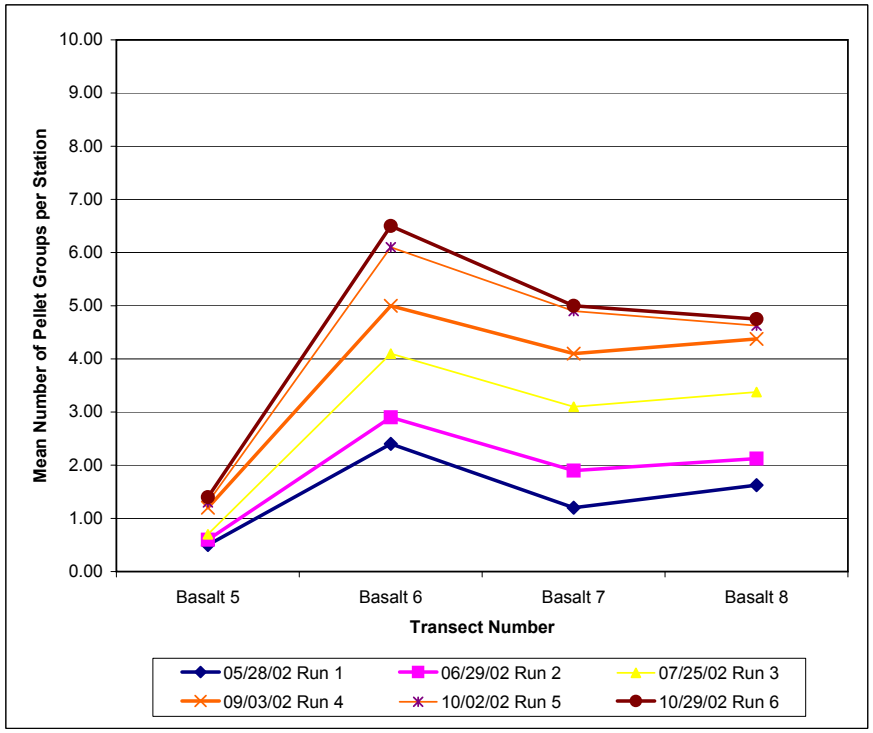


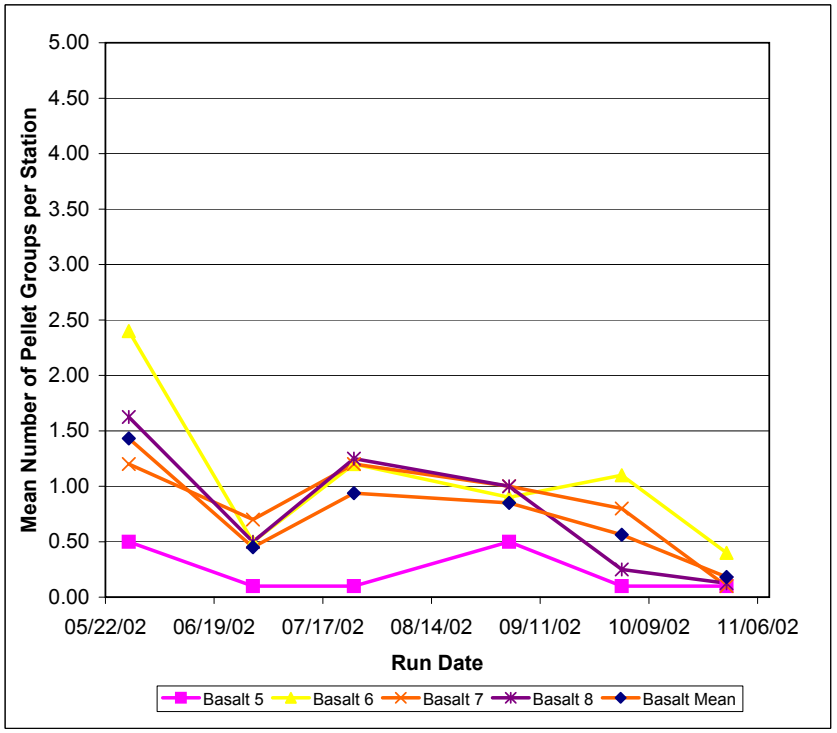


Basalt Canyon Transect Summary

PLATE II

Transect Number	Mean Number of Pellet Groups per Station										Annual Mean
	05/28/02 Run 1	06/29/02 Run 2	07/25/02 Run 3	09/03/02 Run 4	10/02/02 Run 5	10/29/02 Run 6	Run 7	Run 8	Run 9	Run 10	
Basalt 5	0.50	0.10	0.10	0.50	0.10	0.10					**0.23**
Basalt 6	2.40	0.50	1.20	0.90	1.10	0.40					**1.08**
Basalt 7	1.20	0.70	1.20	1.00	0.80	0.10					**0.83**
Basalt 8	1.63	0.50	1.25	1.00	0.25	0.13					**0.79**
Basalt Totals	**5.73**	**1.80**	**3.75**	**3.40**	**2.25**	**0.73**					**2.94**
Basalt Mean	**1.43**	**0.45**	**0.94**	**0.85**	**0.56**	**0.18**					**0.74**
Percent of Mean	**194.6%**	**61.2%**	**127.5%**	**115.6%**	**76.5%**	**24.6%**					

