Acknowledgements

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Appendix 1

FIRE EFFECTS MONITORING ON WILDLIFE

1996

April 23, 1997
Mineral King Risk Reduction Project

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Executive Summary

Wildlife fire effects monitoring was initiated in the East Fork Kaweah River drainage as part of the Mineral King Risk Reduction Project. The monitoring focused on rodents because of the large number of species present and their specificity to habitat structure and composition. In 1996, the monitoring concentrated on two components: 1) permanent monitoring plots to document long-term changes in rodent populations at a few of the most widespread or important habitats, and 2) serendipity surveys to determine the species and relative abundance of rodents in a majority of the drainage's major habitats for drainage-wide evaluation of fire effects.

One-hectare long-term monitoring plots were monitored in mature sequoia forest at Atwell Grove and in westside ponderosa pine forest east of Redwood Creek. The 1,560 trapnights at the Atwell Plot produced 480 rodent captures. The deer mouse (***Peromyscus maniculatus***) was the most abundant preburn rodent at the Atwell plot with an average population estimate of 36 individuals. Other rodents included a few captures of the brush mouse ***(Peromyscus boylii***) and northern flying squirrel (***Glaucomys sabrinus***). The brush mouse was only seen in the postburn sampling and the long-tailed vole (***Microtus longicaudus***) that was present in preburn sampling had disappeared. At the Ponderosa Plot, 1,740 trapnights produced 216 rodent captures. Predominate preburn rodents were brush mouse (***P. boylii***) and deer mouse (***P. maniculatus***). Brush mice were captured in the more mesic areas of the plot, and the deer mice were in the more open dry areas. The other species captured was a pocket gopher (***Thomomys*** sp.).

The Ponderosa Plot habitat was described. The tree/shrub density was estimated at 1,456 stems/ha with incense cedar (***Calocedrus decurrens***) dominating frequency and basal area. Other prominant vegetation included canyon oak (***Quercus chrysolepis***), black oak (***Q. kelloggii***), ponderosa pine (***Pinus ponderosa***), and white fir (***Abies concolor***). The plot faced south-southeast at 1,834-1,873 m elvation. Side slopes varied from 8 to 38 degrees. Rocks, logs, and litter were common. No surface water was present.

Serendipity surveys were conducted at three sites in the East Fork Kaweah River. In descending order of capture abudance, the yucca scrub site had brush mouse (***P. boylii***), western pocket mouse (***Chaetodipus californicus***), pinion mouse (***Peromyscus truei***), dusky-footed woodrat ***(Neotoma fuscipes***), and California mouse (***P. californicus***). In descending capture abuundance, the xeric conifer forest dominated by Jeffrey pine (***Pinus jeffreyi***) had lodgepole chipmonk (***Tamias speciosus***), brush mouse (***P. boylii***), deer mouse (***P. maniculatus***), northern flying squirrel (***G. sabrinus***), and bushy-tailed woodrat (***Neotoma cinerea***). The subalpine meadow had equal capture abundance of long-tailed vole (***M. longicaudus***) and deer mouse (***P. maniculatus***).

Serendipity trapping of mid-sized mammals found ringtail (***Bassariscus astutus***) in westside ponderosa pine forest, pine martin (***Martes americanus***) in sequoia forest and subalpine conifer forest, spotted skunk (***Spilogale gracilis***) in mixed conifer forest and westside ponderosa pine forest, and yellow-bellied marmot (***Marmota flaviventris***) in sagebrush scrub. A visit to the mountain beaver (***Aplodontia rufa***) colony on the east fork of Redwood Creek found evidence of postburn activity.

There was postburn seredipity trapping within the Kaweah Fire perimeter. The predominant species in the burned chamise chaparral was the western pocket mouse (***C. californicus***). Other species included California mouse (***P. californicus***), deer mouse (***P. maniculatus***), brush mouse (***P. boylii***), and pinion mouse (***P. truei***). Captures in burned chamise chaparral were primarily burrowing species, and most species were captured where there was bostburn cover, primarily from rocks and unburned woody material. Postburn fatalities included dusky-footed woodrat (***N. fuscipes***), mule deer (***Odocoileus hemionus*)**, and two lagomorphs, probably brush rabbits *(**Silvalagus bachmani***). The burned riparian area had few captures. They included one western pocket mouse (***C. californicus***) and one California mouse (***P. californicus***). The burned blue oak woodland had the most species and the highest captue frequency. Those species included brush mouse (***P. boylii***), California mouse (***P. californicus***), western pocket mouse (***C. californicus***), deer mouse *(**P. maniculatus***), and dusky-footed woodrat (***N. fuscipes***).

