

2010 Annual Conference

# The Western Section of The Wildlife Society

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**The Western Section of The Wildlife Society**  
**2010 Annual Conference**  
**Schedule at a Glance**

<b>Tuesday January 26</b>		
8:00 am to 5:00 pm	<u>Workshop 1</u> : Animal Necropsy Workshop	College of the Sequoias
2:00 pm to 5:00 pm	Executive Board Meeting	Executive Board Room
<b>Wednesday, January 27</b>		
8:00 am to 12:00 am	Vendor/Exhibitor set-up	San Joaquin Ballroom D
8:15 am to 12:00 pm	<u>Workshop 2</u> : Orienteering Workshop	San Joaquin Ballroom B
9:00 am to 5:00 pm	Registration	Executive Lobby
9:00 am to 5:00 pm	Speaker Practice Room	Executive Board Room
12:00 pm to 5:00 pm	Poster Set-up	Executive Lobby
12:00 pm to 5:00 pm	Vendors/Exhibitors	San Joaquin Ballroom D
1:15 pm to 3:00 pm	<u>Concurrent Session 1A</u> : Amphibians and Reptiles (Part I)	Charter Oak Ballroom D
1:15 pm to 3:00 pm	<u>Concurrent Session 2A</u> : Nongame Mammals (Part I)	Charter Oak Ballroom B
1:15 pm to 3:00 pm	<u>Concurrent Session 3</u> : Shorebirds and Wetlands	Charter Oak Ballroom C
3:00 pm to 3:20 pm	Break	San Joaquin Ballroom D
3:20 pm to 5:00 pm	<u>Concurrent Session 1B</u> : Amphibians and Reptiles (Part II)	Charter Oak Ballroom D
3:20 pm to 5:00 pm	<u>Concurrent Session 2B</u> : Nongame Mammals (Part II)	Charter Oak Ballroom B
3:20 pm to 5:00 pm	<u>Concurrent Session 4</u> : Neotropical Migrants	Charter Oak Ballroom C
6:00 pm to 7:45 pm	Annual Conference Poster Session and Welcome Reception with Hors d'oeuvres, No-Host Bar (Ticket Required)	Executive Lobby
7:30 pm to 9:30 pm	<u>Chapter Meetings</u>	
	Southern California	Charter Oak Ballroom C
	California Central Coast	Charter Oak Ballroom D
	California North Coast/HSU Student	Charter Oak Ballroom B
	Sacramento-Shasta/UC Davis Student	Charter Oak Ballroom C
	San Joaquin	San Joaquin Ballroom B
	San Francisco Bay Area	Charter Oak Ballroom D
	Nevada/UNR Student	Charter Oak Ballroom B

**The Western Section of The Wildlife Society**  
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 Schedule at a Glance (continued)

**Thursday January 28**

7:00 am to 5:00 pm	Speaker Practice Room	Executive Board Room
7:30 am to 5:00 pm	Registration	Executive Lobby
8:00 am to 5:00 pm	Vendors/Exhibitors	San Joaquin Ballroom D
8:00 am to 5:00 pm	Posters	Executive Lobby
8:15 am to 10:00 am	<u>Concurrent Session 5</u> : Climate Change Effects on Wildlife	Charter Oak Ballroom D
8:15 am to 10:00 am	<u>Concurrent Session 6</u> : Large Scale Conservation Strategies (banking, easements, and landscape planning)	Charter Oak Ballroom C
8:15 am to 10:00 am	<u>Concurrent Session 7</u> : Disease and Wildlife Management	Charter Oak Ballroom B
10:00 am to 10:20 am	Break	San Joaquin Ballroom D
10:20 am to 12:00 pm	<u>Concurrent Session 8</u> : Techniques in GIS	Charter Oak Ballroom D
10:20 am to 12:00 pm	<u>Concurrent Session 9</u> : Wildlife Response to Restoration	Charter Oak Ballroom C
10:20 am to 12:00 pm	<u>Concurrent Session 10</u> : Raptors	Charter Oak Ballroom B
12:00 pm to 1:00 pm	Lunch	
1:00 pm to 3:20 pm	<b><u>Plenary Session</u>: Fostering Resilient Wildlife Populations</b>	Charter Oak Ballroom A, B, & E
3:20 pm to 3:40 pm	Break	Executive Lobby
3:40 pm to 4:10 pm	<b><u>Plenary Session</u>: Update from the Executive Director of TWS National</b>	Charter Oak Ballroom A, B, & E
4:10 pm to 5:00pm	<b>Remembering Kevin, Clu, Tom and Mike</b>	Charter Oak Ballroom A, B, & E
5:00 pm to 6:00 pm	Western Section Annual Business Meeting and Members Forum	Charter Oak Ballroom C
6:30 pm to 8:00 pm	Banquet (requires ticket)	Charter Oak Ballroom A, B, & E
8:00 pm to 8:30 pm	<b>Banquet Guest Speaker: Dr. Anthony Barnosky</b> (no ticket required for talk)	Charter Oak Ballroom A, B, & E
8:30 pm to 11:00pm	Awards and Raffle	Charter Oak Ballroom A, B, & E

**The Western Section of The Wildlife Society**  
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Schedule at a Glance (continued)

<b>Friday, January 29</b>		
6:30 am to 8:00 am	HSU Alumni Association - Wildlife Chapter Meeting	San Joaquin Ballroom A
7:00 am to 3:00 pm	Speaker Practice Room	Executive Board Room
7:30 am to 12:00 pm	Posters Break-down	Executive Lobby
7:30 am to 12:00 pm	Registration	Executive Lobby
7:30 am to 1:00 pm	Vendors/Exhibitors	San Joaquin Ballroom D
8:15 am to 12:00 pm	<u>Working Group Meeting 1: Fisher Working Group</u>	Charter Oak Ballroom D
9:00 am to 11:40 am	<u>Workshop 3A: Resume Workshop Part I</u>	San Joaquin Ballroom B
9:15 am to 4:00 pm	<u>Symposium: The American Pika's Capacity for Resilience in the Face of Climate Change</u>	Charter Oak Ballroom B&C
10:00 am to 10:20 am	Break; Silent Auction Closes	San Joaquin Ballroom D
11:00 am to 2:00 pm	Career Fair	Registration Lobby
11:40 am to 1:30 pm	Student Lunch	San Joaquin Ballroom A & B
12:00 pm to 1:00 pm	Lunch	
1:00 pm to 4:00 pm	Vendors/Exhibitors Break-down	San Joaquin Ballroom D
1:15 pm to 5:00 pm	<u>Working Group Meeting 2: California Bat Working Group</u>	Charter Oak Ballroom D
1:30 pm to 4:00 pm	<u>Workshop 3B: Resume Workshop Part II</u>	San Joaquin Ballroom B
3:20 pm to 5:00 pm	Executive Board Meeting	Grand Board Room

## General Information

**Registration Desk.** Registration materials, general information, and Western Section membership applications can be picked up at the registration desk. Members may obtain a copy of the *Transactions* at the registration desk.

**Refreshment and Lunch Breaks.** This year's conference will feature fewer frills than previous years in order to keep costs down, which allowed us to lower registration fees and offer for the first time a drastically reduced early-bird registration rate. Therefore, refreshments will be provided at the morning and afternoon breaks. Lunch will not be provided. For information on local restaurants and services, inquire at the registration desk.

**Speaker Practice Room.** The Executive Board Room will be available throughout the meeting for speakers to practice their presentations. You may obtain the key from the Registration Desk.

**Exhibits and Vendor Displays.** Exhibits will be displayed from noon to 5:00 pm Wednesday, 8:00 am to 5:00 pm Thursday, and 7:30 am to 1:00 pm Friday in the San Joaquin Ballroom C&D.

**Job Board.** Job announcements can be posted and viewed at the job board near the registration desk. Please do not post résumés, as we cannot be responsible for the security of your personal information.

**Messages and Announcements.** Messages and announcements can be posted and viewed at the message board near the registration desk.

**Plenary Session.** The plenary session, titled "Fostering Resilient Wildlife Populations," will be held on Thursday, January 28, from 1:00 pm to 3:20 pm in the Charter Oak Ballroom A, B & E. There will be no concurrent sessions during the plenary session.

**Concurrent Sessions, Symposia, and Working Group Meetings.** Concurrent sessions will begin on Wednesday, January 27 at 1:15 pm, and will continue on Thursday morning. Symposia and Working Group meetings will be held on Friday. Working Group meetings are open to all registered meeting participants.

**Poster Sessions.** Conference posters will be available for viewing on Wednesday, January 27 between 6:00 pm and 7:45 pm, concurrently with the Conference Welcome Reception in the Executive Lobby. Authors will be available to answer questions about their posters during this time. Posters will also be available for viewing all day Thursday, January 28<sup>th</sup> in the Executive Lobby.

**Welcome Reception.** A welcome reception will be held on Wednesday, January 27 from 6:00 pm to 7:45 pm in the Executive Lobby, concurrently with the poster session. A ticket is required for entrance to the welcome reception. A taco bar (available at no additional cost) and a no-host bar will be available. Posters will also be available for viewing at other times during the meeting.

**Plenary Extraordinaire.** We are honored to welcome a distinguished panel of scientists to our plenary session, offering an important perspective on future scenarios facing the natural environment and species we strive to manage. We are facing extraordinary times that will challenge our ability to minimize the potentially catastrophic and exacerbating effects of climate change together with the already existing challenges we face with population increases, and the commensurate loss of habitats. These internationally recognized researchers Dr. Terry Root, Dr. James Thorne, Dr. Patrick Kelly, and Dr. Amber Pairis are leading the way with cutting-edge science and policy development that will inform and guide our ability to foster resilient wildlife populations in the future. This is a plenary meant to provoke thoughtful action in hopes of implementing meaningful change, influencing the best we can some positive steps that may help minimize the outcome predicted by most experts. You won't want to miss this opportunity to hear from this panel, what's at stake, what we are seeing, what's being done and what you can do to help!

**Update from TWS National.** There will be an opportunity to hear from the Executive Director and CEO of the Wildlife Society, what initiatives and policy changes are planned or pending including the recent change to the bylaws requiring active membership in the society to maintain Certified Wildlife Biologist status.

**Memorial to Clu Cotter, Kevin O'Conner, Tom Stolberg, and Mike Donovan.** On January 5, 2010 we tragically lost three California Department of Fish and Game biologists, along with our contract pilot, when their helicopter crashed in a remote part of Madera County while performing a routine aerial survey of deer populations. Our gathering here in Visalia brings us to their home, where they lived and worked, and gave so much of themselves to wildlife and the wildlife profession. We honor them today and thank them for all they gave.

**Annual Business Meeting and Members' Forum.** The Annual Business Meeting and Members' Forum will be held on Thursday, January 28, from 5:00 pm to 6:00 pm in the Charter Oak Ballroom C. Officers and committee chairs of the Western Section will provide reports for membership information and discussion, and new officers and Executive Board members will be introduced. Executive Board members will discuss items of interest to the general membership. Attendance by all members is encouraged and will be rewarded.

