

Pikas, Cows, and Weasels; Pieces in the Puzzle?



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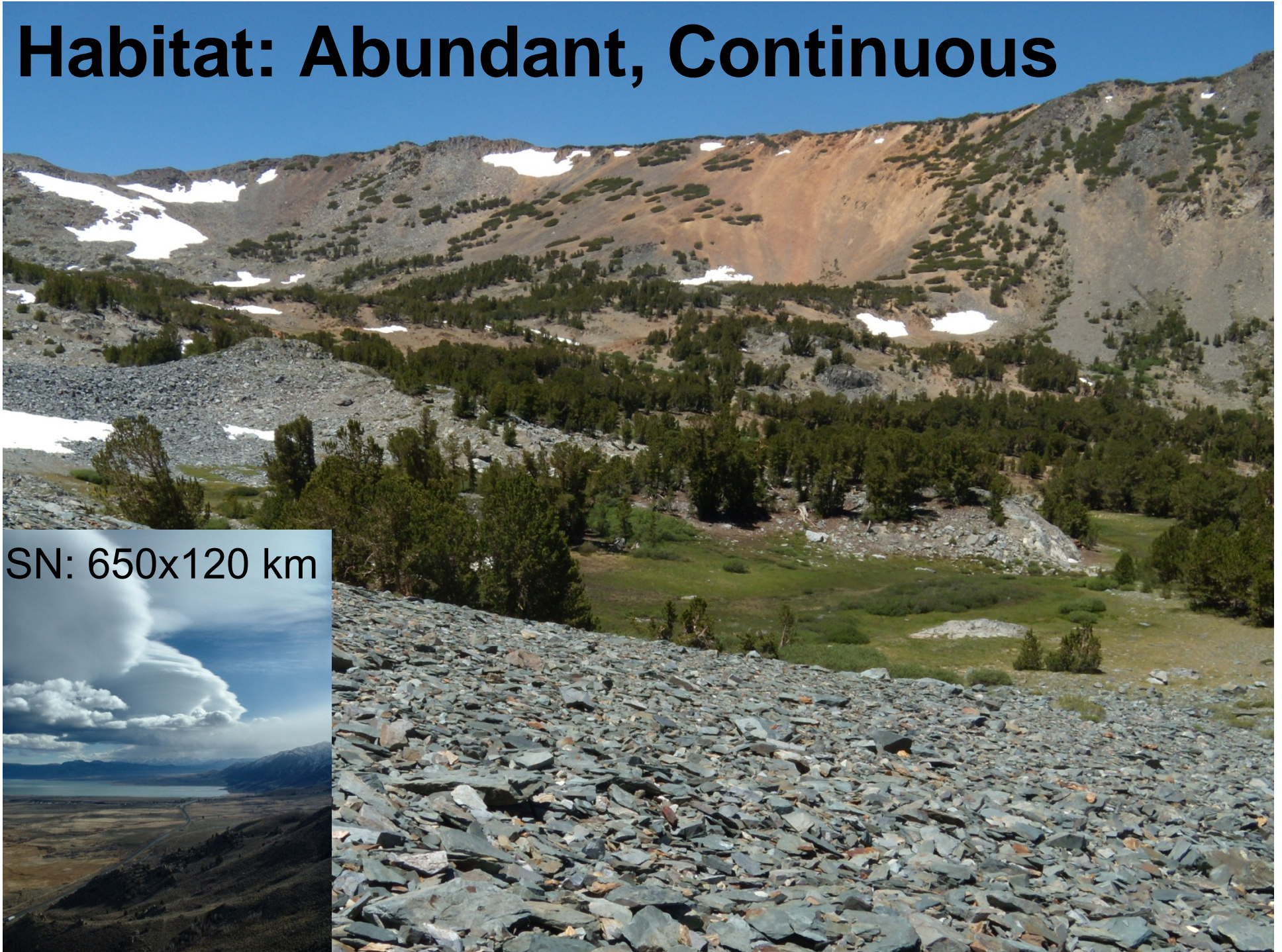


