WINTER MEETING OF THE CALIFORNIA PIKA CONSORTIUM

UPDATES ON PIKAS IN THE SIERRA NEVADA, SOUTHERN CASCADES, AND GREAT BASIN

Riverside Convention Center
Riverside, CA
February 11, 2011

Hosted by:
US Forest Service – Pacific Southwest Research Station
University of California, Berkeley
California Department of Fish and Game
The Wildlife Society – Western Section

SUMMARY REPORT

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Contents

Cover photos by Constance I. Millar. Left to right: Virginia Lakes Canyon, CA; Buddy, Warren Fork, Lee Vining Canyon, CA; Pine Creek, Toquima Range, NV.

California Pika Consortium Winter Meeting
February 11, 2011 – Riverside Convention Center

Notes prepared by Scott Osborn, Deana Clifford, and Randi Logsdon

Slide presentations are available for viewing on the CPC website at the 2011 Meeting Information page.

Participants

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Introduction - Scott Osborn and Toni Lyn Morelli

Background on CPC (see website http://www.dfg.ca.gov/wildlife/nongame/CPC/)

CPC Meeting Goals

- Share information on recent and upcoming pika research and monitoring
- Shared understanding of the basis for conclusions about the conservation status of pika
- Consider next steps for the group

CPC Meeting Objectives

- Introductions
- Brief reports
- Reports on NPS pika occupancy model, GB pika distribution dynamics, status of pikas in Bodie and Bodie Hills, surveys and other work in NV, and new tools for citizen-science monitoring
- Discuss the scientific basis for our understanding of pika status
- Outline next steps for the CPC

CPC Meeting Products

Posted to CPC website:

- Meeting Report, including notes from discussion on pika conservation status
- Copies of slides presented during the meeting

Round Robin Updates - Deana Clifford

Joseph Stewart and David Wright: Pika Surveys in CDFG Region 2 (see slide presentation)

- 19 historic sites/17 of which are occupied (1 from specimen, 13 with little search effort, 2 with 34-65 person-minutes search, 1 with 318 pers-min search)**.** The sites are located from Lassen down through Pacific Grade summit. The sites are from museum specimens or field notes. 1 km search area - if pika present within search area we scored it as currently extant. 2 extirpated sites are relatively low in elevation and also do not seem to have much talus habitat.
- CM – How was historic site defined? DW – anything before 1984. It seemed that was a kind of cut off with most data from 1960s or older, so it was a natural break point in the data.
- CR – It turns out that most of anthropogenic climate change is post 1980s, so the cutoff is useful.
- We also visited some sites in the Sweetwater range.
- Two additional apparent extirpations extracted from literature: Glen Aulin, which had historic records from 1915, and Bodie.
- The 4 historic Glen Aulin sites where pika have not been found during recent surveys are classified as two "site" extirpations in this study because two 1-km radius circles are needed to encompass them.
- For the California-wide data available to us, there appears to be some association between elevation and extirpation (statistically significant), BUT the amount of talus habitat is also a significant factor associated with extirpation. (talus area estimated for the 1-km radius area using remote sensed NAIP 2009 imagery).
- CR – Did you also look at degree of patch isolation? JS - Not yet – that would be next step.
- Limitations: 1 km search radius could lead to false persistence; mapping talus is error prone; historic records are not stratified or random and probably don't adequately sample low elevation habitats
- Are you collecting fecal samples? – Yes – David has them; just archiving at the moment.

Andrew Smith: Bodie Update (see slide presentation)

- The work at Bodie comprise the longest-term studies of pikas in the world.
- Pika are found on ore dumps, islands in a sea of sagebrush.
- Eat sagebrush, bitterbrush, rabbitbrush at Bodie – pikas are not reliant on alpine meadow vegetation to thrive

- Bodie pikas exhibit one of the best examples of a metapopulation – with a constellation of habitat patches (ore dumps); each patch has a probability of occupancy, population extinction, and subsequent recolonization
- Over the past 18 census intervals between 1989 – 2010 (a couple of two-year gaps!), the number of patch colonization events (110) was nearly equal to the number of populations that went extinct on patches (115).
- Yet, each year the number of patches colonized and on which a pika population went extinct varied greatly, with colonizations and extinctions nearly matched over the long-term (see graph).
- Total Percent Patch Occupancy from 20 Censuses 1972-2010 (almost every year since 1989; 76 isolated patches)
  - Average = 39.4% occupancy
  - Range 23.7-58.7%
- Southern patch constellation began to collapse (meta-population collapse) in 1989; semi-complete collapse by 1991
- Northern Constellation of Patches
- Average = 70.2% occupancy
  - Range 48.6-88.2%
  - 1972 = 83.3% occupied
  - 2009 = 83.8% occupied, and yet this is one of the hottest places where pikas have been studied.
- Temperature trend data: includes some temperature data from when the mining activity began 100+ years ago.

Deana Clifford and Janet Foley: Health and Handling Studies

- Alternative methods for handling pika. Slow start, but started!
- No captures at fist site (Lundy Lake).
- Saddleback Lake, two pikas anesthetized using Ketamine and Dexmetathomidine.
- Pika 1 was very lightly anesthetized – conservative dose, reversed quickly, released well.
- Pika 2 dosage was increased. Better sedation and anesthesia, good reversal, release well.
- Collected health/disease samples.
- Q: Why this approach rather than inhalant? A: Previously discussed at CPC meetings, but inhalant is short-term. Injecting anesthesia is a better approach for steady, smooth anesthesia. Also, isofluorane is implicated with respiratory depression. JF: Study design includes other methods and chemicals.
- JF and DC both request salvage of carcasses, collection of blood, parasites for their analysis.
- AS – Doesn't use anesthesia in Tibet. Small cloth bags for handling work well on thousands of animals – consider using as a treatment in the anesthesia study. DC – Yes, that's in the study.

Bob Westfall: Graph-Theoretical Analysis (see slide presentation)

- Preliminary analysis on a set of pika populations to assess connectivity and dispersal.
- Methods from Bunn et al, Urban and Keitt. See other references listed on first slide.
- Slide 2, A. Map of sites used. The set of populations (Green Ck, Virginia Lakes, Rock Creek), ie, North to south through Yosemite.
- B. Delauney triangulation. Provides a distribution of all distances between populations.
- C. Minimum spanning tree – least cost path through populations.
- D. Pruned away connections greater than 5 km. Shows all populations connected by distances less than or equal to 5 km.
- Slide 3. Another method, Voroni diagram – shows area around the populations, as related to distance between populations.
- B. About 10% populations have an area of less than 10 ha – relatively small.
- Slide 4. Top graph shows the number of connected populations based on distance of connections pruned, the number of connected populations in the largest group, and the diameter of the largest group.
- Populations become most disconnected at 5 km and 7 km, less than at 3 km.
- Note: these are based on planar distances, not least-cost distances.

Toni Lyn Morelli: Belding's Ground Squirrel Update (see slide presentation)

- Grinnell Resurvey Project (see background at MVZ website)
- Update from 2010 field season: resurveying historical sites
- California is SW portion of range
- Mid- to high elevation, habitat (meadow) specialists
- 66 sites (2-km radius around historic locations)
- BGS do not currently occur in 30 of 66 historical sites surveyed (45% site extinction in revisited sites in CA)
- Also resurveyed 47 sites where BGS was historically determined to be absent; all 47 do not currently have BGS
- Appear to be disappearing from low sites, hot sites

Shaye Wolf: Update on CESA Petition

- CBD petitioned USFWS and California to list the pika
- Petitioned due to CC effects in August 2007.
- First step is to review info and determine whether listing may be warranted (if yes, then conduct 12-month status review).
- FGC determined "no" – Court determined the FGC used too high a standard, set petition back, FGC again determined "No.".
- Last year, Court again sent petition back, saying FGC did not consider all available information.
- Feb 3, FGC sent the amended petition back to DFG for a 90- (or 120-) day review period. This is an important time to provide new information to DFG.
- SO – All new information must be reviewed in the evaluation process. 90 days is the appropriate period.