**Annual Banquet.** The annual banquet will begin with cocktails and social at 6:00 pm, and with dinner beginning at 7:00 pm, in the Charter Oak Ballroom A, B, & E. (**A symbol on your name badge indicating payment is required for entrance to the dinner**). The evening will be catered by Visalia's own Su Sa's Creative Catering, The banquet will feature local organic free range beef and wild Alaskan salmon. Vegetarian entrees will be prepared using local produce.

**Annual Banquet Special Guest Speaker.** The banquet will feature a special guest speaker beginning at 8:00 pm, Thursday, January 28, in the Charter Oak Ballroom A, B, & E (No ticket required). Dr. Anthony D. Barnosky has been on the faculty at the University of California–Berkeley Since 1990, where he currently holds the posts of professor of Integrative Biology, curator of Fossil Mammals in the Museum of Paleontology, and research paleoecologist in the Museum of Vertebrate Zoology. Author of "Heatstroke:

Nature in an Age of Global Warming,” Dr. Barnosky offers a harrowing look into how the rapid pace of current climate change, combined with habitat fragmentation and other more direct human insults on nature, are forever altering ecosystems and threatening the survival of myriad species. Dr. Paul R. Ehrlich, Bing Professor of Population Studies, Stanford University, says “ ‘Heatstroke’, begins where others on global warming leave off. Anthony Barnosky shows that we’re not just heating up the planet, but changing its basic character: today’s familiar animals and wild places may not be here tomorrow. For anyone who has grown attached to nature as we know it, this is an essential, eye-opening read.” “Heatstroke” will be available for sale prior to and following the banquet.

**Awards.** Presentation of the annual awards will follow the Banquet guest speaker beginning at approximately 8:30 pm on Thursday, January 28, in the Charter Oak Ballroom A, B, & E. Awards will be presented, including the “Raymond F. Dasmann Professional of the Year,” “Conservationist of the Year,” and the “Barrett A. Garrison Outstanding Mentor Award.” Also, the awards for best student presentation and poster will be announced.

**Raffle and Silent Auction.** The annual raffle will be conducted during Thursday evening’s banquet, and the silent auction will conclude at the Friday morning break in the Executive Lobby. Proceeds from the fundraiser go towards the student awards and grants programs. We encourage everyone to purchase raffle tickets, which are available at the registration desk or from Western Section Executive Board members and volunteers. Raffle and silent auction items will be displayed near the registration desk.

**Career Fair and Student/Professional Lunch.** The Career Fair will again be hosted by Karen Swaim, Swaim Biological Consulting, and will be held on Friday from 11:00 am to 2:00 pm in the Registration Lobby. This is an opportunity for students to meet prospective employers and discuss careers in the wildlife sciences. The lunch, served in the San Joaquin Ballroom A & B at noon, is free to students and professionals who have indicated they will attend on their registration form. A symbol on the conference name badge is required. All registered meeting participants are invited to attend the Career Fair.

**Student Presentation and Poster Contest.** Awards will be given to the best student presentation and poster. Student paper and poster awards will be announced at the banquet.

**Local Information.** Information on parking and dining in the downtown Visalia area is available as handouts at the Registration Desk.

**When entering or exiting rooms during sessions, please be careful to open and close the doors quietly. Please do not congregate and converse in the hallway in the immediate area of a door, as your conversation may disturb ongoing sessions.**

**Informal Cell Phone “Policy.”** The Western Section of The Wildlife Society strongly encourages all meeting participants to silence all cellular phones and similar devices prior to entering meeting rooms! The informal policy of the Western Section “Sergeant-at-Arms-for-

Life” (Rhys Evans) is that, if your device makes an audible noise during any session, you will be expected to purchase a beverage for every person in your seating row at that evening’s social function.

**Associated Meetings:**

**Tuesday, January 26**

8:00 am to 5:00 pm Animal Necropsy, College of the Sequoias  
2:00 pm to 5:00 pm Western Section Board Meeting, Grand Board Room

**Wednesday, January 27**

8:15 am to 12:00 pm Orienteering Workshop (San Joaquin Ballroom B)  
7:30 pm to 9:30 pm Chapter meetings (See Below)  
California Central Coast Chapter Charter Oak Ballroom D  
California North Coast Chapter Charter Oak Ballroom B  
Nevada Chapter Charter Oak Ballroom B  
San Francisco Bay Area Chapter Charter Oak Ballroom D  
Southern California Chapter Charter Oak Ballroom C

**Thursday, January 28**

5:00 pm to 6:00 pm Western Section Annual Business Meeting and Member Forum (Charter Oak Ballroom C)

**Friday, January 29**

6:30 am to 8:00 am HSU Alumni Association, Wildlife Chapter (San Joaquin Ballroom A)  
8:15 am to 12:00 pm Fisher Working Group (Charter Oak Ballroom D)  
9:00 am to 11:40 am Student Résumé Workshop (San Joaquin Ballroom B)  
9:15 am to 4:00 pm *Symposium: The American Pika’s Capacity for Resilience in the Face of Climate Change* (Charter Oak Ballroom B&C)  
11:30 am to 2:00 pm Career Fair (Registration Lobby)  
11:40 pm to 1:30 pm Student Lunch (San Joaquin Ballroom A&B)  
1:15 pm to 5:00 pm California Bat Working Group (Charter Oak Ballroom D)  
1:30 pm to 4:00 pm Student Résumé Workshop (San Joaquin Ballroom B)  
3:20 pm to 5:00 pm Western Section Executive Board (Grand Board Room)

**Professional Development.** The number of contact hours for each workshop and contributed paper session is equal to the number of actual hours spent in a workshop or session and does not include time allotted for breaks or lunch. Generally speaking, attendance at a meeting such as this is not creditable for an initial application for Certified Wildlife Biologist or Associate Wildlife Biologist. However, hours may be credited “one for one” toward CWB recertification. As an example, if you attend four 2.5 hour technical sessions (sorry, social events don’t count!), you may claim 10 hours toward a Professional Development Certificate or toward Certified Wildlife Biologist recertification. Speaking in or chairing a session is usually credited at 1 hour = 2 hours. Additional information on the TWS Professional Development Certificate and Certified Wildlife Biologist and Associate



Wildlife Biologist programs is available from the TWS-Western Section Professional Development Committee or on the national TWS website at: <http://wildlife.org/certification>

**Responsibility begins with us!** The Western Section of The Wildlife Society, the Visalia Convention Center, and Su Sa's Creative Catering are pleased to provide our members certified organic and shade-grown coffee (being served during the banquet and all refreshment breaks). The banquet will feature local free range organic beef, and wild Alaskan salmon. You will notice the costs for this year's banquet are higher than past years due to the higher costs for healthy and environmentally responsible food products. This was a conscious decision on behalf of the Executive Board to help reduce impacts on vulnerable species populations.

**Re-usable Nametag Holders.** The Western Section is now using re-usable nametag holders. Please drop your nametag holder off at the Registration Desk at the end of the conference. Thanks!

**Recycled Paper.** This program has been printed on 100% post consumer, chlorine-free, acid-free, recycled paper.

### **Field Trips and Other Outing Ideas**

#### **Opportunities for Self-Guided Field Trips**

*(Come to the information desk to inquire about/sign up to carpool to an outing!)*

#### **Kaweah Oaks Preserve (7 miles away)**

Access to this Preserve is free and it is open to the public from dawn to dusk, 365 days a year. The oaks preserve is located only 7 miles east of the conference location (downtown Visalia).

The Kaweah Oaks Preserve contains 324 acres of the finest remaining Valley oak woodlands in the world, and is a remnant example of the thousands of square miles of Valley oak woodland and riparian forest that once grew on the floor of the Central Valley. Wintering birds begin to arrive in September and stay through mid April; after the leaves have fallen is a very good time to observe wintering raptors. The Preserve is now managed by the Sequoia Riverlands Trust.

Directions: From Freeway 99, take Hwy 198 east (towards Sequoia National Park), turn N on Road 182. Preserve parking area is 1/2 mile north of Hwy 198 at 29979 Road 182. Enter the preserve through the fence opening (cattle-proof) just to the left of the information sign.

#### **Kings Canyon and Sequoia National Parks (46 miles away)**

Sequoia National Park is less than an hour's drive from Visalia (go east on Highway 198). Kings Canyon National Park can then be accessed by traveling north on Generals Highway (maps provided at Park entrance). A *7-day pass* for Sequoia, Kings Canyon, and the Hume Lake District of Sequoia National Forest (Giant Sequoia National Monument) is \$20 per

vehicle or \$10 per person on foot, bicycle, motorcycle, or bus.

Sequoia and Kings Canyon National Parks contain big trees, high peaks, and deep canyons. Located in the southern Sierra Nevada range, the parks' elevations extend from 1,300 feet (418m) in the foothills to 14,491 feet (4,417m) at the summit of Mount Whitney, the highest mountain in the contiguous 48 states. Plunging in the opposite direction far below the surface are over 200 marble caverns, many with endemic cave fauna. Here one can observe a vast diversity of plants and animals representing an array of adaptations. The unusual diversity of climates and ecosystems in Sequoia and Kings Canyon National Parks led to its designation as an International Biosphere Reserve; only 531 areas hold this honor worldwide.

While the Parks have many amazing biological and geologic features, of note are the Giant Sequoia groves. The giant sequoia is world-renowned as the largest living thing on the planet, and these majestic trees continue to inspire wonder. Also known as 'big tree' in California, the giant sequoia lives up to its name, reaching up to 95 meters in height and 11 meters in diameter. This species lives only on the western slopes of the Sierra Nevada in California, in protected areas where there are deep, moist soils, and at altitudes between 1,100 and 1,500 meters above sea level. Today the range is much more discontinuous than it once was, and the species is restricted to around 75 distinct groves. The ages of the General Sherman, General Grant and other large sequoias are unknown, but it is estimated that these giants are between 1800 and 2700 years old. There are many Giant Sequoia Groves in Kings Canyon and Sequoia National Parks as well as in the adjacent Giant Sequoia National Monument and Sequoia National Forests. The groves most easily accessible during January would be Grant Grove (Kings Canyon NP), home to the General Grant Tree, and the Giant Forest (Sequoia National Park), home to the General Sherman Tree, which holds the world record for the most massive living thing.

Sequoia and Kings Canyon National Parks offer more than 850 miles of maintained wilderness trails. Over 723,000 of the parks' acres are officially designated as Wilderness.

The adjacent Sequoia National Forest and Giant Sequoia National Monuments add and additional hundreds of thousands of acres of accessible and protected areas. Please see <http://www.fs.fed.us/r5/sequoia> for more information on the National Forest and Monument.

In Kings Canyon and Sequoia National Parks, winter generally lasts from November until mid-April. This is a great time to explore lower elevations in the parks and the sequoia groves are covered in snow. A few campgrounds are open. The roads to Cedar Grove and Mineral King are closed, but the General's Highway is open but subject to brief closures after winter storms for plowing. For information call 1-559-565-3341. Keep tire chains, a sleeping bag, water and emergency food with you in your car.