Sierra Nevada Pikateering



Habitat: Abundant, Continuous

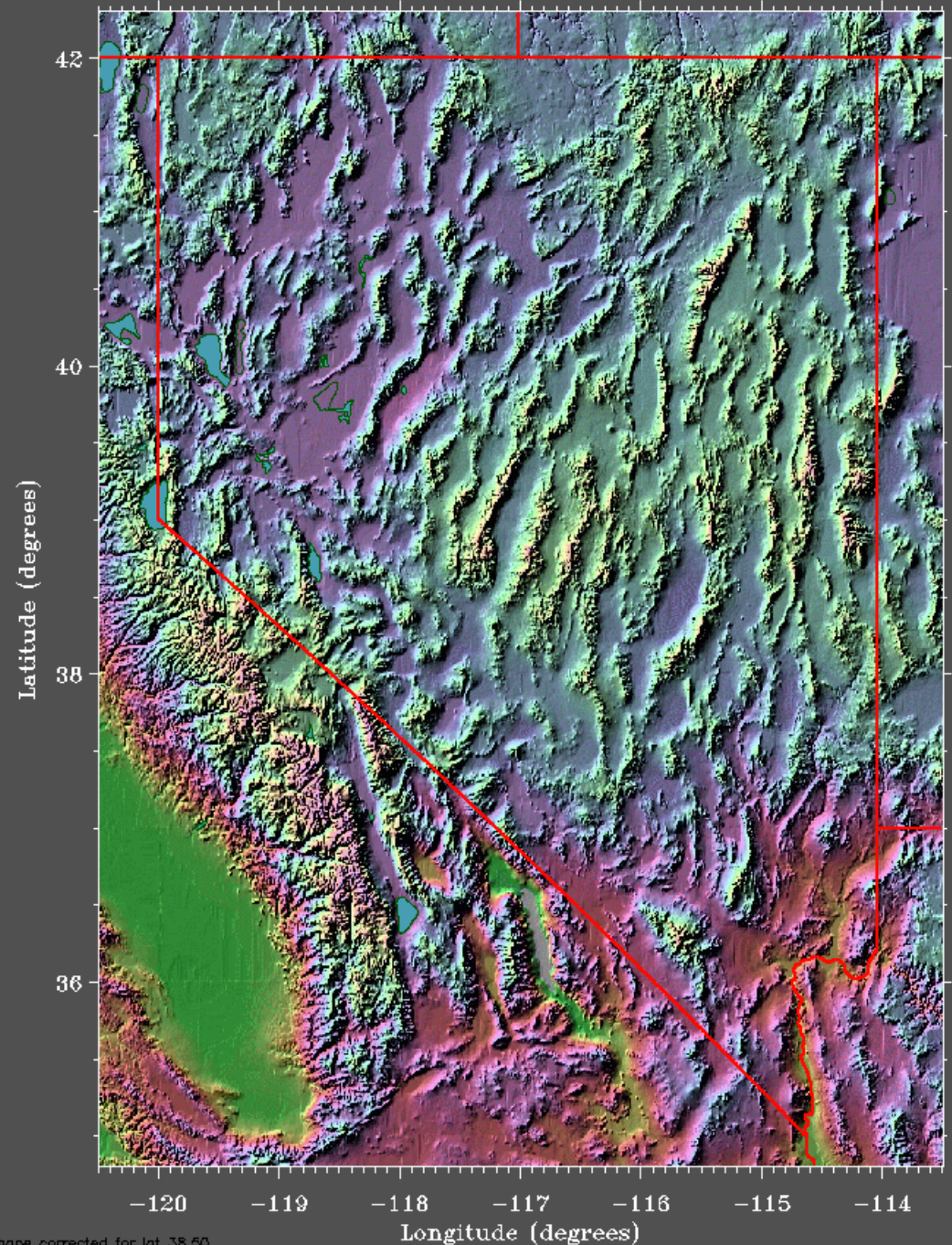
SN: 650x120 km



Nevada

315 Isolated Mountain Ranges

Pika habitat discontinuous within and among ranges



Shape corrected for lat 38.50

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Millar & Westfall 2010:

Smaller % active (current) sites from Sierra Nevada into Great Basin;

Climates increase in continentality from Sierra Nevada into SW Great Basin (= temp extremes, drier)

Mountain region		Age (%)		
<i>Range</i>	Number of sites	Current	Modern	Old
I. PIKA OCCURRENCE SITES (letters refer to Fig. 1)				
Sierra Nevada (<i>a, f, h</i>)	329	77	21	2
Southwest Great Basin	67	35	48	17
<i>Bodie Mtns (e)</i>	16			
<i>Glass Mtns (g)</i>	5			
<i>Monitor Pass (b)</i>	6			
<i>Sweetwater Mtns (c)</i>	8			
<i>Wassuk Range (d)</i>	6			
<i>White Mtns (i)</i>	26			
Central Great Basin	16	6	44	50
<i>Shoshone (j)</i>	6			
<i>Toiyabe (j)</i>	3			
<i>Toquima (j)</i>	7			
Oregon Cascades	8	50	50	0
All occurrence sites	420	67	27	6

Summary of climatic data from PRISM climate model (Daly et al., 1994). Sierra Nevada vs. southwestern Great Basin pika sites. Significance differences: *** $p < 0.001$; * $p < 0.05$; ns, non significant.

Group	<i>N</i>	Mean ann ppt (mm)	Mean Jan ppt (mm)	Mean July ppt (mm)	Mean ann T_{min} (°C)	Mean Jan T_{min} (°C)	Mean July T_{min} (°C)	Mean ann T_{max} (°C)	Mean Jan T_{max} (°C)	Mean July T_{max} (°C)
Significance		***	***	*	*	ns	ns	ns	ns	ns
Sierra	329	1001	184	19	-3.7	-10.6	5.6	8.7	1.1	18.9
swGB	67	487	60	21	-4.9	-11.7	4.2	8.8	0.5	19.7

Jarbidge Mtns



Clan Alpine Mtns



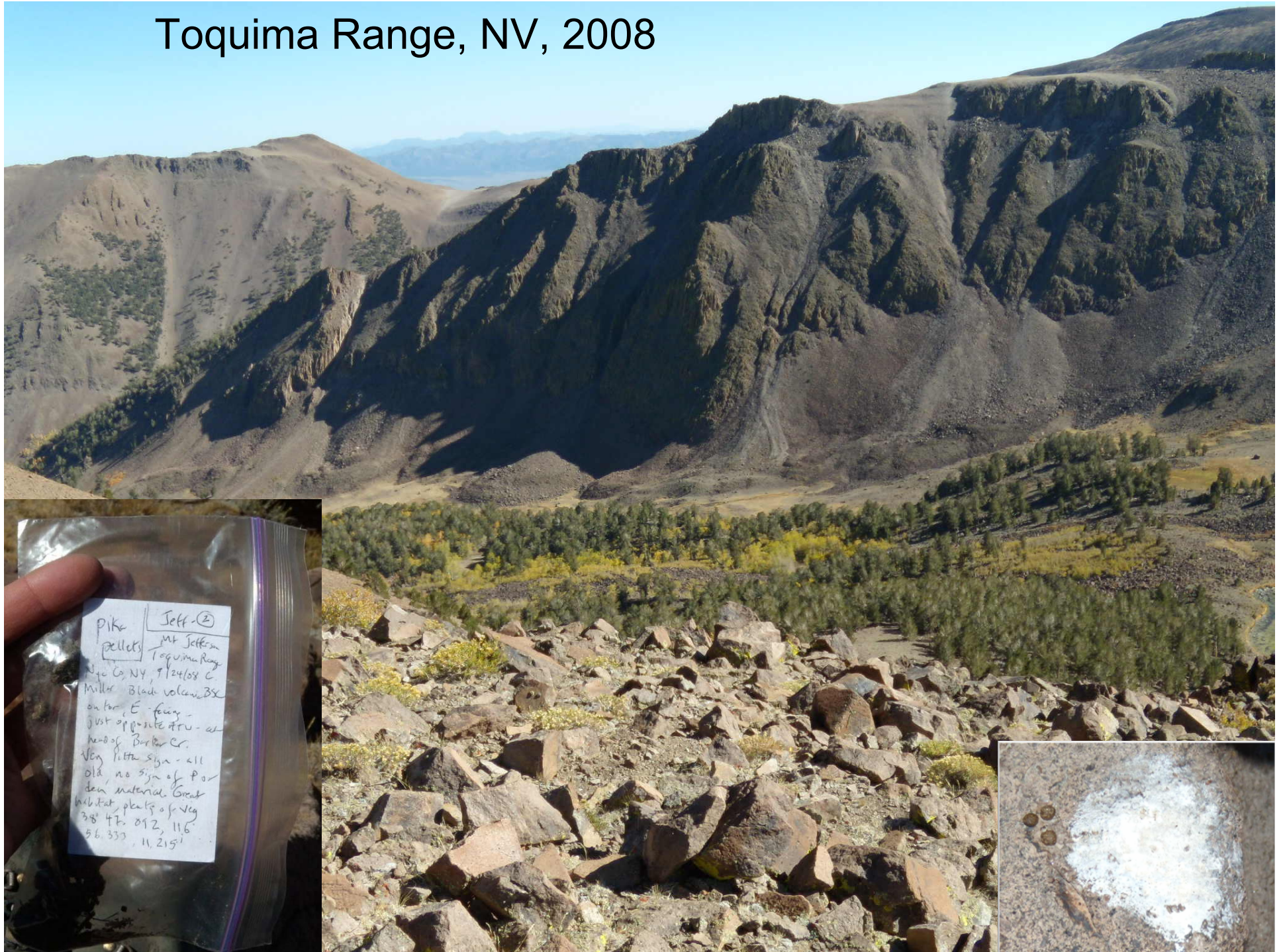
Snake Range



Seaman Range



Toquima Range, NV, 2008



Toquima, 2010



Active cattle allotments –
valley basins to summit



Haypiles are high in talus;
Haypiles comprise ~100%
Rubus idaeus ssp. *strigosus*,
a talus species

