

TORTOISE POPULATIONS ON THE
SECOND COMMUNITY OF CALIFORNIA CITY

Lori Nicholson
4876 Sunnyside Drive
Riverside, California 92506

JOHN F. WESTERMEIER
WESTEC Services, Inc.
118 Brookhollow Drive
Santa Ana, California 92705

and

MICHAEL J. O'FARRELL
WESTEC Services, Inc.
2129 Paradise Road
Las Vegas, Nevada 89104

Desert tortoise populations were assessed within the Second Community of California City in conjunction with preparation of an environmental impact report for relinquishment of surface entry rights by the State of California. Tortoise densities fluctuated significantly throughout the study area, although densities exceeding 200 tortoises/m² (77 tortoises/km²) were recorded. Areas of low tortoise densities were apparently due to habitat destruction by sheep grazing, road grading and off-road vehicle use. Implementation of the proposed action would increase development pressure in the Second Community, resulting in loss of desert tortoise habitat on site and indirect impact to the adjacent Desert Tortoise Natural Area.

INTRODUCTION

Under contract to the California State Lands Commission, WESTEC Services performed environmental studies on the approximately 28,000-acre (11,300-ha) Second Community of California City, Kern County, California. The State Lands Commission currently owns surface entry rights for mineral extraction on approximately 15,000 acres (6070 ha) of the privately-owned community lands. The current developer of California City has applied to the State Lands Commission for relinquishment of the State's right of surface entry to the approximately 6070 ha. Relinquishment of these surface entry rights could facilitate residential development of the Second Community.

The Second Community is virtually unpopulated. However, it has been extensively disturbed through construction of roadways in association with mass land sales, grazing, and through heavy off-road vehicle use. As technical assistants to the State

Lands Commission, WESTEC Services prepared an environmental impact report on the State's proposed action (WESTEC Services, Inc. 1980). A portion of this study included surveys to document the status of the desert tortoise on Second Community Lands and to analyze potential impact of development on the desert tortoise within the Second Community and on the adjacent Desert Tortoise Natural Area (Figure 1).

MATERIALS AND METHODS

Twenty-five transects were surveyed in early November 1979 (Figure 2). Each transect was 1.5 mile (0.93 km) long by 10 yd (9.04 m) wide and was walked in a triangular fashion with 0.5 miles (0.31 km) on a side. Tortoise transects were chosen at random and included some areas disturbed by sheep, motorcycles, and road grading. Tortoise signs were used as an index of density, using the method of Berry and Nicholson (1979).

There were three basic plant communities on the study site: 1) creosote bush community; 2) shadscale community; 3) Joshua tree community. Community designations follow those of Munz (1974) and Thorne (1976). Three subsets of the creosote bush community were identified: a) creosote bush, *Larrea tridentata*, and burrobush, *Ambrosia dumosa*, association; b) pure stands of creosote bush; and c) creosote bush with a high density of perennial species. This latter association was dominated by creosote bush, burrobush, and goldenhead, *Acamptopappus sphaerocephalus*.

There is an existing network of graded roads prepared for eventual subdivision (Figure 2). In addition to the roads, concrete culverts and other diversion structures are present in all drainage courses. A much-used campground is present at Galileo Hill and serves as a base camp for recreational vehicle operators. Motorcycle trails are found virtually everywhere throughout the Second Community area. In addition, domestic sheep have grazed the area. Webb (1979) estimated that 60 to 68% of perennial plant above-ground biomass was removed by sheep grazing.

RESULTS AND DISCUSSION

The desert tortoise, *Gopherus agassizi*, occurred throughout the study area with densities ranging from 10 to 200 tortoises/mi² or 4 to greater than 77 tortoises/km². (Table 1). Although densities fluctuated significantly throughout the study area, some trends were apparent (Figure 3). The southern portion of the study area contained tortoise densities between 30 and 100 tortoises/mi² (12 and 39 tortoises/km²). The central portion contained higher densities of 100 to 200 tortoises/mi² (39 to 77 or more tortoises/km²). Tortoise densities within the northern portion ranged between 10-200 tortoises/mi² (4 and 77 tortoises/km²).

In previous studies conducted in 1977, Berry and Nicholson (1979) estimated tortoise densities to be greater than 77 tortoises/km² throughout most of the Second Community area. Densities in the northeastern portion of the study area were estimated up to 96 tortoises/km² by Berry and Nicholson (1979). In general, the present study may indicate a decline in the tortoise population over the past 2 years. However, some differences in densities may be attributed to differences in survey methods. The earlier survey generally avoided highly disturbed areas whereas the current survey routes were selected randomly.

