Movements of Animals That Don't Go Anywhere: Mazama Pocket Gophers

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ABSTRACT

The Mazama pocket gopher (*Thomomys mazama*) is listed as federally threatened in Thurston and Pierce counties (4 subspecies), WA, and as WA State threatened statewide (all subpecies). Current Mazama pocket gopher populations are found on remnants of historic prairies that appear to be increasingly isolated from each other. Determining the degree of isolation, and developing conservation strategies to ensure persistence of these populations, requires knowledge of Mazama pocket gopher movement patterns. Studies of other pocket gopher species found them to be highly sedentary, likely because of their subterranean lifestyle. Two studies of Mazama Pocket Gophers in Thurston Co. WA conducted in 2009-2013 provided data on movements under a variety of conditions for juveniles and adults using radio-telemetry, mark-recapture, and genetics methods. In general, the longest distance movements (>400m) were made by post-translocated individuals, but other long distance movements (>360m) were also recorded. Once settled, adults rarely moved more than 40m, but distances varied widely in both studies. These studies showed that Mazama pocket gophers are generally as sedentary as expected, but movements of ≥400m are not unknown.

METHODS/ DATA SOURCES

Mark-Recapture

Translocation study, West Rocky Prairie

2009-2011: 559 individuals released.

2010-2014: ~1100 captures in annual spring trapping.

Dispersal study, Weir Prairie

2010-2011: ~565 captures in summer trapping

Radiotelemetry

Translocation study, West Rocky Prairie

2010: 63 radio-collared (unknown age). Daily tracking post-release for 10 days, then every 3 days for at least 30 days, up to 60 days.

Dispersal study, Weir Prairie

2011: 28 juveniles radio-collared. Daily tracking post-capture for up to 56 days.

Parentage Assignment

Dispersal Study, Weir Prairie

2011: Parents of 5 radio-collared juveniles were identified based on genetic analyses of hair samples collected from all captures. Distance between parent and offspring captures assumed to be pre-capture dispersal by offspring. Assumes parents are located at natal nest sites.

RESULTS

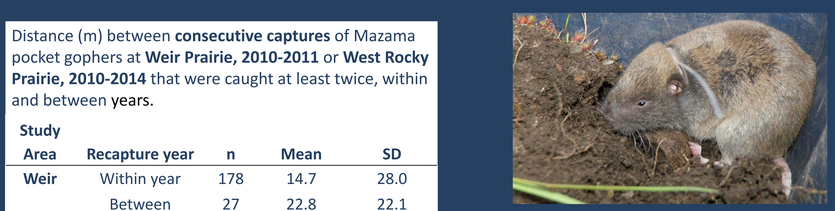
SEDENTARY?

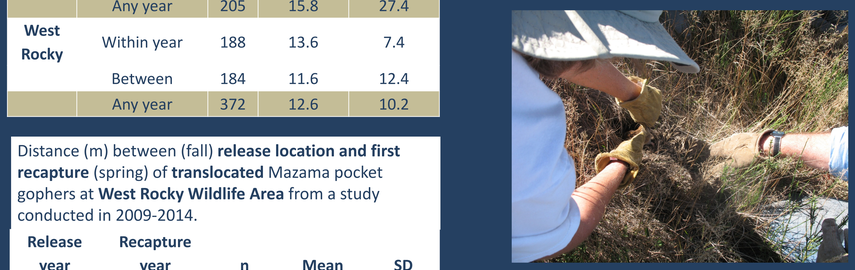
Distance (m) between **consecutive captures** of Mazama pocket gophers at **Weir Prairie, 2010-2011** or **West Rocky Prairie, 2010-2014** that were caught at least twice, within and between years.

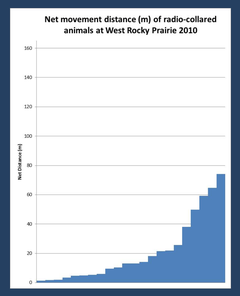
Study Area	Recapture year	n	Mean	SD
Weir	Within year	178	14.7	28.0
	Between	27	22.8	22.1
	Any year	205	15.8	27.4
West Rocky	Within year	188	13.6	7.4
	Between	184	11.6	12.4
	Any year	372	12.6	10.2

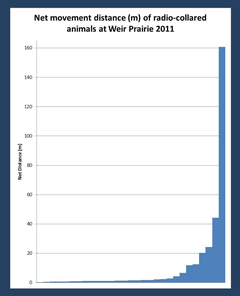
Distance (m) between (fall) **release location and first recapture** (spring) of **translocated** Mazama pocket gophers at **West Rocky Wildlife Area** from a study conducted in 2009-2014.