INTRODUCTION

This work was initiated to evaluate the effects of the Mineral King Risk Reduction Project (MKRRP) on selected fauna. There is considerable existing literature on fire effects on wildlife, and it demonstrates a broad range of responses from favorable to unfavorable for individual species. It is very likely that fire will cause changes in the small mammal community. To understand local responses, it is prudent to have local data under conditions typical of local burns. This report summarizes the second year of field surveys.

This work concentrated on small mammals for several reasons. a) First, the Mineral King area contains a relatively large number of sympatric native rodents. There are at least eleven species of rats and mice present. They range from generalists like ***Peromyscus maniculatus*** which occurs in a wide range of habitats and elevations to other species like ***Chaetodipus californicus*** which has much more specificity in its habitat requirements. b) Most rodents consume significant quantities of vegetation, and some are arboreal or otherwise dependent on plants for cover. This links them to floral composition and structure, two things that are normally affected by fire. c) Rodents do not have large home ranges. The species of rats and mice present in the East Fork Kaweah drainage typically have home ranges that are under 0.6 ha (Zeiner *et al.* 1990). Because the individuals do not roam far, rodent populations can be correlated to more descrete features of their environments than animals occupying larger areas. d) Rodents have short life histories with rapid development and maturation. Some of the species present in the MKRRP have been reported to be reproductive in about 50 days after birth, and most small mammals survive little more than a year in the wild (Orr 1976), some even less. Young disperse after being weaned. This all contributes to high potential for measureable adjustments to the rodent population structure as the habitat changes. e) Finally, rodents are easy to trap, handle, and mark. It takes little time to become familiar with the local species, and there is an abundant literature providing methodologies. Until the recent discovery of hantavirus, their handling seemed to present little risk to the investigators.

Because fire can have significant effects to both the structure and vegetative composition of the habitat and because rodents present a diverse array of easy to handle respondents to habitat changes, they make good cost-effective tools for monitoring fire effects. Other major groups for which we would like to have local data, but which was not collected on this study for lack of resources include birds and insects. Both

of the these groups are represented by large numbers of species, but their documentation requires more observer skill and larger plots for birds.

There are a number of smaller groups for which we have special interest. These include mountain beaver, forest carnivores (e.g. martin, fisher, ringtail, etc.), mule deer, bats, and brown-headed cowbirds. These represent a range of public and agency interests.

METHODS

Rodent populations were investigated from two perspectives: 1) long-term monitoring of select areas, and 2) serendipity surveys of the most common and unique habitats. The long-term monitoring is intended to document long-term changes in rodent populations and their habitat following fire under known conditions. Serendipity surveys inventory rodent species and their relative abundance within both common and unique environments to facilitate large-scale assessment of potential fire effects.

Two one-hectare permanent long-term monitoring plots were surveyed. The Atwell Plot was located in a mature sequoia forest in Atwell Grove with plot center at UTM coordinates 4037.147 northing and 349.506 easting. The Ponderosa Plot was located in westside ponderosa pine forest with plot center at UTM coordinates 4035.466 northing and 349.415 easting. Plot locations and elevations were determined with a Rockwell AN/PSN-11 PLGR geographic positioning system (GPS) on averaging mode. The plots are 75 m by 135 m (flat distance) with 6 mm diameter steel stakes marking the trapping grid at 15 m intervals. Each plot contains 60 trap stations with one Sherman live trap (Model LFATDG, 7.6 x 8.9 x 22.9 cm) normally within one meter of each station stake. The traps were normally run four nights per week. The Atwell Plot was run for a total of 26 nights from June 3 through July 19, 1996 (1,560 trapnights). The Ponderosa Plot was run for a total of 29 nights from July 25 through September 27, 1996 (1,740 trapnights). The traps were baited with a dry mixture of rolled oats and peanut butter. A high-low thermometer was located in each plot at a shady location about 1.5 m above the ground, and a rain guage was located nearby.