National Park Service Pika Habitat Occupancy Study: Preliminary Results from Eight Parks - Chris Ray & Mackenzie Jeffress (see slide presentation)

Overview: Pikas in Peril is a multi-regional vulnerability assessment of a climate-sensitive sentinel species

- Funded in 2010 by the NPS Climate Change Response Program
- Principal Investigators: Chris Ray, Mackenzie Jeffress, Clinton Epps and Susan Wolff
- Goals: Assess the American pika's vulnerability to future climate scenarios projected for the western United States, support the interpretive mission of the NPS, and involve citizens in park science
- Following methods described in NPS pika monitoring protocol (Jeffress et al. 2011) – just approved last week.
- http://science.nature.nps.gov/im/units/ucbn /monitor/pika/pika_peril/

There are 16 NPS units with confirmed pika populations. Eight units are engaged with the project. Five of these are targeted for genetics work – they encompass the known genetic variability in pika and also are representative of the major geomorphic habitat associations in American pika.

Objectives

- Document pika occurrence patterns and predict pika distribution in 8 parks (see Rodhouse et al. (2010) occupancy model figure in ppt.
- Measure gene flow and model connectivity of pika populations within 5 park units.
- Project climate change effects on the future distribution, connectivity and vulnerability of pika populations in each park.

Methods: Surveys

1. Establish plots during the "haying" season
    a. Late June – early October
    b. Each plot = 24 m in diameter
2. Survey plots
    a. 1-2 surveys/plot
    b. 20-30 minutes/survey
    c. Record pikas and pika sign
    d. Record habitat variables
3. Collect genetic samples during plot surveys and in transit between plots from latrines.

Results – Just a preliminary summary at this point. See ppt files for aerial images of study areas. Designation of randomly-selected survey sites depended in part on access and stratification by elevation, lava type (if relevant), vegetation type (if available).

RESULTS - 2010	CRLA	CRMO	GRTE	GRSA	LAVO	LABE	ROMO	YELL
Survey period	Aug-Sep	Jul & Sep	Jul-Oct	Aug-Oct	Jul-Sep	Jun & Sep	Jul-Oct	Jun-Sep
# plots surveyed	85	56	119	49	76	101	58	133
% "occupied"	65%	21%	45%	71%	15%	24%	67%	54%
Elevation range (m)	1170-2429	1511-1833	2092-3635	2811-3832	1840-3091	1249-1717	2572-3795	1636-2936
# genetic samples	190	11	112	Not funded	15	Not funded	59	Not funded

Results: Detection Probability

1. High detection by independent observers
    a. GRSA and ROMO crew: $p \geq 0.92$
    b. CRLA, LABE, and LAVO crew: $p = 0.89$
    c. Discrepancies: Only in plots where just a single "fresh" fecal sample was found (not very often)
2. Potential effects of timing/season
    a. Preliminary analyses suggest that detectability was lower in some of the earliest surveys – most evident in LABE
    b. Surveys in 2011 will begin later in the season (after June 30)

Future Analyses

1. Occupancy modeling
    a. 2010+2011 data
    b. Detection rates
2. Habitat associations (occupancy modeling) will be developed as logistic functions of elevation, slope gradient, aspect, rock size, crevice depth, rock shade, vegetation cover/classes, presence of water, marmot/woodrat presence, and climatic variables.
3. Genetic analyses
4. Vulnerability analyses

Timeline

Now - Preliminary data analysis, analyze genetic samples
Summer/Fall 2011 - Second year of field surveys/sample collection
Winter/Spring 2012 - Occupancy modeling, genetic modeling and vulnerability analyses
2012 - Complete reports and predictive distribution modeling/mapping

Previous data are available from identical or "similar" studies in Craters of the Moon NM&P, Lava Beds NM, Southern Rockies – Informal comparisons with previous work...
CRMO –
LABE – Decline in occupancy from 62% in 2006 to 36% in 2010. May be a real decline in occupancy, since other factors (such as distance to road) don't appear to be important.

ROMO/GRSA – Liesl Erb 2009 study, though at a very different scale, showed similar high occupancy as the 2010 surveys.

Question (Andrew Smith) – Is the name of the project "Pikas in Peril" too value laden to allow some end-users to be objective? Answer: The name came from a perceived need to answer the question "Are pikas in peril?" since so many people were asking that question.

Dynamics of pika distribution in the hydrographic Great Basin, over the last century - Erik Beever

This talk summarizes a variety of work conducted since 1994 in the hydrologic Great Basin.

Overview of what has happened in hydrologic GB -- 3 periods of sampling:
Historic, recent-1, recent-2 – rate of extirpations (per "site years") increased over the three periods.
Considers 3-km radius for site definition.
Pinchot Creek is "functionally" extirpated.

Extirpation sites are at lower absolute and maximum elevations; nearer to primary roads; at slightly warmer and drier sites; northernmost sites

All six of the original site extirpations are within grazed areas, with little talus. Connie Millar found fresh hay at one of the original 6 extirpated sites.,

Resurveys in 2003-2006 confirmed continued extirpation at the original 6 sites, plus 4 additional extirpations. Of these, 3 were in grazed areas, 2 were Wilderness, 1 had little talus habitat, and 1 was in BLM-administered land. Extirpated sites were more southerly than non-extirpated.

Extinction debt has now been purged.

Anatomy of a decline – Upslope migration has occurred. First period was 13.2 m per decade, second period was 145 m per decade (basin-wide average).

Within most sites, the average elevation did not change.

Early warning indications – loss of animals and reduced density on s-facing slopes.

Graphs of Latitude-Elevation through time: First period extirpations occurred at low elevation, northerly sites. Second period extirpations occurred at low elevation, southerly sites. Into future, the vulnerable sites can be identified as falling below the upward-shifting linear regression line.

Evidence of climatic influence on pikas:

- Within mixed-occupancy sites, extirpated patches averaged 2.51˚C warmer during summer than did occupied patches
- Extant sites received PRISM-estimated 1.43x greater PPT during 1961-1990 than did 6 sites initially extirpated, & 1.75x greater PPT during 1971-2000 than 4 sites of recent loss
- Change in population-size index most negative at southernmost sites
- Loss of pikas from low-elevation sites in 4 ranges even though higher-elevation populations in the same range persisted; retractions > 100 m in 6 ranges

Andrew Smith's work (1974) is the best direct evidence for vulnerability to heat stress.

iButton data summary (2005-2006). Loss from very hot and very cold sites.

Top models for Information-Theoretic results:

- Importance of types of stress not previously well appreciated
- Acute heat stress a relatively poor predictor (behavior)
- Recent variables prominent among models with AIC*c* < 2

The rules have changed

- More-rapid rates of site-level extirpation, upslope retraction
- Different relative roles of extirpation determinants, 20th Century vs. last decade
- Test using model-averaged probabilities of persistence from 1990s sampling, to predict losses since 1999 => utter failure ($p = 0.86$)
- North vs. southern latitude of pika-extirpated sites (purging of extinction debt?)
- Proximity to primary roads no longer appeared important
- Populations now being lost even from large mountain ranges and protected areas

Use of residuals improves power.

Question (Connie) – Do an analysis with degree of isolation for the sites? A – Tried that, for both periods, but because of lack of complete information on pika distribution in the GB it didn't seem worth pursuing until we have better information.

Question (Joseph) – How did Erik select the original sites? A - No selection, just used all the sites he could find at the time of the original study. More sites have come to light since.