Release year	Recapture year	n	Mean	SD
All years	Any year	151	30.0	48.1







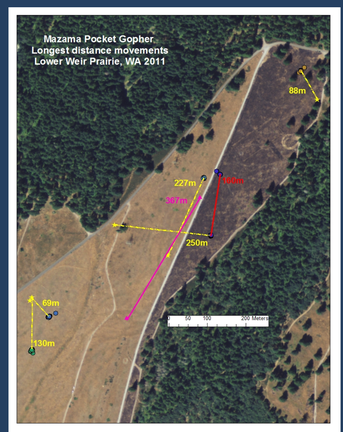


Net movements are measured from first tracking location to last for animals that survived through the tracking period. Pocket gophers in the West Rocky Study were of unknown age and were translocated to the site and released with radio-collars. Animals in the Weir Study were resident juveniles trapped and collared on site. Sex of animals were not known in either study. Tracking season at West Rocky Prairie was fall and late summer at Weir Prairie, and lasted up to 60 days for both studies.

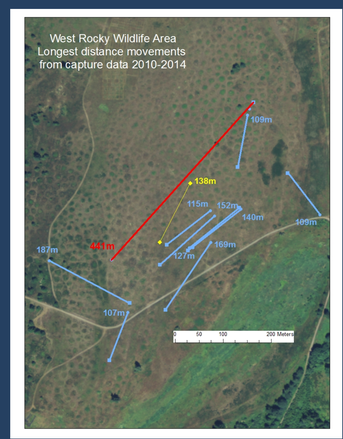
OR NOT?

Longest distance movements (in meters) recorded for Mazama pocket gophers at Weir Prairie, 2010-2011, and West Rocky Prairie, 2010-2014, with year(s) recorded, data source, and frame of movement.

Study Area	Year(s)	Data source	Time Frame	Distance
Weir	2011	Trapping	One day	367
	2011	Telemetry	One day	160
	2011	Parentage Assignment	One season	250
	2011	P.A. + Telemetry	One season	410
West Rocky	2011-2012	Trapping	Over-winter	441
	2013-2014	Trapping	One year	138

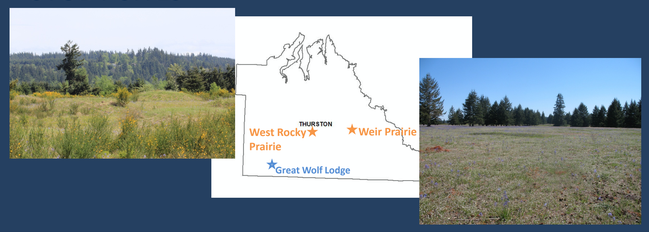


The pink line between captures of an adult female in a single day is the longest distance recorded for all methods. The red line is the longest distance between telemetry checks on consecutive days. The yellow lines are all distances between parent capture locations (★) and first captures of offspring, as identified from parentage assignment analyses of genetic samples.



The red line between release in 2011 and recapture in 2012 of a female is the longest distance recorded for all methods. The blue lines show all distances >100m between releases and first recaptures regardless of year. The yellow line is the longest distance recorded between capture occasions (2013 to 2014), for an adult male.

STUDY SITES



FINDINGS

- Combining data across studies with different objectives, methods, locations, and time scales provide a "big picture" of movement pattern for Mazama pocket gophers.
- Results were remarkably consistent, with average movements detected ≤30m for even translocated individuals. The great majority (>90%) of pocket gophers movements were <40m.
- A few recorded movements of >350m, including one that occurred within a single day, indicate that pocket gophers are capable of traveling much longer distances.
- Long distance movements were made by individuals of both sexes and ages (adult or juvenile).
- The longest confirmed movements recorded were from capture data which are inherently limited by the area trapped. Longer movements may have occurred.
- Movement results from parentage assignment are contingent upon the assumption that parents are captured near natal burrows. This assumption may be questionable, given the long distance movement of an adult female.

MANAGEMENT IMPLICATIONS

- The majority of Mazama pocket gophers in this study (>90%) moved less than 40m, and movements of established gophers averaged <20m, supporting research on other pocket gopher species that concluded they are generally very sedentary, and thus populations may become easily isolated.
- Long distance movements of a few individual indicate that Mazama pocket gophers may be capable of maintaining sufficient genetic diversity among populations separated by as much as 400m to prevent inbreeding depression. However, the rarity of long movements indicate that colonization of unoccupied areas or demographic rescue of declining populations cannot be assumed for sites that are this far apart.

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Weir Prairie:

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