For more general information about these amazing National Parks, please see <http://www.nps.gov/seki>

## Exhibitors

Kathy Kondor  
**ECORP Consulting, Inc.**  
1801 Park Court Place  
Building B, Suite 103  
Santa Ana, CA 92701  
(714)648-0630  
kkondor@ecorpconsulting.com

Blake Henke  
**North Star Science and Technology, LLC**  
PO Box 438  
King George, VA  
(410)961-6692  
blake@northstarst.com

**Peter Knapp**  
Photography  
4312 E. 2nd St. Apt E  
Long Beach, CA 90803  
(562)439-6474  
peterlknapp@yahoo.com

Rene Reyes  
**Reyes Paintings**  
12 E. Noble Street  
Stockton, CA 95204  
(209)466-2129  
Reyespaintings@sbcglobal.net

Chris Kochanny  
**Sirtrack Tracking Solutions**  
845 Pheasant Lane  
North Liberty, IA 52317  
(319)665-2542  
kochannyc@sirtrack.com

Darryl Walter  
**The Wildlife Society**  
5410 Grosvenor Lane  
Bethesda, MD 20814  
(301)530-2471  
dwalter@wildlife.org

## Carbon Offset Information

### Go Carbon Neutral!

Carbon Neutral Visalia, 2010

The Western Section of The Wildlife Society is proud to again partner with River Partners, to offset the carbon footprint of the Visalia 2010 conference. Over the past two years, the Western Section has collected donations from conference attendees, with the proceeds being used to purchase native oak trees that were then planted by volunteers, at the Del Rio Unit and Wilson's Landing Unit of the Sacramento River Wildlife Area in Glenn and Butte Counties, California. These trees will sequester more than 400 metric tonnes of carbon dioxide over their lifetime which will help reduce the long-term impacts associated with global climate change.

This year, your carbon neutral contribution will go towards another River Partners' restoration project located on the San Joaquin River National Wildlife Refuge in Stanislaus County. The project involves restoring 777 acres of floodplain riparian vegetation. This project is located on the West Unit of the Refuge which is made up of approximately 3,166 acres of agricultural land that was sold to the U.S. Fish and Wildlife Service (USFWS) in 1999 by three farmers after adjoining levees failed in 1983 and again in 1997. The major objective of this restoration project is to restore riparian habitat for federally and state-listed species including the riparian brush rabbit, valley elderberry longhorn beetle, yellow-billed cuckoo, Swainson's hawk, Chinook salmon, steelhead and Sacramento splittail. The riparian plantings will be complemented by adjoining seasonal and permanent wetlands being restored by the USFWS, further expanding the habitat benefits of the project to include waterfowl and shorebirds. By planting a diversity of native riparian woody plants with differing physical forms and structures, wildlife habitat will greatly improve in areas that were just recently fallow agricultural fields. Thirteen riparian woody plant species including valley oak, elderberry, Fremont cottonwood, blackberry, box elder, buttonbush, rose, coyote brush, mule fat, Oregon ash, and three species of willows are being planted on the Refuge. Restored riparian plant communities range from Fremont cottonwood forest in areas with relatively shallow water tables and coarse soils to Valley oak savanna clusters located on relatively drier locations with higher elevations.

If you would like to contribute to the Visalia Carbon Offset Program and this project, please see Candace at the registration desk.

## ***Purchase Ecouseable Stainless-steel Water Bottles: Proceeds to Benefit Carbon-Offset Projects***

The Western Section has teamed with Ecousable, Inc. to provide another opportunity for conference attendees to help with carbon offset projects. Ecousable invents, produces and markets reusable eco-friendly products that are fashionable and affordable. The company's two flagship products, Water Wrapz™ (a removable and reusable band to identify your water bottle) and EcoUsable bottles (Stainless Steel bottles that are 100% recyclable) reduce the amount of plastic water bottles one uses, while saving money every day. The company has donated 100 bottles to the Western Section. All proceeds from the sale of the bottles will be donated to one of the carbon-offset projects highlighted at the Carbon-Neutral booth. Thanks, Ecouseable!

For more information go to [www.ecousable.com](http://www.ecousable.com)



**All persons who complete and submit a Conference Evaluation Form will be entered in a drawing for a special prize. The drawing will be held after the conference ends.**

## THE WESTERN SECTION OF THE WILDLIFE SOCIETY

PO Box 6756

Albany, CA 94706

<http://joomla.wildlife.org/western>

### Officers, Representatives, Committee Chairs and Contract Staff

#### 2009 ELECTED OFFICERS

**Scott Osborn**, President  
California Department of Fish and Game  
Sacramento, CA

**Armand Gonzales**, President-Elect  
California Department of Fish and Game  
Rancho Cordova, CA

**Rhys Evans**, Past-President  
Vandenberg Air Force Base  
Lompoc, CA

**Don Yasuda**, Section Representative &  
Membership Services  
U.S. Forest Service  
Diamond Springs, CA

#### 2009 APPOINTED EXECUTIVE BOARD MEMBERS

**Gary Falxa**, Treasurer  
U.S. Fish and Wildlife Service  
Eureka, CA

**Debra Hawk**, Newsletter Editor  
California Department of Fish and Game  
Bishop, CA

**Janae Scruggs**, Secretary  
Sacramento Airport Authority  
Sacramento, CA

**John Harris**, Transactions Editor  
Mills College  
Bakersfield, CA

#### CHAPTER REPRESENTATIVES

**Lisa Ollivier**  
California North Coast Chapter  
Pacific Southwest Research Station  
Arcata, CA

**Shaun Oldenburger**  
Sacramento-Shasta Chapter  
California Department of Fish and Game  
Sacramento, CA

**Bill Standley**  
Hawai'i Chapter  
U.S. Fish and Wildlife Service  
Honolulu, HI

**Natasha Dvorak**, SF Bay Area Chapter  
Environmental Science Associates  
Petaluma, CA

**Nova Simpson**  
Nevada Chapter/UNR  
Reno, NV

**Craig Bailey**  
San Joaquin Valley Chapter  
California Department of Fish and Game  
Fresno, CA

**Tim Belton**, CA Central Coast Chapter  
Vandenberg Air Force Base  
Santa Maria, CA

**Jeff Lincer**, Southern CA Chapter  
Wildlife Research Institute Field Station

**Sara Peterson**, Humboldt State Univ.  
Arcata, CA

**Chris Mosser**, Davis Student Chapter  
Davis, CA

## TWS-WS COMMITTEE CHAIRS

### Awards and Grants

**Richard Burg**

California Department of Parks and  
Recreation  
San Diego, CA

### Conservation Affairs

**Rick Truex**

U. S. Forest Service

### Historian

**James Yoakum**

Western Wildlife  
Verdi, NV

### Professional Development

**Denise Walker-Brown**

McKinleyville, CA

### Student Affairs

**Darla DeRuiter**

Feather River College Quincy, CA

## TWS-WS CONTRACT STAFF

### Bookkeeper

**Mike Chapel**

Grass Valley, CA

### Program Director

**Cynthia Perrine**

San Luis Obispo, CA

### Registrar

**Candace Renger**

Albany, CA

### Webmaster

**Eric Renger**

Albany, CA

## 2010 Annual Meeting Program Committee

Chair: **Armand Gonzales**,  
Calif. Dept. of Fish and Game

### Audio Visual Captain

**Don Yasuda**, U.S. Forest Service, El Dorado  
National Forest

### Career Fair and Student Lunch

**Karen Swaim**,  
Swaim Biological Consulting

### Raffle and Silent Auction

**Lisa Ollivier**, U.S. Forest Service,  
Pacific Southwest Research Station  
**Sandra Hunt-von Arb**,  
Pacific NorthWestern Biological, Inc.

### Posters

**Canh Nguyen**, Calif. Dept. of Fish and  
Game  
**Amy Fesnock**, Bureau of Land  
Management

### Volunteer Coordinator

**Janae Scruggs**, Sacramento Airport  
Authority

### Program Editing

**Rhys Evans**, Vandenberg Air Force Base  
**Cynthia Perrine**, Program Director

### Vendors and Exhibitors

**Natasha Dvorak**,  
ESA Biological Services Group

### Section Chapter Coordinator

**Cynthia Perrine**, Program Director

### Student Posters & Presentation Judging

**Kristen Reynolds**, Beale Air Force Base  
**Rhys Evans**, Vandenberg Air Force Base

### Awards

**Rich Burg**, Calif. Dept. of Parks and  
Recreation

### Childcare Arrangements

**Julie Vance**, Calif. Dept. of Fish and Game

### Local Arrangements and Field Trips

**Julie Vance**, Calif. Dept. of Fish and Game  
**Craig Bailey**, Calif. Dept. of Fish and Game

### Green Meeting/Carbon Offset

**Sandi Jacks**, Calif. Dept. Fish and Game

### Registrar & Webmaster

**Candace & Eric Renger**,  
Renger Conference & Event Planning



## Concurrent Session Chairs and Workshop Instructors

### CONCURRENT SESSION CHAIRS:

Session	Topic	Chair
1	Amphibians and Reptiles, Part I & II	Rhys Evans
2	Nongame Mammals, Part I & II	Scott Osborn
3	Shorebirds and Wetlands	Dave Shuford
4	Neotropical Migrants	Geoff Geupel
5	Climate Change Effects on Wildlife	Sarah Pittiglio
6	Techniques in GIS	Tom Lupo
7	Large Scale Conservation Strategies (banking, easements, and landscape planning)	Tina Bartlett and Hal Holland
8	Wildlife Response to Restoration	John Carlon
9	Disease and Wildlife Management	Deana Clifford and Krysta Rogers
10	Raptors	Jeff Lincer
11	Poster Session	Amy Fesnock and Canh Nguyen
12	Symposium: American Pika	Toni Lyn Morelli and David Wright

### WORKSHOP INSTRUCTORS:

**Orienteering with Map, Compass, and GPS:**

**David Wright**, Calif. Dept. of Fish and Game

**Résumé Workshop:**

**Barbara Peters**, Humboldt State University. (Retired)

**Necropsy Workshop:**

**Pam Swift, Deana Clifford**, Calif. Dept. of Fish and Game; **Leslie Woods**, U. C. Davis School of Veterinary Medicine and California Animal Health and Food Safety Lab System (CAHFS)