Spatial Relationship and Social Organization in Pikas - Andrew Smith

This summary is based on 1980s pika work (Smith and Ivins) at Gothic, CO study site.

- Reproductive dynamics
  - All adult females are reproductively active and equivalent

  - All females breed, initiate two litters, and litter size does not vary with age or with quality of vegetation surrounding the female's territory
  - Thus, with all females essentially equal – there is no need for males to "shop around" for mates
  - Timing of breeding – selected to occur as early as possible, and thus in relative synchrony (so males might have a difficult time having access to multiple females)
- Behaviors that lead to spacing (the individual territoriality of pikas
  - Aggression (chases)
  - Surveillance (musing)
  - Short calls (vocalizations)
  - Cheek rubbing
  - Social tolerance (two pikas close to one another, but without a fight or a chase)

Seasonal shifts in behaviors, differences between sexes.

Gothic behavior study conducted over 3 years. Talus gridded with 5-m quadrats.

- All demographic patterns, including survivorship, colonization, and movements, were determined from observational data
- All animals trapped (handled following anaesthesia – weighed, sexed, examined for reproductive and general condition) – marked with colored ear tags
- Study population with an even sex-ratio
- FOCAL and SCAN SAMPLING
  - 40 X 40 m area
  - Location and behavior of every animal, focal animals and others, noted every minute
  - 15 minute periods/focal animal
  - 1,581 hours of direct observation (not including time spent trapping)
  - Spatial / behavioral data set with almost 1,000,000 lines of data!
  - Animals habituated rapidly to observers, so all sampling accurately portrayed the behavior and spacing of the pikas.

Spacing

- Three types of data were used to describe the spacing of pikas:
- I = Area occupied
  - No consensus as to best methodology
  - Modified bivariate normal distribution with no trunctation of data points
  - Sum of actual quadrats occupied
- Both methods give similar results, just different magnitude of space utilization…
- Home range area declines during the field season, adults have larger HRAs than juveniles, adult males have larger HRAs than adult females
- II = Nearest-neighbor distances = a measure of dispersion
  - Calculated center of Home Range (from Bivariate program), and then measure Nearest-neighbor distances between dyads

  - N-N distances between male and nearest female and females and nearest male are very close; N-N distances for same-sex dyads much greater.
- III = Overlaps
  - Weighted overlaps = sum of proportions of observations from those quadrats that were also occupied that month by the other individual in the dyad
  - [most other overlap presentations = unweighted; these are remarkably unreliable]
  - Overlap is greater for M-F than for M-M or F-F.
  -

Temporal Component of Spacing

- What happens when an animal disappears and the vacant territory is available for colonization?
- We observed replacement on 22 territories
  - 9 female sites claimed directly by a female
  - 13 male sites; 11 claimed directly by a male, and 2 temporarily by a female then a male
- Thus: all replacements by members of the same gender as the previous occupant (highly non-random!!!)
- Sequential occupants had nearly identical space use centers of activity and haypiles as previous occupant.

Summary of Spacing Results

- Males and females occupy individual home ranges, yet overlap primarily one individual of the opposite gender
- There was an alternate Male-Female (paired) organization, and this persisted in time
- But, no aspect of resource distribution or abundance could predict this non-random dispersion of pikas on the talus, nor its persistence in time
- To do this, we must examine the behaviors responsible for the observed spacing patterns.

Social Behaviors

- Two categories:
  - AFFILIATIVE
  - AGGRESSIVE (AGONISTIC)
- Affiliative Behavior
  - SOCIAL TOLERANCE – Almost all social tolerance behaviors were in M-F pairs
  - DUETS (90% heterosexual pairs; 95% Nearest-neighbors)
  - COPULATIONS (100% Nearest-neighbors)

Pika Awareness – Adults

- Pika locations (adult territory holders) sorted by minute
- 8,270 instances of territory intrusion by adult conspecfics
- Pikas usually waited until occupants were unavailable to defend their territory before intruding, apparently to avoid detection and repulsion by the occupant.

- Intruder avoidance of active occupants was most pronounced among same-sex dyads and non-nearest neighbors.
- Instances of territory intrusion were most frequent among nearest neighbor heterosexual dyads.
- Most cases of intrusion appeared to be related to eventual relocation of territories, deterring settlement of unfamiliar conspecifics on nearby vacant territories, and/or increasing familiarity with nearest neighbors of the opposite sex.

Pika Awareness – Juveniles

- Most juvenile pikas remain on the home ranges of their parents throughout the summer of their birth and eventually settle close to their natal home range. Because conflicts potentially exist between these philopatric young and their individually territorial parents, we tested whether periods of juvenile activity on parental territories were independent of adult activity.
- Juvenile activity on the territory of a parent was dependent on parental activity; juveniles were most likely to be active when their parents were inactive – parents and juveniles only simultaneously active 14% of the time.
- Temporal separation between parents and juveniles appears doubly advantageous in that it allows juveniles to avoid adult aggression and may facilitate their settlement nearby.

Pika Colonization

- 13 of 17 territories were colonized by juveniles born on the study area
- of the 13, 11 were philopatric
- of the 4 colonists, 3 appeared over winter (dispersal under the snow), one first appeared in late summer

Pika Immigration

- 16 immigrant juveniles appeared during summer (7 male; 9 female)
- These represented 26% of all juveniles
- 12 appeared later than mid-August
- 9 appeared in September or later
- Only 1 of these colonized successfully
- 2 yearlings immigrated in spring – neither of which became established

Pika Movements

- Adults
  - 35/41 (85%) sedentary
  - 6 dispersed (4 male; 2 female)
- Juveniles
  - Of 45 born and marked, 2 (4%) dispersed
  - In two years – of 33 born and marked, 21 alive by mid-September and only 1 had dispersed

Andrew notes that Pika in Peril 12-m radius sampling effort may miss declines because it could cover multiple home range areas.

Question (Shaye): Juvenile dispersal, warmer sites more limited? A – Pika populations are viscous, long-lived animal, population is like a lottery, the juveniles hang on hoping an adult dies. Most do successfully establish this way. Most juveniles don't disperse a long distance, but some do move a long way. At warmer sites (e.g., Bodie), dispersal distances are short. At high elevations, pikas can "cruise" longer distances. Mary Peacock: Similar results in SN as Andrew reported. Animals showed up over winter – not known from where. Genetics suggested very few came from a long distance (1 – 2 km). Chris – Can't describe the temperature relationship for dispersal in these cases, because temperature is unknown (likely under snow). (?) Bodie: Pikas moved more, because patches are so small there often wasn't room for juveniles to stay.

Status of Pika Populations in the Bodie Hills - Lyle Nichols

Summarize study results obtained in the Bodie Hills area since 1972. Includes work by several individuals. Three areas: Bodie SHP (Anthropogenic patches), New York Hill (Anthropogenic patches), and Bodie Hills proper (Natural patches).

Bodie SHP – From 1972 to 2010, the southern constellation of sites went from partially occupied to unoccupied. The northern constellation remains mostly occupied. 2008 was the lowest year for patch occupancy, about 26% .

The decline by year is highly significant as described by linear regression. Note the gap in the record from the late 1970s through the 1980s. More interestingly, what was the occupancy pattern BEFORE the 1970s? Was 50+% patch occupancy the norm during the 20th Century?

Severaid's mid-20th Century work suggests very high patch occupancy at the anthropogenic sites. "Hundreds, perhaps even thousands, of pikas now inhabit the Bodie mine field." Of 28 pika sites identifiable from Severaid's dissertation (100% occupancy), 57% were occupied in 2010.

New York Hill - Very similar in terms of habitat structure to Bodie. Elevation is very similar to Bodie, though overall area is smaller. 17 patches, 41% currently occupied.

