UC Science Team updates for SNAMP 2013 First Quarter (Q1)
Main project findings and work accomplished since previous report on January 10, 2013
~April 29, 2013~

Project Integration and Management Team

Quarterly financial update

The UC Science Team is on budget for Year 7, 2013 (Table 1). We have received $1,258,057 in direct funding from the US Forest Service, as well as $289,000 in aviation support for research on the Pacific fisher. The University of California contributed $207,323 to SNAMP in 2013 by waiving indirect charges. We have discussed Year 7 support from the Department of Water Resources (DWR). Funding from the DWR is contributed directly to UC Merced. Currently, Year 7 is under discussion between DWR and UC Merced scientists.

In addition to the status of DWR funding, other financial concerns include the need to obtain crew housing on the commercial market for summer 2013 field work at Last Chance. This is an unanticipated expense for the Fire and Forest Ecosystem Health Team. In addition, the expenses of field work associated with the transition of the SNAMP fisher project to the Sugar Pine fisher project inject uncertainty into the budget. We will continue to monitor expenses and adjust accordingly.

Integration

In addition to the financial, administrative, and logistical support that PIM provides to the UCST, we have been developing the integration framework that the UCST will use to produce the final integrated assessment. Building on ideas from the 2012 All Scientist meeting, PIM has created an Integration roadmap that describes the points at which teams have to work together to produce the integrated final products in as timely and efficient a manner as possible. The Integration roadmap also explores various methods for standardizing resource metrics so that the multi-resource integrated metrics will be broadly comparable, at least in terms of the magnitude of impact to each resource. This could help decision-makers compare SPLAT effect sizes among resources and, therefore, make more fully informed decisions about SPLAT planning and implementation. Finally, the Integration roadmap will help the UCST evaluate, with input from the MOUP and stakeholders, how best to present the integrated assessment to SNAMP’s multiple audiences.
Work on the Integration roadmap is also serving as background material for a SNAMP white paper on methods of integrating multi-resource assessments. The Integration roadmap and its associated timeline have been provided to the MOU partners prior to the April 2013 MOUP quarterly meeting.

UCST Coordination

PIM continues to plan and budget for successful project completion in 2014/2015. Budget uncertainties and shortened project timelines, as well as unanticipated project needs such as the Last Chance lidar reflight, have required PIM to invest much time and effort into multiple budget and workplan revisions and other administrative activities.

- Administration: assisting teams with HR activities, planning, and budget reporting; maintaining SNAMP publications list; maintaining bSpace archive
- Logistics: coordinating monthly UCST conference calls and other interteam communication; assisting teams with field crew lodging and other logistical needs
- Produced Integration roadmap as a planning document for 2013-2015
- Met with PPT to plan integration activities and timeline
- Keeping track of adherence to SNAMP and science team agreements
- Helping to coordinate SNAMP Fisher project 2013 field season
- Participated in PPT Collaborative Adaptive Management workshops in Auburn
- Produced notes for UCST conference calls and 2012 All scientist meeting

Communication with MOU Partners (MOUP) and stakeholders

- Coordinated UCST production of the 2012 Q4 MOUP updates and produced Q4 notes
- Helping organize April MOUP 2013 Q1 meeting in Davis
- Coordinating UCST team updates and agenda for MOUP 2013 Q1 meeting
- Communicated with MOUP members regarding MOUP 2013 Q1 meeting
- Coordinating with USFS regarding lodging for UCST field crews in 2013
Table 1. Summary of expenditures of the Sierra Nevada Adaptive Management Project for Year 7 from 1/1/13 - 3/31/13. Budgeted amounts were based on Year 7 budget. Received amounts reflect actual transfers of funds to the contracting institutions. Balance reflects account balance as of 3/31/13. Encumbered amounts reflect funds already committed to pay salaries (as specified in hiring agreements) and ordered supplies/services. Available reflects the difference between Received – (Spent+Encumbered). All amounts in USD($).