## Concurrent Session Schedules

### Concurrent Session 1A: Amphibians and Reptiles, Part I

Wednesday Afternoon, January 27, 2010

Charter Oak Ballroom D

Chair: **Rhys Evans**, Vandenberg Air Force Base

#### Wednesday

- 1:15 to 1:20 pm     **Session Introduction and Announcements**
- 1:20 to 1:40 pm     **Demographics and Ecology of the Coast Horned Lizard (*Phrynosoma blainvillii*) at Atwell Island, Tulare County, California**  
Susan M. Hult\* and David J. Germano
- 1:40 to 2:00 pm     **Preliminary Results of the *Masticophis (=Coluber) lateralis euryxanthus* Taxonomy: Morphology Review**  
Milton Yacelga, Karen Swaim\*, and Tammy C. Lim
- 2:00 to 2:20 pm     **The Effects of Seasonal Drying on Western Pond Turtle Movement Ecology and Body Condition in a Northern California River (*Student Paper*)**  
Cheryl A. Bondi\* and Sharyn Marks
- 2:20 to 2:40 pm     **Genetic Variation Among Populations of *Gambelia sila* with Emphasis on a Purported Hybrid Zone**  
Adam J. Grimes\*, David J. Germano, Paul T. Smith, and Gwynne N. Corrigan
- 2:40 to 3:00 pm     **Effects of Enhancement Actions on Habitat Use by the San Francisco Garter Snake at Mori Point, Pacifica, California, 2004-2008**  
Jeffery J. Mitchell, Karen Swaim\*, and Tammy C. Lim
- 3:00 to 3:20 pm     *Afternoon Break*

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**Concurrent Session 2A: Nongame Mammals, Part I**

Wednesday Afternoon, January 27, 2010

Charter Oak Ballroom B

Chair: **Scott Osborn**, California Department of Fish and Game

**Wednesday**

- 1:15 to 1:20 pm **Session introduction and announcements**
- 1:20 to 1:40 pm **Use of Baited Camera Stations for Monitoring Mammalian Biodiversity and Surveying Sensitive Species at Large Scales in Northern Conifer Habitats**  
Brett J. Furnas\* and Pete Figura
- 1:40 to 2:00 pm **Using Noninvasive Genetic Sampling to Estimate Population Characteristics of the Point Arena Mountain Beaver (*Aplodontia rufa nigra*) in California**  
William J. Zielinski\*, Fredrick V. Schlexer, T. Luke George, Kristine L. Pilgrim, and Michael K. Schwartz
- 2:00 to 2:20 pm **Recovering the Endangered Tipton Kangaroo Rat: Can Translocation Help?**  
David J. Germano\*, Lawrence R. Saslaw, Paul T. Smith, and Brian L. Cypher
- 2:20 to 2:40 pm **Determining Optimal Translocation Conditions and Potential Competitive Interactions for the Endangered Tipton Kangaroo Rat (*Dipodomys nitratooides nitratooides*) and the Heermann's Kangaroo Rat (*D. heermanni*) (Student Paper)**  
Erin N. Tennant\* and David J. Germano
- 2:40 to 3:00 pm **Distribution, Site Occupancy, and Habitat Selection by Pacific Fishers in the Sierra National Forest, California**  
Rick A. Sweitzer\* and Reginald H. Barrett
- 3:00 to 3:20 pm **Afternoon Break**

**Session 3: Shorebirds and Wetlands**  
Wednesday Afternoon, January 27, 2010  
Charter Oak Ballroom C

Chair: **Dave Shuford**, Point Reyes Bird Observatory

**Wednesday**

- |                 |  |
|-----------------|--|
| 1:15 to 1:20 pm | <b>Session introduction and announcements</b>  |
| 1:20 to 1:40 pm | <b>Removal of Winter Grazing Increases Patch Colonization Rates of California Black Rails</b> ( <i>Student Paper</i> )<br>Orien M. Richmond*, Jerry Tecklin, and Steven R. Beissinger                    |
| 1:40 to 2:00 pm | <b>Several Factors Influencing California Clapper Rail (<i>Rallus longirostris obsoletus</i>) Densities in the East Bay Regional Park District</b><br>Steven Bobzien                                     |
| 2:00 to 2:20 pm | <b>Managing for Shorebird Resiliency Within the South Bay Salt Pond Restoration Project</b><br>Cheryl M. Strong  |
| 2:20 to 2:40 pm | <b>Creating Habitat in California's Rice Fields for Migrating Shorebirds: Potential for a Novel Approach</b><br>Khara M. Strum*, Dave Feliz, Catherine Hickey, Rodd Kelsey, and Matthew E. Reiter        |
| 2:40 to 3:00 pm | <b>Waterbird Distribution, Abundance, and Habitat Use in Seasonal Wetlands at the San Luis National Wildlife Refuge Complex</b><br>Kenneth M. Griggs*, Robert Parris, Karl Stromayer, and Richard Albers |
| 3:00 to 3:20 pm | <i>Afternoon Break</i>   |

**Concurrent Session 1B: Amphibians and Reptiles, Part II**

Wednesday Afternoon, January 27, 2010

Charter Oaks Ballroom D

Chair: **Rhys Evans**, Vandenberg Air Force Base

**Wednesday**

- 3:20 to 3:40 pm     **Effects of a Prescribed Fire on Amphibians and Reptiles in a California Oak Woodland**  
Bill D. Tietje\* and Jim M. Zingo
- 3:40 to 4:00 pm     **Predatory Leeches (*Hirudinida*) May Contribute to Amphibian Declines in the Lassen Region, California**  
Jonathan Stead\* and Karen L. Pope
- 4:00 to 4:20 pm     **Restoration of Native Species in High Elevation Aquatic Ecosystems of Sequoia and Kings Canyon National Parks**  
Daniel M. Boiano\* and Erik W. Meyer
- 4:20 to 4:40 pm     **Landscape Genetics and the Management of Tailed Frogs on Commercial Timberlands in Northwestern California**  
Andres Aguilar\*, Jason D. Baumsteiger, Matthew O. Goldsworthy, and Robert B. Douglas
- 4:40 to 5:00 pm     **California Tiger Salamander Larval Growth Observations**  
Brian T. Pittman\* and Natasha Dvorak

**Concurrent Session 2B: Nongame Mammals, Part II**

Wednesday Afternoon, January 27, 2010

Charter Oak Ballroom B

Chair: **Scott Osborn**, California Department of Fish and Game

**Wednesday**

- 3:20 to 3:40 pm     **Carnivore Use of Forest Roads in the Redwood Region of Northwestern California**  
Keith M. Slauson\* and William J. Zielinski
- 3:40 to 4:00 pm     **Habitat Use by Yuma Bats and Mexican Free-Tailed Bats in South San Francisco Bay Wetlands: An Acoustic Study** (*Student Paper*)  
Theresa M. Brickley\* and Dave S. Johnston
- 4:00 to 4:20 pm     **Low Wind Speeds and Hoary Bat (*Lasiurus cinereus*) Mortality at the Montezuma Hills Wind Energy Region in Central California**  
Dave S. Johnston\*, Judd A. Howell, Scott B. Terrill, and James Castle
- 4:20 to 4:40 pm     **Economic Stimulus, Mine Closure and Wildlife: A Double-Edged Sword**  
Patricia E. Brown
- 4:40 to 5:00 pm     **Bats, Cows, and Water; Eat a Burger, Save a Bat**  
Daniel A. Taylor

**Concurrent Session 4: Neotropical Migrants**

Wednesday afternoon, January 27, 2010

Charter Oak Ballroom C

Chair: **Geoff Geupel**, Point Reyes Bird Observatory

**Wednesday**

- 3:20 to 3:40 pm **Cadmium Toxicity in Birds: Updating the Toxicity Reference Value used in Predictive Ecological Risk Assessments in California**  
Beckye J. Stanton\*, Regina Donohoe, Sonce de Vries, Michael Eichelberger, and Michael Anderson
- 3:40 to 4:00 pm **Purple Marten Status in Northern California: Survey Results for a 15-Year Update**  
Daniel A. Airola
- 4:00 to 4:20 pm **Response of the Least Bell's Vireo (*Vireo bellii pusillus*) to Wildfire in Southern California**  
Lisa D. Allen\* and Barbara E. Kus
- 4:20 to 4:40 pm **Monitoring Trends in a Breeding Bird Assemblage with Implications for Riparian Conservation**  
David L. Riensche\*, Marty Marrow, Maggie Clark, and Christopher L. Kitting
- 4:40 to 5:00 pm **Does Clutch Size Decrease with Increasing Elevation?**  
Kathryn L. Purcell

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**Concurrent Session 5: Climate Change Effects on Wildlife**

Thursday morning, January 28, 2010

Charter Oak Ballroom D

Chair: **Sarah Pettiglio**, California Energy Commission

**Thursday**

- 8:15 to 8:20 am      **Session introduction and announcements**
- 8:20 to 8:40 am      **Small Scale Movement Patterns of Tule Elk at Point Reyes National Seashore** (*Student Paper*)  
McCrea A. Cobb\* and Reginald H. Barrett
- 8:40 to 9:00 am      **Non-native Cordgrass and the California Clapper Rail: Biogeographical Overlap Between an Invasive Plant and an Endangered Bird.** (*Student Paper*)  
Jules G. Evens\*, Katy Zaremba, and Joy Albertson
- 9:00 to 9:20 am      **The Effect of Burn Severity on the Response of Riparian Birds and Vegetation to Catastrophic Wildlife**  
Kimberly Ferree\* and Barbara E. Kus
- 9:20 to 9:40 am      **Influence of Climate On Timing of Nest initiation in Least Bell's Vireos**  
Barbara E. Kus
- 9:40 to 10:00 am    **Managing for the Future: Changing Species on Public Lands**  
Christina A. Howell\*. Diana Stralberg, Dennis Jongsomjit, and John Wiens
- 10:00 to 10:20 am    **Morning Break**

**PLEASE REFRAIN FROM WEARING PERFUME OR COLOGNE AS SOME PEOPLE MAY BE SENSITIVE OR ALLERGIC TO STRONG FRAGRANCES**



**Concurrent Session 6: Large Scale Conservation Strategies**

Thursday morning, January 28, 2010

Charter Oak Ballroom C

Chairs: **Tina L. Bartlett**, California Department of Fish and Game  
**Hal Holland**, Westervelt Ecological Consulting

**Thursday**

8:15 to 8:20 am	<b>Session introduction and announcements</b>
8:20 to 8:40 am	<b>Keys to Successful Large Scale Conservation Plans Utilizing the NCCP Act</b> Ronald D. Rempel
8:40 to 9:00 am	<b>California Essential Habitat Connectivity Project</b> Monica D. Parisi* and Amy Pettler,
9:00 to 9:20 am	<b>Multi-Tiered Monitoring For Landscape Conservation Plans</b> Ronald D. Rempel
9:20 to 9:40 am	<b>Translocation as a Conservation Strategy For Endangered Bakersfield Cactus</b> Brian C. Cypher, Brianna D. Borders, Ellen A. Cypher*, Christine L. Van Horn Job
9:40 to 10:00 am	<b>Status of the Marbled Murrelet in the Northwest Forest Plan Area: Ten Years of Population Monitoring</b> Gary L. Falxa*, Jim Baldwin, Thomas D. Bloxton, Monique Lance, Sherri L. Miller, Scott F. Pearson, Martin G. Raphael, and Craig Strong
10:00 to 10:20 am	<b><i>Morning Break</i></b>

**Concurrent Session 7: Disease and Wildlife Management**

Thursday Morning, January 28, 2010

Charter Oak Ballroom B

Chairs: **Deana Clifford**, California Department of Fish and Game  
**Krysta Rogers**, California Department of Fish and Game