Bodie Hills proper – patches are larger, rocks are larger, more widely spaced. 2200 – 3110 m. All of these sites were occupied at some point, as shown by fecal pellets.

Map figure points each represent a talus patch.

51 patches, 0% occupied.

Summary for the three areas

- Bodie SHP – 41% occupied but in decline
- New York Hill – 41% occupied (trend?)
- Bodie Hills proper – 0% occupied

Dating Patch Occupancy in the Bodie Hills
- Last known occupied year estimated as in Nichols 2010
- Estimates based on mean pellet diameters by latrine
- Last known occupied year = most recent latrine on patch
- n = 260 latrines, 10,518 pellets

Declines for BSHP and NYH are statistically equivalent (see figure in slide show). Bodie Hills curve is significantly different, decline starts earlier and overall is steeper than BSHP and NYH.

Status of Bodie Hills Pikas
Bodie Hills (natural site) pika populations suffered a region-wide collapse in the late 20th century. Two declining relict populations survive on vulnerable anthropogenic sites: New York Hill (unprotected) and Bodie SHP ("Protected" but not really protected – there are on-going ground disturbing activities, such as EPA projects for mercury contamination).

Research in Progress
- What factors influence persistence and extirpation on Bodie Hills patches?
- Assess Bodie SHP patch microclimates with temperature data loggers (will happen starting summer 2010)
- Determine genetic structure of Bodie SHP and New York Hill populations, in collaboration with Mary Peacock's lab.
- Request for Fecal Help – generalized pellet aging model (Note: There was an extended exchange via email on this topic after the meeting).

Question (??) – What about the proximity of the patches as a factor in persistence? A – Yes, that's something to examine. If distance varies, then rates of extinction/persistence should be affected.
Andrew – There's a third anthropogenic site, Aurora, which is lower and hotter. Connie will discuss.

Citizen Science Monitoring - Scott Loarie

- Importance of monitoring in general, coordination among the pika research community, citizen science.
- iNaturalist application – could be used to for citizen science and general monitoring.
- IUCM range intersected with county layer. Gives us a basis for starting to plan monitoring.
- Intersect with mountain ranges, park units.
- Species page at iNaturalist, flicker photos, Wikipedia article.
- Click on observation, shows Scott's info, map.

- Allows Wiki-based validation of data (especially with photos).
- Data gets associated with the species page
- Go to Jasper Ridge place page – using iPhone app, someone could confirm presence. Signage could encourage participation by citizens.
- Allows both fine scale and large scale data collection.
- Q (Andrew) – IUCN map was produced in collaboration by Andrew – it's not particularly precise. Better alternatives might be Hafner's map, or Erik's and Connie's more recent maps – Better resolution. Scott: Agrees, but this is just a framework for updating with new observations – it's okay to start with a coarse mapping.
- Q (Scott) What about the updateable niche model application you demonstrated a year or so ago? A – This would be folded into an updateable niche model.
- Q (Joseph) – Can you enter more spatially-explicit (precise) location information? A – Yes. Absence points require fairly precise data.
- Andrew – Need a way to confirm observations in this modern era of no voucher specimens. Cameras help, but need to know exact locations. David – Smartphones provide exact locations for the photos.

Pikas, Cows, and Weasels - Connie Millar and Bob Westfall

- Increasing interest in pikas from the SN out into the GB.
- Lucky to start working in the SN, due to the saturation there that it was easy to see the range of suitability there.
- SN – habitat is abundant and continuous, GB in NV habitat is discontinuous within and among the many small isolated mountain ranges.
- The work in the GB is modern/recent occupancy determinations only.
- Pattern observed along transect from SN into SWGB is that fewer patches are occupied (either currently or in "modern" period). "Modern" is pika seen or heard; green haypiles, "Old" is indirect sign (pellets or old haypile).
- Also, the continental climate pattern becomes more predominant along the W to E transect.
- The ranges that DON'T have pika are very interesting. They look fine, with similar geomorphology to the Sierra, in some cases. Suggests biogeography is playing a role.
- So, now trying to tease out these various factors.
- Toquima Range work (relatively early in development of methods) – only classified sign as "Recent" versus "Relict." No pika observed in that earlier work, so revisited in summer 2010. Found intensively-grazed canyons adjacent to talus. Pikas are present at some of these sites. Discovered reason for lack of observations of green haypiles in 2008: the pikas are located higher in the talus than typical for ungrazed sites. Also, the haypiles consist of talus plants *Rubus idaeus* ssp. *strigosus* only, not meadow species. Poor nutritional value. (See table summarizing distance of haypiles to talus edge in grazed versus ungrazed ranges.)
- GB allotments are not restricted elevationally – cattle range up to crests of the ranges.

- What is the importance of grazing as factor in pika status? See maps of Humboldt-Toiyabe and Inyo national forests grazing allotments. SN grazing allotments almost all too low to affect pika. GB allotments overlap more with pika-suitable elevation range.
- Connie wants to look at this issue in more depth.
- Bodie Hills, Ore Dumps, and Weasels
- Native talus is minimal and scattered in the Bodie Hills, but anthropogenic habitat is abundant and connected. What are the thermal regimes of the ore dumps? Predators? Pika behavior? What effect has town/mine activity had on pikas? Overall, Connie thinks anthropogenic sites don't offer the best location to learn about pikas, given native habitat elsewhere is so different.
- iButton data snippets: See the photos and temperature records in the slide show.
- Comparison of temp records for an ore dump in Bodie (temp logger placed down into ore dump matrix on N- and S-facing sides) versus native habitat at similar elevation in the SN. Is Bodie really a lot warmer than the SN (e.g., at the slightly higher elevation Green Creek Canyon site)? These graphs suggest they're not very different in the winter through mid-spring.
- For comparison, Carson Canyon, the lowest pika site in the SN, is also quite cool. Elevation is not the only factor affecting the thermal regime. Microclimatic variability is greatly affected by topography, geomorphology.
- In the summer, haypile temps on the surface and in the matrix at Bodie Hills versus Carson Canyon. Surface temps much more variable (with much higher maximum temps) at Bodie than Carson Canyon, but matrix temps in the summer are quite similar between sites.
- Lee Vining Cyn and Lundy Lake Trail at 7500 and 7800 feet elevation have summer surface temps that range up to above 30 C. Both are occupied by pikas.
- Same with Obsidian Dome (8200 feet) and Mono Craters (8400 feet).
- Relatively cool matrix provides refugia in these sites.
- Weasels: Might weasel dynamics be implicated in pika population status? Connie has never seen a weasel in the talus of the SN.
- Impacts of historic activity:
- dogs, mining, rodents?
- Primary prey (voles)
- abundance?
- **Can we detect**:
    - Differences in weasel presence & abundance? Use conservation canines.
    - Proportion of pika in weasel diets?
    - Influence of climate on weasel populations and prey base?
- Brad Bauman: Similar haypiles with *Rubus* observation.
- Lyle: Rattlesnakes now in Bodie, that's new.

Lunch Break

Pika Population Status and Threats– Facilitated Discussion - Scott Osborn

Introduction and Goals (see Discussion Plan): To increase our shared understanding of pika conservation status, motivated in part by current CESA petition for pika in California. We decided to eliminate climate change impact model due to lack of principal authors on this topic.