Captured rodents were marked with numbered self-piercing 1 monel ear tags (Style # 1005-1 from National Band and Tag Company). Captured rodents were ear tagged, and recorded information included tag number, species, sex, age (adult, subadult), weight, hind foot length, ear notch length, tail length, and general comments. The handlers wore respirators, rubber gloves, and eye protection for hantavirus protection (Mills *et al*. 1995).

Plot populations were estimated using a modified Jolly-Seber Method (Buckland 1980). Data was stored in dBase III$^+$ files.

Serendipity trapping for rodents was done at three sites in the Mineral King drainage: yucca scrub at UTM coordinates 4038.2 northing, 342.1 easting (375 trapnights), a xeric conifer forest at UTM coordinates 4035.3 northing, 355.9 easting (130 trapnights), and a subalpine wet meadow at UTM coordinates 4034.4 northing, 355.9 easting (70 trapnights). In addition, seredipity trapping was done at five sites in the Kaweah Fire in the drainage of the main stem of the Kaweah River. These habitats included chamise burned by a high intensity headfire and little rock (UTM coordinates 4040.6 northing,

333.2 easting; 94 trapnights), chamise burned by high-intensity headfire and much rock (UTM coordinates 4040.7 northing, 333.5 easting; 63 trapnights), chamise burned by medium-intensity fire (UTM coordinates 4040.6 northing, 333.4 easting; 38 trapnights), a riparian area in which all leaves and twigs were consumed by fire (UTM coordinates 4040.6 northing, 333.2 easting; 38 trapnights), and burned blue oak woodland (UTM coordinates 4040.2 northing, 334.2 easting; 36 trapnights). These coordinates need to be verified on the ground with a GPS. Sherman live traps were scattered loosely through these sites at approximately 15 m intervals (not measured). These areas were surveyed from September 30 through October 25, 1996, 1997 for a total of 575 trapnights in Mineral King drainage and 269 trapnights on the Kaweah Fire. Catch per unit effort (captures/trapnight) was used as a measure of relative abundance among sites. An ink spot on the fur was used to recognize recaptures.

Serendipity surveys also included some trapping for medium-sized mammals (e.g. forest carnivores) using mid-sized Tomahawk and Havahart traps baited with meat and covered with burlap bags. This sampling was done from July through September, 1997. It amounted to 151 trapnights. This trapping included mixed conifer forest (12 trapnights), subalpine conifer forest (8 trapnights), westside ponderosa pine forest (62 trapnights), sequoia grove (7 trapnights), sagebrush scrub (15 trapnights), mixed chaparral (30 trapnights), chamise chaparral (5 trapnights), blue oak woodland (6 trapnights), and palustrine wetland forest (6 trapnights). The last three sites were part of the sampling following the Kaweah Fire.

Vegetation density was determined using T-square procedures as described in Krebs (1989). The station stakes were used for random points making the procedure systematic. The same plots surveyed for density were used to characterize the species composition and size. Basal area was measured at breast height. Only living stems >1 cm diameter at ground level and trees were surveyed.

RESULTS AND DISCUSSION

Permanent Plots:

Atwell Plot: The Atwell Plot was located in a mature giant sequoia forest. The plot was burned on or about November 20, 1995. The plot's location, topography, preburn vegetation (trees only), preburn rodent population, and duff/litter consumption is described in Werner (1996). Visually the postburn plot resembled the preburn condition except for the loss of duff and litter, increase in exposed rocks, and widespread ash. While much of the heavy fuel was eliminated by the fire, there was enough tree fall for the postburn condition to resemble the preburn plot (**Fig. 1**).

Twenty-six nights of trapping (1,560 trap nights) produced 480 rodent captures (101 different individuals). The mean population estimate during the survey period was 36 individuals (95% CI = 28-45 individuals). This was twice as high as the preburn sampling (Werner 1996). The postburn sampling did begin earlier in the summer than the preburn sampling, but numbers were higher even where dates overlapped (**Fig. 2**). Ninety-six percent of the individuals (99% of the captures) were ***Peromyscus maniculatus*****.** Three percent of the individuals (1% of the captures) were ***Peromyscus boylii***. One ***Glaucomys sabrinus*** was captured. Captures of non-rodents included two ***Sorex trowbridgii***. There were serveral changes in species captured between the preburn sampling in 1995 and the first year of

