Distribution, Geomorphology, & Thermal Relationships of American Pika in the Sierra Nevada & Great Basin

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Photo: A. Shcherbina

Geographic Inventory: Sierra Nevada & Great Basin

Millar & Westfall in press, AAAR

Site Occurrences confirmed by pellet vouchers

76% Current pika seen, heard, and/or green veg in haypi

19% Modern fresh pellets, fresh urine sign, recent haypile

5% Old pellets white & decomposing; urine sign chalky, no other sign

519 Sites ≥ 50m apart

172 Demes ≥ 3km

95 Regions 5-15 km

12 Mountain Ranges ≥ 15 km

a. Sierra Nevada North
b. Monitor Pass Range
c. Sweetwater Mtns
d. Wassuk Range
e. Bodie Mtns
f. Sierra Nevada Central
g. Glass Mtn Range
h. Sierra Nevada South
i. White/Inyo Mtns
j. Central NV Ranges

Survey Form: http://www.fs.fed.us/psw/programs/snrc/staff/millar/

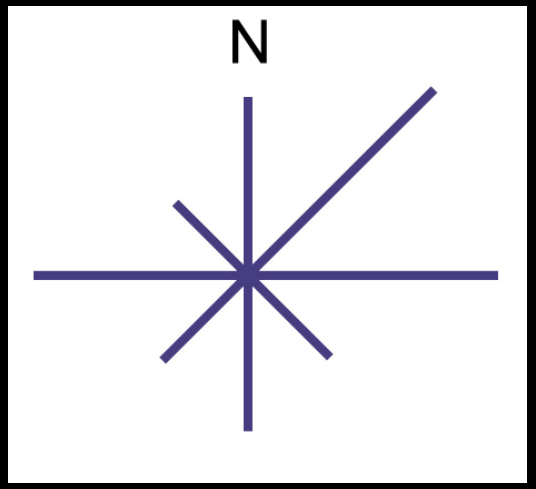
Elevation & Aspects in the Sierra Nevada & W Great Basin

Elevation Range
1827m – 3968 m
(5593’ – 13,020’)

Compare to historic range
2500m considered low

E.g. Grinnell & Storer, 1924
2350m

18% of our sites are lower



Slope aspects

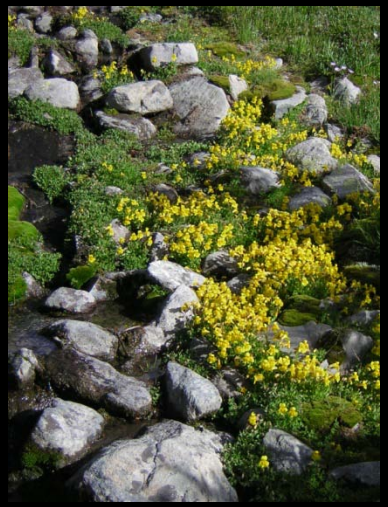
Geomorphic Relations of Pika Sites

85% Rock-Glacier & Related Rock-Ice Features (RIFs)

14% Non-RIFs (eroding slopes, rockslides, moraines)

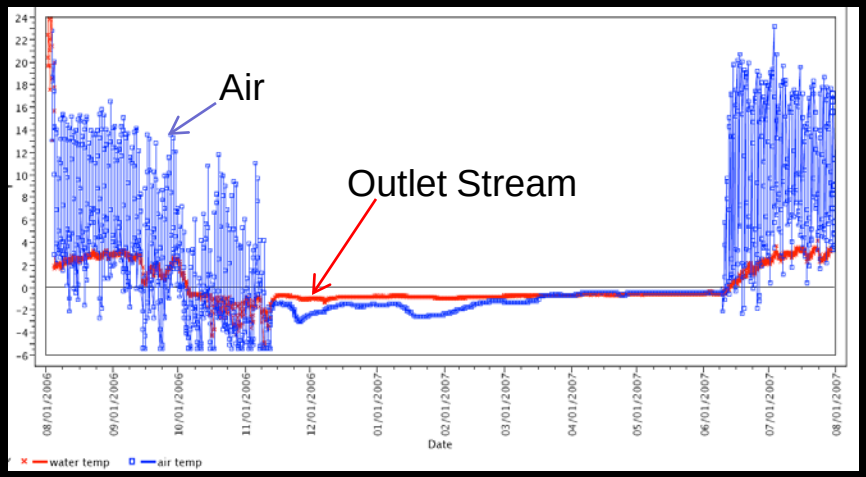
1% Anthropogenic (rock wall, house foundation, mine tailing)