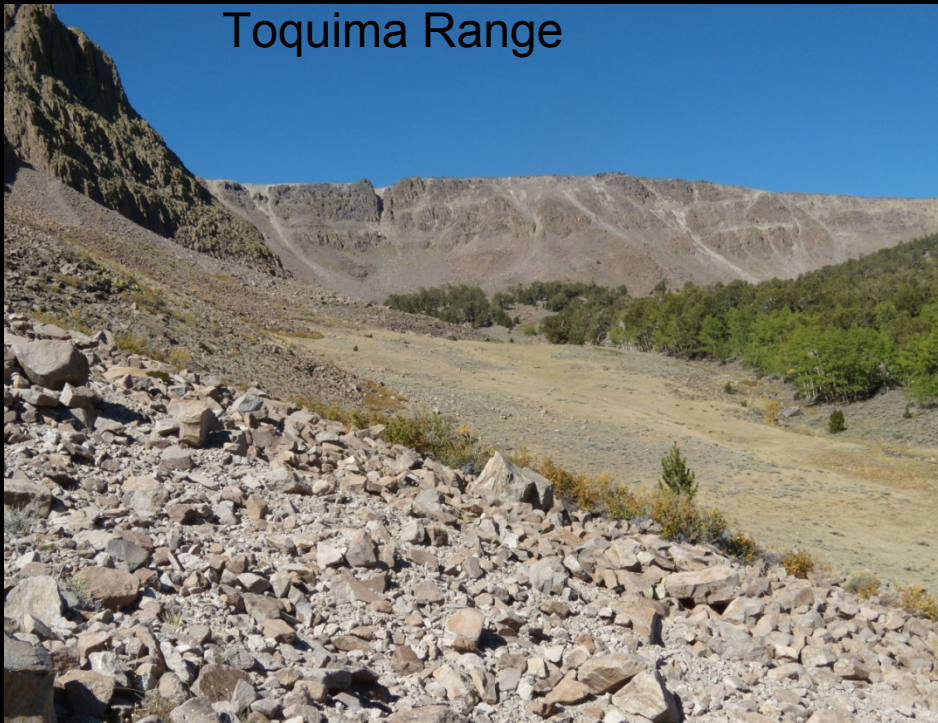




Sweetwater Range



Toquima Range



Burt Cyn, SN, sheep



Relationship of Grazing and Haypile Location

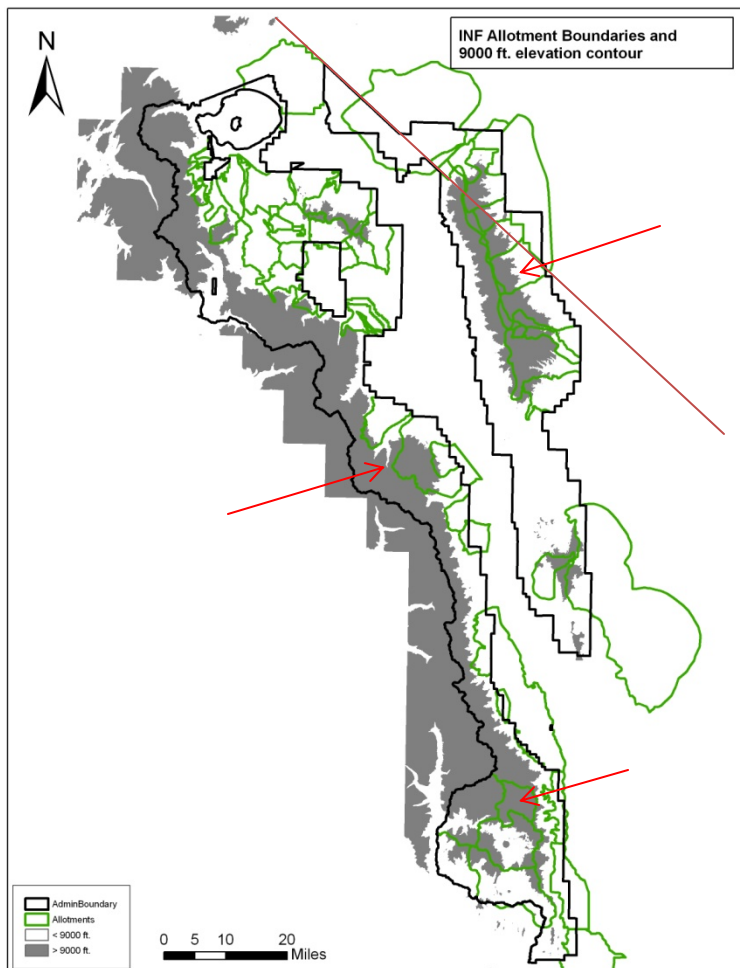
35 Areas, 85 Haypiles (only 1 sheep; other cattle)

Mountain Range	State	N Sampling Areas	Elev Range (m)	N Haypiles	Mean (& SD) distance haypile to talus edge (m)	Haypile source T or FF
<u>Grazed</u>						
Sierra Nevada	CA	4	2835-2940	6	11.7 (3.0)	FF
Sweetwater	CA	3	3080-3510	5	51.8 (23.1)	T
Toiyabe	NV	1	2985-3000	3	28.0 (4.4)	T
Toquima	NV	4	3140-3430	10	32.5 (15.1)	T
White Mtns	CA, NV	2	2490-3020	3	23.0 (13.7)	T
Total Grazed		14		27	30.1 (18.9)	
<u>Ungrazed</u>						
Bodie Hills	CA	2	2520-2680	9	1.8 (0.7)	FF
Sierra Nevada	CA	7	2800-3290	21	2.4 (0.5)	FF
Sweetwater	CA	3	3100-3290	3	3.1 (1.1)	FF
Wassuk	NV	5	3000-3390	12	1.5 (1.1)	FF
White Mtns	CA, NV	5	3025-3525	12	1.4 (0.9)	FF
Total Ungrazed		21		57	1.8 (0.9)	

Locations included, SN: Burt Cyn, Molybdenite Cyn, Green Cr Cyn, Virginia Cyn; Sweetwater: Belfort, Frying Pan Cyn, Mt Wheeler, Mt Patterson, Lobdell Lake; Toiyabe: N and S Fks Twin River Cyn; Toquima: S and Mid Fks Pine Cr, Mt Jefferson Plateau; White Mtns: Crooked Cr Cyn, Wyman Cyn, Mt Barcroft, Cottonwood Cyn, Trail Cyn; Bodie Hills: Bodie State Historic Park, Masonic; Wassuk: Cottonwood Cyns, Dutch Cr Cyn, Rose Cr Cyn, Big Indian Mtn.