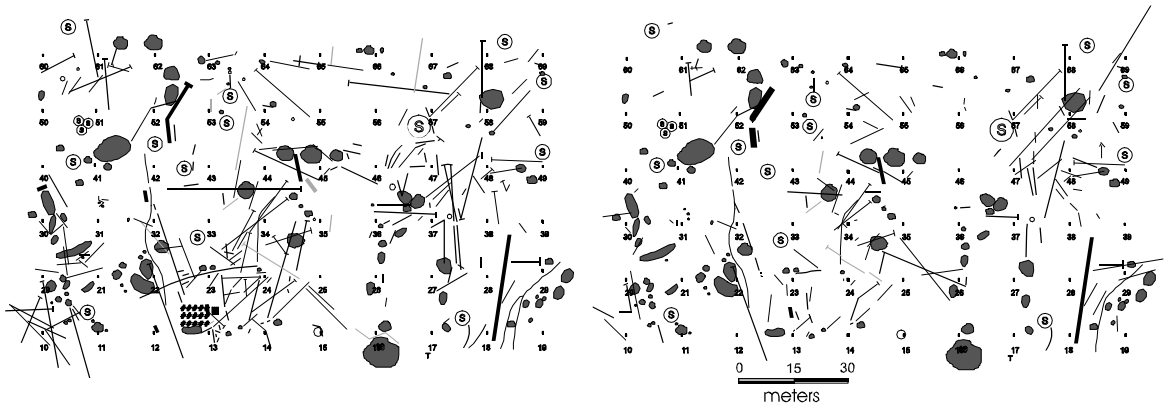

Figure 1. Comparison of downed logs in the Atwell Plot between the preburn condition in 1995 (left side) with the postburn condition in 1996 (right side). The circles with an "S" in the middle are mature sequoia trees and the circular objects are rocks. The curved lines are steambeds.

postburn sampling in 1996. ***Peromyscus boylii*** was only captured in the postburn sampling, and ***Microtus longicaudus*** was only captured in the preburn sampling. Both of these species were relatively scarce. ***M. longicaudus*** was usually associated with wetland vegetation, which was limited to a small perennial seep near the center of the plot. After the burn, it seemed smaller and more isolated by the large areas of ash. Catch rates for the three rodent species were 0.304, 0.003, and 0.0006 captures/trapnight for ***P. maniculatus***, ***P. boylii***, and ***G. sabrinus***, respectively. Like the mean population size, the catch rate for ***P. maniculatus*** doubled during the postburn sampling from 0.133 captures/trap-night preburn to 0.304 captures/trapnight postburn.

The sex ratios for the sampled population of ***P. maniculatus*** were about equal, 49% female and 51% male (n=94); but females were captured more frequently than males (**&** = 63% of captures, n=470). Three of the four ***P. boylii*** captures were male.

Eighty-eight percent of the P. maniculatus were adult. Only adults were captured for the other species.

Ponderosa Plot: The Ponderosa Plot (**Fig. 3**) was located in a stand of westside ponderosa pine forest. The density of trees and shrubs was estimated at 1,456/ha (95% CI = 1,092-2,180 trees & shrubs/ha). While ***Pinus ponderosa***, ***Quercus kellogii***, and ***Abies concolor***

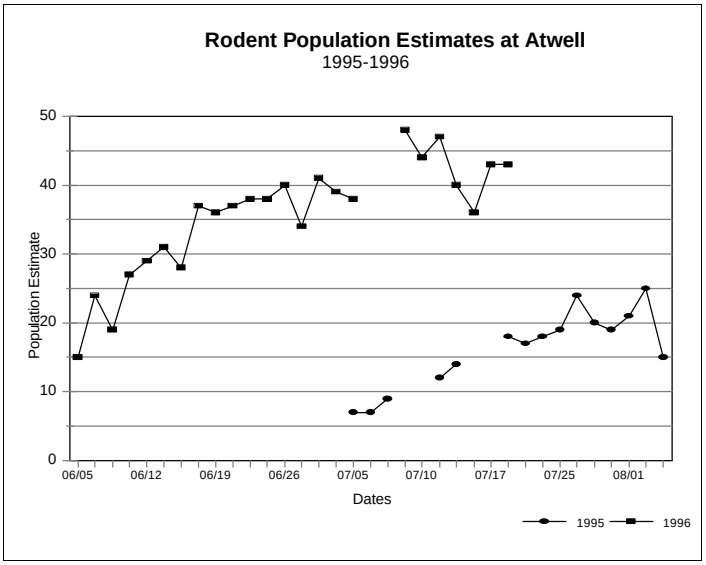

Figure 2. Comparision of daily population esti-mates for the Atwell Plot during 1965 (preburn) and 1966 (postburn).