RIFS in the Sierra Nevada
Millar & Westfall, 2008
Quaternary International



RIFs support optimal forage for pika in arid mtns

Persistent RIF seepage = diverse wetland forefields



Forefield Vegetation Studies

Thermal Environment Studies

Collaring Pika with iButs

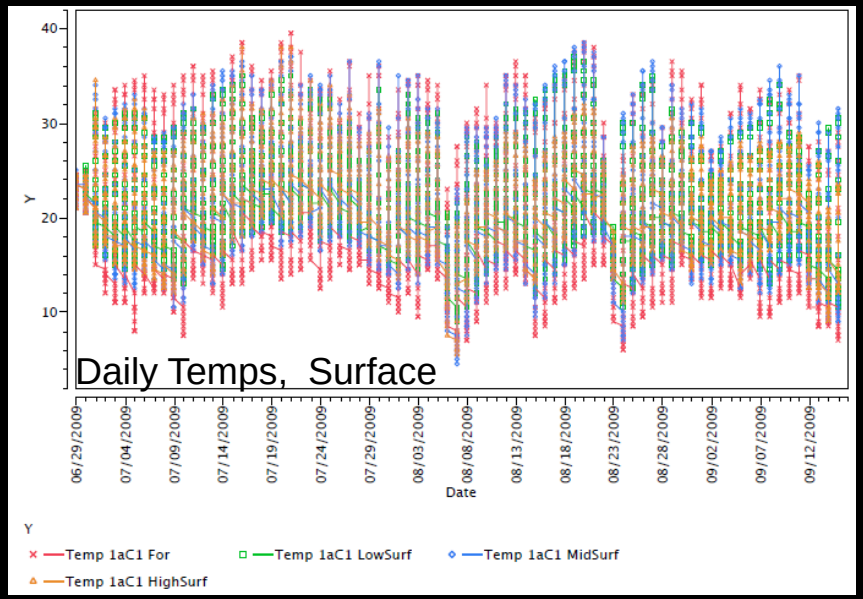
Morelli & Clifford

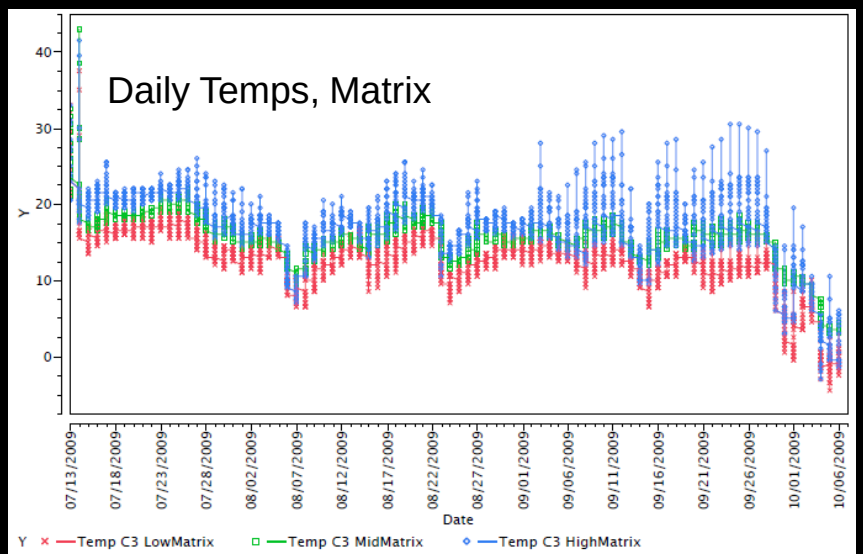
Intensively Instrumenting Taluses

RIFs Buffer Temperatures Relative to Ambient Climate

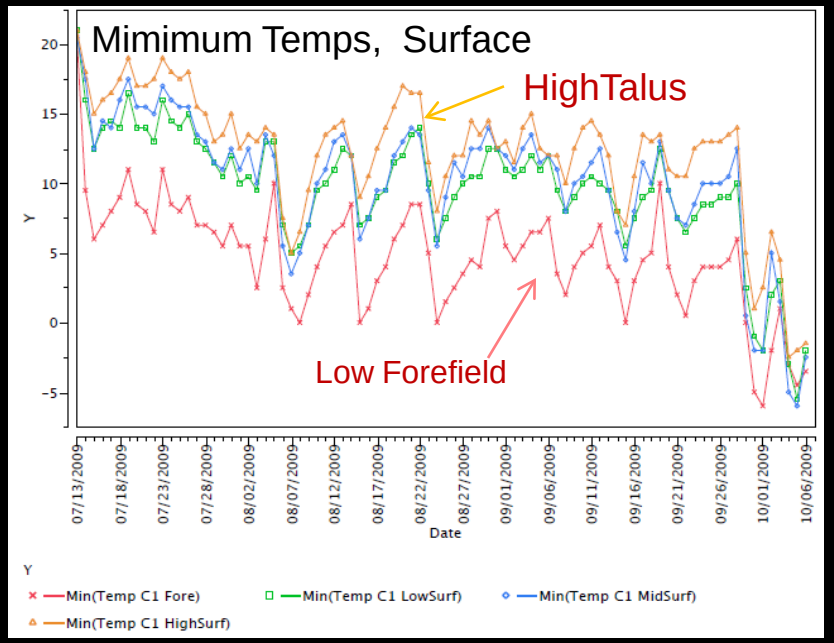
SUMMER: Pika can escape heat by retreating to matrix

