

BLUNT-NOSED LEOPARD LIZARD SURVEYS AT PIXLEY NATIONAL WILDLIFE REFUGE IN 2011



PREPARED FOR: PIXLEY NATIONAL WILDLIFE REFUGE

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INTRODUCTION

The blunt-nosed leopard lizard (*Gambelia sila*) has been listed as federally endangered since 1967 and California State endangered since 1971 (U.S. Fish and Wildlife Service 1998). This species continues to decline due to profound upland valley habitat loss, fragmentation, and disturbance. Blunt-nosed leopard lizard (BNLL) survival also can be negatively impacted by seasons of dense vegetation and flooding (Montanucci 1965). Few viable BNLL populations remain in their historic range, but one population has persisted at the Pixley National Wildlife Refuge (PNWR, Figure 1) in southwest Tulare County, California. PNWR has approximately 5,350 acres of protected upland habitat consisting a mix of grassland, alkali playa, and vernal pool habitat (U.S. Fish and Wildlife Service 2005). Cattle grazing is used to help manage non-native annual grass vegetation from about November to April. Some horse grazing is also conducted during the winter months on the Horse Pasture Unit. Grazing duration varies from year to year, depending on the grazing lease and amount of precipitation received from winter rains (Pam Williams, pers. comm.).

Objectives for this project were to:

- Conduct surveys on an established monitoring grid
- Conduct surveys in other portions of the PNWR to provide information on the distribution and abundance of BNLL

METHODS

GRID SURVEYS

Surveys were last conducted by ESRP in 2007 on the previously established 300-m x 300-m “Grid 3 Pixley” in the NE section of the Deer Creek West Unit. Many of the wood stake grid markers had deteriorated and/or were knocked down by cattle and replacement was necessary prior to surveys. Pam Williams from PNWR and Steve Laymon from the Bureau of Land Management (BLM) coordinated remarking of Grid 3.

For each survey day the following data were recorded: date, observers, weather, start and end times, beginning and end soil, surface, and air temperatures (degree Fahrenheit). Lizard counts were conducted by 2-6 surveyors walking transects in overlapping circles starting from the NE corner and moving east to west, and then starting at the NW corner moving west to east the next survey day. The direction was alternated in this manner each survey day. Surveyors walked the transect lines at a moderate pace counting BNLL, coast horned lizards (CHL; *Phrynosoma coronatum*), side-blotched lizards (SBL; *Uta stansburiana*), and western whiptail lizards (WWL; *Cnemidophorus tigris*). Grasshopper numbers also were counted within approximately 1 m on either side of the transect. Grasshopper counts from each surveyor were added together for a total count per day. We attempted to capture all BNLL and CHL observed. BNLL were captured using a noose pole (graphite fishing pole) fitted at the tip with a loop of dental floss. All CHL were hand captured. All captured lizards were placed in a numbered cloth bag and placed in a shaded bucket for later processing. Lizard locations were noted by north-south, east-west

reference to the closest numbered grid point. Lizard activity at the time of observation was also recorded (e.g., sunning, running, mating, etc.).