Areas within a 10-mile (16-km) radius of the Second Community have generally high tortoise densities. The Desert Tortoise Natural Area has the highest reported densities, over 96 tortoises/km² (Berry and Nicholson 1979). Furthermore, Berry and Nicholson speculated that tortoise densities above 19 tortoises/km² represent viable populations. Therefore, most areas within the Second Community study have significant populations.

Desert tortoise populations may be declining in the Second Community area. This decline may be due to collections by the public, vehicular mortality, grazing, and general habitat degradation due to grazing and off-road vehicles. The large variation in densities within the study area may reflect this general habitat degradation.

Relinquishment of the State's right to surface entry on Second Community lands would result in increased potential of development of these lands. This development would result in loss of significant desert tortoise populations within the Second Community.

In addition to on-site losses, development of the Second Community would indirectly impact the Desert Tortoise Natural Area through increasing tortoise collection on the periphery, increasing the potential for unauthorized off-road vehicle use within the area, as well as a potential for dogs and on-road motor vehicles to increase tortoise mortality.

ACKNOWLEDGEMENTS

This study was conducted under contract to the State of California, State Lands Commission. We are grateful to Kristin Berry for furnishing previously collected data for the study area.

REFERENCES

- Berry, K. H., and L. L. Nicholson. 1979. The status of the desert tortoise in California. Draft report, California Desert Program, Bur. Land Manage., Riverside, California. 115 pp.

Munz, P. A. 1974. A flora of southern California. Univ. of Calif. Press, Berkeley. 1086 pp.

Thorne, R. F. 1976. The vascular plant communities of California. Pages 1-31 in Symposium on plant communities of southern California. Calif. Native Plant Soc., Special Publ. No. 2, Berkeley.

Webb, R. H., and S. S. Stielstra. 1979. Some effects of sheep grazing on Mojave desert vegetation and soils. Environmental Management 3:

WESTEC Services, Inc. 1980. Preliminary draft environmental impact report for relinquishment of surface entry rights, Second Community of California City. Biological Resources Technical Appendix. Calif. St. Lands Comm., Sacramento. 46 pp.