Talus Matrix: Temps Low & Buffered Relative to Surface

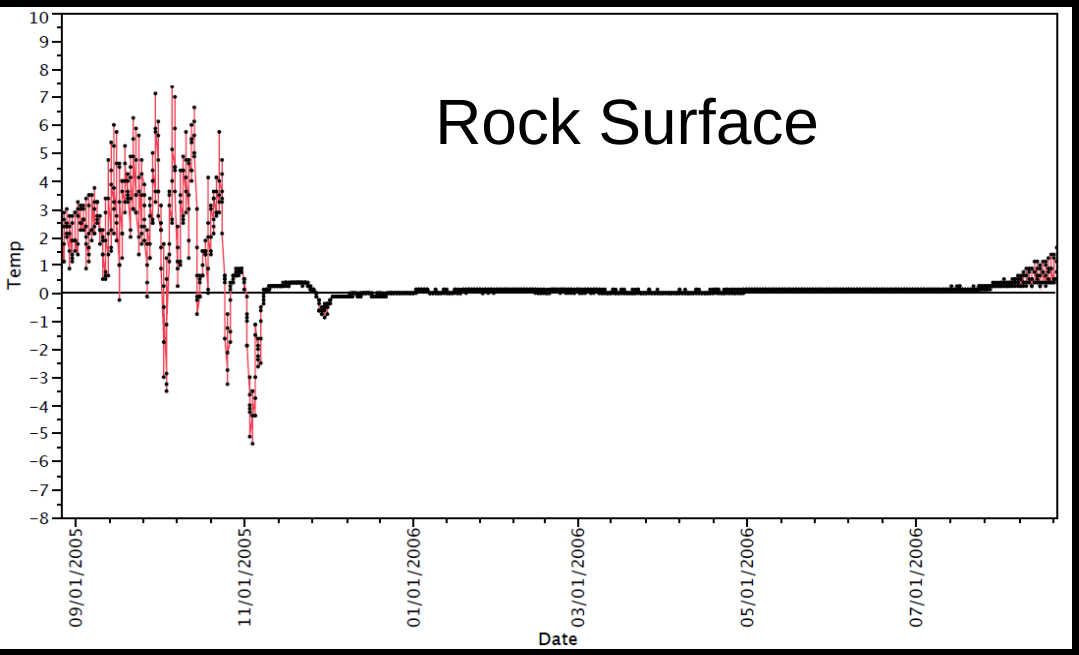


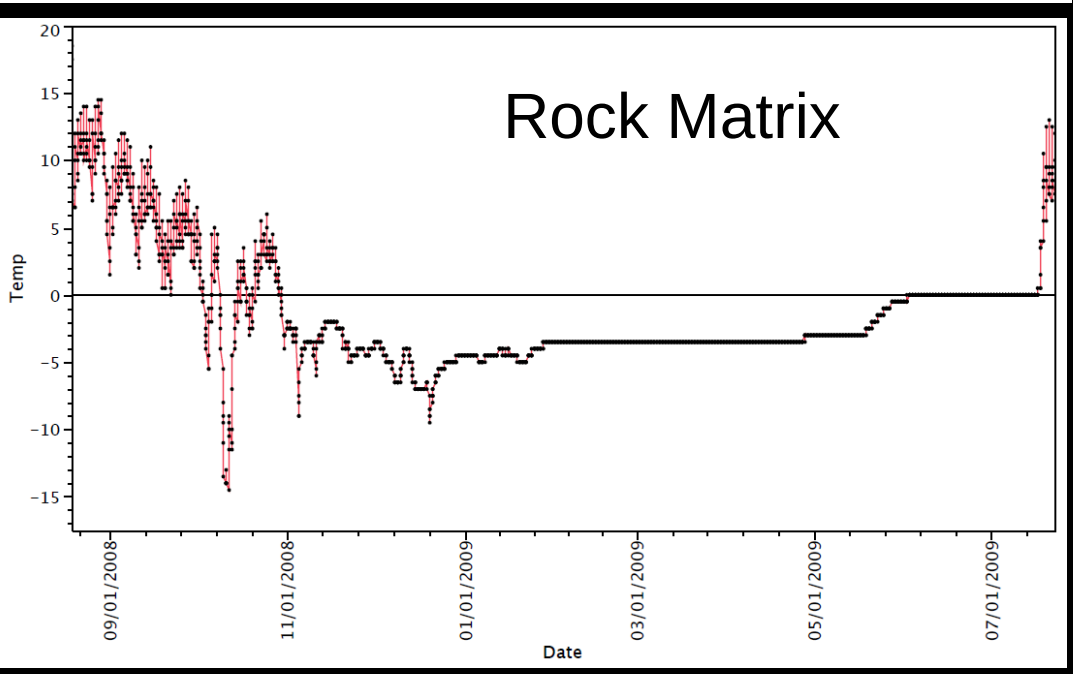


Positive Lapse Rates: Coolest at Low Elevations both Talus Surface & Matrix!



Winter Talus Surfaces Are Warmer





Haypiles are at surface;
Warmer for pikas
in winter?

Conness Rock Glacier
(11,786')