*In review,
WNAN*

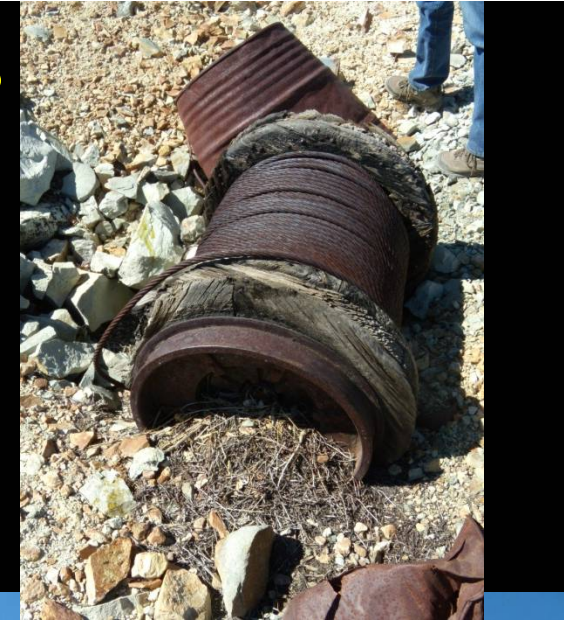
Humboldt Toiyabe NF administers much high-elevation terrain in NV; widespread active allotments



Inyo NF active allotments >9000' are only in E White Mtns, and Wheeler Crest, Kern Plateau (SN)

Might widespread livestock grazing in the GB influence pika status there?
→ More work (exclosures, surveys)

Bodie Hills, Ore Dumps, & Weasels



Native talus minimal, scattered;
Anthropogenic habitat abundant, connected

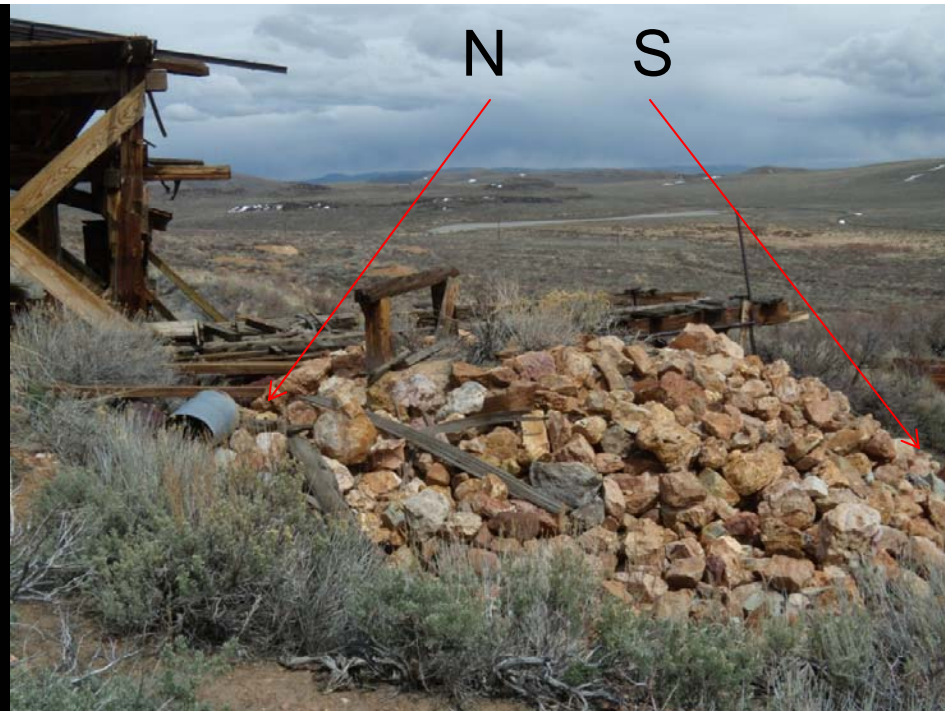
- Thermal regimes?
- Pika behavior?
- Predators?
- Town/mine activity?