1. Sierra Nevada: Erik Beever, Connie Millar, Cody Massing

Erik Beever:

- Sierra Nevada local extirpations in publication Global Change Biology article (data from Art Shapiro at UC Davis)
- Eastern Sierra Nevada spur ranges – very different feel from the true Great Basin. High site occupancy in ESN.
- Not clear understanding of historic distribution of pika at lower elevations in SN

Connie Millar (see slides):

- Role of continuous habitat, clast size, elevation range
- Nature of talus – periglacial process and how it forms talus fields. Pikas do not prefer rockslides (depositional process). Talus forms in situ through process of convectional rock formation, some are Pleistocene-era formed. More capacity for this in Sierra Nevada than in Great Basin.
- Glacial process exposed bedrock.
- Nature of Sierra rocks gave propensity to right clast size
- Climate – Mediterranean influence creates a much greater snowpack than in GB. Compare regions with lighter snowpack areas but similar geomorphology (SW Colorado?)
- Need to remember that elevation does not translate directly to micro scale thermal environment
- Sites occupied from lowest to highest (all available habitat in range) 5800 ft elevation span. There's no basin lower than 7000 ft elevation, so that's the lower limit.
- Where extirpated, lowest sites are surrounded by active sites

Cody Massing: (see slides from Rob Klinger):

- Results for SN and White Mountains from the USGS high-elevation study (Klinger et al.)
- Line transects, point counts (point counts only in SN)
- Higher densities in White Mtns than in SN, more spatially variable (one area more dense than others)
- Densities decreased 2008 to 2010 in SN
- Growth rate – expansion of sites between 2008 and 2009, relative stability between 2009 and 2010. No trend yet, but fluctuations have occurred.

- Macrohabitat variables influence occupancy and abundance. Simpson's index – measure of habitat heterogeneity/diversity – has high explanatory power. Also, positive relationships with elevation and rock, negative relationships with meadow and conifer.
- In 2011 will be adding transects in Sequoia
- Microhabitat sampling

Shaye Wolf:

- Connie and Bob's paper – The conclusion that pikas are "thriving" in SN and GB – concerned about drawing conclusion that pika's status is thriving, which is difficult from a one-time study – needs study over time.
- Regarding statements that pikas inhabit a wider range of elevation than was previously reported, we need to look at historic data indicating that pikas were extremely abundant at high elevations. Natural history accounts gave general elevation ranges (such as "above 2000m" or "above 2100m") – these were not exhaustive accounts, we know pikas were found at lower elevations. Caution against concluding that pikas are inhabiting a wider range of elevations than was previously thought.
- Connie: See the set of papers published in AAAR (Shaye's reply to our original paper and our response to her reply) – these address issues Shaye raises here.

Chris Ray

- Pika presence doesn't necessarily mean that population's lambda is 1 or greater.
- Pika at different elevations – it's possible that lower (or higher) elevations could be sink populations. Not suggesting that pikas are faring poorly in the SN.

Mary Peacock

- Habitat heterogeneity in Cody's presentation: is that talus or plant diversity? Meadows can be very plant species diverse. Food resource also important to influence quality of a patch.
- Cody: the Simpson's index is macrohabitat heterogeneity, doesn't include plant species diversity.

Andrew Smith:

- Within or between plot plant heterogeneity is important because individual pikas spend very little time off their home range. The meadow plants there are the menu from which they can choose.
- Pikas are generalized herbivores, but they select from the available plants. Seem to do well on whatever is available.
- Degree of selectivity varies at different elevations. At lower elevations pikas are more selective.

Erik Beever:

- We need to understand low elevation limits and trends at low elevations; establish elevations where changes in occupancy may occur.

Bob Westfall:

- Cold air drainage influences persistence of populations; opportunity to forage in later part of the day. Carson canyon data.

2. Southern Cascades: John Perrine, Chris Ray, Cody Massing, Shaye Wolf

John Perrine:

- Resurveys of historic Grinnell sites in the vicinity of Lassen.
- Have now visited all historic Grinnell sites at Lassen.
- One site was especially important for pika status question: the lowest elevation and furthest east of Grinnell's documented pika sites. It is at 4800 feet and is now not occupied by pika.
- Found a pika population around Mineral
- Caveat related to persistence: Metapopulation dynamic with resurveys: We will always get loss of sites, but the converse (addition of newly-occupied sites on the landscape) is inherently difficult to demonstrate, given the nature of the historical record.

Cody Massing:

- Occupied sites – on revisiting this past season, saw one site (in Lassen NP) occupied that had been found to be abandoned the previous season.
- Ibutton data indicate abandoned sites are warmer than occupied sites (see slides)
- Vegetation cover around ibuttons: More forbs, more graminoids, less shrubs in occupied sites compared to abandoned sites.

Chris Ray:
For Lava Beds, the 2005 study was a similar occupancy survey at LABE as discussed for later years, though sample size was lower, other slight differences in methods.

- Random lava site occupancy was: 2005 39%; 2007 77%; 2010 36% -- shows not only potential decline, but perhaps just variability.
- Mary: It's hard to document metapopulation dynamics in a short time – Need to develop a pika pellet aging method for this part of the range.
- David: Would need multiple models of scat decay with variation of sites
- Chris: Need consistent ways to determine the freshness of fecal pellets – need an objective and quantitative way to date pellets, regardless of variation between sites.
- Janet: Western pika group has several protocols of what others are using for all methods.
- John Perrine: Has anyone tried stable isotopes for aging pellets? Lyle: Has looked into it a bit. An expert thinks if would work. $500 per sample, but some ambiguity in the results
- Lyle: Also thinking about a chemical assay – e.g, chlorophyll break down.

- Erik: NW Nevada – a lot of earlier losses, but also finding new populations in Sheldon area. Genetic markers could give indication of connectivity/isolation, fostered by current climate.
- Toni Lyn: Referencing John Perrine's comment, if we're starting with occupied sites only, will go in negative direction; what are people's thoughts about site extirpations?
- Erik: Metapopulations – Bodie scale, they make sense; if larger than that, different dynamic – not a classic metapopulation situation.
- Mary: Bodie tests of metapopulation ideas are artificial due to size, but can be considered for SN scale at different time scale
- Chris: Again, potential for source-sink – abundance does not mean they are "OK"

3. Great Basin: Erik Beever, Connie Millar, Brad Bauman

Brad Bauman:

- NDOW – There is not a lot of historic pika information; need census and inventory with predictive modeling plus some historic information (this work has started).
- After census, need to monitor trends using NPS protocol on population shifts.
- Temperature loggers in Sheldon and throughout the state.
- Sheldon area: is doing genetic work. Ruby Mountains, east Humboldt: very little information.
- Oregon sites, Warner Mts, and Rubies – historical sites to be looked at.

Erik Beever:

- Global Change Bio article: Climatic variable models since 1999, since historic records. See slide 27 in the presentation.
- Model: both climatic and non-climate are predictive of patterns of losses over time. Models are getting better at predicting patterns of loss.
- Talus area is less important as a predictor of loss in these latest models.
- Chronic heat, average temperature over summer and cold stress are important in these analyses.
- Highest ranking models have both climatic and non-climatic variables.

Connie Millar: (see slides)

- Disjunct isolated ranges, habitat scattered in the Great Basin
- Land use history needs to be explored.
- Exploration history is important – it affects our knowledge of the baseline or historical condition of an area.
- Great Basin glacial history has resulted in less true talus fields than in the SN.
- Mono Basin, west aspect, is snowy; south, snow free; variations in same day within 10 miles.
- GB is mostly dry and free of snow (on the same day the SN has snow). But some ranges (to the north and east) are cold and wet – but no pika here.

