

Appendix 1.

**SURVEY PROTOCOL FOR ANNUAL SPRING COUNTS OF  
UTAH PRAIRIE DOGS (*Cynomys parvidens*)**

1. Counts will be conducted in the spring following emergence of adult Utah prairie dogs from winter hibernation and should be completed prior to emergence of young-of-the-year. This will be, generally, between 1 March and 1 June, but exact dates may vary from year to year.
2. Surveyors should begin counts at lower elevation colonies first and advance to higher elevations as the season progresses.
3. Counts will be conducted on calm, sunny days with temperature above 50°F. Surveys should be discontinued if winds exceed 3 on the Beaufort scale, if cloud cover exceeds 15%, if clouds cast moving shadows across the colony, or if otherwise inclement weather is encountered. Counts can be made between 0800 and 1800 hours, but are best made mid-morning through early afternoon.
4. Surveyors should approach colonies to be counted in a vehicle and in such a way that they avoid disturbing the resident Utah prairie dogs. Counts should be made from a vantage point which provides unobstructed viewing of the entire colony. If this is not possible, surveyors should choose a few good vantage points from which to count easily identifiable portions of the colony, count each of these subdivided areas and arrive at a composite count for the colony by summing these partial counts. In this latter case, special care should be taken to avoid over counting.
5. At least three counts will be made at each colony. After waiting a brief time to allow Utah prairie dogs to acclimate to observer arrival, the surveyor will slowly scan the colony from one end to the other with binoculars or spotting scope and count all adult Utah prairie dogs visible in the colony. **Do not count juveniles!** Two additional counts will be made immediately thereafter. If, however, the three counts lead to ever increasing numbers, counting will continue until numbers reach a plateau. Once a consistent count has been obtained, the observer should slowly approach the colony until an alarm call is elicited and count one more time. Often times "barking" will incite other Utah prairie dogs to assume an erect posture, making them much easier to count. The highest count achieved using these methods shall be recorded as the colony total.
6. Colonies which have been inactive for five consecutive years will not be surveyed annually. These shall be surveyed on a serendipitous basis until Utah prairie dogs recolonize. Recolonized locations will be added back to the annual survey rolls.

Direct counts will be used in trend analysis between years. If population estimates are required, they will be calculated from direct counts by making adjustments suggested by Crocker-Bedford (1976) and Mackley *et al* (1988). The former suggested that 40-60% of Utah prairie dogs are above ground at any one time. The latter developed the following

regression-based formulas for converting direct counts to a population estimate. If  $\text{count} \leq 8$ , then  $N = (\text{count})(1.403)$ ; if  $9 \leq \text{count} \leq 30$ , then  $N = (\text{count})(1.583)$ ; and if  $23 \leq \text{count} \leq 62$ , then  $N = (\text{count})(1.682)$ .

