

Community Dynamics Toolbox - Dataset #6379

Small Mammal Mark-Recapture Population Dynamics at Core Research Sites at the Sevilleta National Wildlife Refuge, New Mexico (1989-2013)

01/15/2014 10:35 AM - Sydney Jones

Status:	New	Start date:	01/15/2014
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Category:		Estimated time:	0.00 hour
Target version:		Spent time:	0.00 hour
Description			
<p>This file contains mark/recapture trapping data collected from 1989-2012 on permanently established web trapping arrays at 8 sites on the Sevilleta NWR. At each site 3 trapping webs are sampled for 3 consecutive nights in spring and fall. Not all sites have been trapped for the entire period. Each trapping web consists of 145 rebar stakes numbered from 1-145. There are 148 traps deployed on each web: 12 along each of 12 spokes radiating out from a central point (stake #145) plus 4 traps at the center point. The trapping sites are representative of Chihuahuan Desert Grassland, Chihuahuan Desert Shrubland, Pinyon-Juniper Woodland, Juniper Savanna, Plains-Mesa Sand Scrub and Blue Grama Grassland.</p>			
Sampling Design			
<p>Permanent capture-mark-release trapping webs were used to estimate density (number of animals per unit area) of each rodent species at each site. The method makes use of concepts from distance sampling, i.e., point counts or line-intercept techniques. The method makes no attempts to model capture-history data, therefore it was not necessary to follow individuals through time (between sessions). Distance sampling methods allow for sighting or detection (capture) probabilities to decrease with increasing distance from the point or line. The modeling of detection probability as a function of distance forms the basis for estimation. Trapping webs were designed to provide a gradient of capture probabilities, decreasing with distance from the web center. Density estimation from the trapping web was based on three assumptions: 1. All animals located at the center of the web were caught with probability 1.0; 2. Individuals did not move preferentially toward or away from the web center; 3. Distances from the web center to each trap station were measured accurately. Each web consisted of 12 trap lines radiating around a center station, each line with 12 permanently-marked trap stations. In order to increase the odds of capturing any animals inhabiting the center of a web, the center station had four traps, each pointing in a cardinal direction, and the first four stations of each trap line were spaced only 5 m apart, providing a trap saturation effect. The remaining eight stations in a trap line were spaced at 10 m intervals. The web thus established a series of concentric rings of traps. Traps in the ring nearest the web center are close together, while the distances separating traps that form a particular ring increase with increasing distance of the ring from the web center. The idea is that the web configuration produces a gradient in trap density and, therefore, in the probability of capture. Three randomly distributed trapping webs were constructed at each site. The perimeters of webs were placed at least 100 m apart in order to minimize homerange overlap for individuals captured in the outer portion of neighboring webs.</p>			
Measurement Techniques			
<p>Each site containing three webs was sampled for three consecutive nights during spring (in mid May or early June) and summer (in mid July or early August for years 1989 to 1993, then mid September to early October for years 1994 through 2000). In that rodent populations were not sampled monthly over the study period, there is no certainty that either spring or summer trapping times actually captured annual population highs or lows. Based on reproductive data in the literature, an assumption was made that sampling times chosen represent periods of the year when rodents have undergone, and would register, significant seasonal change in density. During each trapping session, one Sherman live trap (model XLF15 or SFAL, H. B. Sherman Traps, Tallahassee, FL) was placed, baited with rolled oats, and set at each permanent, numbered station (four in the center) on each web, for a total 444 traps over three webs. Traps were checked at dawn each day, closed during the day, and reset just before dusk. Habitat, trap station number, species, sex, age (adult or juvenile), mass, body measurements (total length, tail length, hind foot length, ear length), and reproductive condition (males: scrotal or non-scrotal; females: lactating, vaginal or pregnant) were recorded for each initial capture of an individual. Each animal was marked on the belly with a permanent ink felt pen in order to distinguish it from other individuals during the same trapping session. The trap station number for an initial capture related to a particular trapping ring on a web and, therefore, to a particular distance from the center of the web. The area sampled by a ring of traps was computed based on circular zones whose limits are defined by points halfway between adjacent traps along trap lines; an additional 25 m radius was added to the outer ring of traps in order to account for homerange size of individuals caught on the outer ring.</p>			
Analytical Procedures			
<p>Area trapped and number of individuals caught for each ring of traps was the basis for estimating the probability density function of the area sampled. The program DISTANCE produced the estimators used to calculate density. Where sample size for a particular species and web was less than an arbitrarily chosen $n=10$, the number of individuals captured during that session was simply divided into the area of the web plus the additional 25 m radius (4.9087 ha). This dataset includes only the raw capture data.</p>			

History

Files				
SEV008_raw.csv	1.17 MB	01/15/2014	Sydney Jones	
SEV008_table_variables	2.03 KB	01/17/2014	Sydney Jones	