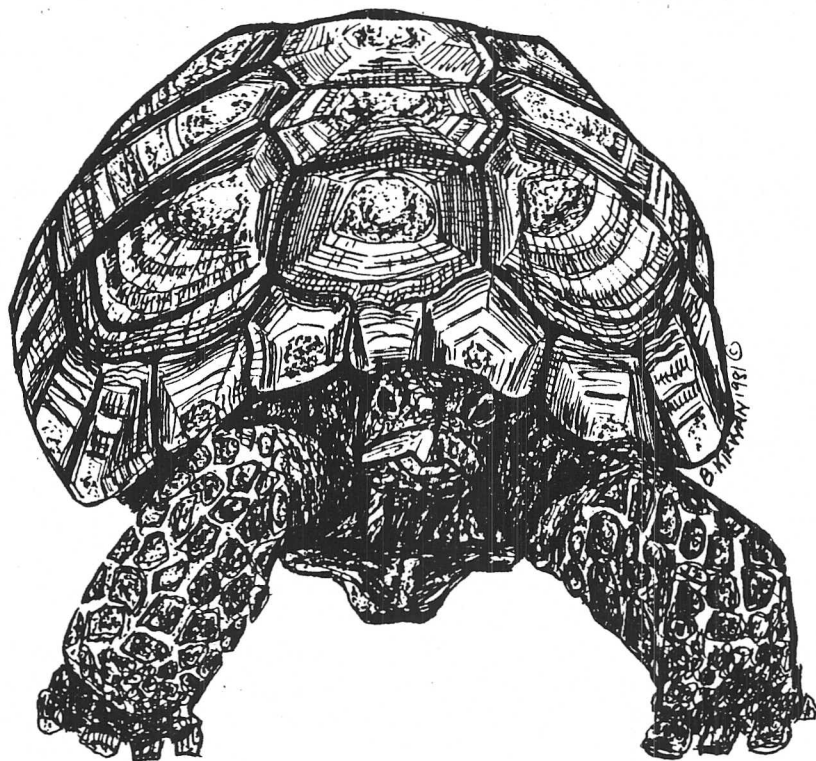
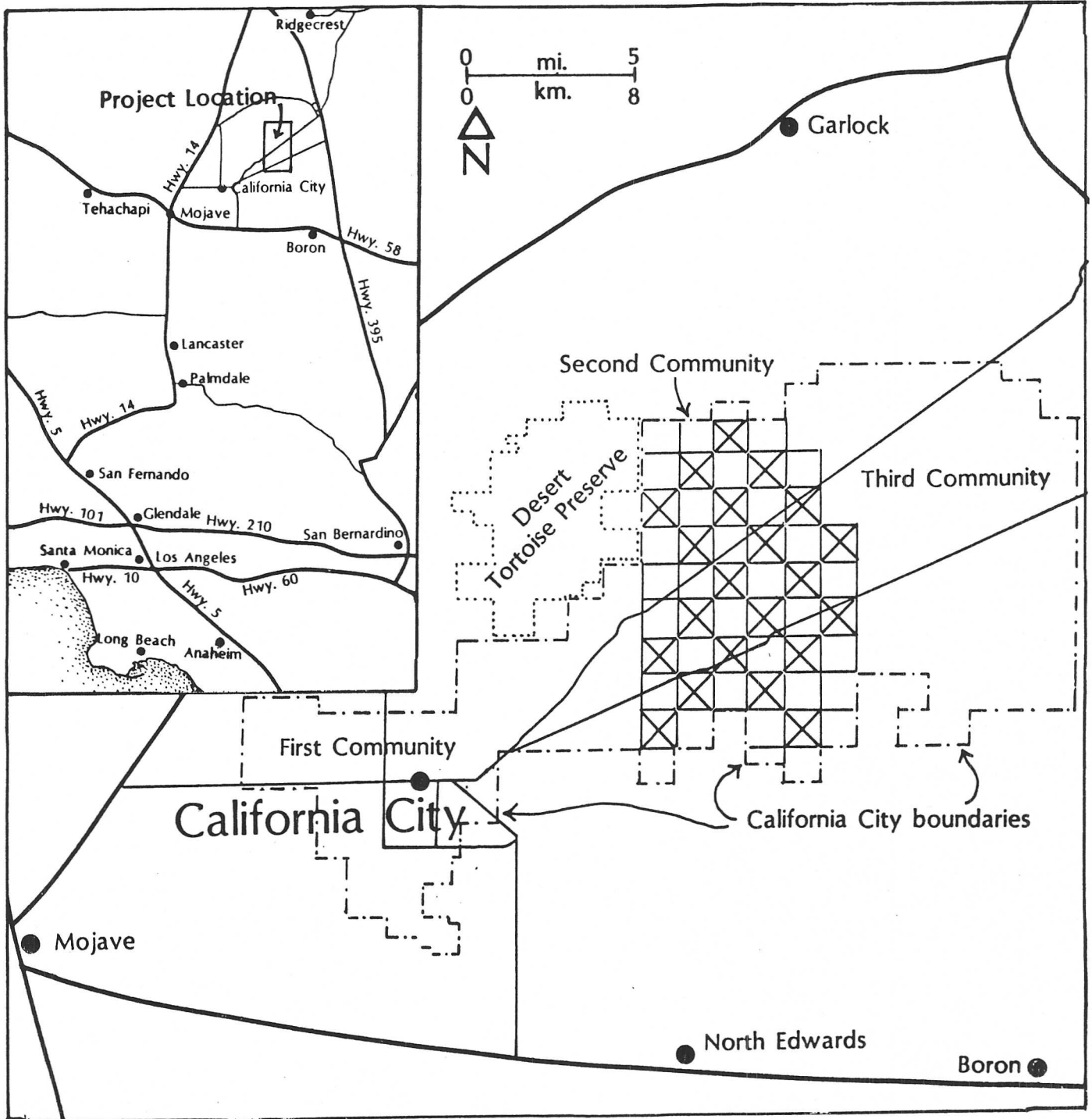


FIGURE 1. Regional map of the Second Community of California City and surrounding areas

Vicinity Map



Tortoise Transects

FIGURE 2. Map of the Second Community of California City and locations of tortoise transects