**Thursday**

- 8:15 to 8:20 am **Session introduction and announcements**
- 8:20 to 8:40 am **Southern Sea Otter Health and it's Management Implications**  
David A. Jessup\*, Melissa Miller, Tim Tinker, James E. Estes, Michelle Staedler, Christine K. Johnson, Patricia A. Conrad, Jonna A.K. Mazet
- 8:40 to 9:00 am **A Risk Analysis of Brucella Transmission Among Bison, Elk, and Cattle in the Northern Greater Yellowstone Area (GYA).** (*Student Paper*)  
Brant A. Schumaker\*, P.J. White, John Treanor, Rebecca K. Frey, Jonna A.K. Mazet, and Tim E. Carpenter
- 9:00 to 9:20 am **Evidence for a Novel Form of "Harmful Algal Bloom" Cyanotoxin Transfer from Land to Sea Otters**  
Melissa A. Miller\*, Abdou Mekebri, Dave Crane, Stori Oates, David Jessup, , Tim Tinker, Michelle Staedler, Woutrina Miller, Sharon Toy-Choutka, Clare Domink, Dane Hardin, and Raphael Kudela
- 9:20 to 9:40 am **Disease Surveillance in the California Deer Population Between 1990 and 2007** (*Student Paper*)  
Annette TS. Roug\*, Christine Kreuder-Johnson, Steve Torres, and Pamela Swift
- 9:40 to 10:00 am **Integrating Ecology and Epidemiology to Assess the Risk of Disease Transmission at the Wildlife-Livestock Interface: The Case of Sierra Nevada Bighorn Sheep**  
Deana L. Clifford\*, Brant A. Schumaker, Thomas R. Stephenson, Vernon C. Bleich, Maya L. Cahn, Ben J. Gonzales, Walter M. Boyce, Jonna and AK. Mazet
- 10:00 to 10:20 am **Morning Break**

**Concurrent Session 8: Techniques in GIS**

Thursday Morning, January 28, 2010

Charter Oak Ballroom D

Chair: **Tom Lupo**, California Department of Fish and Game

**Thursday**

- 10:20 to 10:40 am      **Development of a GIS-Based Land Suitability Analysis Model for Choosing Programmatic Habitat Mitigation Sites in the Sacramento-San Joaquin Delta**  
Robert L. Capriola\* and Mike Lazano
- 10:40 to 11:00 am      **Areas of Conservation Emphasis (ACE-II), the California Department of Fish and Game's Strategy for Identifying and Conserving Areas of High Biological Value.**  
Melanie Gogol-Prokurat, California Department of Fish and Game
- 11:00 to 11:20 am      **WEB 2.0 as a Framework for Adaptive Management and Conservation of Landscapes**  
Douglas A. Miller
- 11:20 to 11:40 am      **Using GIS to Recreate Historical Habitat Patterns**  
Ruth A. Askevold
- 11:40 am to 12:00 pm      **The Use of GPS Collars to Monitor Sierra Fishers: Preliminary Results**  
Jim D. Garner\*, Tessa Smith, Rebecca Green, Craig Thompson, Kathryn Purcell
- 12:00 to 1:00 pm      *Lunch Break*

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**Concurrent Session 9. Wildlife Response to Restoration**

Thursday Morning, January 28, 2010

Charter Oak Ballroom C

Chair: **John Carlon**, River Partners

**Thursday**

- |                      |  |
|----------------------|--|
| 10:20 to 10:40 am    | <b>Restoring Vegetation Structure for Wildlife Habitat in the Floodway</b><br>Tom Griggs   |
| 10:40 to 11:00 am    | <b>Avian Response to Riparian Restoration along the San Joaquin River, CA</b><br>Mark Dettling* and Christine A. Howell  |
| 11:00 to 11:20 am    | <b>Monitoring and Maintenance Approach to Accomplish Riparian Restoration Goals for Goat Canyon Sediment Basins Riparian Restoration Project</b><br>Richard G. Burg*, James Prine, and Erin Riley                                  |
| 11:20 to 11:40 am    | <b>Habitat Characteristics of Yellow-billed Cuckoo Along the Sacramento River, California</b><br>Jessica E. Hammond*, Colleen Hatfield, and Joe Silveira   |
| 11:40 am to 12:00 pm | <b>Impacts, Lessons Learned, and Restoration Efforts Associated with a Large Oil Well Blowout in Western Kern County.</b><br>Julie A. Vance*, Randi McCormick, Michael J. Anderson, Matthew Zafonte, Mike Ammann, and Brad Noblitt |
| 12:00 to 1:00 pm     | <b><i>Lunch Break</i></b>  |

**Concurrent Session 10. Raptors**  
Thursday Morning, January 28, 2010  
Charter Oak Ballroom B

Chair: **Jeff Lincer**, WRI Research Director

**Thursday**

- |                      |   |
|----------------------|---|
| 10:20 to 10:40 am    | <b>Predictive Modeling of Northern Spotted Owl Core Areas and Home Ranges</b><br>Elizabeth C. Willy*, Brian Woodbridge, Jeffrey R. Dunk, and Douglas Miller   |
| 10:40 to 11:00 am    | <b>Evaluating Survey Methods and Sampling Designs for Monitoring Great Gray Owls in the Sierra Nevada, California</b><br>John J. Keane*, Joseph R. Medley, Eric P.A. Jepsen, Ryan Byrnes, and Holly B. Ernest                             |
| 11:00 to 11:20 am    | <b>Golden Eagle Nesting Success on a Managed Watershed</b><br>Jeff A. Alvarez * and M. A. Shea  |
| 11:20 to 11:40 am    | <b>Assessing California Spotted Owl Response to Forest Management Treatments and Wildfire</b><br>John J. Keane*, James Baldwin, Ross A. Gerrard, Claire V. Gallagher, Paula A. Shaklee, and Gretchen Jehle                                |
| 11:40 am to 12:00 pm | <b>Golden Eagle (<i>Aquila chrysaetos</i>) Movements Tracked by Patagial Tags, Satellite and VHF Transmitters throughout Western North America</b><br>Dave Bittner*, Chris Meador, James Hannan, Jeffrey L. Lincer, Jeff Wells, Jeff Laws |
| 12:00 to 1:00 pm     | <b><i>Lunch Break</i></b>   |

## Plenary Session

### *Fostering Resilient Wildlife Populations*

Thursday Afternoon, January 28, 2010

Charter Oak Ballroom A, B & E

- Chair: **Armand Gonzales**, California Department of Fish and Game,  
TWS Western Section President-Elect
- 1:15 to 1:20 pm **Welcome, Announcements, and Introduction**
- 1:20 to 1:45 pm **Climate Change and Extinctions: How to Prioritize?**  
Terry Root, Professor and Senior Fellow at the Woods Institute for the  
Environment, Stanford University
- 1:45 to 2:10 pm **70 Years of Vegetation Dynamics and Climate Change in the Sierra  
Nevada**  
James Thorne, Department of Environmental Science and Policy,  
University of California, Davis
- 2:10 to 2:35 pm **Terrestrial Restoration of Habitats Along the San Joaquin River:  
Challenges and Benefits**  
Patrick Kelly, Professor of Zoology & Coordinator Endangered Species  
Recovery Program, California State University, Stanislaus
- 2:35 to 3:00 pm **California's Climate Adaptation Strategy**  
Amber Pairis, Climate Change Advisor, California Department of Fish and  
Game
- 3:00 to 3:20 pm **Panel Discussion**  
Terry Root, James Thorne, Patrick Kelly, and Amber Pairis
- 3:20 to 3:40 pm *Afternoon Break*
- 3:40 to 4:10 pm **Update from the Executive Director of TWS**  
Michael Hutchins, Executive Director/CEO, The Wildlife Society
- 4:10 to 5:00 pm **Remembering Kevin, Clu, Tom and Mike**  
Scott Osborn, Department of Fish and Game, and Cynthia Perrine

**Western Section Annual Business Meeting and Members Forum  
Charter Oak Ballroom C**

5:00 to 6:00 pm            **Business Meeting/Members Forum**  
Scott Osborn, President

**Western Section Annual Banquet  
Charter Oak Ballroom A, B, and E**

6:30 to 7:00 pm            Reception and No-host bar  
7:00 to 8:00 pm            Banquet  
8:00 to 8:30 pm            **Heatstroke: Nature in an age of Global Warming**  
Anthony Barnosky, Curator/Professor, Integrative Biology, University of  
California, Berkeley  
8:30 to 10:00 pm           Awards, Raffle, and Silent Auction  
10:00 to 11:00 pm           Social Hour

## Symposium

### *The American Pika's Capacity for Resilience in the Face of Climate Change*

Friday Morning, January 29, 2010

Charter Oak Ballroom B&C

Chairs: **Toni Lyn Morelli**, University of California, Berkeley  
**David Wright**, California Department of Fish and Game

9:15 to 9:20 am	<b>Introductions and Announcements</b>
9:20 to 9:40 am	<b>Introduction to the California Pika Consortium</b> Toni Lyn Morelli
9:40 to 10:00 am	<b>Investigating the Status of American Pika (<i>Ochotona princeps</i>) at Historic Northern Sierra Sites</b> David H. Wright
10:00 to 10:20 am	<b>Resurveying Historic Pika Populations in California: Results and Lessons from the Grinnell Resurvey Project</b> John D. Perrine* and James L. Patton
10:20 to 10:40 am	<i>Morning Break</i>
10:40 to 11:00 am	<b>Establishing the Baseline: Historical Biogeography of the American Pika</b> Kurt Galbreath
11:00 to 11:20 am	<b>A Passel of Pikas in Lava Beds at Low Elevation</b> Chris Ray
11:20 to 11:40 am	<b>Dispersal in Fragmented Habitats: Using Genetic Markers to Understand Long Term Movement Patterns</b> Mary M. Peacock*, Susan J. Merideth, Chris Ray, Eileen Hickey and Peter F. Brussard
11:40 am to 12:00 pm	<b>Thermal Regimes of Talus Fields Enhance American Pika's Resilience to Warming</b> Constance I. Millar; Robert D. Westfall*; Andrew Smith
12:00 to 1:15 pm	<i>Lunch Break</i>
1:15 to 1:20 pm	<b>Introductions and Announcements</b>
1:20 to 1:40 pm	<b>Adaptive Capacity of Pikas: Physiological and Behavioral Responses to Changing Microclimate</b> Edward D. West
1:40 to 2:00 pm	<b>Increasingly Rapid Ecoregional Decline of a Montane Mammal: Contemporary Climate Change Alters Extinction Dynamics</b> Erik Beever*, Jennifer Wilkening, Chris Ray, Philip Mote, and Peter F. Brussard
2:00 to 2:20 pm	<b>Climate Threats to the American Pika: Modeling Historical Persistence for 21<sup>st</sup> Century Projections</b> Scott Loarie
2:20 to 2:40 pm	<b>Conservation Priorities Models for the American Pika in the Western</b>