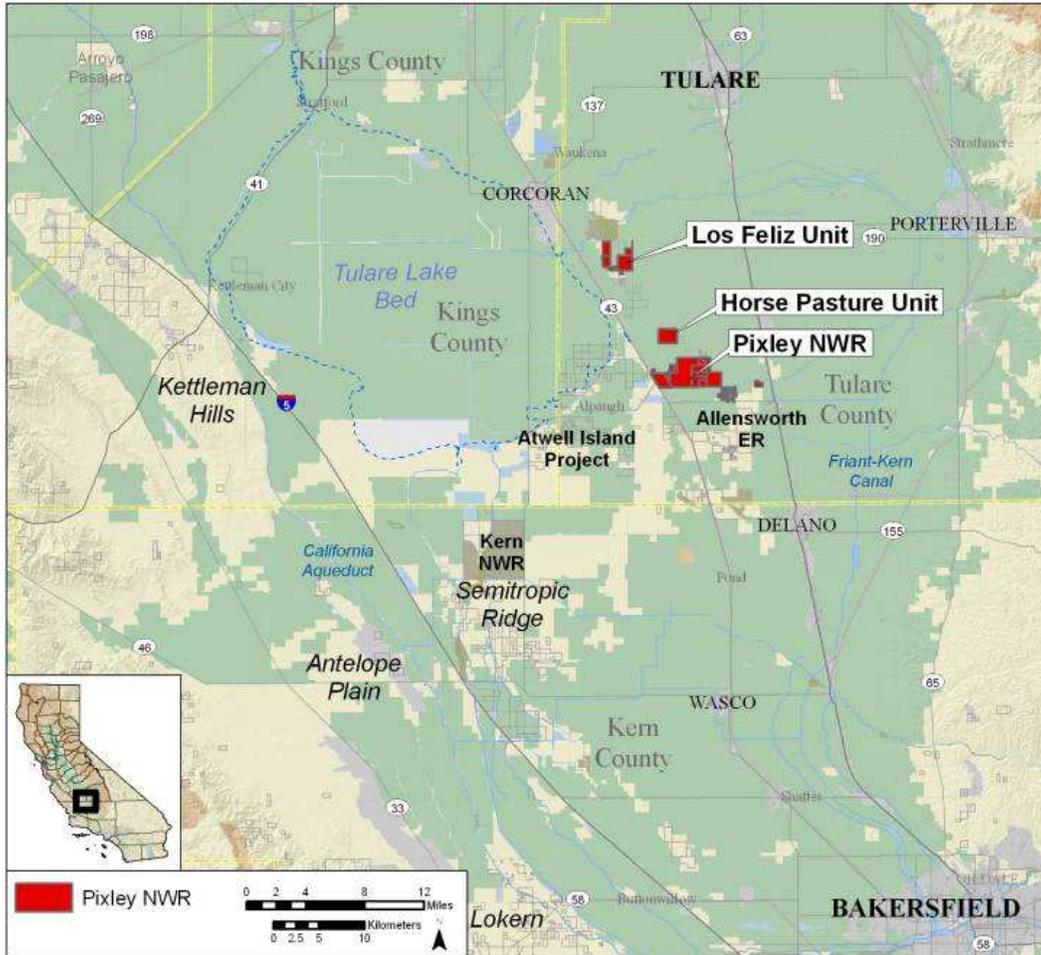


Figure 1. Pixley National Wildlife Refuge.

Processing for each BNLL and CHL included measuring body weight, snout-vent length (SVL) and snout-tail length (STL). Lizard age and sex were recorded. Female lizards were palpated for eggs and the number of eggs recorded. Lizards were scanned for possible passive integrated transponder (PIT) tags from previous years. Lizards with no PIT tag were implanted with a tag just underneath the skin on the lower abdominal area and the PIT tag number was recorded on the datasheet. A few drops of skin adhesive were put on needle incision site and allowed to dry a few minutes. Each lizard was marked on the back with a large identification number using either white-out or a permanent marker. A BNLL genetic sample was collected for an ongoing range-wide genetic survey conducted by BLM. Genetic samples were collected by excising a small portion of the tail tip (~5 mm) and preserving the tissue in a vial with 95% ethanol. Lizards were released back at their capture location after processing.

WALKING SURVEYS

Since BNLL numbers were relatively low on Grid 3, it was decided to conduct only 5 survey days instead of 10 on Grid 3, and focus the remaining 5 days on surveying other selected Refuge units for BNLL and CHL presence. Units were selected based on whether

they had appropriate BNLL upland habitat, if biological surveys had been conducted in the past, and/or if BNLL had ever been observed opportunistically on that unit (Pam Williams, pers comm.). Based on these factors, the following units were selected: Deer Creek East, Two Well, 200-acre Tract, Center Field, Ledezma, Horse Pasture, and Los Feliz. Units were walked by the surveyors in meandering transects, focusing on areas of low vegetation and scalded alkali areas, while attempting to cover as much of the unit as possible. We attempted to capture BNLL and CHL as in the Grid 3 surveys, but PIT tagging was not conducted. Grasshopper counts were also not conducted since it could not be done in a systematic manner. Exact temperatures were also not collected, but all surveys were conducted within the optimal temperature ranges for BNLL. All other incidental lizard species were recorded, as well observances of other fauna such as burrowing owls (BUOW; *Athene cunicularia*) and coyotes (*Canis latrans*).