Bodie Ore Dumps

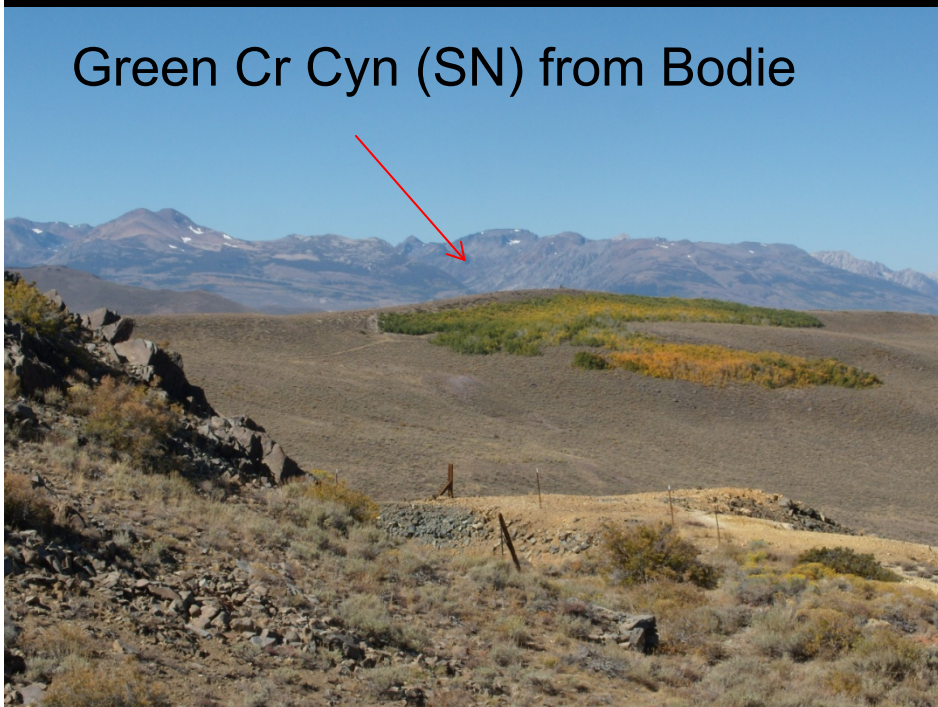


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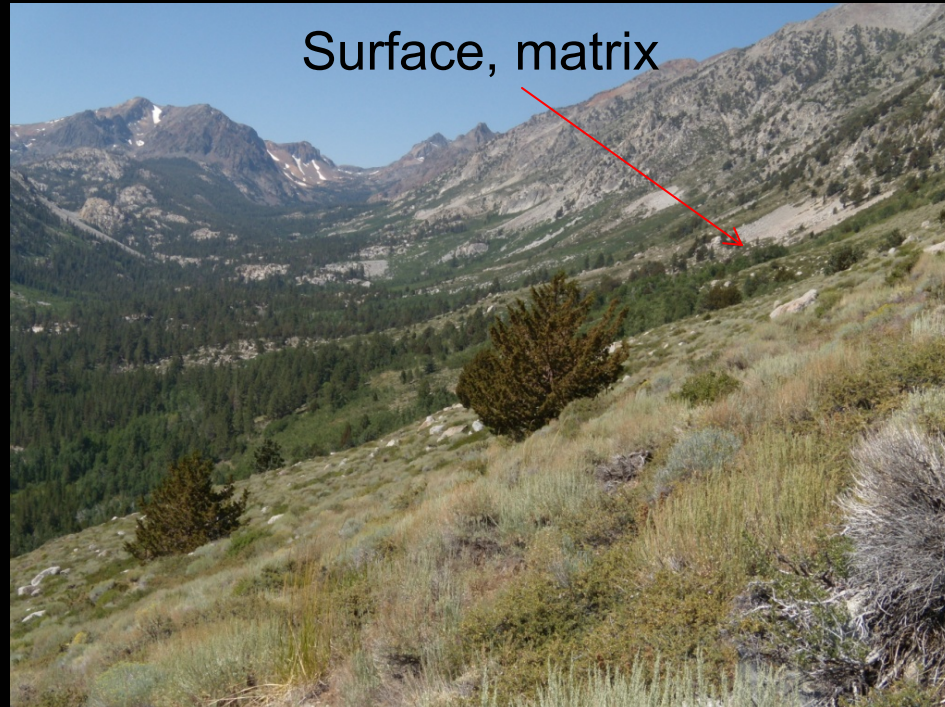
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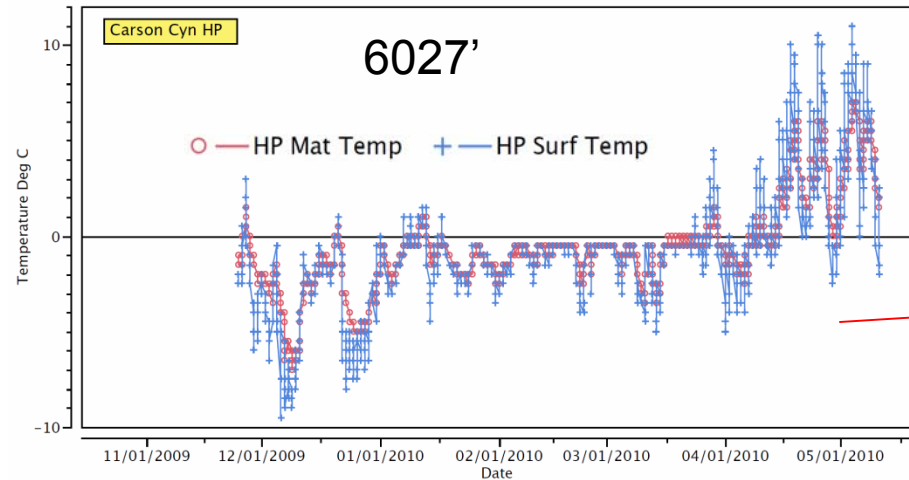
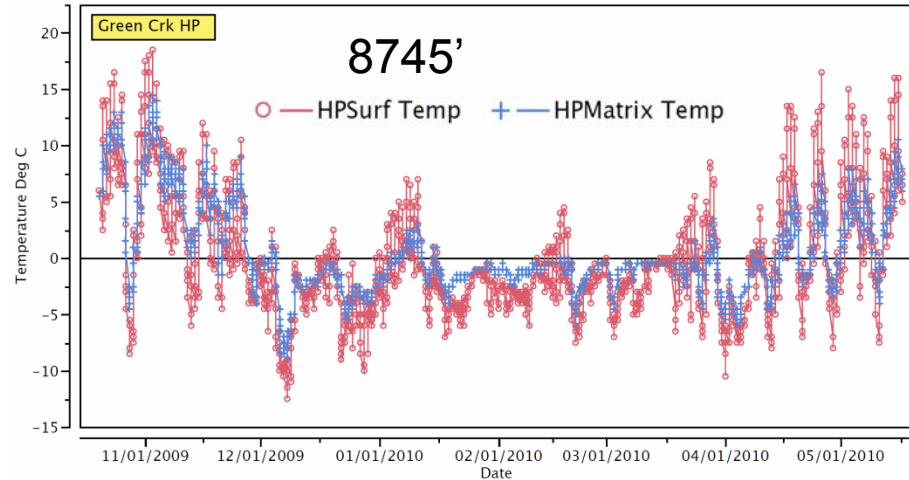
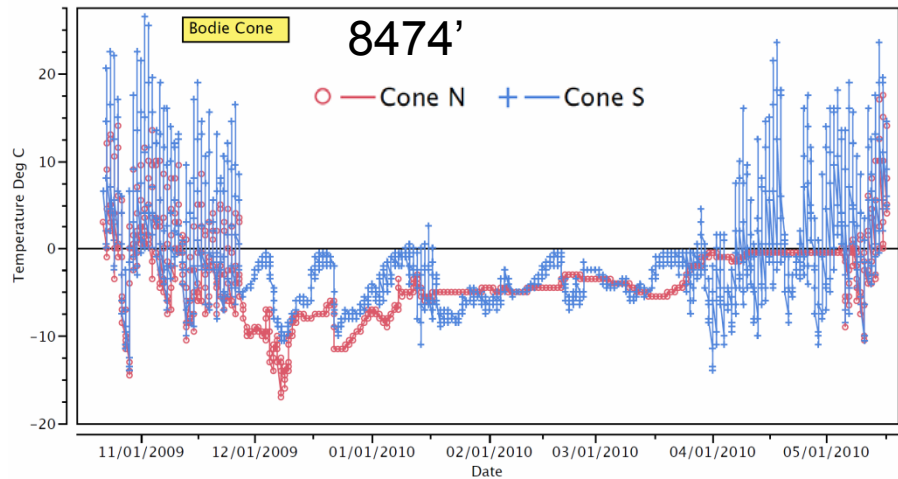
Green Cr Cyn (SN) from Bodie