	<b>United States</b>
2:40 to 3:00pm	Michael T. Calkins*, Mark C. Andersen, and Kenneth G. Boykin <b>Protecting the American Pika under the Federal and California Endangered Species Acts</b>
3:00 to 4:00 pm	Shaye Wolf <b>Group Discussion</b>

### **Workgroup Meeting Schedules**

#### **Workgroup Meeting 1: Pacific Fisher**

Friday Morning, January 29, 2010

Charter Oak Ballroom D

Chair: **Kathryn Purcell**, USFS, Pacific Southwest Research Station  
Sierra Nevada Research Center

8:15 to 8:20 am	Session introduction and announcements
8:20 to 10:00 am	Group Discussion
10:00 am to 10:20 am	<i>Morning Break</i>
10:20 am to 12:00 pm	Group Discussion

#### **Workgroup Meeting 2: California Bat Working Group**

Friday Afternoon, January 29 2010

Charter Oak Ballroom A

Chair: **Dave Johnston**, H.T. Harvey and Associates  
**Bronwyn Hogan**, Calif. Dept. of Fish and Game

1:15 to 1:20 pm	Session introduction and announcements
1:20 to 3:00 pm	Group Discussion
3:00 to 3:20 pm	<i>Afternoon Break</i>
3:20 to 5:00 pm	Group Discussion

### **Workshop 3: Resume Workshop**

Friday, January 29, 2010

San Joaquin Ballroom B

Instructor: **Barbara Peters**

9:00 to 11:30 pm	Session 1
11:30 am to 1:30 pm	Career Fair/Student Lunch
1:30 to 4:00 pm	Session 2

### **Poster Session Schedule**

Wednesday Evening 6:00 – 7:45 pm, January 27, 2010

Executive Lobby

Chairs: **Amy Fesnock**, Bureau of Land Management – California State Office  
**Canh Nguyen**, California Department of Fish and Game

1. **Determining temporal patterns of passerine migration during fall using nocturnal flight-call recording.** Amon Armstrong and T. Luke George
2. **Newly discovered low-elevation American pika populations on the Sheldon National Wildlife Refuge in northwest Nevada.** Bradley T. Bauman and Gail H. Collins
3. **Effect of habitat disturbance on dispersal behavior and site fidelity of Least Bell's Vireos (*Vireo bellii pusillus*).** Melissa A. Blundell and Barbara E. Kus
4. **Distributions and species richness of carnivores in mid elevation mixed conifer forests of the central Sierra Nevada.** Joseph A. Bridges, Rick A. Sweitzer, and Reginald H. Barrett
5. **Poster Withdrawn – Jennifer Carlson**
6. **Temperature tests for diurnal live trapping shade configurations.** Howard Clark, Darren P. Newman, Charles J. Randel III and Marc D. Meyer
7. **Effects of incubation temperature on development and phenotype in the Western pond turtle, *Actinemys marmorata*.** Zammie Dallara, Nicholas R. Geist, Nazim Bal, Vanessa Farnham, Amanda Blanchette, and Rebecca Gordon

(Student Paper)

8. **Introduction and range expansion of the white-tailed ptarmigan in the Sierra Nevada, California.** Jesus R. Garcia, Glenn P. Frederick, and R. J. Gutiérrez
9. **Integrating bird habitat suitability indices into a conservation planning framework for the San Joaquin River, California.** Geoffrey R. Geupel, Nat E. Seavy, Tom Gardali, Greg H. Golet, Dennis Jongsmjit, S. Paine, Seth Matsumoto, and Diana Stralberg
10. **Skewed sex ratio and breeding system shift in a California population of southwestern willow flycatchers (*Empidonax traillii extimus*).** Scarlett L. Howell and Barbara E. Kus
11. **Seasonal abundance and distribution of non-breeding long-billed curlews at the San Luis National Wildlife Refuge Complex.** Marianne G. Huizing, Kenneth Griggs, Ann K. Kohlhaas
12. **Aging Bell's vireos in the hand: A test of morphometric characteristics.** Suellen Lynn and Barbara E. Kus
13. **The spread and control of *Dittrichia graveolens*.** Meg Marriott
14. **Annual abundance and productivity indices of five temperate migrants at Rocky Point Bird Observatory: A Pacific coastal migration monitoring station.** Ronald E. Melcer Jr., Rachel J. Gardiner, and Ann Nightingale
15. **Effects of enhancement actions on habitat use by the San Francisco garter snake at Mori Point, Pacifica, California, 2004-2008.** Jeffrey J. Mitchell and Tammy C. Lim
16. **Hibernation periods and potential influence of climate change on den entry and den emergence by black bears in the Central Sierra Nevada.** Brady Y. Neiles, Rick A. Swietzer and Reginald H. Barrett
17. **Monitoring trends in a breeding bird assemblage with implications for riparian conservation.** David L. Riensche, Marty Marrow, Maggie Clark, and Christopher L. Kitting
18. **Influence of temperature and climate on spring arrival time of migratory birds in Southern California.** Michelle M. Rogne and Barbara E. Kus
19. **Limb malformations in the California red-legged frog observed in Contra Costa County, California.** Mary A. Shea, Jeff A Alvarez, and Pieter Johnson
20. **Ranch sustainability analysis system.** Bill Tietje, Jim Zingo, and Royce Larsen

21. **Entrapment of San Joaquin kit foxes in sports netting.** Christine L. Van Horn Job and Brian L. Cypher
22. **Preliminary Results of the *Masticophis (=Coluber) lateralis euryxanthus* Taxonomy: Morphology Review,** Milton Yacelga, Tammy C. Lim, and Karen Swaim

## **Plenary, Concurrent Session and Poster Abstracts**

**\* Asterisk indicates presenting author for oral presentations**

### **Landscape Genetics and the Management of Tailed Frogs on Commercial Timberlands in Northwestern California**

**Andres Aguilar\***, UC Merced, 5200 N. Lake Rd, Merced, CA 95344, 209.228.4057, aaguilar2@ucmerced.edu; **Jason D. Baumsteiger**; **Matthew O. Goldsworthy**; and **Robert B. Douglas**;

**Abstract:** Headwater-stream amphibians are touted as ideal species for studying the impacts of anthropogenic disturbance because their narrow physiological requirements make them susceptible to changes in forest structure and water quality conditions. The coast tailed frog (*Ascaphus truei*) is listed as a 'species of special concern' in California and is associated with cool, fast-flowing headwater streams containing rocky substrates and little fine sediment. Concern over its conservation status has been raised because much of its distribution coincides with lands managed for timber production, and several studies suggest that tailed frog populations may exhibit reduced genetic diversity in areas that have been intensively harvested. To better address this concern, we initiated a landscape-scale genetic study on commercial timberlands along the Mendocino County coast in northwestern California. Over 300 individuals were genotyped at nine microsatellite loci. None of the sampled populations departed from mutation-drift equilibrium, indicating recent population bottlenecks could not be detected in contemporary samples. The lack of a genetic signature of population bottlenecks in any of the sampled sites is surprising given the history of timber harvest in the region. Given adequate refugia and enough time to rebound from landscape alteration, this species may prove to be more resilient to timber harvest in this region than previously thought.

*Amphibians and Reptiles*

### **Purple Martin Status in Northern California: Survey Results for a 15-year Update**

**Daniel Airola\***, Airola Environmental Consulting, 2700 6th Avenue, Sacramento, CA 95818, 916-454-3073, d.airola@sbcglobal.net;

**Abstract:** The Purple Martin (*Progne subis*) has declined in California since the 1970s, leading to its designation as a California Species of Special Concern. The most recent status assessment was based on information through the early to mid-1990s. Existing survey methods do not effectively assess martin population trends. Therefore, I developed and applied a tailored method to estimate breeding populations at sites within 15 Northern California counties where martins nested in the 1990s. I tested two approaches to estimate nesting pairs: repeated mapping of hole-use and detection-corrected counts. I used results to quantify recent nesting populations, assess population trends for sites with previous population estimates, and assess current occupation rates at sites occupied in the 1990s. Previous population data were sufficient to assess trends only at four sites, of which three showed generally stable populations. The Sacramento population, however, declined since 2004 by 60% to 70 pairs. Thirty (71%) of 42 previously occupied Northern California sites were active in 2009, supporting 235 nesting pairs. Occupation rates in 2009 indicate a colony loss rate of 2 to 3.5% per year. I did not survey potential newly created habitat (e.g., through wildfire), however, which if colonized could have partially offset effects of other declines. Accumulated evidence suggests that no widespread and substantial declines have occurred since the 1990s. North Coast populations appear abundant and healthy, while northern interior populations are sparse but apparently stable. Low occupancy by central coast populations, except in San Luis Obispo County, is of concern. The remnant Sacramento population's decline is alarming because it is the main source of potential colonists for any future population recovery in the Central Valley. The 2009 population estimates provide a firm basis for future assessment of population trends. The southern Sierra Nevada and Southern California populations, which were not addressed in this survey, warrant further survey and status assessment.

### *Neotropical Migrants*

### **Response of the Least Bell's Vireo (*Vireo bellii pusillus*) to Wildfire in Southern California**

**Lisa D. Allen\***, USGS Western Ecological Research Center, 4165 Spruance Road Suite 200, San Diego, CA 92101, 619-225-6425, ldallen@usgs.gov; and **Barbara E. Kus;**

**Abstract:** Wildfires are a major disturbance to vegetation communities, altering habitats critical to endangered species. We analyzed the response of the endangered migratory least Bell's vireo to wildfire at Marine Corps Base Camp Pendleton (MCBCP), San Diego County, California. Wildfire burned riparian vegetation in October 2007 within several drainages on MCBCP, prior to the 2008 vireo breeding season. We surveyed vireos during the breeding seasons from 2007-2009 and compared the abundance of vireos pre-fire and post-fire within five burned sites and four unburned reference sites. Vireo numbers declined 21-52% within the first year post-fire in four of five burned sites, and remained constant at one site. In contrast, vireo numbers increased 5-50% at all five reference sites during the same time

period. By the second year post-fire, vegetation within the burned sites exhibited a high rate of regrowth and a dense shrubby understory had developed. Vireo numbers in burned sites were recovering and increased from the first year post-fire by 67-200%, exceeding pre-fire numbers within two of the five sites. This annual increase of vireo numbers was greater than that at reference sites, which averaged 24%. Although vireo abundance declined immediately after wildfire, the high breeding site fidelity of vireos and a preference for early successional habitats combined with the capacity for riparian vegetation to resprout and recover quickly suggests that the effects of wildfires on vireo populations may be short-lived.