<table>
<thead>
<tr>
<th>Research Theme</th>
<th>Contracting Institution</th>
<th>Budgeted Year 7</th>
<th>Received 10/1/12</th>
<th>Balance 3/31/13</th>
<th>Encumbered thru 12/31/13</th>
<th>Available 3/31/13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial</td>
<td>UC Berkeley(^1)</td>
<td>34,736</td>
<td>34,736</td>
<td>34,033</td>
<td>30,145</td>
<td>3,888</td>
</tr>
<tr>
<td></td>
<td>UC Merced(^2)</td>
<td>66,080</td>
<td>66,080</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>Imagery (Lidar)</td>
<td>147,056</td>
<td>147,056</td>
<td>0</td>
<td>147,056</td>
<td>0</td>
</tr>
<tr>
<td>Fire and Forest Health</td>
<td>UC Berkeley(^1)</td>
<td>129,598</td>
<td>129,598</td>
<td>146,585</td>
<td>117,016</td>
<td>29,569</td>
</tr>
<tr>
<td>Wildlife</td>
<td>UC Berkeley (fisher)</td>
<td>417,000</td>
<td>417,000</td>
<td>237,512</td>
<td>223,256</td>
<td>14,256</td>
</tr>
<tr>
<td></td>
<td>U Minnesota (owl)(^2)</td>
<td>98,139</td>
<td>98,139</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Water(^4)</td>
<td>UC Merced(^2)</td>
<td>149,492</td>
<td>99,492</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Project integration</td>
<td>UC Berkeley(^1)</td>
<td>124,200</td>
<td>124,200</td>
<td>128,597</td>
<td>118,938</td>
<td>9,659</td>
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<tr>
<td>Public participation</td>
<td>UC Cooperative Ext(^3)</td>
<td>82,000</td>
<td>82,000</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>UC Berkeley</td>
<td>59,756</td>
<td>59,756</td>
<td>53,864</td>
<td>50,001</td>
<td>3,863</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>UC Science Team</td>
<td>1,308,057</td>
<td>1,258,057</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>
NOTES

1. First quarter balances include carry forward from Year 6 (2012).

2. We cannot track subaward finances as closely as the awards held at UC Berkeley.

3. The public participation subcontract with UC Cooperative Extension is the only award that extends past the calendar year. Year 7 award starts on May 1, 2013 and continues to 30 April 2014.

4. There was no firm commitment from the State for 2013 although they did provide $150,000 in support for Water in 2012. We budgeted the same amount for 2013.
California Spotted Owl Team  
*Jan-April 2013*

- We completed the retrospective habitat map, which tracks vegetative changes due to timber harvest, fire, and regeneration from 1993-2012 across 74 territories.

- We are currently extracting the data from the habitat map that will be used as covariates in the models for the retrospective analysis.

- We have established the set of *a priori* models that we will use for the retrospective analysis.

- We began the 2013 field season and are busy completing owl surveys on the demographic and SNAMP study areas.

- We participated in a USFS meeting in January that concentrated on our group’s recent work with the California spotted owl.

Fire and Forest Ecosystem Health (FFEH) Team  
*1st Q 2013 Activities:*

- The FFEH team is preparing for the summer 2013 field season. It is/will be challenging logistically due to the size of the crew and number of plots that need to be remeasured. We have hired the crew, purchased equipment, and secured housing for Sugar Pine. We are still searching for housing at Last Chance now that the barracks are unavailable.

- We continue to meet with the Spatial Team to discuss altering the forest structure lidar maps for a fire behavior sensitivity analysis and the SPLATs fire hazard assessments. The challenge is that the plot-based crown bulk density and canopy base height values produced with FMA were used for the pretreatment maps. These values are different, however, when produced using Forest Vegetation Simulator-Fire & Fuels Extension, and the reasons are a bit elusive. FVS is needed for 30 year fire hazard analysis.

- We plan to begin the first (pretreatment forest structure, no SPLATs, 30 years out) FFEH outputs as soon as the veg map is finalized and made available.

Spatial Team  
*Update:*

Lidar data have been flown for the entire southern site and about 50% of the northern site. We are considering how to move forward with the reflight of the northern site. New lidar data are discrete return and waveform. We have received the discrete and waveform lidar for the southern site and part of the northern site (totaling about 2 Terabytes of space).
Working with the FFEH team, the Berkeley Spatial team is focusing on an uncertainty analysis of lidar data used for forest modeling (FARSITE).

The Merced spatial team has been actively working on the following:

1. Working on classifying the vegetation classes for both sites at the plot level.
2. Working with the Fisher team to model fisher habitat using environmental niche models.
3. Communicating actively with NCALM re: acquiring the new lidar data.
4. Working on extracting vegetation parameters from the discrete and waveform lidar data.

Presentations/Workshops:

Maggi Kelly gave 2 talks about SNAMP lidar:


Publications:

New/In Process:

In Press or Published:


- Science Briefs for many of the published papers can be found on the SNAMP website under Science Briefs: http://snamp.cnr.berkeley.edu/news/categories/research-briefs/.