RESULTS

GRID SURVEYS

During the 5 surveys on the grid, BNLL were observed on only 4 occasions and only 1 animal was captured (Table 1). Daily BNLL observations ranged from 0 to 2. Additional BNLL were observed just off the grid (one of which was captured) or on the grid after the survey was concluded. Additionally, CHL were observed on 15 occasions and all were captured. In total, 8 unique individuals were marked. Daily CHL observations ranged from 0 to 5. An average of 13 SBL was observed each day (range = 9-17). An average of 2,213 grasshoppers were observed each day (range = 1,827-2,609).

WALKING SURVEYS

Walking surveys were conducted on 7 days in 8 parcels on PNWR (Table 2, Figure 2). BNLL were observed in 4 of the parcels (Deer Creek East, Center Field, Two Well Tract, 200-acre Tract; Figure 3). CHL were observed in 3 of the parcels (Deer Creek East, Ledezma – northern half, and 200-acre Tract), and WWL were observed in 1 parcel (Ledezma – northern half) (Figure 4).

Data collected from all BNLL and CHL captured are provided in the Appendix.

Table 1. Grid surveys for BNLL on Grid 3 on Deer Creek West Unit, Pixley National Wildlife Refuge, 2011.

Survey Date	Surveyors ¹	BNLL obs/caps	CHL obs/caps	SBL Obs.	Grasshoppers	Other notes
2011-06-08	BC, CV, KT, ET, JB, CJH	0/0	0/0	9	2370	Grid heavy with grass thatch this year due to very high winter rains. Scalded areas still remain.
2011-06-09	BC, KT, CV, ET, JB, TW	1/0	5/5	17	1827	One additional BNLL cap just off east side of grid.
2011-06-10	BC, CV, ET, CJH	2/1	3/3 (2 recap, 1 new)	16	1929	Two adult males obs off grid on north road. Two of CHL observed on grid were mating.
2011-06-14	CV, PW, CJH, JB, NM	1/0	4/4 (3 recap, 1 new)	14	2609	Marked CHL obs on grid after survey ended.
2011-06-15	CV, TW, PW, ET, CJH, DV	0/0	2/2 (1 recap, 1 new)	11	2329	BNLL obs after survey on north side of grid on road going east-west through grid.

¹ BC = Brian Cypher (ESRP), CV = Christine Van Horn Job (ESRP), KT = Krista Tomlinson (CDFG), ET = Erin Tennant (CDFG), JB = John Battistoni (CDFG), CJH = Clara J. Hurley (BLM), TW = Tory Westall (ESRP), PW = Pam Williams (PNWR), NM = Nathan McLachlin (CDFG), DV = Dyana Valencourt (CDFG)

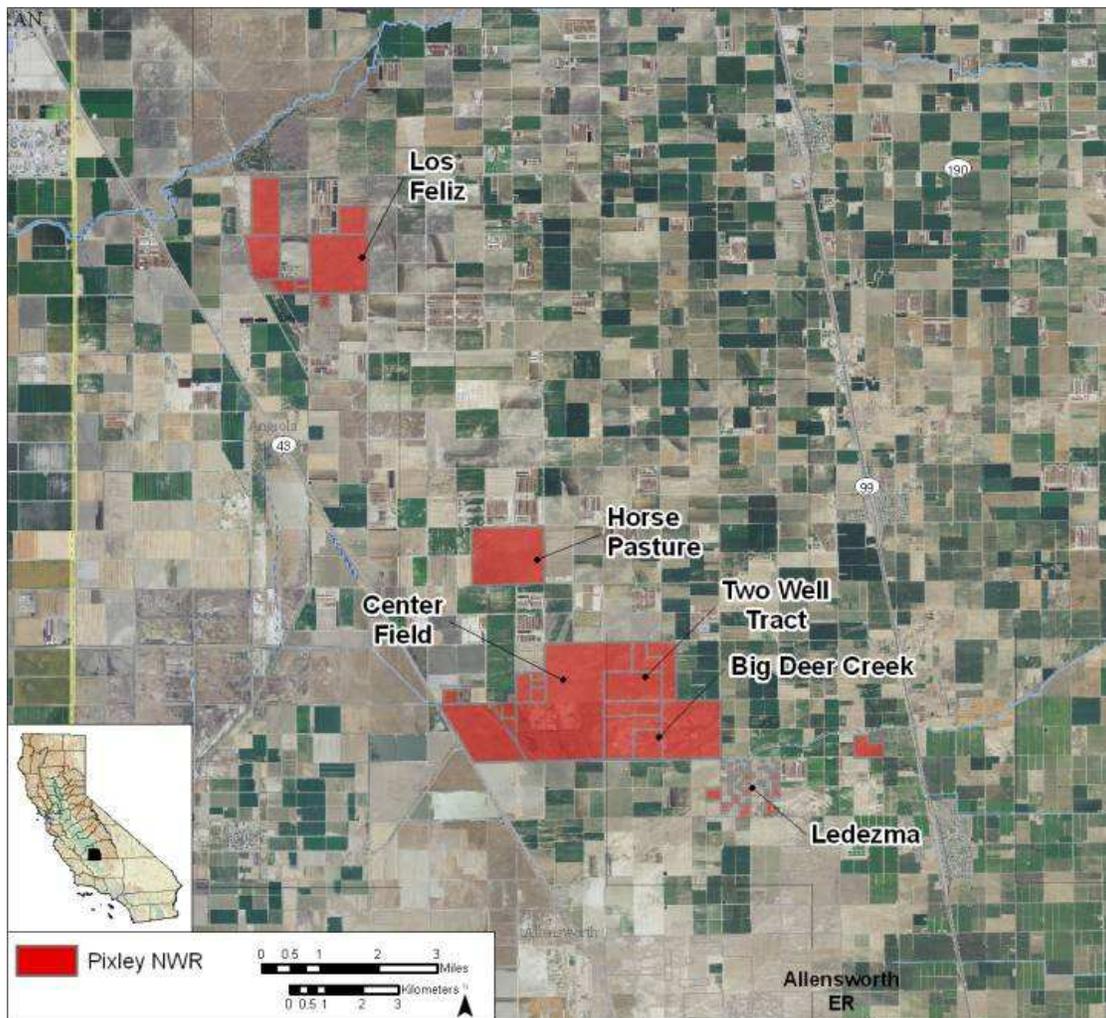
**Figure 2. Locations of walking surveys for BNLL on PNWR in 2011.**

