

Size and Location of Active and
Extinct Prairie Dog (*Cynomys Ludovicianus*)
Towns in the Boulder Valley Ranch Area

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ABSTRACT

This study determined the locations and sizes of black-tailed prairie dog (*Cynomys ludovicianus*) towns in the Boulder Valley Ranch area in north Boulder, Colorado. The investigation described the condition of the towns (alive, most likely alive, and extinct) and mapped each site to scale. It was determined that 33 percent of the towns have become recently extinct. It is believed that the recent outbreak of the bubonic plague (*Yersinia pestis*) is responsible for this decline in prairie dog population.

Black-tailed prairie dogs (*Cynomys ludovicianus*) are medium sized, ground dwelling squirrels of the plains (Lechleitner, 1969). *Cynomys ludovicianus* are found in the Rocky Mountains, eastward to southern Saskatchewan, central North Dakota, eastern South Dakota, Nebraska, Kansas, central Oklahoma, northwestern Texas and a portion of north-central Mexico (Lechleitner, 1969). Prairie dogs must be protected because they are part of the ecosystem. They provide food and habitat for predators. Reductions in their populations may negatively affect the populations of black-footed ferrets (*Mustela nigripes*), raptors, badgers, bobcat and fox, all of which prey on prairie dogs. The worst case scenario would be the extinction of prairie dogs in Boulder and the demise of their various predators. Black-footed ferrets are dependent on prairie dogs for food and shelter and were historically restricted to prairie dog towns (Anderson et al., 1986). If Black-footed ferrets are ever to be reintroduced to Boulder, prairie dog towns are a necessity.

In many areas in Boulder, prairie dogs are exterminated because they are in problematic areas (i.e. areas soon to be constructed, on farms and ranches, where they compete for food with cattle and other livestock). The Department of Open Space for the city of Boulder is planning to relocate all prairie dogs currently

in problematic areas to a large tract of open space in south Boulder. In this open space, the prairie dogs could roam freely, without human interference. However, for the plan to be possible, the Department of Open Space needs to know exactly where all the prairie dogs in Boulder are located. Open Space has a map of the prairie dog colonies from 1993, however, in the summer of 1994, the bubonic plague (*Yersinia pestis*) reduced Boulder's prairie dog populations dramatically (Stone, 1995). The plague is transmitted by fleas, and prairie dogs are highly susceptible to it (Lechleitner, 1969). The map from 1993 no longer being accurate, a new study was needed to locate all the prairie dogs.

The Department of Open Space is also interested in knowing to what extent prairie dogs have been decimated by the plague. To discover the effects of the plague, we measured the general area and location of each existing town. This study was important because the prairie dog populations are thought to have declined dramatically due to the recent plague, and the protection of these animals is necessary.

METHODS

During the month of November, 1995, we studied the area surrounding Boulder reservoir in north Boulder, Co. (specifically the Boulder Valley Ranch area, see Map 1). We walked transects through the entire area. Transects were spaced approximately 50 meters apart. When we found a prairie dog hole, we circled out from that hole, thus determining the area of the town. A prairie

dog town was considered active(A) if a visualization of one animal was made. A town was considered most likely active(A?) if vegetation around the mound was absent, the mounds were maintained, and tracks were observed through the grass. A town was considered extinct(E) if the mounds were closed by dirt and debris, the mounds had vegetation growing on them, and the whole area was densely vegetated. Each town was mapped to scale on a 1:24,000 U.S. Geological Survey Topographic Map. Authorization was provided by City of Boulder Open Space.

RESULTS

We found one active(A), eleven most likely active(A?), and six extinct(E) prairie dog towns(see Table 1 and Map 1). Only two prairie dogs were observed at our lone active town over a thirty minute period.

DISCUSSION

This study attempted to provide useful detailed information on the location and areas of active and extinct prairie dog towns in the Boulder Valley Ranch area. It would appear as though one third of the prairie dog towns have recently become extinct. However, due to scant available data on past locations and populations, we cannot say with certainty when and why the towns died off. It is believed, through personal communication with park rangers and area biologists, that the die off was due mainly to the bubonic plague that has swept through the area in the past couple of years.