Public Participation Team (PPT)

Website

- Maintained and updated regularly
- Sent out Web Updates
- Maintained server health and backed up data
- Updated SNAMP Facebook page regularly
• Continued citations tracking: Total number of citations for all publications is 77.

Assessment

• Archiving SNAMP materials – on-going
• Analysis of online survey, interview and observational data – on-going
• Program evaluation matrix refinement – on-going
• Three papers from learning data with Dr. Heidi Ballard:
  - Data: 2010 interviews, 2012 interviews, email survey, and post-event evaluations
  - First round coding complete
  - Second round coding begun and analysis by type of participant
  1) “What is the Relationship Between Adaptive Management and Environmental Learning?: Impacts of the Sierra Nevada Adaptive Management Project on Participants’ Environmental Learning” For Submission to Environmental Education Research or Ecology and Society
  3) “What and How Forest Managers, Scientists and Other Stakeholders Learned as Part of the Sierra Nevada Adaptive Management Project and Why it Matters” For submission to the Journal of Forestry and possibly Journal of Extension
• One paper in progress for studying the effect of social network on participation and information flow in adaptive management using social network analysis and content analysis methods
• One paper in progress - “third party monitoring paper,” exploring the evolution of the USFS management model from 1900 through SNAMP
  - Presented at conferences twice in January 2013
• One paper planned for California Agriculture – Snapshot of SNAMP based on the email survey from 2010
• Final interviews and email survey planned
  - Final interviews to be completed by December 2013
  - Data analysis – 3 months – to start January 2014
  - Writing of final report – 6 months – to start May 2014
  - Final email survey to be conducted in summer 2014
• Final interview planned subjects:
  - Integration
  - Learning
  - 3rd Party
  - AM process
  - Forest health
  - Closing the AM loop.
Outreach

- Both sites:
  - Developed and sent out follow up messages on SNAMP project status to update participants on the project
  - Successfully developed training modules to facilitate community Collaborative Adaptive Management (CAM) efforts in the future through a series of workshops at each research site
  - Attended mediation training in Davis, March 12 & 13, 2013
  - Assisted in the preparation of the MOUP meeting in Davis on April 29, 2013.

- Northern site:
  - Attended a CA Spotted Owl workshop sponsored by the US Forest Service on January 7, 2013
  - Participated in and helped facilitate a Sierra Cascade Dialog meeting on January 25, 2013
  - Facilitated three Collaborative Adaptive Management (CAM) workshops in Auburn on January 31, February 28 and March 28, 2013
  - Attended a CA Fisher working group meeting on February 1, 2013
  - Attended the Oakhurst CAM workshop on February 14, 2013
  - Assisted in the facilitation of a UC PACE conference on February 20, 2013.

- Southern site:
  - Presented SNAMP and the Pacific Fisher at Yosemite High School to 6 classes and about 120 students on January 16, 2013
  - Attended a Dinky Creek Desired Conditions Workshop, February 4, 2013
  - Put on two CAM workshops in Oakhurst, February 14 & March 14, 2013
  - Presented SNAMP to the Prather Fire Safe Council, Prather, CA, February 21, 2013
  - Posted Fisher update to SNAMP website [http://snamp.cnr.berkeley.edu/news/](http://snamp.cnr.berkeley.edu/news/)
  - Presented SNAMP to the Society of American Foresters – High Sierra Chapter, Clovis, CA on March 21, 2013
  - Submitted an article for the May 2013 ANREP story on SNAMP outreach
  - Wrote a proposal for a Chukchansi Grant of $40,000 with Yosemite Sequoia RCDC for rodenticide/poisons clean-up of marijuana grow sites in the local forest.
Fisher Team

- As of April 15, we are monitoring the activities/fates of 32 radiocollared fisher by fixed wing aerial radiotelemetry: 18 female and 14 male fishers.
- There were four mortalities of radiocollared fishers during this reporting period (mid-January 2013 to mid-April 2013). All four deaths were male fishers.
- This reporting period coincides with the end of SNAMP Fisher Study “Population Year 6”, when summary data for the full year can be provided. There were a total 11 mortalities of radiocollared fishers during April 1, 2012 to March 31, 2013, including 5 female and 6 male fishers. On average, the project has recorded 10 deaths/population year (excluding partial population year 1) during the timeframe of the study (Table 1).