### *Neotropical Migrants*

## **Golden Eagle Nesting Success on a Managed Watershed**

**Jeff Alvarez\***, The Wildlife Project, PO Box 579805, Modesto, CA 95357, 209.815.5660, Jeff@thewildlifeproject.com; and **M. A. Shea**;

**Abstract:** As part of mitigation for the construction of the Los Vaqueros Reservoir in the upper Kellogg Creek watershed, the Contra Costa Water District monitored golden eagle nesting success within the watershed. Territorial occupancy and reproductive success of nesting golden eagles was monitored from 1994 to 2009. As many as 7, and as few as 4, golden eagle pairs were observed maintaining nesting territories annually. Changes in land use formed the basis for comparison of nesting success within a managed watershed over time. Portions of 3 golden eagle territories were inundated when the reservoir was filled in 1998. Recreational trails were constructed and opened in 1999. Inundation of the reservoir may have influenced nesting success as well as the number of occupied territories of golden eagles within the watershed. Average productivity was 0.57 before recreational access (1994-1998). During the inundation and construction of the reservoir from 1998 to 1999, annual productivity was 0.19. After inundation and with public access, but with trail closures enforced, average annual productivity was 0.70 (1999-2009). When trail closures were enforced, the annual nesting success of golden eagles typically remained higher than prior to public access on the watershed.

### *Raptors*

## **Determining Temporal Patterns of Bird Migration During Fall Using Nocturnal Flight-Call Recordings**

**Amon Armstrong\***, Dept of Wildlife, Humboldt State University, Arcata, CA 95521, 707.826.1474, amoninspace@yahoo.com; and **T. Luke George**;

**Abstract:** Nocturnal migration is an important, yet little studied, aspect of seasonal movement for many passerines and non-passerines. I examined monthly, nightly, and hourly variation in nocturnal flight calls of birds, and compared flight-call records of Swainson's Thrushes (*Catharus ustulatus*) to an index of daytime abundance. I analyzed temporal patterns using acoustic recordings of 11,862 flight calls of migrating birds. Nightly

flight call totals were negatively correlated with the advancing date during fall migration. Swainson's Thrush calls increased hourly within nights, peaking in the hours nearest sunrise. Numbers of Swainson's Thrush calls also had a positive relationship by date with daytime banding data. Protocols and data used in this study provide a step for advancing acoustic monitoring of bird populations by researchers and wildlife managers along the Pacific flyway.

*Poster Session*

### **Using GIS to Recreate Historical Habitat Patterns**

**Ruth Askevold**, San Francisco Estuary Institute, 7770 Pardee Lane, Oakland, CA 94621, 510-746-7341, ruth@sfei.org;

**Abstract:** California's landscape has been highly modified during the 19th and 20th centuries, and we often have little information about how historical habitats functioned. Using historical ecology methods to synthesize diverse historical data sources in a GIS can fill this information gap, providing a range of useful information for innovative, ecologically-based environmental management. This presentation examines the ways in which the Historical Ecology Program at the San Francisco Estuary Institute (SFEI) uses a GIS to reconstruct historical landscapes to inform restoration strategies. SFEI's approach includes georeferencing historical maps and aerial photography; integrating historical textual data and landscape photography; modeling potential habitat conditions; and synthesizing multiple sources to create a map reflecting the complexity of habitats in the mid-1800s. Examples from several projects show that developing management strategies based on historical systems tends to be more supportive of existing natural processes (e.g. local soils, topography, hydrology) and calibrated to highly variable rainfall conditions than homogenous, one-size-fits-all models that are often imported from other regions.

*Techniques in GIS*

### **Newly Discovered Low-Elevation American Pika Populations on the Sheldon National Wildlife Refuge in Northwest Nevada**

**Bradley Bauman\***, Nevada Department of Wildlife, 815 E 4th Street, Winnemucca, NV 89445, 775-623-6565, bbauman@ndow.org; and **Gail H. Collins**;

**Abstract:** The recent discovery that seven of the 25 historically described populations of American pikas (*Ochotona princeps*) in the Great Basin of North America appear to be extinct has added emphasis to earlier warnings that Great Basin populations of this species may be highly vulnerable particularly those populations occurring at lower elevations (<2,500 m). It has been suggested that increases in temperature related to global climate change is one of the factors in these extirpations; American pika are currently under review for listing under the Endangered Species Act. Pikas in the Great Basin have received more scientific attention than other populations; however, little is still known about the number of populations or the number of individuals throughout the Great Basin portion of the range. Here we report on

the discovery of five previously undescribed low-elevation pika populations on the Sheldon National Wildlife Refuge in northwestern Nevada. The average elevation of pika occupied sites was 1,944 m, ranging between 1,815 m and 2,171 m; there is limited available habitat above 2,500 m in northwestern Nevada. Pika evidence was found on all aspects, but the majority were found on north and northwest aspects (27% and 24%, respectively). Slope also varied, averaging 34° and ranging from nearly flat (5°) to very steep (70°). Fresh haypile composition comprised mostly of perennial bunchgrasses and forbs; cheatgrass (*Bromus tectorum*) was also present in several pika haypiles examined on Sheldon Refuge. Recently, there was the discovery and confirmation of pikas in the Hays Canyon Range, approximately 57 km southwest of Sheldon Refuge. That population, and those discovered on Sheldon Refuge during 2009, suggests that pika may be more common in northwestern Nevada than previously thought. In addition, the sites discovered on Sheldon Refuge may include one of the lowest elevation populations documented in the Great Basin to date.

#### *Poster Session*

### **Increasingly Rapid Ecoregional Decline of a Montane Mammal: Contemporary Climate Change Alters Extinction Dynamics**

**Erik Beever\*;** Jennifer Wilkening; Chris Ray; Philip Mote; and Peter F. Brussard;

**Abstract:** It has been known for over a century that climate shapes distribution of vertebrates via gradients in latitude and elevation. Some of the best-documented changes of species distributions associated with recent climate change have been elucidated within relatively small spatial domains, over short continuous time periods, or using two periods of sampling. We use records from three sampling periods during 1898-2008 of the temperature-sensitive alpine mammal *Ochotona princeps* across 38.2 million ha of an ecoregion to a) highlight that rates of site-level extirpations and upslope retraction of the lower-elevation boundary within sites have been more dramatic during the last ~9 yrs than during the latter 2/3 of the 20th century; and b) illustrate using model-updating analyses that mechanisms of climatic stress have played an increasingly important role in determining site-level extirpations region-wide. Contrary to the predictions of Island Biogeography Theory-the dominant paradigm for isolated mountaintop habitats of the Great Basin of the western USA for nearly three decades - results suggest that mountaintop habitat area and isolation from 'mainlands' are less-important determinants of loss than is climatic stress. We deployed a network of 167 temperature sensors in formerly and currently occupied microsites at 25 sites with historic records of the species to test whether magnitude of change in, or relative status of, metrics of temperature stress were better predictors of site-level extirpations. Competing hypotheses also compared evidence in support of three types of hypothesized thermal stress: extreme-cold stress, acute-heat stress, and chronic heat stress.

#### *Pika Symposium*

### **Golden Eagle (*Aguila chrysaetos*) Movements Tracked by Patagial Tags, Satellite and VHF Transmitters throughout Western North America**



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Over the last eighteen (18) years, WRI scientists have banded three hundred and eighty three (383) Golden Eagles. Three hundred and forty three (343) of these had patagial tags applied and one hundred and five (105) of those have also had VHF transmitters attached. Since 2006, we have placed satellite telemetry on twenty one (21) Golden Eagles; thirteen (13) adults; and eight (8) juveniles. These Golden Eagles have moved as far south as San Miguel El Alto, MX (1,938 kilometers below the U.S. border) and as far north as Alaska (2,827 kilometers north of their winter range). One Golden Eagle migrated north for eighteen (18) days at an average rate of 156 kilometers per day. Preliminary data will be presented on causes of mortality, including wind farms, line strikes, vehicles, and possibly WNV. Local and long range migration information, implications for wind energy development and species management will be presented as well as additional significant results learned from these banding and tracking efforts.

### *Raptors*

#### **Effect of Habitat Disturbance on Dispersal Behavior and Site Fidelity of Least Bell's Vireos (*Vireo bellii pusillus*)**

**Melissa Blundell\***, USGS Western Ecological Research Center, 4165 Spruance Road Suite 200, San Diego, CA 92101, 619-225-6453, [mblundell@usgs.gov](mailto:mblundell@usgs.gov); and **Barbara E Kus**;

**Abstract:** Conservation management for endangered Least Bell's Vireos involves habitat restoration, which creates disturbance that may affect vireo breeding site fidelity or dispersal behavior. We assessed the effects of habitat disturbance on (1) site fidelity and inter-annual movement of color-banded adult males and (2) site preference and dispersal distances of banded first-year adults at two monitored breeding populations in San Diego County, California (Marine Corps Base Camp Pendleton, MCBCP, and Lower San Luis Rey River, LSLR). We compared movement and dispersal of vireos at disturbed sites (exotic plant removal [MCBCP] or vegetation removal related to flood control [LSLR]) to those in undisturbed sites over a five-year study period, 1-7 yrs post-disturbance. Overall > 95% of adult males at the two sites (N = 188) displayed breeding site fidelity in the subsequent year. At MCBCP, adult males did not differ significantly in the proportion returning to disturbed (100%) or undisturbed (97%) sites. Excluding one outlier, adult males (N = 60) at MCBCP moved an average of 55 m from the previous year's breeding territory. Distance moved between years did not differ between males in disturbed (average 50 m) and undisturbed sites (average 57 m). However, males in undisturbed sites tended to move farther than those in disturbed sites as time since disturbance increased. At LSLR return rate of males to previous year's site was significantly higher in disturbed (99%) than in undisturbed sites (90%). Excluding one outlier, adult males (N = 126) at LSLR moved an average of 52 m from

the previous year's breeding territory, with no difference between males at disturbed (average 53 m) and undisturbed sites (average 47 m), and no effect of time since disturbance on distance moved. First-year adults at MCBCP dispersed to habitat types matching their natal habitats in similar proportions across disturbed (88%) and undisturbed (81%) sites, as was also seen at LSLR (49% and 46%, respectively). Overall, we found no adverse effects of habitat disturbance on dispersal and site fidelity of vireos.

#### *Poster Session*

### **Factors Influencing California Clapper Rail (*Rallus longirostris obsoletus*) Densities in the East Bay Regional Park District**

**Steven Bobzien**, East Bay Regional Park District, 2950 Peralta Oaks Court, Oakland, CA 94605, (510) 544-2347, sbobzien@ebparks.org;

**Abstract:** The California clapper rail (*Rallus longirostris obsoletus*) is a federal and state endangered species limited to the tidal marshes of San Pablo and San Francisco Bay. This rail is particularly vulnerable to anthropogenic and natural environmental conditions, including habitat loss and fragmentation, non-native predators, and winter high-tide events. Since 1990, the East Bay Regional Park District has been conducting clapper rail surveys within various tidal marshes. Our objectives are to determine the distribution of rails, identify threats to their survivorship, and evaluate habitat suitability, including the influence of non-native cordgrass (*Spartina spp.*). To assess the effects of colonization and removal of non-native *Spartina*, biologists have been conducting winter high-tide and breeding-season surveys of rails. We analyzed our data from several sites, including Elsie Roemer Marsh (suboptimal conditions), the New Marsh (recently restored), and Arrowhead Marsh (extremely high rail densities). Overall, our preliminary results suggest a strong positive correlation with the presence of non-native *Spartina* and increased rail densities and reproductive success. This information is useful in the conservation and recovery of California clapper rails and in developing adaptive management strategies associated with controlling invasive *Spartina*.

