White-tailed Prairie Dog 2013 Monitoring Pinedale Anticline Project Area

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Survey Objectives

1. Monitor long-term trends in occupancy rates via mapping of prairie dog towns

2. Monitor long-term trends in active burrow density/prairie-dog numbers

Monitoring Matrix

- **Sensitive Species (WTPD)**
- Criteria:
  - Occurrence of species and change in numbers of each species
- Assessing Change:
  - 3-year change in presence/absence and numbers of individuals, compared to reference areas.
- Specific Change Requiring Mitigation:
  - 3 consecutive years of decline in presence/absence of a species, or an average of 15% decline in numbers of individuals each year over 3 years.

Objectives for 2013

- Compare year-to-year changes in prairie dog occupancy based on the acreage of towns within each area (PAPA and Reference).

- Estimate prairie dog abundance based on the number of active prairie dog burrows within each area and compare to prior years (2011 and 2012) results.

Methods

- Mapping of Towns
  - All towns mapped in 2011 and 2012 were revisited and mapped
  - New towns identified while in the field were also mapped
- Burrow Density
  - Transects were walked in all accessible towns to count burrows and estimate active burrow density

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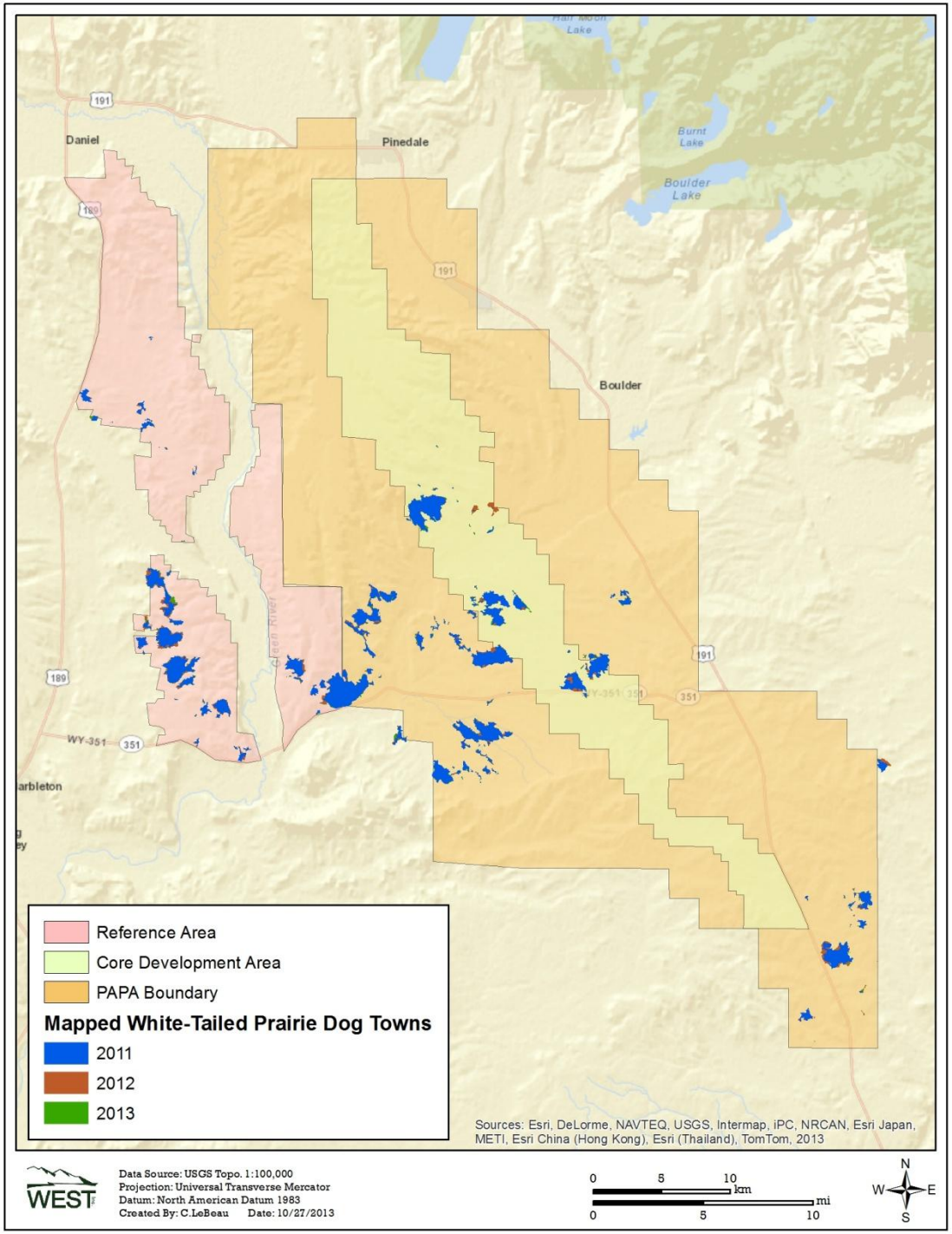
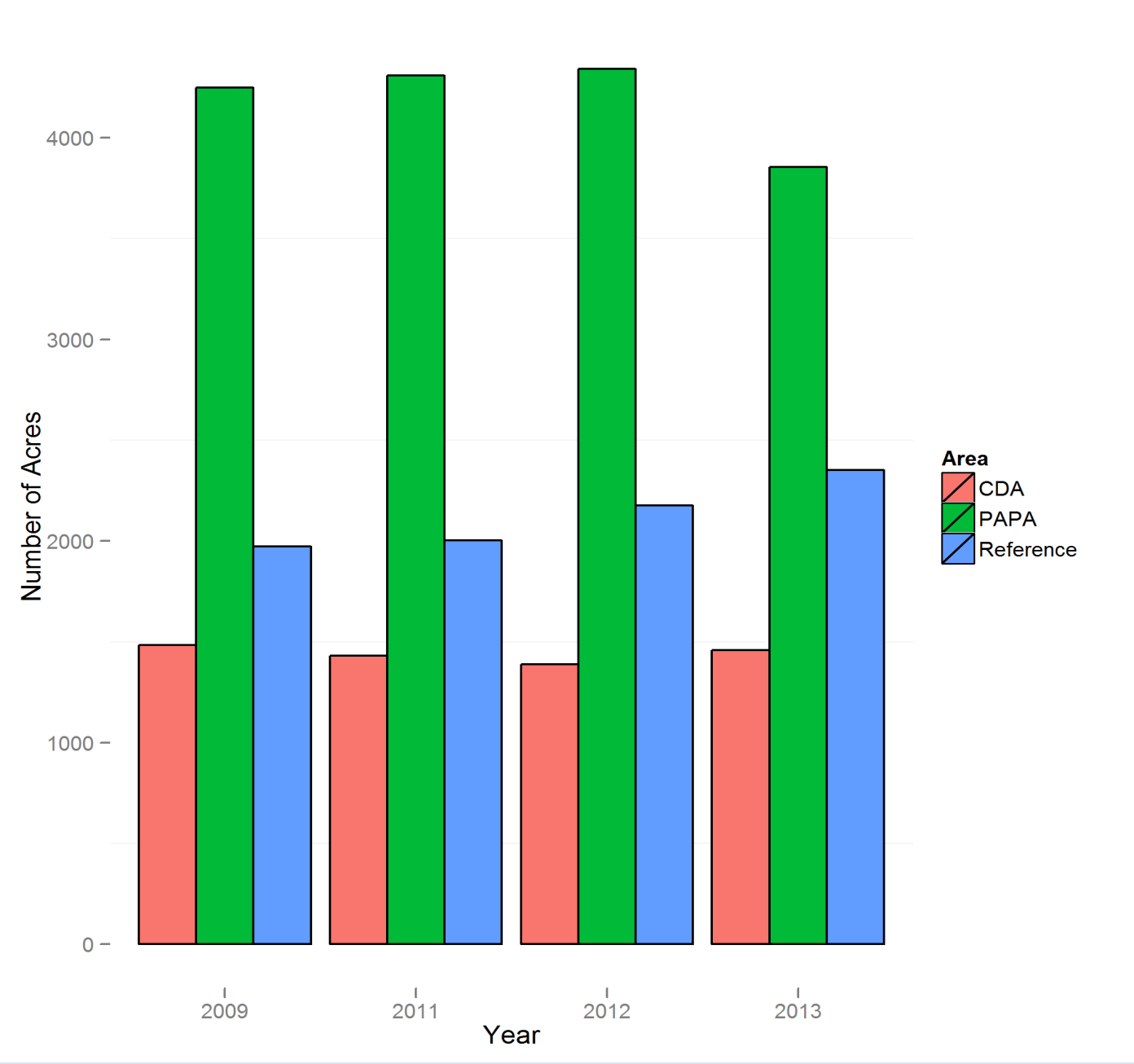
2013 Towns

Towns were mapped based on methods of Biggins et al. (1993)



2013 Towns

Number of prairie dog colony acres mapped



Acreage of Towns

Change in acreage of mapped white-tailed prairie dog towns between 2009 and 2013.