Table 2. Walking surveys for BNLL, Pixley National Wildlife Refuge, 2011.

Unit and sublocation	Date surveyed	Surveyors ¹	BNLL obs/cap	CHL obs/cap	WW obs	SBL obs	Other notes
Deer Creek East	2011-06-20	BC, CV, PW, CJH	1/0	2/0	0	1	Grass thick, but still has some open scald areas, and dirt road going diagonally through unit. BNLL obs just off this road. Low-med rodent burrow numbers. One active coyote den found.
Center Field	2011-06-21	BC, CV, CJH, AB	4/1	0/0	0	Not recorded	
Two Well Tract	2011-06-22	BC, CV, AB	3/1	0/0	0	Not recorded	Obs. 3 burrow areas with larger lizards scats, likely BNLL.
Ledezma (northern half)	2011-06-24	CV, PW, CJH, AB	0/0	2/2	3	31	3 potential BNLL scats collected. One active coyote den, animal growled from inside den. Much of unit very thick with grass. Still has some open, scalded areas mixed throughout. Active CA ground squirrel areas even in thicker grass areas. Squirrel activity more dense in NW part of unit. Some rodent burrow activity, mainly along northern berm. Very few burrows in rest of unit.
Horse Pasture	2011-07-01	CV, CJH, AB	0/0	0/0	0	10	3 BUOW obs. Unit very thick with grass. More open areas on east & west sides & where cattle and horse grazing have removed some of the RDM on north side of unit. Low-moderate ground squirrel activity. Almost no small rodent burrows obs and no larger lizard scats obs.
Two Well (east side 200 acre strip)	2011-07-12	BC, CV	1/0	2/1	0	32 (16 adult, 16 hatchlings)	2 BNLL scat collected. Off the unit on road just north of Deer Creek East Unit, obs BNLL pair mating. Ran south back into PNWR. Collected one BNLL scat on road also. Unit grassy in middle, but more open on north and south ends. BNLL found at north end. Moderate ground squirrel activity in open areas. Not many rodent burrows.
Ledezma (southern half)	2011-07-12	BC, CV	0/0	0/0	0	4 (2 adult, 2 hatchling)	This part of unit has thick grass, but it opens up more on very southern end & has more scald areas. Almost no rodent burrows found. Low ground squirrel activity, mainly on southern end and along west fence line. Ground squirrels abundant along ag-NWR-private property interfaces!
Los Feliz	2011-07-13	BC, CV	0/0	0/0	0	10	Area north of southern fence line is a good mix of open areas, native annuals, and microtopography. Abundant ground squirrel and kangaroo rat burrow activity. Kangaroo rats could be Tipton. Grass is not too thick in this area, but does become increasingly thick toward north in unit, but still obs squirrel and kangaroo rat activity in these areas.