The bubonic plague (*Yersinia pestis*) was first documented in prairie dog populations as far back as 1908 (Cully, 1991). The plague produces spectacular die offs and prairie dogs are very susceptible to both infection and disease (Lechleitner, 1968). Prairie dogs do not appear to be a reservoir for the disease since it is usually quickly fatal (Edwards and McDonnell, 1982). It is believed that small mammals, such as the deer mouse, the vole, and the golden mantled ground squirrel, serve as reservoirs for the plague. The plague is transmitted to prairie dogs through a flea's carrying the bacterium *Yersinia pestis*. At our present state of knowledge, plague outbreaks among prairie dogs are not predictable as to time and location. This study was important for a number of reasons. First, a decline in prairie dogs will affect other animal populations that depend on them for food, or their empty burrows for shelter. These animals include badgers, coyotes, foxes, bobcats, black-footed ferrets, eagles, hawks, rattlesnakes, and many more. The dependence of the endangered black-footed ferret on prairie dogs (Anderson et al., 1986) and the recent implementation of black-footed reintroduction plans have focused attention on the plague's affect on prairie dogs. In fact, in 1994, bubonic plague was diagnosed in a black-footed ferret (Williams et al., 1994). The plague has also been found to have a dramatic affect on raptor populations. In a study conducted over a two year period, during which a major die off occurred among prairie dogs due to the plague, it was found that golden eagles (*aquila chrysaetos*) and terruginus hawk (*B. regalis*) populations declined

significantly(Cully, 1991).

Second, this study provides the location of active and most likely active towns. This information can be used for future prairie dog censuses and by the Department of Open Space if they decide to follow up on their plans to relocate the prairie dogs to a south Boulder location in order to make way for ranching and development. A concern that should be addressed in relocating the prairie dogs is whether we will be spreading the plague to healthy, isolated populations.

Some recommendations for future studies include:

- 1) Positively identify our "most likely active" as either active or extinct through visualizations, hole plugging and check for unplugging, tracks in the snow, etc. Due to time constraints, this was not possible for this study.
- 2) Duplicate this study on a yearly basis to determine long term effects of the plague.
- 3) Look at the difference between active and extinct sites, such as; location, size, vegetation, etc.

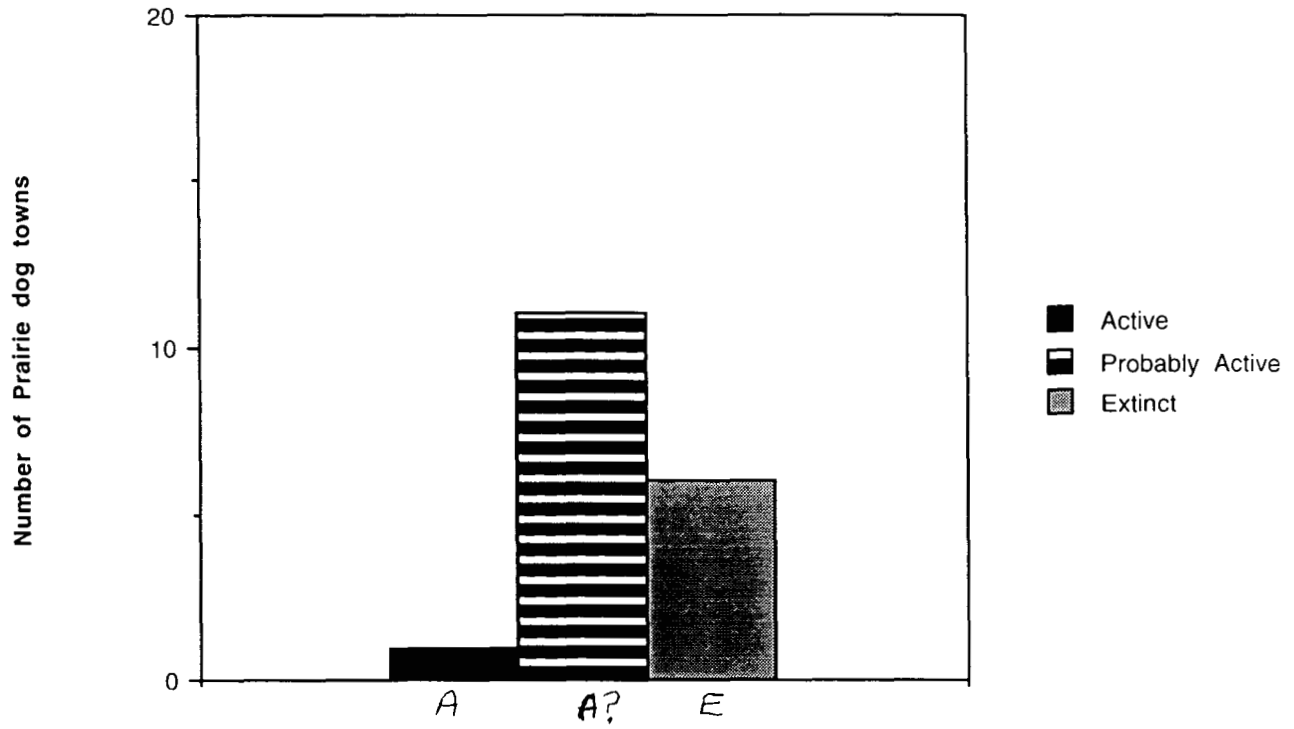
In conclusion, we hope that this study will set the groundwork for future research.