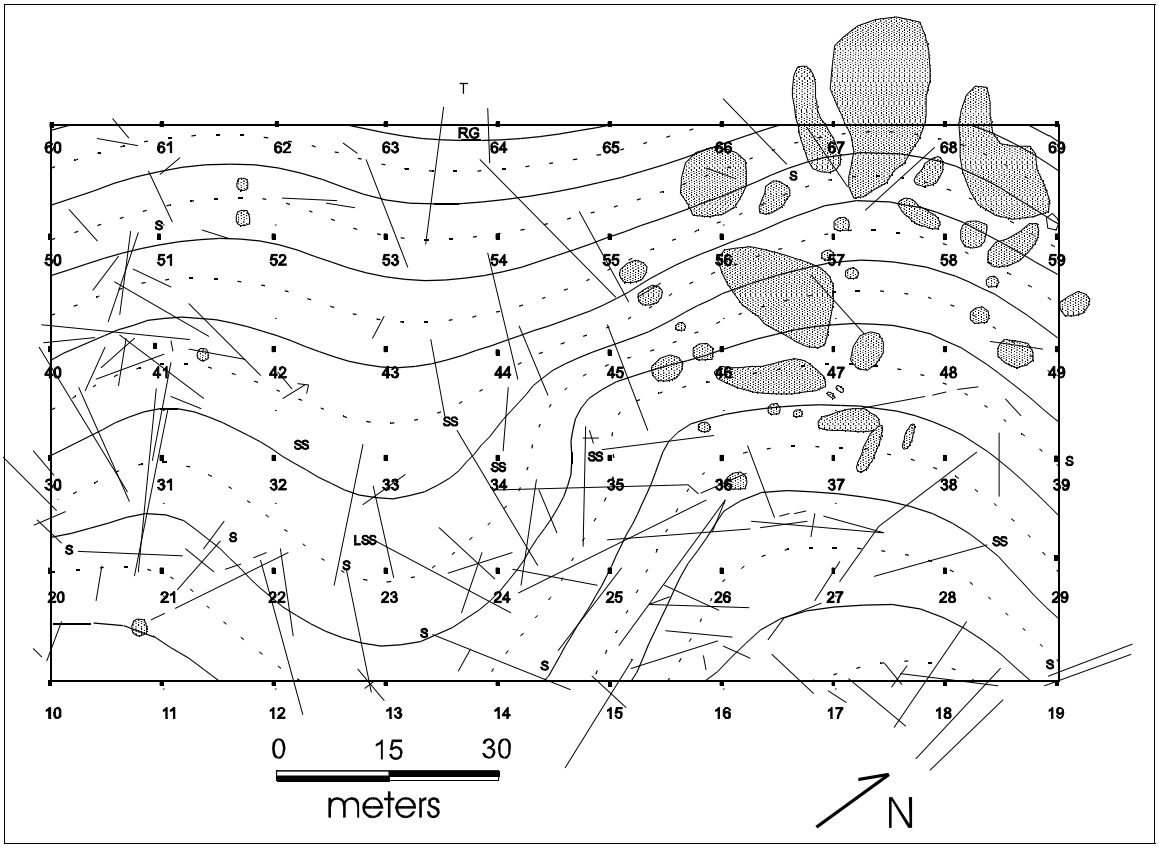

Figure 3. Ponderosa Plot. The curved lines represent contours. The straight lines are logs. Rocks are grey. Numbers are trap stations. The "T" and "RG" are the locations for the thermometer and rain guage. The "SS" and "LSS" are large snags.

were the largest and often most conspicuous trees present, ***Calocedrus decurrens*** dominated the plot by frequency and area (**Fig. 4**). By descending order of frequency, the sampled vegetation was dominated by ***C. decurrens*** (54%), ***Quercus chrysolepis*** (9%), ***Q. kelloggii*** (9%), ***A. concolor*** (7%), ***P. ponderosa*** (7%), ***Arctostaphylos mewukka*** (5%), ***Pinus lambertiana*** (5%), ***Quercus garryana*** (2%), ***Umbellularia californicus*** (2%), and ***Torreya californica*** (1%). By area in descending order, the sampled vegetation was dominated by ***C. decurrens*** (55%), ***A. concolor*** (16%), ***Quercus chrysolepis*** (12%), ***Q. kelloggii*** (8%), ***P. ponderosa*** (7%), ***P. lambertiana*** (1%), ***Q. garryana*** (<1%), ***T. californica***(<1%), ***A. mewukka*** (<1%), and ***U. californicus*** (<1%).