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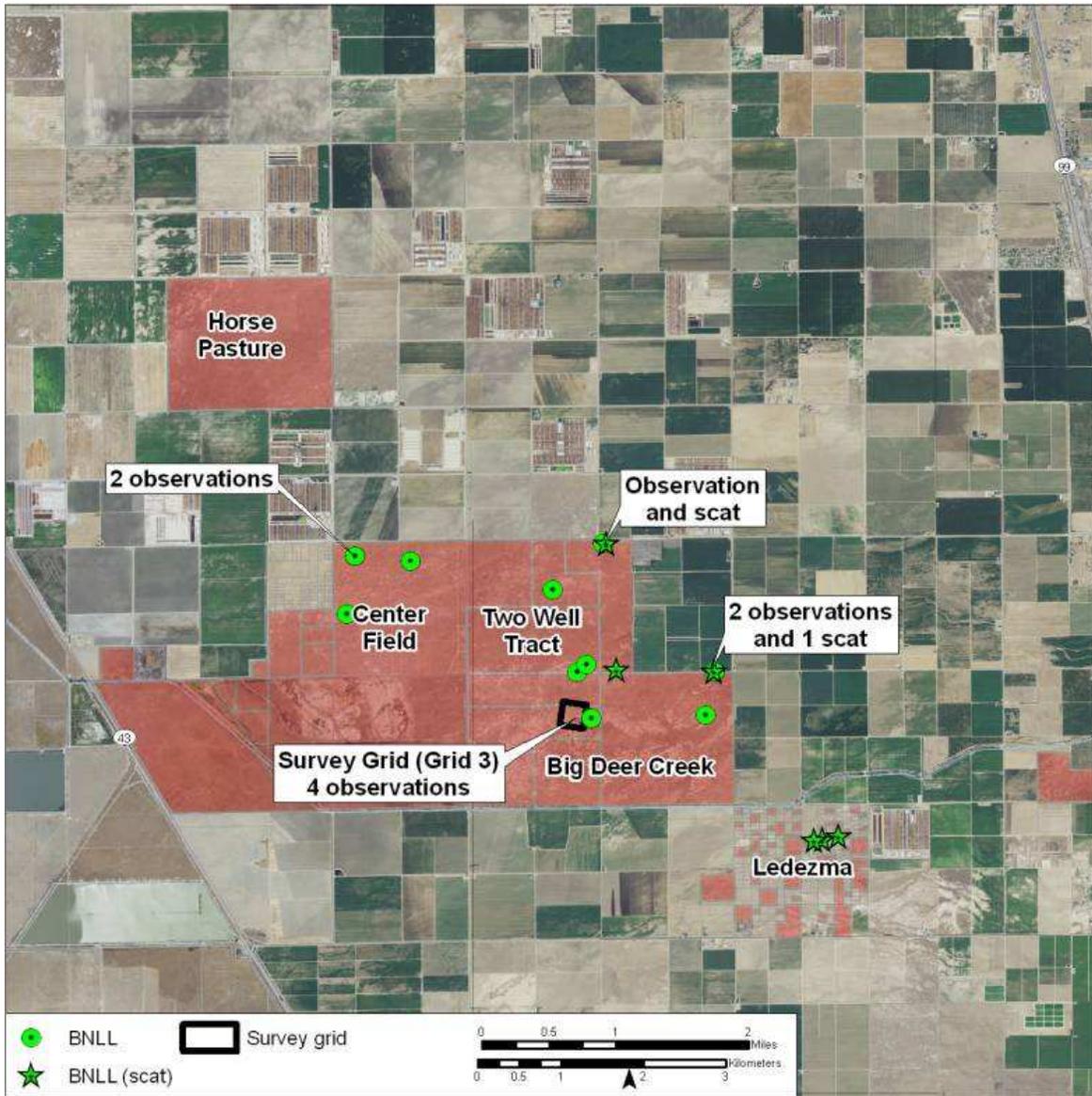


Figure 3. Blunt-nosed leopard lizards observed at Pixley National Wildlife Refuge.