- Four of the eleven deaths of radiocollared fishers for Population Year 6 were linked to predation, one was a roadkill fisher within Yosemite National Park (fisher “M02”), and the other six are in storage pending completion of necropsy evaluation at UC Davis.
- Predation continues as the most important cause of death for radiocollared fishers on the SNAMP Fisher study, followed by disease, and roadkill and starvation (see figure to right).
In late March, R. A. Sweitzer organized a meeting with scientists from the PSW Forest Service Kings River Fisher Project and UC Davis to review and verify information on cause-specific mortality for fishers in the Sierra National Forest. Overall, we have compiled information on a total 112 fisher mortalities in this part of the southern Sierra Nevada since May 2007 (Table 2). Information included in Table 3 has already been incorporated into two published manuscripts, two current submitted manuscripts (identified below), one draft manuscript (“Survival, causes of mortality, and an evaluation of the current status of the fisher population in the Sierra National Forest, California”), and two Ph.D. dissertations nearing completion by collaborators M. Gabriel and G. Wengert at UC Davis.

The 6th year of repeat camera surveys in the Key Watersheds and other parts of the Fisher Study Area has been ongoing since mid-October, and will continue through August 2013. To date, camera-based surveys to identify fisher activity (use or nonuse) have been completed or are underway in 134 1-km² grids associated with five fuel management treatment projects that occurred in the study area after Fall 2007; Sonny North, Sonny South, Graham Mountain, Cedar Valley, and Sugar Pine.

Although the annual re-survey of grids within the Key Watersheds area is not yet complete (82 of 127 grids have been surveyed so far), it is possible to provide insight on two of the three “Indicators for Fisher Management” we began tracking for the SNAMP Fisher Project in 2008. Adult female survival for Population Year 6 was 0.82 or 82%, which is slightly above the five year average of 79% (Table 3). Recently completed analyses of fisher home ranges indicates that there were a combined 6.6 adult+subadult “resident” fishers occupying portions of the Key Watershed area during the Fall and Spring period of Population Year 6 (September 1, 2012 to March 15, 2013; Table 3). Also, the trend for fisher use of 1-km² grid cells within the Key Watersheds for the current “camera year” (Cam Year 6) appears nearly as high as from last year (Table 3). Overall, the recent trend for all three Indicators for Fisher

Table 2. Cause-specific mortalities identified for radio collared and non-radio collared fishers for the SNAMP and Kings River Fisher projects during the period May 2007 to March 2013.

<table>
<thead>
<tr>
<th>Site</th>
<th>Predation</th>
<th>Infectious disease</th>
<th>Starvation</th>
<th>Injury-induced disease, or starvation</th>
<th>Roadkill</th>
<th>Rodenticide toxicosis</th>
<th>Human structures</th>
<th>Indeterminateb</th>
<th>Unknown pending</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNAMP</td>
<td>32</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>54</td>
</tr>
<tr>
<td>KRFP</td>
<td>32</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>9</td>
<td>4</td>
<td>45</td>
</tr>
<tr>
<td>Non-collared</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Non-collared kits</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

a Animals for which necropsies found evidence of significant debilitating injuries or wounding from failed predation attempts (n = 2) that prevented foraging, and/or contributed to bacterial infection (septicemia) eventually leading to death.
b Includes animals that were recovered in decomposed/dessicated condition, or animals for which neither necropsy or DNA forensics were able to detect evidence definitively linked to the death process
c Includes released orphan fisher kit M22; died two months post release
d Combined field and necropsy data indicated this animal became entrapped in a PVC air sampling tube; likely died by starvation/dehydration
e This category includes information on dead non-collared fishers that were reported to the projects by the public or wildlife biologists with Yosemite National Park or the Sierra National Forest.
f Carcass of this non-collared fisher was recovered on the ground next to a water tank on which the lid was ajar. Maintenance workers extricated the carcass and dropped it on the ground next to the tank.
g Orphaned fisher kits that were recovered from den trees but died in captivity during hand-rearing rehabilitation under care of a zoo veterinarian
h Abandoned fisher kit that was recovered in a den tree cavity that died from starvation and dehydration
Management in the SNAMP Fisher study area suggests that the study population is stable (Table 3).

Table 3. Summary of data on three different "Management Indicators" being used by the SNAMP Fisher Project to provide information on the status of the fisher population within the Bass Lake District of the Sierra National Forest, California.