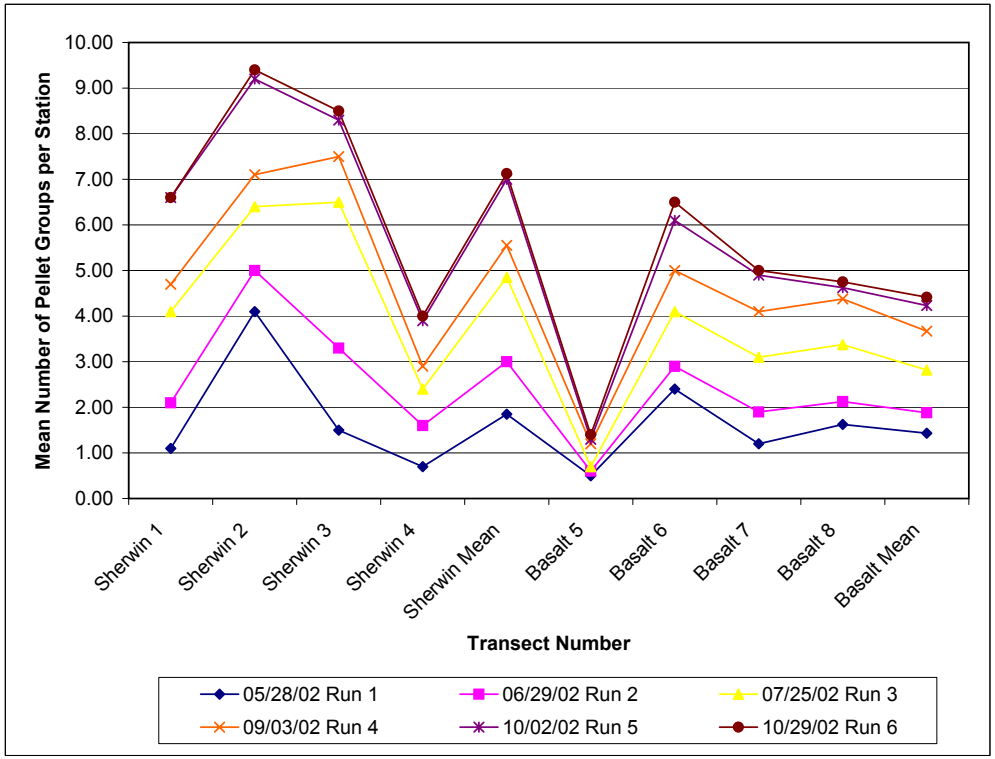


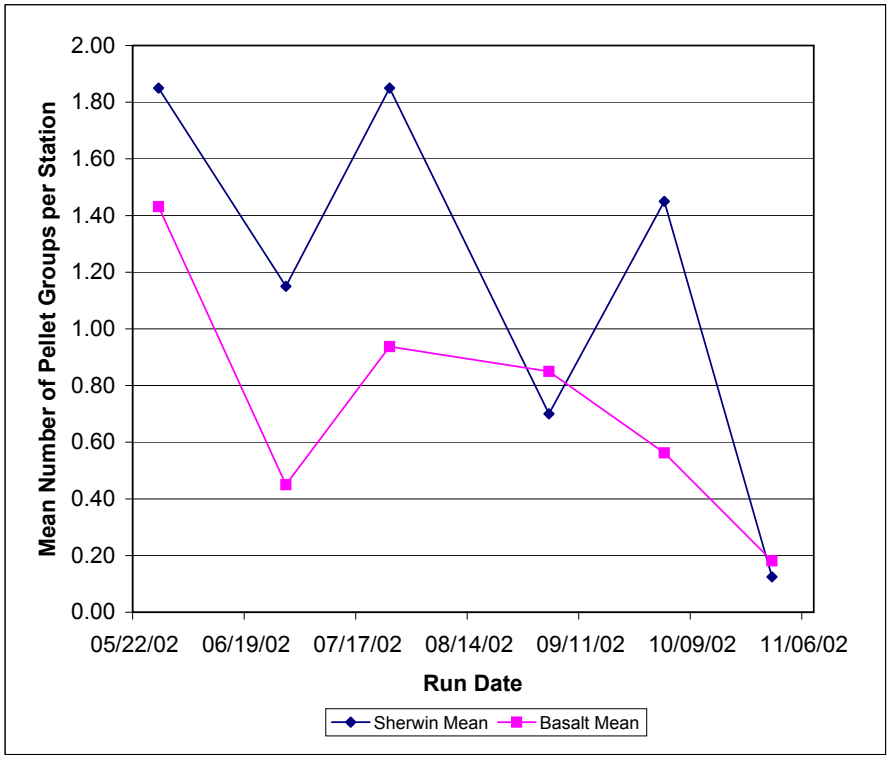


Sherwin-Basalt Transect Compare

PLATE III

Transect Number	Mean Number of Pellet Groups per Station										
	05/28/02	06/29/02	07/25/02	09/03/02	10/02/02	10/29/02					Annual
	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6	Run 7	Run 8	Run 9	Run 10	Mean
Sherwin 1	1.10	1.00	2.00	0.60	1.90	0.00					**1.10**
Sherwin 2	4.10	0.90	1.40	0.70	2.10	0.20					**1.57**
Sherwin 3	1.50	1.80	3.20	1.00	0.80	0.20					**1.42**
Sherwin 4	0.70	0.90	0.80	0.50	1.00	0.10					**0.67**
Sherwin Mean	1.85	1.15	1.85	0.70	1.45	0.13					**1.19**
Basalt 5	0.50	0.10	0.10	0.50	0.10	0.10					**0.23**
Basalt 6	2.40	0.50	1.20	0.90	1.10	0.40					**1.08**
Basalt 7	1.20	0.70	1.20	1.00	0.80	0.10					**0.83**
Basalt 8	1.63	0.50	1.25	1.00	0.25	0.13					**0.79**
Basalt Mean	1.43	0.45	0.94	0.85	0.56	0.18					**0.74**
Overall Mean	**1.64**	**0.80**	**1.39**	**0.78**	**1.01**	**0.15**					**0.96**
Percent of Mean	**170.6%**	**83.2%**	**145.0%**	**80.6%**	**104.7%**	**15.9%**					





Interp Sherwin-Basalt Compare

PLATE IV

Transect Number	Mean Number of Pellet Groups per Station										
	05/28/02	06/29/02	07/25/02	09/03/02	10/02/02	10/29/02					Annual
	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6	Run 7	Run 8	Run 9	Run 10	Total
Interpreted Sherwin Mean	1.85	1.15	1.85	**1.68**	1.45	0.13					**8.10**
Basalt Mean	1.43	0.45	0.94	0.85	0.56	0.18					**4.41**