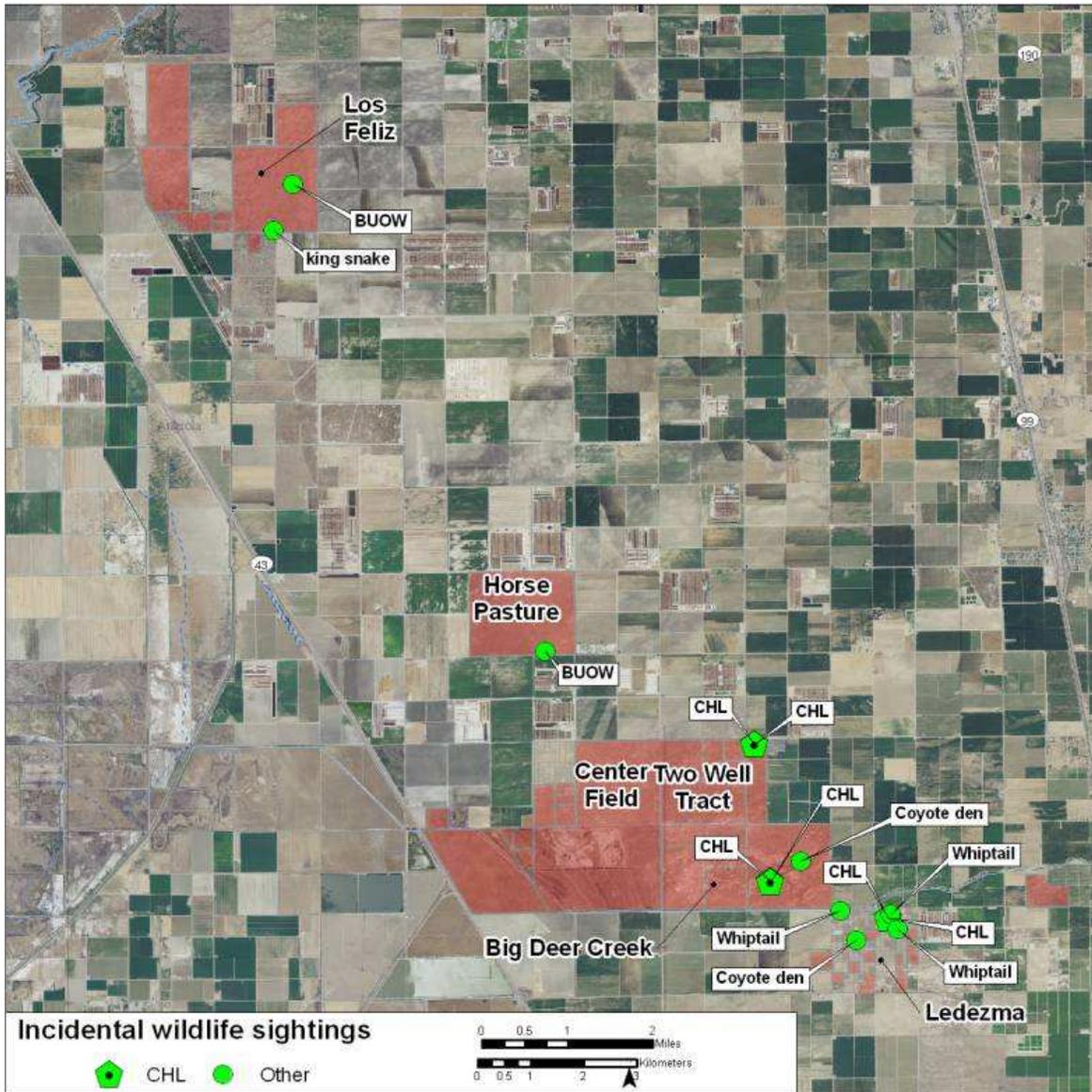


Figure 4. Incidental wildlife sightings at Pixley National Wildlife Refuge, 2011.

DISCUSSION

This year may have been a good year to conduct surveys for BNLL because populations in many portions of the species' range appeared to be high (L. Saslaw, BLM, pers. comm.). However, although numbers possibly were elevated, detection rates may have been reduced because of above average precipitation during the previous winter. This precipitation resulted in dense, tall vegetation that made BNLL less easy to observe. A number of lizards were observed just outside of rodent burrows and quickly entered burrows upon seeing us. More lizards may have entered burrows prior to us spotting them. Indeed most BNLL observed were in areas of sparse or no vegetation, such as alkali scalds, disturbed areas outside of rodent burrows, and roads.