The plot faced south-southeast at 1,834-1,873 m elevation, though some sites within the plot faced south and soutwest. Sideslopes varied from 8 to 38 degrees (mean = 18º). The northeast corner of the plot was extremely rocky, and the soil was covered by litter except on south and southwestern exposures where ***Chamaebatia foliolosa*** covered the ground (50% of the trap sites). There was no surface water in the plot, but two drainages were present. Maximum temperatures during the trapping were 15-35ºC (mean = 28ºC) during the day and 6-21ºC (mean = 14ºC) at night. The only evidence of cultural use was an abandoned trail along the north edge of the plot.

The abundance of small trees, the lack of large trees, and the sparse scattering of ***A. mewukka*** suggested that the current vegetation structure may have become an artifact of fire exclusion. I suspect that at the turn of the century, this site had far less trees and that the open areas contained both more grass and larger patches of flamable brush. The site looked like it could continue to evolve toward dense forest, return to a more open condition, or become very "park-like" with large trees and open understory depending on the nature of furture fires in the plot.

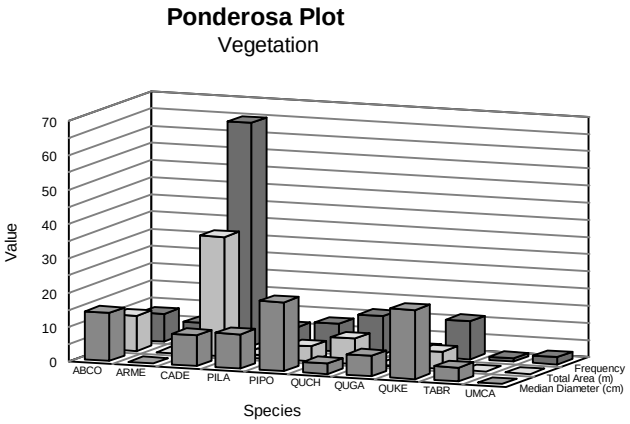

Figure 4. Structure of woody vegetation at the Ponderosa Plot. Graph compares species frequency, area, and median diameter of sampled vegetation.

Twenty-nine nights of trapping (1,740 trapnights) produced 216 rodent captures (72 individuals). Two species dominated the rodent population at the Ponderosa Plot, ***P. boylii*** and ***P. maniculatus*** (**Fig. 5**). ***P. boylii*** was the predominate species initially, but abundance was similar for both species during the late summer. In addition, there were two captures of ***Thomomys*** sp. Non-rodents captured included four captures of shrews, ***Sorex*** sp.

The two species of ***Peromyscus*** were captured largely in different portions of the plot. ***Peromyscus boylii*** were captured primarily on southeast facing slopes and near drainage bottoms. These areas were predominately ***Abies concolor***, ***Quercus chrysolepis***, and ***Calocedrus decurrens***. There was little ground cover by live plants. ***Peromyscus maniculatus*** were captured primarily on south and southwestern slopes and on ridge tops. The vegetation was primarily ***Pinus ponderosa***, ***Quercus kelloggii,*** and ***C. decurrens*** with ***Chamaebatia foliolosa*** for ground cover. While there was no significant difference in the number of captures for either species on the plot (P=0.270), the capture frequency for each species was significnatly different (P=0.047 for ***P. maniculatus***, P=0.042 for ***P. boylii***) depending on the presence or absence of ***C. foliolosa***, the indicator for each of the two areas (**Table 1**).