- David: Question about cows: is grazing significant? Chris: Early support, continued modeling, support for grazing as a predictor has lowered in the models. However, need to consider the scale of data. It was factored in as a yes or no "Has there been long-term grazing?" in the model. Not modeled over time. Grazing occurs in low elevations – confounding factor. Did account for correlated factors before modeling.
- Brad: Site specific impacts of grazing depend on talus-meadow interface. Changes have occurred in grass species composition (native bunch grasses replaced with non-native annual grasses).
- Mary: Metapopulation dynamics in Ruby Mountains – genetic analysis shows a lot of spatial structure in Ruby Mountains, suggesting metapopulation dynamics at a very large spatial scale.
- Connie: With regard to grazing, the eastern Sierra Nevada has the same vegetation structure as GB. In areas without active grazing, the haypile locations were near the talus border.
- Andrew: Definitions of the "Great Basin" – Should we use a vegetational definition?
- Erik: Need to map threshold of vegetation and elevation and connectivity to talus, connected continuously or not?

4. Bodie Hills and Bodie SHP: Andrew Smith (BHSP), Lyle Nichols (BH), Connie Millar

Andrew Smith:

- Bodie studies have been instructive, but to what extent can we extrapolate metapopulation dynamics, due to small size of the site and small time frame, to other larger scales?
- In 1989, 1991: What could have happened in the south that did not affect the north, besides climate causing collapse? Parasites, disease, were considered. Climate didn't seem likely, given the north set of sites is only 3 km from the south sites. Could, for example, weasels have cleaned out some key patches in the south, which then collapsed?
- Original paper indicated 300 m was a real barrier because of the conditions at Bodie – and it may be even shorter now, if climate is warmer.
- Can't understand dynamics at Bodie only in terms of climate change.

Lyle Nichols:

- Status of population at Bodie: there are fewer pikas now than there were in the past. More occupation in past, whatever the cause. For Bodie Hills: different habitat structure, different timing of loss of occupancy. The anthropogenic sites at NY Hill and at Bodie had patterns of decline that are not distinguishable. But Bodie Hills was different. So, different factors could be influencing these populations, and climate change may be an indirect factor.

Connie MIllar: (see slides)

- We keep thinking of Bodie as a hot place, but it's not. It's a cold, dry place. Climate records indicate average annual temperature (37 F) is the same as at Ellery Lake (SN at 9600 ft). Monthly minimum temperatures are all colder at Bodie than at Ellery. Maximum temperatures are higher at Bodie than at Ellery.
- Survey results: some differences from Lyle's results: Sierra/Sweetwater sites occupied; Lundy, lower elevations occupied (in canyons). Need to go back and figure out why there are differences.

Mary Peacock:

- South half of Bodie is different than the north set of sites in terms of the quality of patches and vegetation. Role of difference in vegetation is important. South has poorer talus habitat.
- Lyle: Patches are more interconnected in the north than in the south.
- Andrew: but some of the south patches are really good.

Chris Ray:

- Doesn't think pikas would have any problem moving between any of the patches anywhere in Bodie – maybe not in summer, but during other seasons they would be fine. The fact that they don't seem to be recolonizing suggests a habitat quality issue.

Toni Lyn Morelli:

- Can we look across the landscape and say though they are abundant they are not doing fine?
- Chris: If pika really are a climate change sentinel species, then we need to determine pika's demographic response to changing climate. Long-term occupancy studies can provide show population responses. But short-term demographic studies correlating climate data with vital rates could provide the information, too.
- Mary: Nancy Huntly (early 2000s) study: Source-sink dynamics on small spatial scales based on aspect of talus and meadow. Showed constantly occupied sites but that were clearly sinks. Need to delineate where sinks are.
- Toni Lyn: But how different is any of that from other species?
- Chris: Pika have been picked for this sort of study because occupancy and demographics of pika easier to study than other species. But pika are not unique in their response.
- Andrew: One thing that runs counter to saying the habitat at Bodie is low quality is that the litter sizes at Bodie are the highest reported for any North American pika population. Bodie has the highest percentage of litters of 5, and that includes the south sites. The mothers are physiologically able to deliver litters of 5, and many of these litters had 4 young raised to independence. The NA pika litters average litter size is 3 in first litter, raises 2, and abandons second litter.
- Mary: By marking pikas at northern sites in Bodie, Mary showed lower survival of adults and juveniles there than in SN. Andrew's study using bone/tooth cross-sections to

produce life tables showed that adult survival at the time was higher at Bodie than in SN. (Mary's study occurred after Andrew's).

5. Pika ecological resilience: Erik Beever, Andrew Smith, Connie Millar

Dave Wright questions for the group:

- Are pika retracting, declining in range, retreating upslope? And, if so, why?
- Are pikas resilient to climate change, to changes in temperature?
- Do pikas have a lower elevational limit, and if so, what does that mean?
- What is the cause of the (apparent) lower elevation limit (which can vary based on topography)? Is the low-elevation limit thermal in nature, as opposed to lack of habitat? Why are talus fields at low elevations not occupied?
- Were the prehistoric changes in pika range correlated with temperature or something else? We think about the modern changes a lot, but the prehistory changes can inform these questions, too.
- Is there a metapopulation gradient? Is the population core up high, and resistant to extinctions, with satellite populations (or a more classic metapopulation pattern) at the lower elevational edge that tend to wink out?

Andrew Smith:

- See the graph. Proportion of patches at carrying capacity vs. size of patch – scale of occupancy.
- Close vs. distant refers to the physiological and behavioral dispersal capability between patches.
- This helps explain the pattern of occupancy at Bodie (close together and large patches tend to remain occupied more over time). These relationships can also help address David's questions.

Connie Millar: (see graphs)

- Talus thermal regime of habitat: how important is it in affecting habitat suitability?
- Transects of iButtons up talus fields, low and high elevations, and location matters for thermal condition.
- Base of talus and talus forefield are colder, higher in talus is warmer. Impact of grazing of thermal environment experienced by pikas.
- Internal matrix stable without extremes, warm in winter, cool in summer. Not at all like surface temperatures. Even when snow cover is lacking in winter, the matrix is less cold than the surface.

Andrew Smith: (see slides)

- A favor request: Lethality experiments were conducted on pikas at Bodie and at high elevation. The idea was to add to the behavioral observations that pikas were avoiding high temperatures in the middle part of the day. But now, these experiments are being characterized as "Pikas die from overheating when exposed to temperatures as mild at

78 degrees." We should not mislead the public, who assumes that's the ambient temperature. But the lethality experiments are inherently unrealistic: there was no opportunity for the pikas to use behavior to contend with the solar heat load.

- But this doesn't mean that temperature doesn't affect pikas behavior – it does! But to say that pikas die at 78 degrees F is very misleading.
- How do we measure temperatures that are likely to influence life of pika?
- How variable is diet for a generalized herbivore; are there any situations where diet impacts life history? So far, no evidence from anywhere (even at grazed sites in GB, where diet appears to be low quality) that diet affects vital rates.
- What are reproduction determinants?

Erik Beever:

- See slide 36 (27?): Global Change Biology paper explicitly addresses some of David's questions related to various scales and processes. Local (patch), within-mountain range, ecoregional, and continental scales, and the factors that drive dynamics at these scales.
- Capacity for resiliency will vary across the landscape.
- Reintroduction in GB. We had sites that climatically looked suitable for pika, but stochastic processes where pikas were lost in recent past. These might be good candidates for reintroductions.
- Behavior: selection of rocks or other thermal stability/inertia for center of activity.

Janet Foley:

- Encroachment of other small mammals in the community, plus their associated disease pathogens or predators.
- Bodie may be different in part because it is dry, so ectoparasites may not persist. The population may be fairly protected from disease most of the time, but then when a disease shows up it has a large impact.

Chris Ray:

- Pika selectivity of plants in haypiles. Pikas are more selective at lower elevations (selected plants with higher nutrient and water content) than at higher elevations. But pikas at lower elevations also have other risks (predators). There may be some elevational effect other than temperature. Every other investigation of pika diet is just one location.

Mary Peacock:

- One site diet study in-depth foraging study in Rubies. Grazing and haying diets were different. What's along talus shapes success of individual. Ate grasses and stored forbs.
- More selectivity could potentially mean less resilience.