Surface, matrix

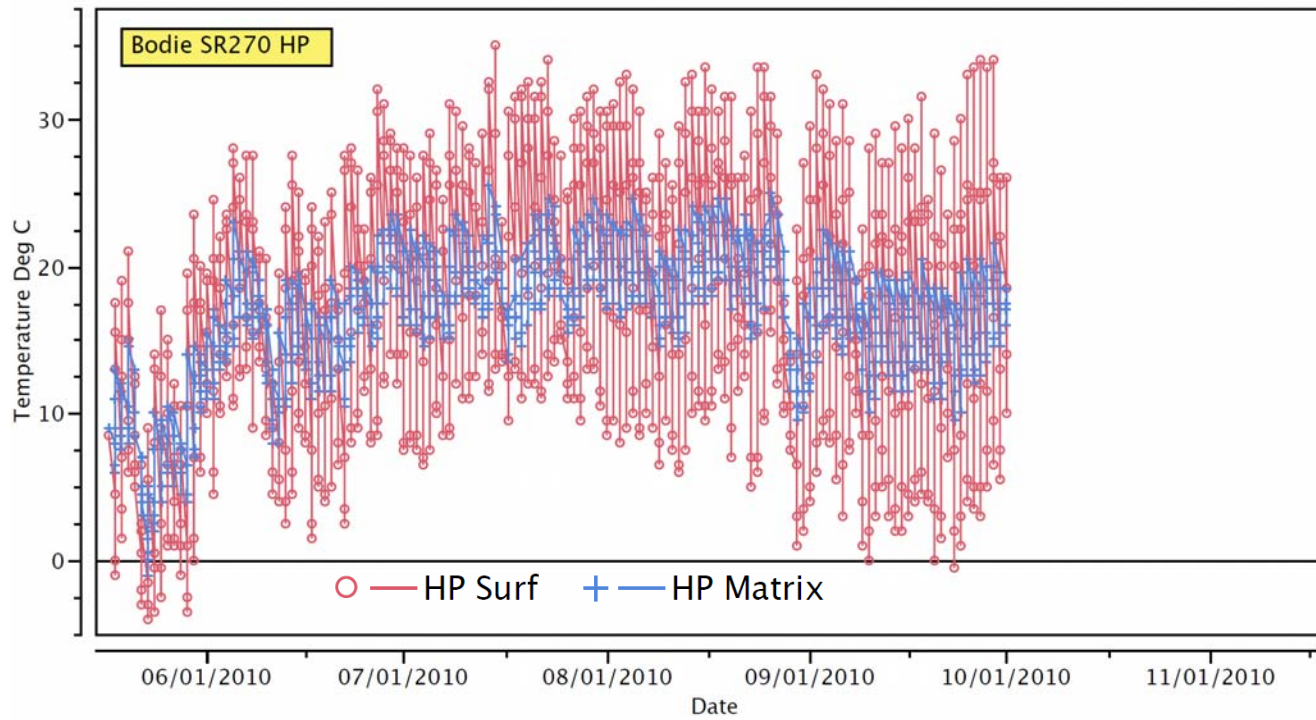


Winter Temperatures, Pika Haypile Sites, 2010

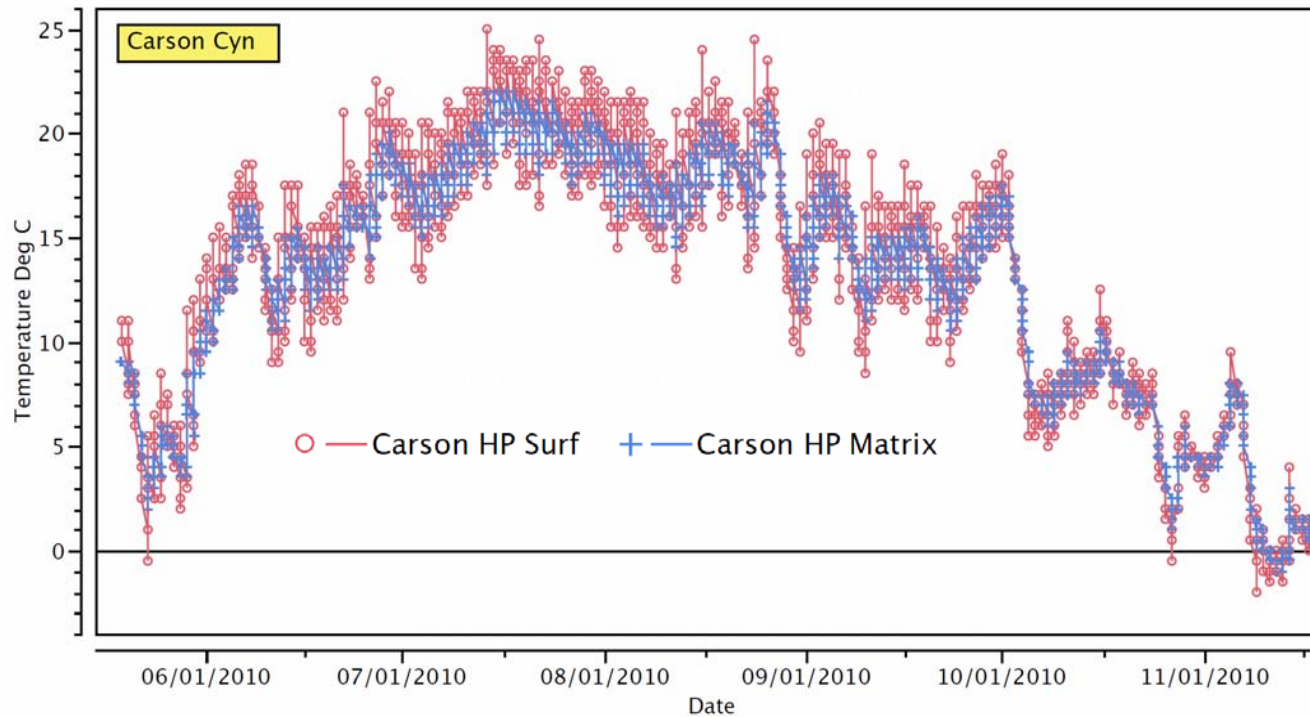


Carson Cyn (SN)