Area	Year				Change in Acreage from 2009 to 2013		Change in Acreage from 2012 to 2013	
	2009 (acres)	2011 (acres)	2012 (acres)	2013 (acres)	Acres	%	Acres	%
CDA	1,483	1,431	1,389	1,458	-25	-1.7	69	5.0
PAPA	4,248	4,309	4,341	3,855	-393	-9.3	-486	-11.2
Reference	1,974	2,003	2,176	2,351	377	19.1	175	8.0
Total	**6,222**	**6,312**	**6,517**	**7,664**	**1,442**	**23.2**	**1,147**	**17.6**

Survey Methods-Burrow Density

- Mapped towns were surveyed for burrow density based on methods in Biggins et al. (1993).
  - Strip transects (3m wide) spaced 60m apart
  - Data Recorded during each visit:
    - Total Number of Burrows (>7 cm diameter entrance without visible end) per transect
    - Number of Active Burrows (fresh scat within 0.5m of entrance) per transect
    - Data was recorded for each individual transect instead of for each town as was done in the past.

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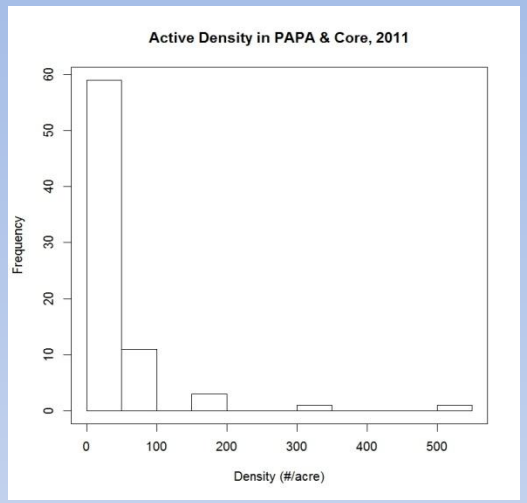
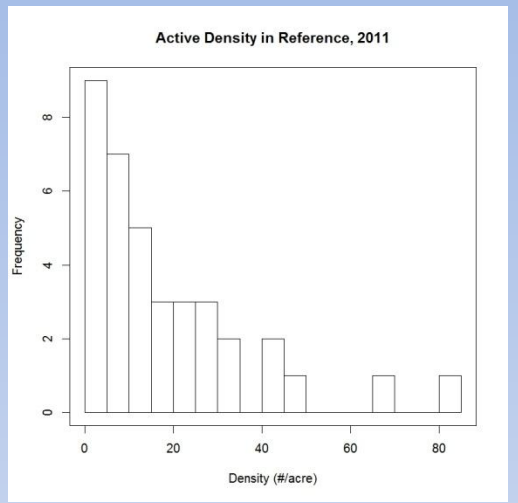
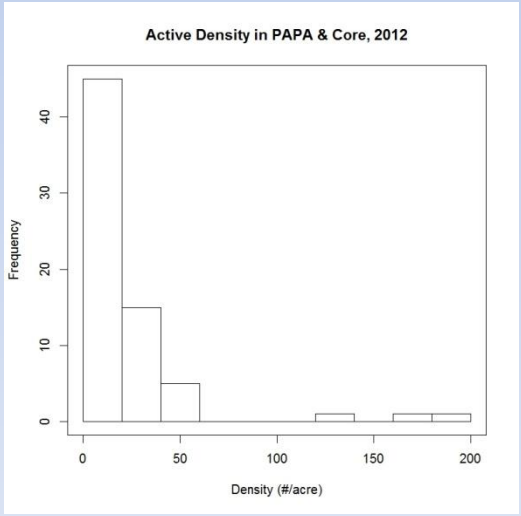
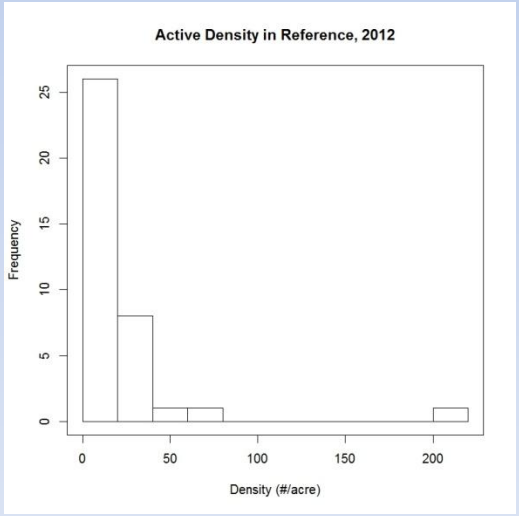
Analysis - Outliers