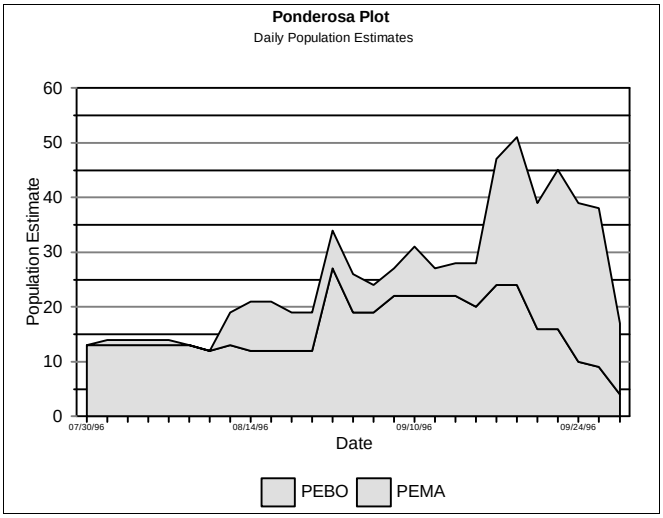

Figure 5. Daily population estimates for ***P. boylii*** and ***P. maniculatus*** at the Ponderosa Plot.

Catch rates for the three species of rodents were 0.066 captures/trapnight for ***P. boylii***, 0.057 captures/trapnight for ***P. maniculatus***, and 0.0001 captures/trapnight for ***Thomomys*** sp. The catch rates were probably artificially low due to ***Ursus americancus*** (and possibly

other animals) disturbing the traps during at least half of the trapping days. Disturbance often accounted for a third to half of the traps being sprung. One day, 87% of the traps were knocked over. The traps were normally not destroyed, and the effect it had on the trapping depended primarily on whether the traps were disturbed before rodents had an opportunity to be trapped. At least once, the crew had to deal with a bear while they were working in the plot.

The sex ratios for the sampled population was predominately female (58%) for ***P. boylii*** and male (58%) for ***P. maniculatus***.

Table 1. Comparison of stations showing where ***P. boylii*** and ***P. maniculatus*** were captured in relation to the presence or absence of ***C. foliolosa***.

Species Captured	Number of Trap Stations	
	C. foliolosa Present	***C. foliolosa*** Absent
PEBO	6	13
PEMA	10	1
Both	10	13
None	4	3

Most of the rodents captured were adults. This included 94% of the ***P. maniculatus*** and 96% of the ***P. boylii***.

Serendipidy Surveys:

The habitat for the yucca scrub was characterized by steep, open, rocky terraine over a marble substrate. Where soil existed, it was very coarse. Characteristic plants included ***Yucca whipplei***, ***Cercocarpus ledifolius***, and scrubby ***Quercus chrysolepis***. The general appearance resembles a desert. The elevation was about 1,600-1,800 m.

Species captured (n=58) in the yucca scrub in descending order of capture abundance included ***Peromyscus boylii*** (0.064 captures/trapnight), ***Chaetodipus californicus*** (0.048 captures/trapnight), ***P. truei*** (0.035 captures/trapnight), ***Neotoma fuscipes*** (0.005 captures/trapnight), and ***P. californicus*** (0.003 captures/trapnight). About half of the traps were on the east side of a canyon which was very rocky, and the other traps were on the west side that contained considerable soil. Seventy-seven percent of the ***P. truei*** (n=13) were captured on the west side, and 72% of the ***C. californicus*** (n=18) and 58% of the ***P. boylii*** (n=24) were captured on the rocky east side. The east side was the only place ***N. fuscipes*** (n=1) and ***P. californicus*** (n=1) were captured. Forty percent of all captures were recaptures.

The habitat for xeric conifer forest was steep and rocky. ***Pinus jeffreyi*** dominated the overstory. The understory contained large patches of brush, particularly ***Arctostaphylos patula***. The elevation was about 2,310-2,380 m. The species captured (n=56) in the xeric conifer forest included ***Tamias speciosus*** (0.2238 captures/trapnight), ***P. boylii*** (0.100 captures/trapnight), ***P. maniculatus*** (0.077 captures/trapnight), ***Glaucomys sabrinus*** (0.008 captures/trapnight), and ***Neotoma cinerea*** (0.008 captures/trapnight). Thirty-four percent of the captures were recaptures.

The habitat for the subalpine meadow consisted of dense graminoid vegetation growing on moist soil. The land was not flat, but most slopes were gradual. The elevation was about 2,390 m. The species captured in the subalpine wet meadow included four ***Microtus longicaudus*** (0.057 captures/trapnight) and four ***P. maniculatus*** (0.057 captures/trapnight). This was very different from the wet meadow

sampled last year where the dominant species was ***Zapus princeps*** (Werner 1996). The 1996 sampling was done after temperatures began to routinely drop below freezing. This may have influenced what species were active in the meadow. Thirty-eight percent of the captures were recaptures.