BNLL were confirmed to be still present on the monitoring grid. We also were able to confirm that BNLL were present in several other portions of PNWR. Based on these

results, it appears that there is a reasonably robust population on the contiguous parcels north of Deer Creek (i.e., Deer Creek West, Deer Creek East, Center Field, and Two Well). Our survey efforts were relatively limited and it also is possible that BNLL may be present in other parcels as well. Alternatively, it is possible that the other, more isolated parcels may have been subject to past events that resulted in the extirpation of BNLL, or it also may be possible that the parcels are smaller than some minimum size necessary to maintain a self-sustaining BNLL population. Suitable habitat appeared to be present in many of these parcels, particularly the Los Feliz unit.

Maintaining a viable BNLL population at PNWR is important for the conservation and recovery of this species (U.S. Fish and Wildlife Service 1998). Maintaining suitable habitat conditions may be the greatest challenge to maintaining the PNWR BNLL population. In particular, BNLL appear to prefer relatively sparse vegetation with a low structure. The most cost-effective approach to achieving these conditions is probably cattle grazing. PNWR already has a grazing program in place, which will help immensely. Another habitat component important to BNLL are rodent burrows, which are used for cover, eluding predators, and over-wintering. Any measures taken to maintain or enhance rodent populations, particularly California ground squirrels (*Spermophilus beechyi*) and kangaroo rats (*Dipodomys* spp.), also will benefit BNLL. Rodent control efforts (e.g., bait stations) were observed on properties adjacent to PNWR, including along refuge fence lines, but the extent to which these efforts might be reducing rodent abundance on the refuge is unknown.

PNWR also appears to have a robust and wide-spread CHL population. Although not currently a listed species, range-wide declines in CHL populations have been cause for concern. Conservation and management measures implemented to benefit BNLL also will likely benefit CHL as well.

RECOMMENDATIONS

1. Continue the current grazing program on PNWR.
2. If possible, explore strategies to increase grazing intensity in years with above-average precipitation when vegetation density is high.
3. Consider habitat enhancement measures for rodents, such as mound or berm construction. Increasing the number of rodents will increase the availability of burrows for BNLL.
4. Conduct additional surveys in parcels where BNLL have not yet been detected.
5. Consider exploring the possibility of using translocation to introduce BNLL (and possible CHL) to parcels where they are not present but where habitat appears to be suitable.

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APPENDIX

Biological data for blunt-nosed leopard lizards and coast horned lizards captured at Pixley NWR during surveys conducted in summer 2011.

Blunt-nosed Leopard Lizards Captured on Pixley NWR during Summer 2011.

Date	Location	Mark	PIT	Sex	Age	Wt (g)	SVL (mm)	STL (mm)	Activity
2011-06-09	Deer Creek West	1	4657052031	M	A	73	110	325	Hiding
2011-06-10	Grid 3	2	4658330D-8	F	A	49	92	261	Sunning
2011-06-21	Centerfield	5	-	F	A	59	102	272	Running
2011-06-22	Two Well	7	-	F	A	34	92	265	Running

Coast Horned Lizards Captured on Pixley NWR during Summer 2011.

Date	Location	Mark	PIT	Sex	Age	Wt (g)	SVL(mm)	STL(mm)	Activity
2011-06-09	Grid 3	1	462E11627E	F	A	37	69	87	Sunning
2011-06-09	Grid 3	2	455E762130E	F	A	52	71	103	Running
2011-06-09	Grid 3	3	46584D387A	M	A	23	64	91	Sunning
2011-06-09	Grid 3	4	462D31104A	M	A	27	61	97	Sunning
2011-06-09	Grid 3	5	465671066E	M	A	35	68	104	Sunning
2011-06-10	Grid 3	6	-	M	A	32	65	98	Mating
2011-06-14	Grid 3	7	461E560542	F	A	41	70	94	Running
2011-06-14	Grid 3	8	442147001A	M	A	37	72	110	Sunning
2011-06-24	Ledezma	11	-	F	A	-	76	102	Running
2011-06-24	Ledezma	12	-	F	A	-	73	104	Running
2011-07-12	200-acre Tract	14	-	M	A	24	62	95	Not recorded