<table>
<thead>
<tr>
<th>Population or Camera Year</th>
<th>Adult female survival (95% C.I.)</th>
<th>Adult and subadult fisher home ranges within the Key Watershed region</th>
<th>Repeated camera surveys of 1 km² grids within the Key Watersheds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Females</td>
<td>Males</td>
<td>Both</td>
</tr>
<tr>
<td>2007-08</td>
<td>0.80 (0.57 - 1.03)</td>
<td>5.6</td>
<td>2.6</td>
</tr>
<tr>
<td>2008-09</td>
<td>0.86 (0.68 - 1.04)</td>
<td>6.1</td>
<td>1.4</td>
</tr>
<tr>
<td>2009-10</td>
<td>0.57 (0.33 - 0.80)</td>
<td>4.1</td>
<td>0.1</td>
</tr>
<tr>
<td>2010-11</td>
<td>0.91 (0.74 - 1.08)</td>
<td>4.0</td>
<td>2.9</td>
</tr>
<tr>
<td>2011-12</td>
<td>0.82 (0.61 - 1.03)</td>
<td>5.0</td>
<td>1.7</td>
</tr>
</tbody>
</table>

\(^a\) Survival rates were estimated for each complete fisher population year (1 April to 31 March) using Kaplan-Meier staggered entry models; data were monthly records on known-fates of radiocollared animals. Individual fishers with dropped or failed radiocollars were censored from the analysis when they were not recaptured within 45 days.

\(^b\) Calculated based on the sum of the percent of each individual fisher home range (95% Fixed Kernel method) included within the Key Watershed region of the SNAMP Fisher Study area. Fixed kernel home range models were created using the Home Range Tools extension in ArcGIS 9.3.1, based on all individual fisher locations recorded during the period from September 1 to March 15 for each population year. Analyses to determine the percent overlap of each individual fisher home range with the Key Watershed region were completed in ArcGIS 9.3.1.

\(^c\) All grids that are mostly USDA Forest Service federal lands are surveyed/resurveyed during each "Camera year" (approx 15 Oct to 14 Oct) with remote cameras using a standardized survey protocol. Typically, the Key Watershed grids are surveyed during the fall and winter periods each year.
Late March-early April marked the start of the Spring 2013 denning season for fishers. Project field staff are actively working to identify new and possible re-used den trees/structures for fishers in the study area. In mid-March, the project was monitoring 15 female fishers with the potential to den/reproduce during Spring 2013. As of April 8, eight of those 15 females have been tracked and isolated in den trees. We expect several of the other seven females to den as well and should be able to estimate both the current year reproductive rate and current year fecundity by early June 2013.

Prior analyses have revealed that the locations of fisher den trees are very consistently located within each animal’s 50-60% core home range use area. Therefore, and in advance of the Spring 2013 denning season, Project Scientist R. A. Sweitzer provided Bass Lake District Wildlife Biologist Anae Otto with GIS shapefiles delineating the annual home range polygons for all adult and subadult female fishers (N = 15) being monitored in the District. The Bass Lake District was provided these data to support information needs for forest management in and around likely fisher denning habitats.

Project Scientist R. A. Sweitzer also provided Yosemite National Park with home range shapefiles for all SNAMP radiocollared fishers that have dispersed into the park, or that have significant portions of their home ranges within the boundaries of YNP. These data were requested and provided to facilitate management of habitats used by fishers within Yosemite NP.

Project Scientist R. A. Sweitzer continued data analysis and work on several manuscripts associated with data collected by the study during 2007 to March 2015. Work has been underway on two previously identified research products during this reporting period; draft manuscripts (1) “Survival, causes of mortality, and an evaluation of the current status of the fisher population in the Sierra National Forest, California, and (2) Predictions of space use consistent across monitoring techniques: camera traps and telemetry for Pacific fishers (re-titled: “Reconciling different types of animal space use data: camera traps and telemetry for Pacific Fishers (Martes pennanti)).

A few pre-submission details from the manuscript on fisher survival for combined data from the SNAMP and Kings River Fisher Projects include:

1. Nearly half (n = 54) or 49.5% of the total 109 individual fishers captured and radiocollared on the SNAMP Fisher project are known to have perished, compared to 45 (43%) of 105 fishers captured on the Kings River Fisher Project. Accordingly, survival trends are lower for all age and sex classes of fishers in the SNAMP Fisher study area compared to in the Kings River Project area.
2. Survival trends are lower for male compared to female fishers among all age classes within the SNAMP Fisher study area, which is also the case for juvenile and adult fishers in the Kings River study area.
3. On the SNAMP Fisher project, adult female fishers experienced very low survival (0.57 or 57%) during population year 4 (2010-11; Apr 1, 2010 to Mar 31, 2011). In all other years, however, adult female survival exceeded 0.8 or 80%, and was over 0.9 or 90% in both 2009-10 and 2011-12.
4. Although low male survival is much less of a concern for the biology of any population of wild animals, adult male survival on the SNAMP Fisher Project dropped to only 0.42 (43%) during 2011-12 (population year three). Adult male survival has rebounded to around 0.79 (79%) this year.
5. Known-fate survival modeling in analytical program MARK revealed that study “Site” is much less important than Age, Sex and especially Season (two 6-month seasons; Mar to Aug, Sep to Feb) for understanding fisher survival across the study areas. Importantly, and contrary to original expectations, survival among fishers in this part of the Sierra Nevada is actually lower during Spring-Summer compared to Fall-Winter. The atypical pattern wherein survival is lowest during spring and summer appears related to the previous discovery that the use of anticoagulant rodenticides and other toxic chemicals used around marijuana grow sites in the Sierra National Forest (and elsewhere in California) is poisoning fishers and their rodent prey (squirrels and mice). A co-authored manuscript describing details on how exposure to anticoagulant rodenticides (and other toxins) contributes to reduced survival among female fishers was submitted for publication during this reporting period (see below).

- Two manuscripts including contributions and data from SNAMP Fisher were submitted for peer-reviewed publication during this reporting period:

- One manuscript including contributions and data from SNAMP Fisher was accepted for publication during this reporting period:

- Project Scientist R.A. Sweitzer attended the 2013 meeting of The Western Section of The Wildlife Society in Sacramento in late January where he provided updates (paper handouts and Powerpoint presentations) related to the SNAMP Fisher Project:
  - Contributed information/presentations during a meeting of the Southern Sierra Nevada Fisher Working Group: (1) Update on SNAMP Fisher, (2) Preliminary Review: Status of Porcupines in the Sierra Nevada, and (3) SNAMP/Bass Lake District “Culvert Project” for the Wildlife-vehicle Collision Working Group.
  - Contributed a presentation review new findings and current activities by the SNAMP Fisher Project for a meeting of the California Martes Working Group

- Project Scientist R.A. Sweitzer presented an overview of the SNAMP Fisher Project to the local Audubon Society in Oakhurst, CA on March 13, 2013. The presentation was titled “Ecology of the Rare Pacific Fisher in the Sierra Nevada”. There were approximately 45 people in attendance.
Water Team

Field Activities

- Current field priorities are ongoing repairs to sites as needed to maintain data collection. A lower than average snow year coupled with a warm spring is allowing for earlier than usual access to sites.
- The culvert weir at Speckerman North Creek was removed in the fall to accommodate higher winter flows, and will be replaced in the next few months, once flows recede, to facilitate more accurate low flow measurements.
- Designs for fabricating the additional culvert weirs in Last Chance for next summer have been finalized.
- Damage to the instruments at Fresno Dome Met Station’s North Node from a fallen tree has been repaired.
- Much of the infrastructure for the wireless network around the Bear Trap Meteorological Station (Last Chance lower elevation met) has been installed and is awaiting delivery of data loggers to be fully operational. This is being done under a parallel NSF-supported project, and it is planned that the site will continue to operate after SNAMP ends, in cooperation with the local water agency.

Data Analysis

- Data efforts are focused on detailed analysis of sediment patterns, water sources/flow paths, discharge measurement methods, and stream chemistry.
- Data processing for the 2012 water year has been completed and is being used for higher level data analysis as well as for validating hydrologic models. We will carry out processing of 2013 data over the next few months.
- Laboratory processing of sediment and water chemistry samples are ongoing with some preliminary analysis completed.
- In-depth analysis of turbidity and storm event data has been completed and will be included in an upcoming manuscript. An additional manuscript on erosion rates is in the works.

Hydrologic Modeling

- Models are running for all 4 headwater catchments for water years 2010-2011. Tests are currently being run to determine the effects of different methods of thinning in the model – 1) decreasing Leaf Area Index, 2) decreasing canopy cover, and 3) increasing gaps in the canopy. The method, or combination of methods, used will have variable effects on transpiration, evaporation, soil water storage, and snow accumulation/melt. Assembling the spatial data for modeling the fireshed-scale catchments has also been ongoing. Recent discussions with Dr. Christina Tague, the developer of RHESSys, have emphasized the possible importance of understory vegetation, ground litter, calculating local daily temperature lapse rates, and implementing lateral soil distribution on modeling the effects
of forest thinning. These elements are being implemented into the model calibrations, along with the vegetation map the FFEH and Spatial teams are developing.