Serendipity sampling for medium-sized mammals included resulted in ***Spilogale gracilis*** in mixed conifer forest (0.083 captures/trapnight) and in westside ponderosa pine forest (0.016 captures /trapnight), ***Martes americana*** in subalpine conifer forest (0.250 captures/trapnight) and in sequoia forest (0.143 captures/trapnight), ***Bassariscus astutus*** in westside ponderosa pine forest (0.081 captures/trapnight), and ***Marmota flaviventris*** in sagebrush shrub (0.400 captures/trapnight).

The rodent sampling on the Kaweah Fire was more successful. The rodent trapping results are summarized in **Table 2**.

No ***N. fuscipes*** were captured in the areas of burned chamise, and ***P. truei*** were only captured in the area with low consumption. These are the two species that I would have expected to have been common prior to the burn based on surveys in similar vegetation (Werner 1981). Because ***N. fuscipes*** live in stick houses above the ground, they are very susceptable to fire mortality. Several ***N. fuscipes*** carcasses were found after the fire. Two of the dead ***N. fuscipes*** were **not** burned even though they were in the ashes. The physical evidence suggested that they died after the fire passed. I speculated that they escaped the flames in a nearby rock outcrop, but were not able to escape the heat and probably died later from internal heat injuries, particularly to their lungs. There was one observation of a live ***N. fuscipes*** in the burned chamise at night.

While all expected species of ***Peromyscus*** were captured in chamise chaparral, catch rates were not high. ***Peromyscus californicus*** was the most frequently captured, and it was primarily in rocky areas.

Chaetodipus californicus was most abundant rodent in the postburn sampling of chamise. This is a burrowing species that appears to have survived well during the fire. It was the only species captured in the area that was completely denuded of all vegetation and without rock cover.

Postburn cover was probably important. By day, hawks were commonly observed over the burned landscape, and tracks of ***Canis latrans*** were commonly seen in the ashes. The areas of chamise with the most cover, primarily rock and unburned woody material, were also the areas with the most postburn rodent captures.

Another burrowing rodent that was not captured, but which left evidence of postburn activity, was ***Thomomys bottae***. Several fresh soil mounds were observed after the burn, and one live specimen was seen at night.

In addition to the woodrats, several other animal carcasses were found in the burned chamise. These included at least two lagomorphs, probably ***Silvalagus bachmani***, and one male ***Odocoileus hemionus***.

Only two rodents were captued in the burned riparian area. Whether there was high mortality or naturally low use was not apparent without preburn data or previous experience trapping in that habitat. Prior to the fire, the dominat trees were ***Quercus wislizenii***, ***Aesculus californica***, and ***Plantanus***

racemosa. I was impressed at how thoroughly the fire consumed vegetation that I normally think of as incombustible.

The most diverse rodent biota and highest capture success was in the burned blue oak. Structurally, this area was least affected by the fire, and it contained a rich diversity of microhabitats.

Table 2. Summary of rodent capture success immediately following the Kaweah Fire.

Site Description	Species Capture Rate (captures/trapnight)					
	CHCA	**NEFU**	**PEBO**	**PECA**	**PEMA**	**PETR**
chamise, complete consumption, few rocks	0.021	-	-	-	-	-
chamise, complete consumption, very rocky	0.159	-	0.032	0.079	-	-
chamise, poor consumption (numerous stems)	0.132	-	-	0.026	0.053	0.026
foothill riparian, high consumption (all leafy vegetation consumed)	0.026	-	-	0.026	-	-
blue oak woodland, surface fuels consumed	0.083	0.028	0.194	0.111	0.056	-

Miscellaneous:

The Aplodontia colony on the east fork of Redwood Creek was visited once after the burn, and it appeared to be active (Ray, pers. comm.).

PLANS FOR 1997

1. Conduct post-burn survey of the Atwell Plot.
2. Establish one more long-term monitoring plots. It will go into a lower subalpine environment (red fir forest, Jeffrey pine forest, green-leaf mananita chaparral, or sagebrush scrub).
3. Continue serendipity surveys in habitats not surveyed with long-term plots.
4. Visit burned ***Aplodontia rufa*** colonies and record observations that may be fire related.
5. Continue development of guide to wildlife fire environments.
6. Continue postburn sampling of the Kaweah Fire.

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