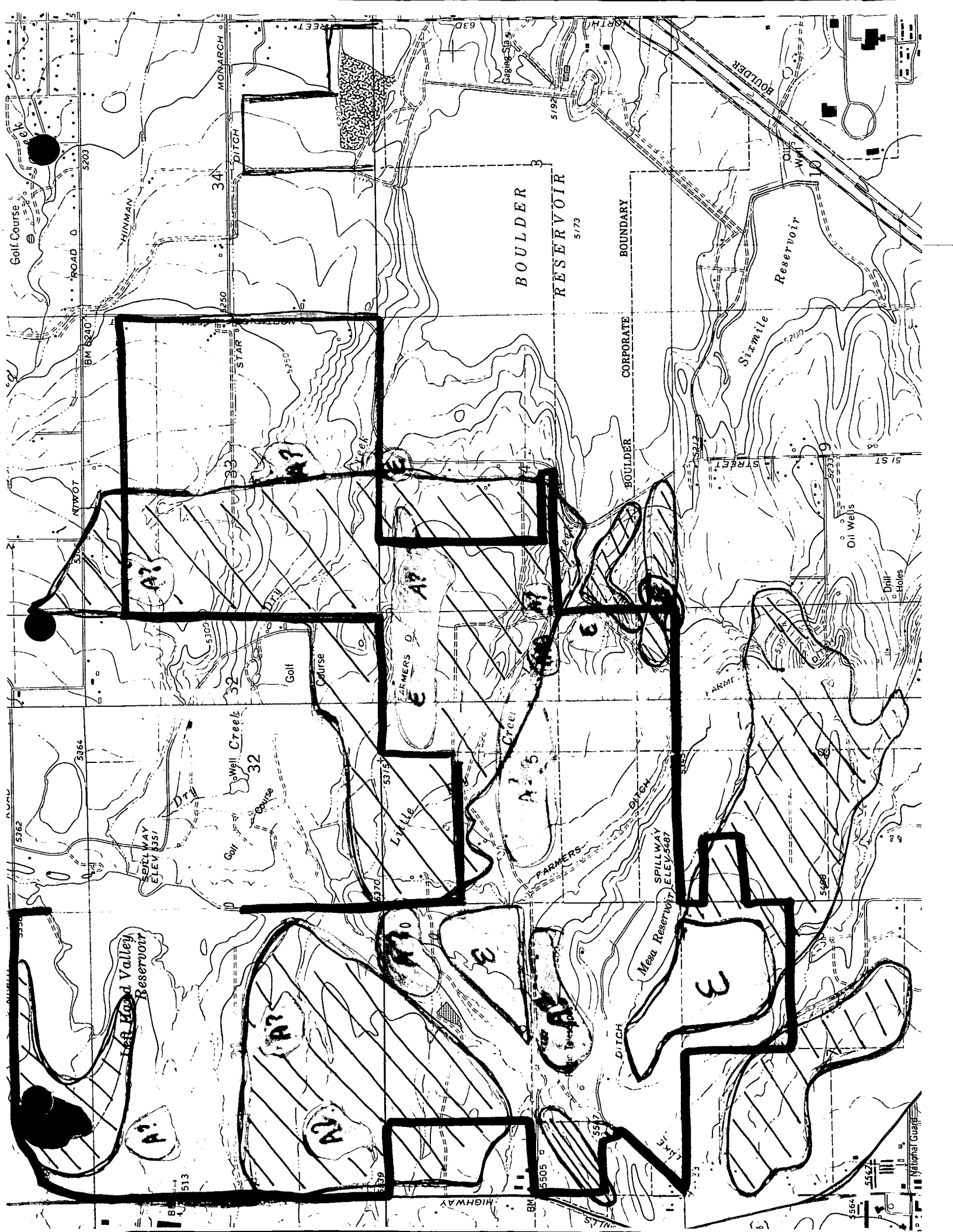
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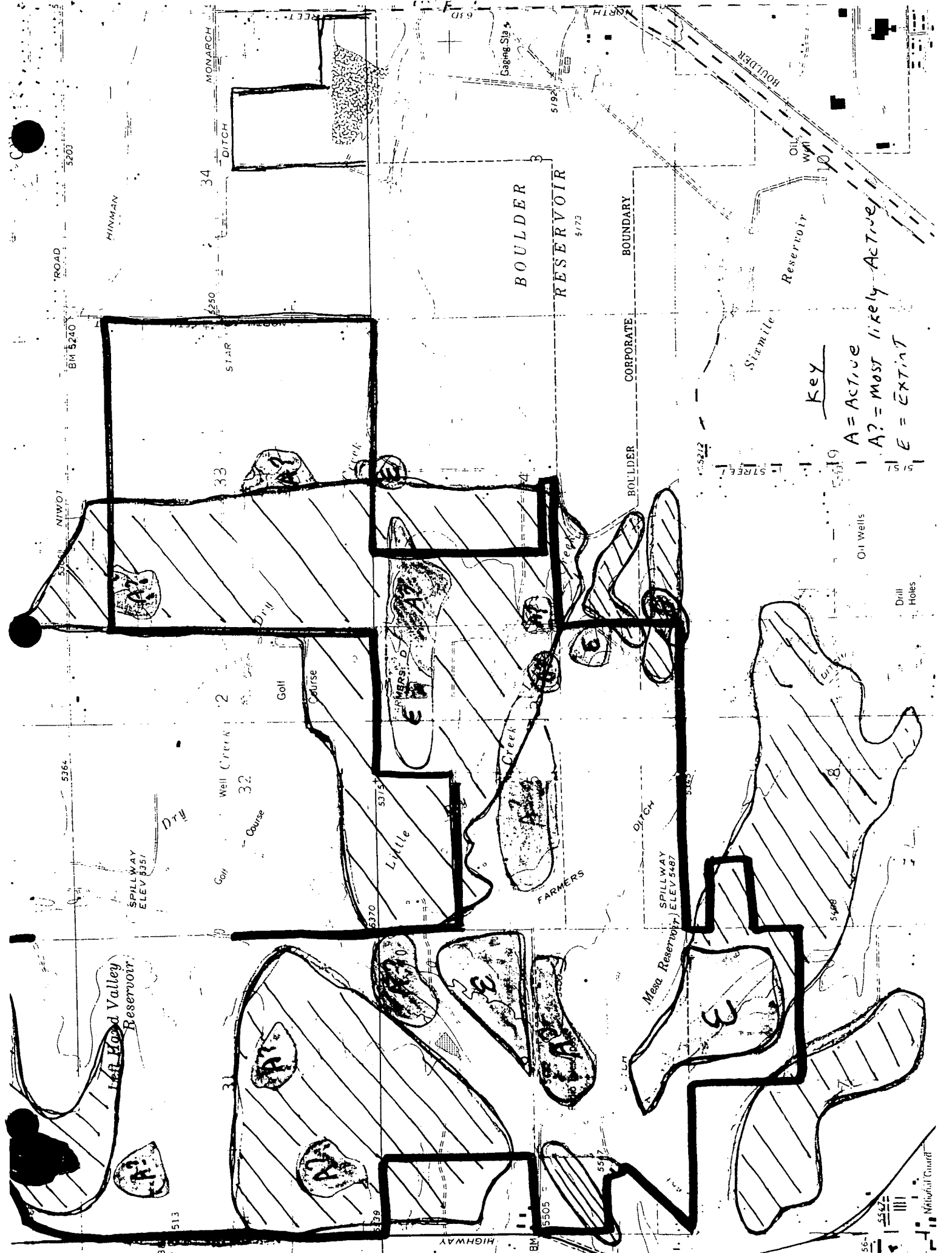
We would like thank Clint Miller from the Department of Open Space, and Eric Stone from the University of Colorado for all their suggestions and help.

Table 1

Active (A), Probably Active (A?), and Extinct (E) Praire Dog Towns in Boulder Valley Open Space







Key
 A = Active
 A? = Most likely Active
 E = Extinct

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