- Calculate burrow densities for each town (# burrows/area surveyed)
- Outliers identified that were highly influencing the data (i.e., small towns with extreme burrow densities due to sampling)
- 5 outliers in identified 2011 data and 4 in 2012 data



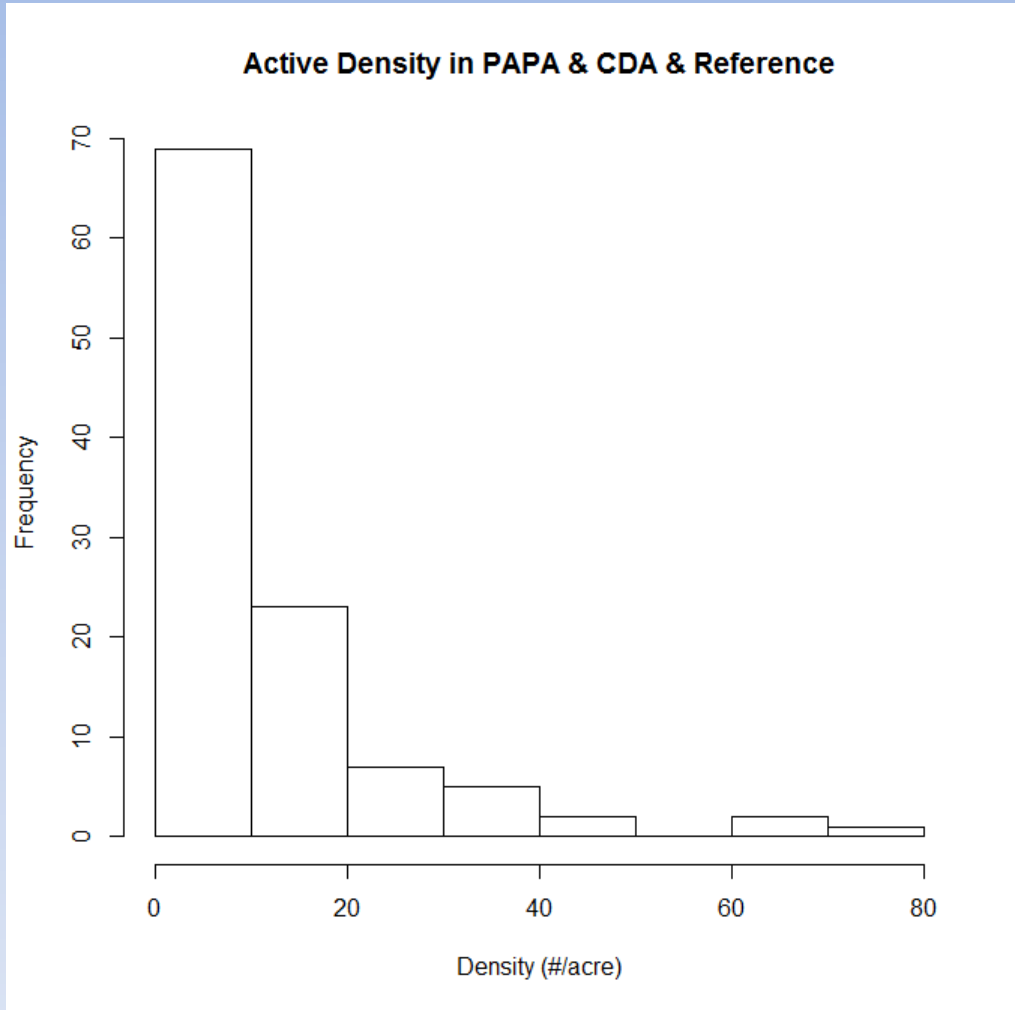






Analysis - Outliers

- No outliers were identified in 2013



Results

Table 9. Average active burrow density (number per acre) based on dataset excluding outliers in each area with 95% bootstrap confidence interval.

Area	2011			2012			2013		
	Density	95% CI		Density	95% CI		Density	95% CI	
		Lower	Upper		Lower	Upper		Lower	Upper
CDA	23.92	14.22	33.85	20.83	15.22	25.52	13.38	7.69	19.84
PAPA	20.99	15.32	26.89	14.94	12.40	18.74	8.33	3.96	14.03
Reference	17.98	11.96	24.13	14.10	9.28	19.15	12.06	7.69	17.76

Table 10. Total number of active burrows in each area with 95% bootstrap confidence interval.