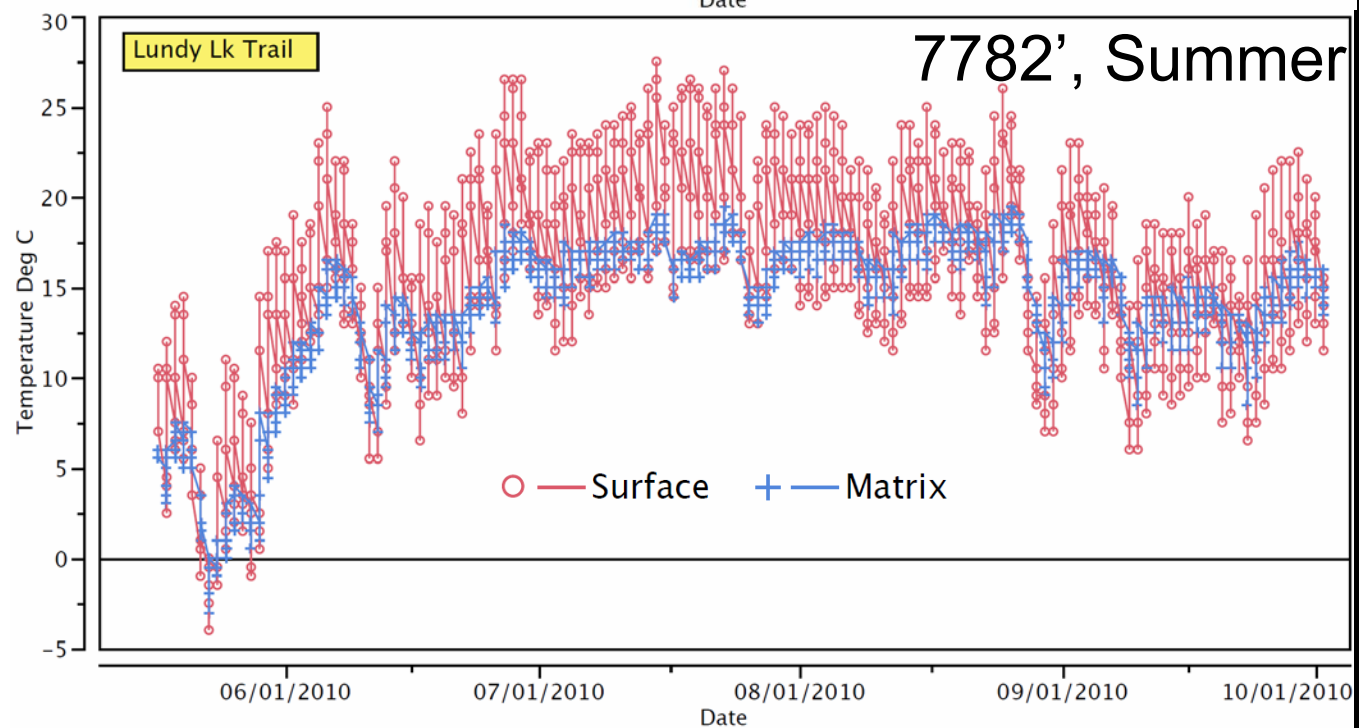
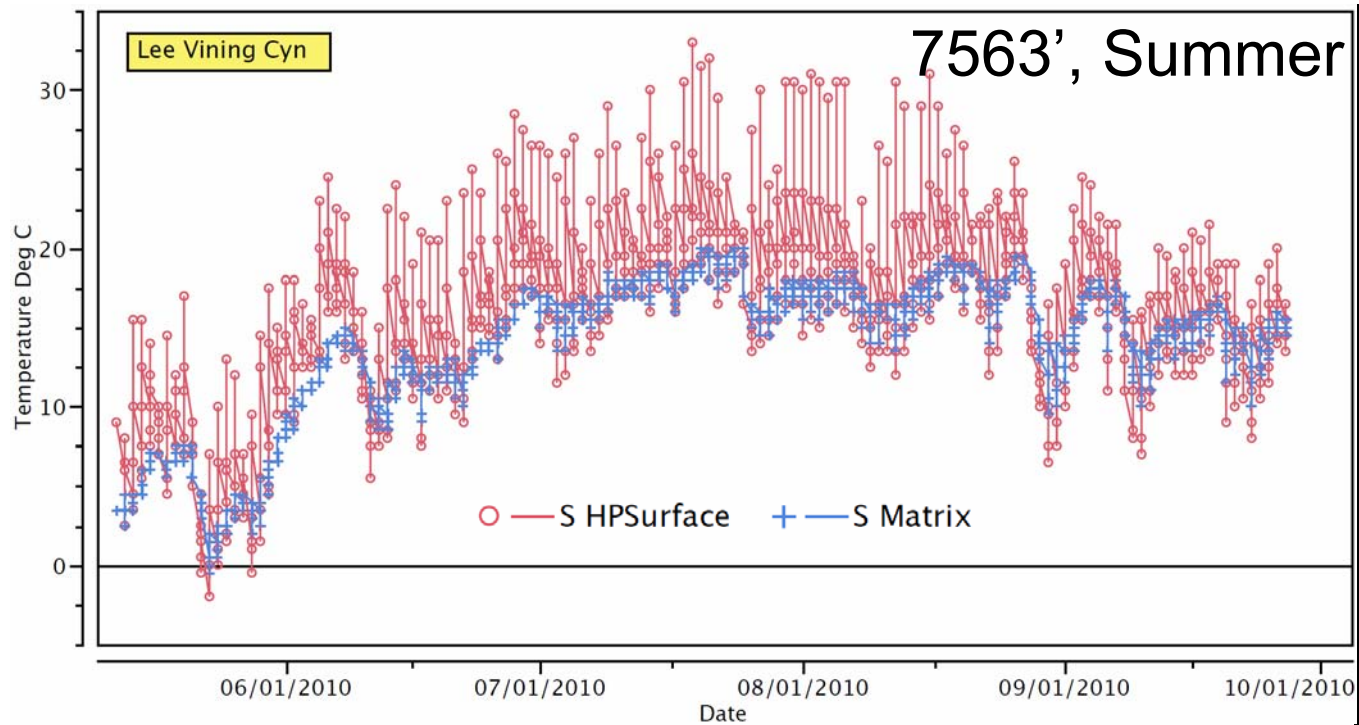