Bob Westfall:

- Influence of climate in population dynamics, using Andrew's dataset. Used current and previous year's climate; higher correlations found with the climate data. Looked at

large-scale climatic variation from NOAA -- confirmed climate data he used. Precedent conditions can be important.

- Influence of large-scale climatic fluctuations. We often assume that climate is on a trajectory, but in fact it is variable over low frequencies. Patterns may show decline over periods like 20 years, but increase in next phase. So, long-term studies can be misleading.
- Genetics: Studies of the evolution of species ranges have shown that marginal populations are vulnerable as demographic sinks; they can't adapt to edge environment because they're constantly getting migrants from the central population so they can't adapt.

Lyle Nichols:

- Bodie Hills is not typical pika habitat. We don't need to invoke climate change. If there's some sort of widespread general degradation of habitat, then the marginal patches (like BH) would be affected first. We wouldn't expect pikas to start winking out at the Sierra crest from such a generalized factor.

Connie Millar:

- Low elevation (or marginal) sites. Found low pika occupation where there is high occupation of woodrat. Another potential factor at marginal sites.
- John Perrine: Pikas are not doing better where woodrats are gone.
- Andrew: Woodrats are nowhere near as common at Bodie now compared to when I worked there in the early 1970s. Lyle: Has seen evidence of woodrats at Bodie.

Shaye Wolf:

- In bigger context of climate projections, pika stands out as a vulnerable species because it has characteristics that would make it susceptible.
- Evidence from GB: good predictors for occupancy are climate-related.
- Some individuals can cope with current emission/temperature change levels – but predictions for loss of snow pack will affect cold extremes; heat waves, etc., then the pikas' ability to cope at tremendous climate change needs to be factored in. How will they be able to cope with this level of change?

Chris Ray:

- Shaye makes a good point: our discussion has been about pika now and over last two decades; but what will happen in the future? There's some disagreement about what's going on now. But Chris thinks there might be demographic problems in next few decades?

Mary Peacock:

- There's no doubt that changes in temperatures are affecting a lot of species. It's naïve to think that pikas can adapt rapidly to the predicted changes.
- Bob: Tree researchers are seeing evidence of adaptation to changing climate.

Andrew Smith:

- Climate change is real. Evidence indicates that pikas are sensitive to temperature. Countering some of the concern is that, when he started his work at Bodie, temperatures there were 8.3 C warmer than the 11,000-ft elevation sites in the SN. This is a much greater difference than what is predicted from climate change models for the next century.
- Suggests the species does have the capacity to deal with warmer temperatures.
- Bodie, being an anthropogenic habitat area, may not tell us much generally about pikas. But the data from Bodie do suggest pikas can successfully deal with warm temperatures.

Erik Beever:

- Quick note about 2010 Ecological Applications. Was it a single hard ecological niche boundary, or is it different across the landscape. Some species show local adaptations. But the EA paper suggests that the most thermally stressful sites in the GB were the ones that lost pikas.
- Urges that we step back and look at other areas, other time and spatial scales for pikas and other species.

Shaye Wolf:

- Doesn't agree that the Bodie pikas are demonstrating resiliency. The southern group of sites has collapsed and the Bodie Hills populations are extirpated.
- Predicted increases in average temperature will be accompanied by increases in maximum temperatures, which will be more difficult for pikas to deal with.

Lyle Nichols:

- Hypothetically, if climate change is affecting pikas, it doesn't mean that temperature is having a direct effect on pikas.
- Direct effects could occur through other agents that are directly affected by climate/temperature: disease, vegetation/diet, parasites, predators, for example.
- We don't understand ecology well enough to make predictions.

Next steps for the CPC - Connie Millar (see slides)

Promote CPC's goals through funding for dedicated program coordinator

- Competitive SWG proposal – Award announcement expected by June 2011.
- Other funding opportunities?
- California LCC: 2-page preproposals due Feb 20, 2011 http://californialcc.org/
- Foundation Grants for small projects – brokerage for donors to contribute to scientific studies (SciFLies)

Online forum or interactive blog site for CPC. Hosted at AGU Blogosphere – would require a CPC manager. http://blogs.agu.org

Need to expand scope of our interest to include other high-elevation small mammals.

Also, expand scope to other geographic areas

How about incorporating citizen science more?

How about better ideas for aging feces?

Need to coordinate better with the Western Pika Consortium. We should all be members of the listserv that Janet Foley manages. Should we just collapse ourselves into the Western Consortium? But perhaps continue meeting and working as a focused group?

Without a Coordinator, actually accomplishing the Consortium's objectives is difficult.

Closing remarks - Toni Lyn Morelli

Science Locator and Sean Finn – is he in a new position? Yes, he is.

Thanks to everyone for attending. This was a good meeting! There is a fine line between information overload and accomplishing a lot.

Summary of Evaluation Responses
CPC Winter 2011 Meeting

Question	Responses
1a. Was this meeting productive for you?	• Yes • + • Yes the meeting was productive. • Yes • Yes • Yes • Yes • Yes • Yes • Yes • Yes, thanks!
1b. From your perspective, what was the best part?	• The a.m. • Positive discussion • Updates in all the different regions • Discussions were productive • Debate(ish) was Great • Research updates • Lots of information and especially clarification on where people stand and status of their research • I am new to the pika world so meeting everyone was great! • Sharing about our project and learning about other projects. Networking. • Sharing, informing, seeing summaries of recent work. • The discussion session was helpful.
2. What was the most important thing(s) you learned at the meeting?	• More about specific work being done by various scientists • That there are some significant differences of opinions that are unfortunate • That Bodie is empty of pikas (maybe) • Lower elevations can actually be colder (or same temp) as higher elevation sites-Like Bodie • Everything =) • J Stewart's work, L Nichol's work, C. Millar's work • Bodie Hills data overview, grazing in pika habitat in Nevada, update on Pikas in Peril Project

Question	Responses
3. What could have been done better?	• I think the afternoon was largely repetitive-the freer-form in am was excellent. • More time • More time • Nothing • We could have an employee who organizes all this! • More time! • More time • Nothing • The a-v issues weren't unavoidable =) Fewer snacks needed when lunch & dinner are planned • Fit in one more short break but overall very well organized!
4a. Regarding the facilitated discussion on pka status, do you think the discussion will be useful to scientists, managers, and decision-makers working on pika?	• ? • Yes • Yes • Yes • Yes • Yes • Yes • Yes • Mainly useful for managers, Shaye, and egomaniacs (for different reasons!) • Yes
4b. Did it seem fair to all participants?	• Yes • Yes • Yes • Yes • Yes • Yes • Yes • Yes • Yes • Yes

Question	Responses
4c. How could the discussion have been improved?	• More time • More time • Nothing • More time • A little longer discussion portion • Whiteboard for ideas • Fewer topics, longer time/topic; but not much more time • More time for the discussion topics, more explicit conclusions or interpretations of the data
5. Other comments about the meeting:	• Good overall • Let's get $ to hire someone! • Rushed, but good! • Fun to see everyone • I think it would be good to coordinate more with Western pika group and reach out to folks from that group to participate
6. What topics would you like future meetings of the CPC to focus on?	• Acknowledging climate change and not debating it as if it is one hypothesis • Fecal sample dating (sounds bad!) • pika-climate models
Other Comments	• Thanks! • Good job!