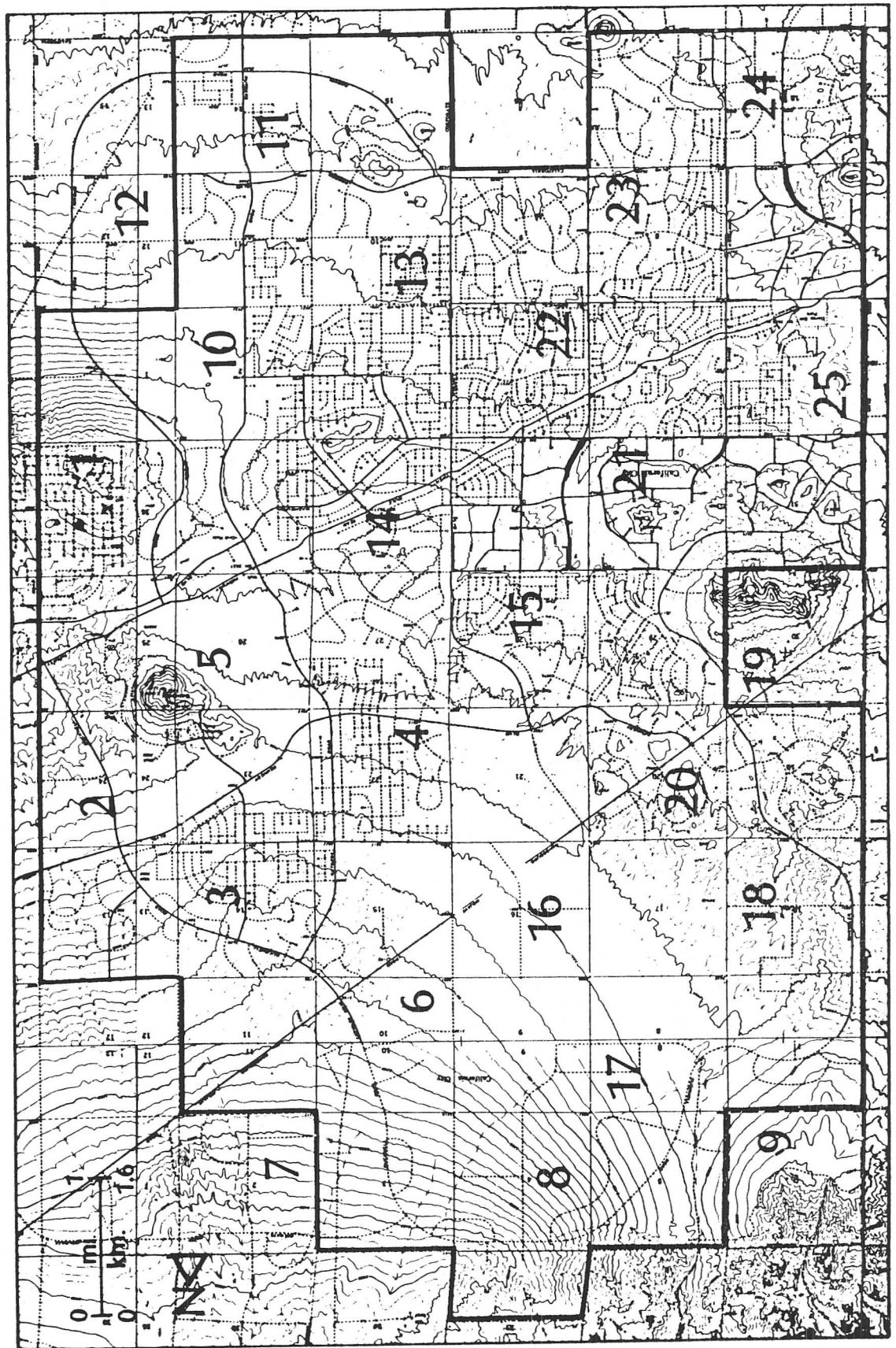


Figure 3. Tortoise densities on the Second Community of California City.