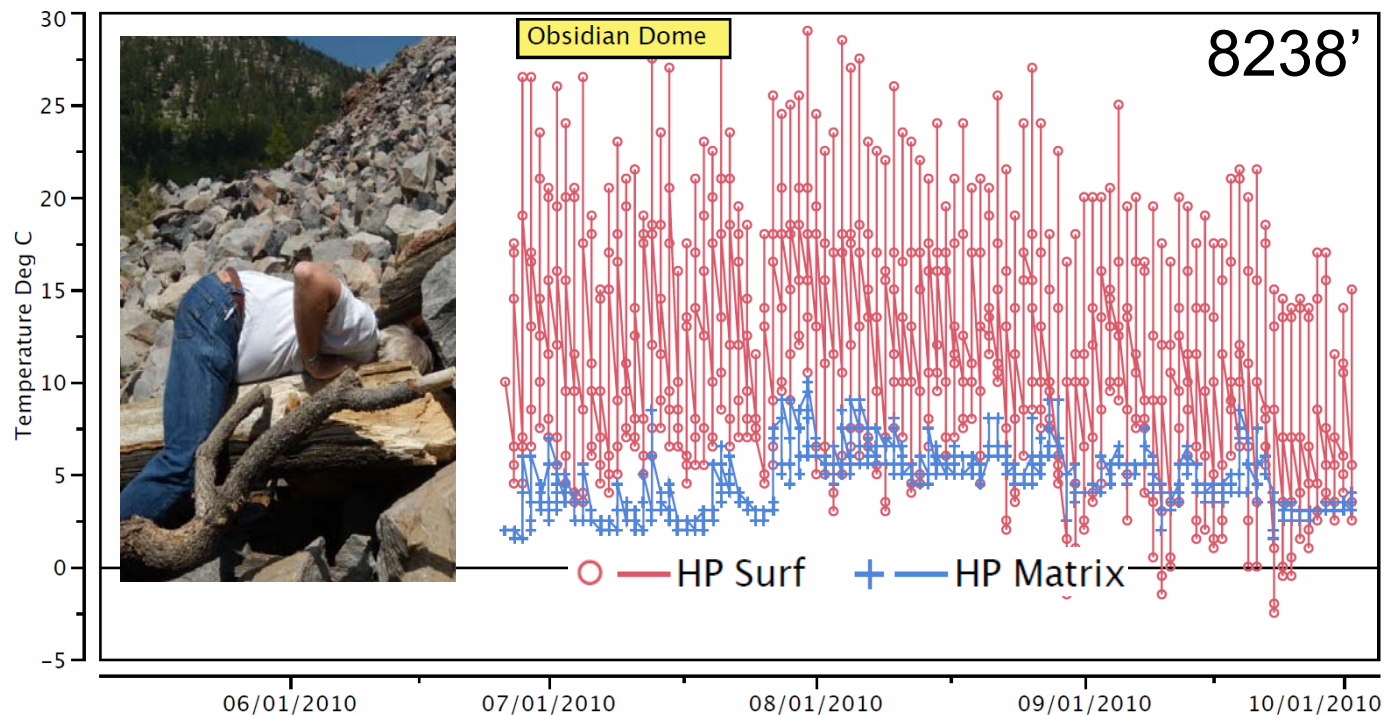


Bodie Hills
SR 270
Extirpated site?
Summer, 2010
7226'



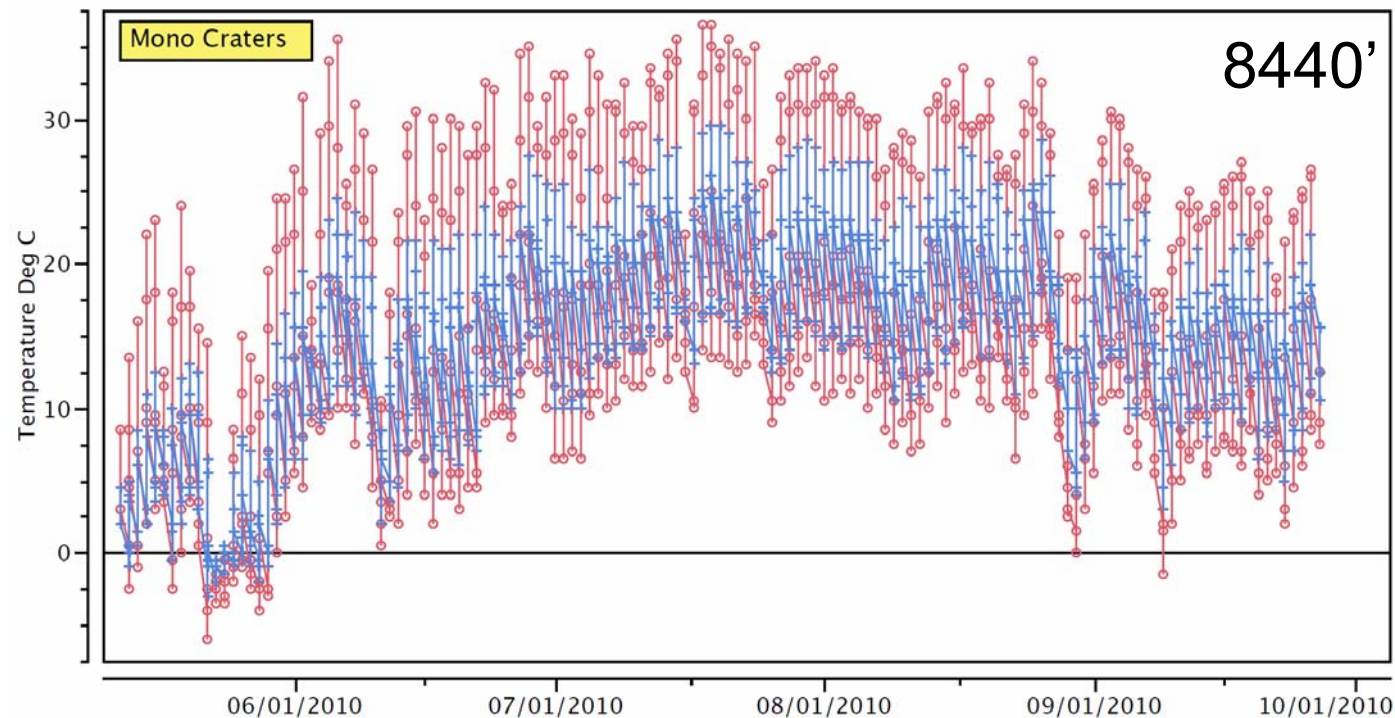
Carson Cyn
Summer, 2010
6027'





Haypiles
Summer 2010

Mono-Inyo
Craters



New York Hill, Serita Mine Bodie Hills, 8435'

Might weasel dynamics
be implicated in pika
population status?

- Impacts of historic activity:
dogs, mining, rodents?
- Primary prey (voles)
abundance?



Noninvasive Survey Methods for Carnivores

Edited by Robert A. Long, Paula MacKay,
William J. Zielinski, Justina C. Ray

Weasel scat or fur



Can we detect:

- Differences in weasel presence & abundance?
- Proportion of pika in weasel diets?
- Influence of climate on weasel populations and prey base?
- Interaction of weasels, talus, alpine meadows, grazing, voles, pika?