AGENDA

Winter 2011 Meeting of the California Pika Consortium

Riverside, CA - 2/11/2011

Start Time	Topic/Title	Speaker/Facilitator
10:15	Introduction	Scott Osborn
10:30	Round Robin Updates	Deana Clifford
11:00	National Park Service pika habitat occupancy study: Preliminary results from eight parks	Chris Ray & Mackenzie Jeffress
11:20	Dynamics of pika distribution in the hydrographic Great Basin, over the last century	Erik Beever
11:35	Status of Bodie Pikas	Andrew Smith
11:50	Status of Pika Populations in the Bodie Hills	Lyle Nichols
12:05	Pikas, Cows, and Weasels	Connie Millar
12:20	Citizen Science Monitoring	Scott Loarie
12:45	**Lunch**	
14:15	Pika Population Status and Threats – Facilitated Discussion 1. Sierra Nevada populations 2. Southern Cascades populations 3. Great Basin populations 4. Bodie populations 5. Modeling climate change impacts on pika (CANCELLED) 6. Pika ecological resilience	Scott Osborn
15:45	Next steps for the CPC	Connie Millar
16:00	Closing remarks	Toni Lyn Morelli

Winter 2011 Meeting of the California Pika Consortium
PROSPECTUS

The next semiannual meeting of the California Pika Consortium will be held at the Riverside Convention Center, Riverside, CA, on Friday, February 11. We have synced the CPC meeting with The Wildlife Society - Western Section annual meeting, although registration/fees will not be required to attend the CPC meeting only. If you are interested in attending the TWS-WS conference, and to find helpful logistic information, visit the TWS-WS conference website here:

http://joomla.wildlife.org/Western/index.php?option=com_content&task=view&id=212&Itemid=324

The focus of the meeting will be updates on the latest pika research, discussion of strategies to better to coordinate pika and other high-elevation small mammal work across the western states, and new potential funding for a cross-state initiative for pika coordination, research, and monitoring. In addition, we will have a discussion about how the CPC can be most helpful in providing scientific information for future decisions of whether to list the pika as endangered or threatened at the state or federal level, specifically in the context of the Center for Biological Diversity information that is the subject of the recent court ruling. As always, we will have opportunities for people to link in remotely if they cannot or prefer not to travel.

If you would like to suggest additional items for the agenda please contact Toni Lyn Morelli (morellitlm “at” gmail.com).

Pika Population Status and Threats
CPC Meeting – Riverside, CA – February 11, 2011

FACILITATED DISCUSSION PLAN

Purpose	This discussion will allow California Pika Consortium (CPC) meeting participants to describe the scientific basis for their interpretations on the population status of pikas in California and suggestions for their conservation.
Need	Pika scientists have a range of evidence and interpretations available about the current status of pikas and the degree of influence that climate change and other factors are having. This discussion will provide a forum for sharing information and discussing its applicability to the questions of pika population status, threats, and conservation. The discussion will be documented in the CPC meeting report to help inform decision-makers involved with pika listing petitions.
Who Will Participate	Contributors to the discussion will include scientists working on pika-related studies and persons using information from such studies to address pika conservation and management needs.
Objectives	• Participants will address six topics pertaining to pika population status and threats (see schedule) • Each participant with information relevant to a given topic will have the opportunity to briefly present that information • Discussion on each topic will help all participants understand where points of either convergence or divergence occur regarding the available information and its interpretation
Expected Outcomes	• Shared understanding about the available evidence and points of agreement and disagreement among experts on pika population status in the various regions, climate change effect models, and the pika's ecological resiliency to climate change impacts • Shared understanding of the scientific basis for the experts' interpretations of the information available on these topics • Identification of specific pika conservation status topics requiring additional study • A complete and concise report of the discussion for future reference
Discussion Length	90 minutes
Facilitator	Scott Osborn, California Department of Fish and Game

Discussion Format

After a brief introduction by the facilitator, the discussion will address six topics on pika population status and threats, climate change models, and the pika's ecological resilience to climate change impacts. For each topic, pre-identified speakers will present or recap the scientific information available to address that topic. To ensure a range of perspectives is heard, the facilitator will work with pika experts before the meeting to identify one or more speakers for each topic. Time will be allocated based on the total number of speakers for each topic, with a total of 9 minutes allocated to pre-identified speakers. Some coordination between speakers before the meeting will help ensure good coverage of the available information. Four minutes will be allocated to speakers who are not pre-identified but who have relevant information to add to the discussion, or who wish to respond to points made by the other speakers. The total time allotted to each topic may be adjusted before the meeting based on discussions between the facilitator and speakers.

In the interest of addressing all the topics in the short amount of time available, the time limits will be strictly enforced by the facilitator. If, during the discussion, a speaker indicates he or she has more information to present on the topic, then this will be noted on a flip chart and the discussion will return to the topic if time permits. To the extent possible, speakers should reference information provided during the morning presentations. Speakers with information not presented in the morning, but which is available in graphical or tabular form, should summarize the information on one or two PowerPoint slides. PowerPoint slides may be provided to the facilitator during the meeting lunch break or via email before the meeting.

Persons interested in speaking during the discussion should contact the facilitator (Scott Osborn, sosborn@dfg.ca.gov) as soon as possible to ensure efficient use of time and, especially, to avoid repetition.

Roles

- Participants will collaborate despite sometimes having conflicting perspectives on the available information. Disagreement can be a powerful tool for improving our state of knowledge.
- Speakers will focus on the available information addressing the six topics.
- Speakers are not required to provide their assessment of what the information means to the pika's conservation status, but they may do so if they wish.
- The facilitator will create a neutral and fair setting for the discussion, and will ensure the schedule is followed, visual aids are queued up and displayed properly, and notes are taken.
- Participants will provide evaluation comments at the end of the CPC Meeting.

Ground Rules

- Speak to the group rather than to an individual, unless posing a specific question to be addressed in a follow-up period.
- Stay within time limits.
- Respectful disagreement is fine.
- Interruptions and distractions are not allowed.

Recording

A note-taker will record the main points made by each speaker in a Word document. These notes will form the basis for the report section on the discussion. PowerPoint slides presented to the group will be retained for inclusion in the report as well. All CPC members will be afforded the opportunity to review a draft version of the report and provide corrections and clarifications prior to finalizing the report. The final report will be posted on the CPC website.

Evaluation

The CPC steering committee has prepared an evaluation form for the Winter Meeting. The evaluation includes a section on the facilitated discussion. Your comments will help ensure the success of future events like this one.

Discussion Topics

The first four discussion topics will address the regional population status of pikas. The four regions and area are: Sierra Nevada, Southern Cascades, Great Basin, and Bodie Hills/Bodie State Historic Park. The fifth topic will address pika climate change impact models. The last topic will address the pika's ecological resilience to climate change impacts and our current state of knowledge on this topic.

Discussion Schedule

If you are interested in presenting information in any of the 9-minute time slots, please contact Scott Osborn (sosborn@dfg.ca.gov) as soon as possible. Scott will work with self-identified speakers to ensure the most efficient coverage of the discussion topics.

Topic	Start Time	Time (min)	Identified Speakers
Introduction	14:15	10	Scott Osborn
1. Sierra Nevada	14:25	10	Shaye Wolf, Erik Beever, Connie Millar, David Wright, Cody Massing
	14:35	5	Other speakers not pre-identified
2. Southern Cascades	14:40	10	John Perrine, Chris Ray
	14:50	5	Other speakers not pre-identified
3. Great Basin	14:55	10	Andrew Smith?, Connie Millar, Erik Beever, Brad Bauman
	15:05	5	Other speakers not pre-identified
4. Bodie Hills and Bodie SHP	15:10	10	Andrew Smith (BSHP), Lyle Nichols (BH/BSHP), Connie Millar (BH)
	15:20	5	Other speakers not pre-identified
5. Pika ecological resilience	15:25	10	David Wright, Erik Beever (?), Andrew Smith, Connie Millar
	15:35	5	Other speakers not pre-identified
Conclusion	15:40	5	Scott Osborn