Legend

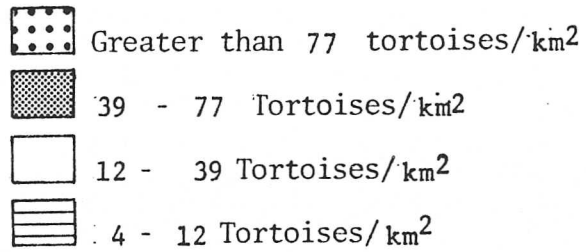


FIGURE 3. Tortoise densities on the Second Community of California City

Tortoise Densities

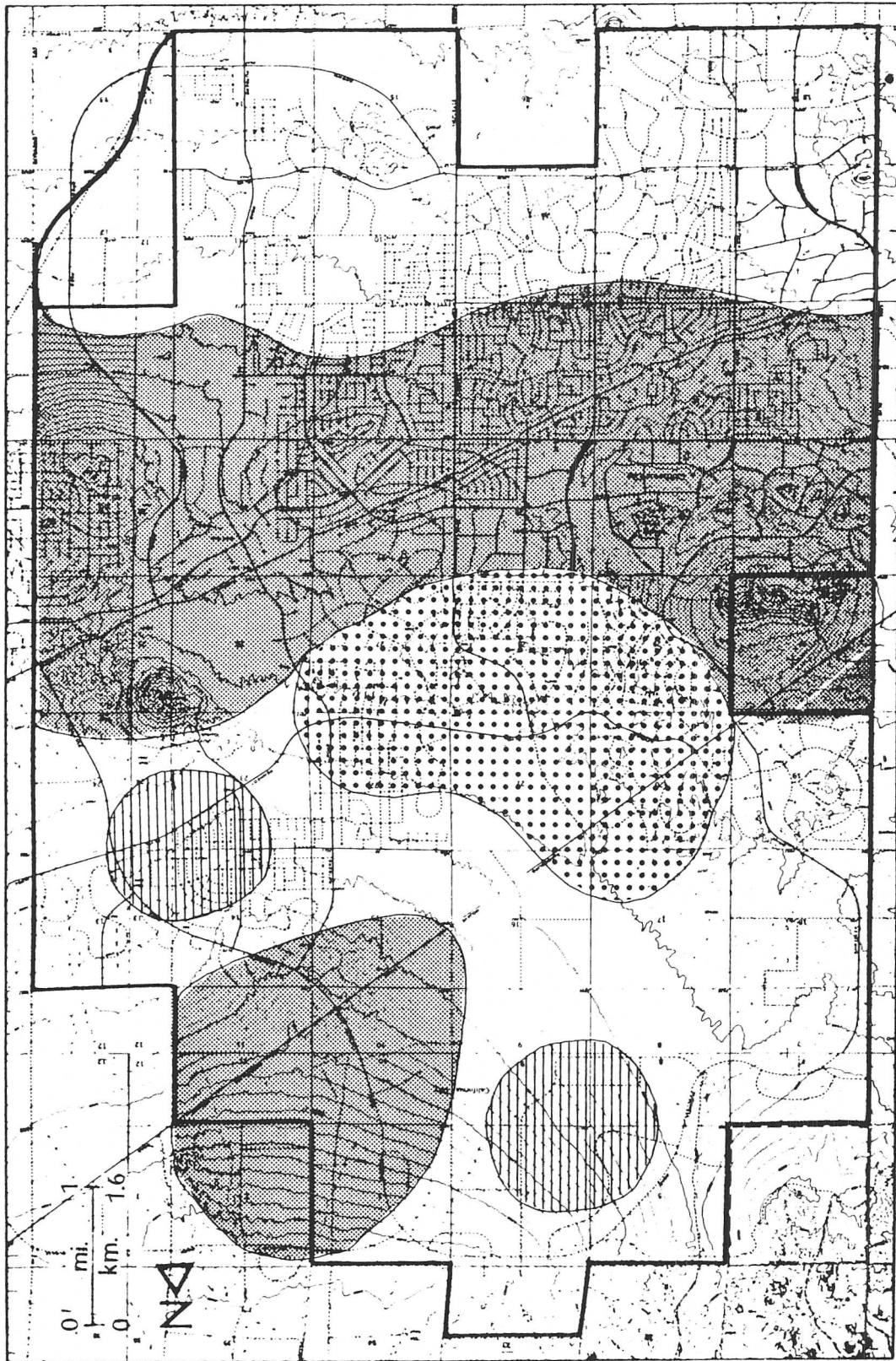


TABLE 1. Tortoise Transect Results

<u>Transect Number</u>	<u>Area Quarter</u>	<u>Total Sign</u>	<u>Number of Burrows</u>	<u>Number of Scats</u>	<u>Live Tortoises</u>	<u>Shells</u>
1	SE	12	6	6	0	0
2	NE	9	2	7	0	0
3	NE	2	0	2	0	0
4	NE	31	7	22	1	1
5	NE	11	4	7	0	0
6	NE	19	7	10	2	0
7	NE	14	6	7	1	0
8	NW	5	0	7	0	0
9	NW	9	0	9	0	0
10	SE	20	4	12	2	2
11	SE	4	3	1	0	0
12	SE	5	1	4	0	0
13	SE	4	1	3	0	0
14	SE	10	6	2	0	2
15	SW	17	9	7	0	1
16	NW	8	1	7	0	0
17	NW	6	2	3	0	1
18	NW	11	1	9	0	1
19	NW	15	4	11	0	0
20	NW	28	7	18	1	2
21	SW	17	6	11	0	0
22	SW	13	6	6	0	1
23	SW	11	4	6	0	1
24	SW	10	3	7	0	0
25	SW	28	3	24	0	1