Area	2011			2012			2013		
	Number	95% CI		Number	95% CI		Number	95% CI	
		Lower	Upper		Lower	Upper		Lower	Upper
CDA	25,589	15,026	40,705	21,636	12,361	29,947	19,511	5,883	39,037
PAPA	72,262	58,191	90,986	63,130	52,158	76,796	32,121	12,467	60,084
Reference	31,951	21,651	44,696	21,187	16,367	26,978	28,377	12,115	50,348

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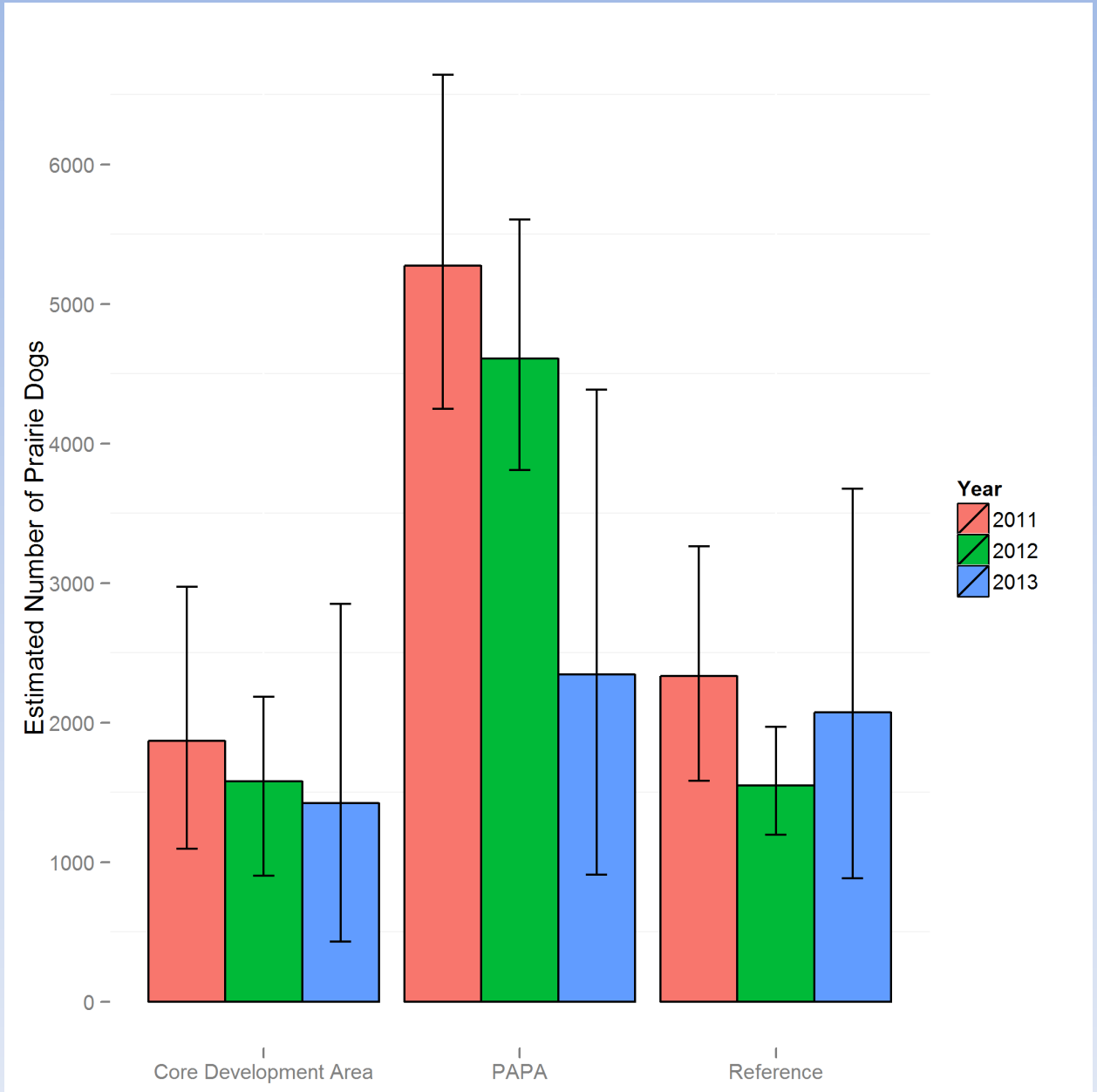
Number of Prairie Dogs



Recommendations

- Continue with current methods of mapping towns and estimating burrow densities
- Conduct survey (aerial or other) of the entire study area (PAPA and Reference Areas) to search for newly established towns.
  - Without a survey of the entire Study Area, the monitoring protocol may be biased toward easier estimation of decreases in prairie dog presence/occupancy (i.e., # and/or acreage of towns) if newly established towns are only added incidentally.