#### *Shorebirds and Wetlands*

### **Restoration of Native Species in High Elevation Aquatic Ecosystems of Sequoia and Kings Canyon National Parks**

**Daniel Boiano\***, National Park Service, Sequoia & Kings Canyon National Parks, 47050 Generals Hwy, Three Rivers, CA 93271, 5595654273, danny\_boiano@nps.gov; and **Erik W. Meyer**;

**Abstract:** In 2001, Sequoia & Kings Canyon National Parks (SEKI) began eradicating non-native trout from 11 naturally fishless lakes and adjacent streams to assess the feasibility of restoring aquatic habitat for native species, with an emphasis on conserving imperiled mountain yellow-legged frogs (MYLF; *Rana muscosa*, *R. sierrae*). These frogs once commonly occupied high Sierra Nevada lakes, but have disappeared from approximately 94% of

historic localities, largely due to the widespread introduction of trout and chytridiomycosis disease. By 2008 we removed nearly 24,000 trout, and fully or nearly restored all 11 lakes. MYLF densities measured in these 11 lakes showed an average 16-fold increase between 2001 and 2008, while one lake showed a 72-fold increase. Several of these populations are now among the largest in the entire range of MYLFs. Due to these results, SEKI is proposing to expand this work to additional high elevation basins across these parks, including using piscicides to restore larger waters and achieve eradications more quickly. Although chytridiomycosis has caused many MYLF populations to crash, several formerly abundant populations occupying fishless sites have persisted after becoming infected. Since eradicating non-native trout allows MYLF populations to expand, additional restoration efforts will help foster native wildlife populations that are more resilient to uncertain future conditions.

*Amphibians and Reptiles*

**The Effects of Seasonal Drying on Western Pond Turtle Movement Ecology and Body Condition in a Northern California River**

**Cheryl Bondi\***, Humboldt State University, 1 Harpst St., Arcata, CA 95616, 707-616-9688, cbondi11@gmail.com; and **Sharyn Marks**;

**Abstract:** When water levels decline turtles may respond by estivating, moving to alternate bodies of water, or staying in remnant pools. Research on Western pond turtle response to water declines is needed for conservation of this species. We used radiotelemetry to compare the seasonal movements of Western pond turtles inhabiting perennial and intermittent river reaches of the Mad River, in northwestern California. In addition, we investigated the effects that seasonal drying may have on body condition of individuals.

Turtles in the intermittent reach migrated from the river earlier than those in the perennial reach. As water levels dropped, turtles migrated to upland habitats to estivate by burying themselves beneath substrate and leaf litter. Despite turtles at the intermittent site returning to the river earlier in the spring, individuals spent significantly more time on land annually than those at the perennial site. Turtles at the intermittent site had lower body condition suggesting an ecological trade off between estivation and body size. These results can aid management in predictions of terrestrial occupancy in intermittent systems, as well as maintaining upland habitats that may be potential estivation sites. Also, anthropogenic changes in water availability may negatively affect resident turtles by decreasing their body condition.

*Amphibians and Reptiles*

**Student Paper**

**Habitat Use by Yuma Bats and Mexican Free-Tailed Bats in South San Francisco Bay Wetlands: An Acoustic Study**

**Theresa Brickley\***, San Jose State University, 2609 Highwood Dr., San Jose, CA 95116, 415-640-1289, tbrickley@gmail.com; and **Dave S. Johnston**;

**Abstract:** Little is known about bats foraging over estuaries and no detailed study has been conducted to determine to what extent bats forage over brackish and salt water wetlands. Preliminary data suggested that *Myotis yumanensis* (MYYU) and *Tadarida brasiliensis mexicana* (TABR) regularly forage over South San Francisco Bay wetlands, but in which microhabitats and to what extent remains unclear. Our goal was to examine habitat utilization of these species in brackish and saline habitats in South San Francisco Bay wetlands during summer and early fall months. We recorded bat echolocation call sequences in salt marsh, salt water, brackish marsh, and brackish water habitats at three study areas in Alviso, California. Anabat II bat detectors and Z-Caim recorders manufactured by Titley Electronics were randomly deployed each survey night in 2 habitat types, salt marsh/salt water or brackish marsh/brackish water. There were 15 survey nights per habitat type for a total of 30 survey nights from August 10- October 9, 2009. Because of collecting constraints, we assessed prey availability for the 4 habitat types for one night only, September 17th. Insect specimens will be identified to family level. The data are currently being analyzed with a randomized block ANOVA. Brackish water had significantly more calls than other habitat types and open water sites had substantially more call sequences than marsh sites. Our data suggest that MYYU has a strong preference for brackish water habitat, whereas TABR spent fairly equal amounts of time in brackish water, brackish marsh, and salt water habitats. Both species were recorded on 13 out of 15 survey nights foraging over salt water, suggesting this habitat is regularly used. No call sequences were recorded after September 10th in brackish marsh, indicating a possible temporal shift in bat use. Although there were no recordings in salt marsh during the sampling period, we recorded call sequences in this habitat during our preliminary investigations on three evenings. These results should increase our knowledge about bats foraging over estuaries, and therefore, provide needed information to enhance bat conservation in coastal wetlands.

*Nongame Mammals*

**Student Paper**

### **Distributions and Species Richness of Carnivores in Mid Elevation Mixed Conifer Forests of the Central Sierra Nevada**

**Joseph Bridges\***, University of California Berkeley, SNAMP Fisher Study, 51354 Old Corral Ranch Road, Oakhurst, CA 93604, 559-642-4539, bridgesj@berkeley.edu; **Rick A. Sweitzer**; and **Reginald H. Barrett**;

**Abstract:** There is growing recognition of the important roles played by predators in regulating ecosystems and sustaining biodiversity. Large predators can also regulate or suppress populations of smaller predators (mesocarnivores) by intraguild interactions including direct predation. The distribution and abundance of the larger predators within an interacting community of carnivores may therefore significantly influence the complexity of predator communities. Because of their importance as indicators of overall ecosystem health, forest-dwelling carnivores have been the focus of significant recent management interest. As part of a larger study focused on the biology of fishers (*Martes pennanti*) in the southern Sierra Nevada, we are using automatic digital cameras to survey for forest carnivores in the Bass Lake Ranger District of the Sierra National Forest. Although fishers

are the focus of our research because of their conservation status, several other carnivores prey on them, including puma (*Puma concolor*), bobcats (*Felis rufus*), and coyotes (*Canis latrans*). Further, marten (*Martes martes*) and ringtails (*Bassariscus astutus*) are also limited in number and distribution in California. Our purpose in this study is to provide information on the distribution of carnivores in mixed conifer forest habitats in the central Sierra Nevada between 1000 m and 2500 m elevation. Our methods are that high resolution digital cameras were placed in forested habitats near the center points of 1km<sup>2</sup> grid cells. Camera stations were baited with a small piece of venison in a dark sock affixed to a tree (scent lures were placed on the bait sock and on nearby trees), and then checked and refreshed every 8 days over an approximate 1 month period. The project has been underway for two full camera survey years (Oct 25, 2007 to Oct 14, 2008, and Oct 15, 2008 to Oct 14, 2009); a total 219 grids were surveyed during camera year 1, and 345 grids were surveyed in camera year 2. Eleven different species of carnivores were detected, and resultant data on the distributions of a smaller subset of these animals will be summarized. Composite distributions will also be prepared for identifying areas where diverse assemblages of carnivores occur and interact.

*Poster Session*

**Economic Stimulus, Mine Closure and Wildlife: A Double-edged Sword**

**Patricia Brown**, Brown-Berry Biological Consulting, 134 Eagle Vista, Bishop, CA 93514, 760 387 2005, patbobbat@aol.com;

**Abstract:** The recent influx of funds for mine closure has stimulated a rush to remediate mine hazards on federal lands. To attain the goal of the Economic Stimulus Package of putting more people to work over a broad geographic region, many people are involved who do not have adequate knowledge of bat biology or bat-compatible closures. Although bats are the most dependent on mines, a wide variety of vertebrate species use mines such as desert tortoises, owls and carnivores. If done properly, bats and other wildlife in mines could be protected through the installation of bat gates and cupolas. However if wildlife habitat is not identified, mines could be closed through foam (PUF) and backfill that would deprive bats (and other wildlife) of valuable roosting or nesting habitat and potentially kill them, especially if exclusions are not done properly at the appropriate time of year.

Most bat species use a variety of roosts throughout the annual cycle as dictated by physiological and behavioral needs. Rarely do bats occupy a single mine year round. The timing of surveys will influence the ability to detect bat use of a given mine feature. This in turn can affect the treatment that a mine may receive (sealing/hard closure, bat-compatible closure or no action). There is no substitute for site-specific wildlife surveys using established survey protocol designed to detect wildlife use, nor is there a universal style of mine closure. Some bat species do not accept culverts or even gates (i.e. large free-tailed bat colonies, some *Myotis* maternity colonies, etc.). To understand the importance of a single mine feature, most of the mines in a given geographic unit (drainage or mountain range) may need to be evaluated in order to determine those with the most significant bat use at different times of the year. The scope of the "landscape" will depend on the species of bat and their dispersal ability. The goal is to identify and protect the most important bat

roosting mines with the best type of closure, and to avoid killing animals if a non-wildlife compatible method is selected.

### *Nongame Mammals*

## **Monitoring and Maintenance Approach to Accomplish Riparian Restoration Goals for Goat Canyon Sediment Basins Riparian Restoration Project**

**Richard Burg\***, California Department of Parks and Recreation, 8885 Rio San Diego Drive, Suite 270, San Diego, CA 92119, 619-204-0182, rburg@parks.ca.gov; **James Prine**; **Andrew Fisher**; and **Erin Riley**;

**Abstract:** The California Department of Parks and Recreation and EDAW conducted monitoring and adaptive maintenance and management on 27 acres of restored riparian scrub and maritime succulent scrub in Border Field State Park. The restoration program served as mitigation for the loss of habitat resulting from installation of two sediment basins which were installed to address unnatural sediment loads in the Tijuana River Hydrologic Unit (watershed) and protect downstream saline emergent wetland habitats within the Tijuana River National Estuarine Research Reserve. Monitoring and maintenance were performed for three years after installation and total native cover is over 100 percent based on combined cover from the vegetation strata. As part of the monitoring approach, data has been collected and will be presented on vegetation richness and composition, groundwater elevations and salinity, and avian use including least Bell's vireo (*Vireo bellii pusillus*). In addition, annual aerial photographs were taken as a tool in conjunction with ground-truthing to track vegetation changes over time. The monitoring data contributed to maintenance and management decisions regarding supplemental planting, weed control priorities, irrigation use, and attainment of project goals.

### *Wildlife Response to Restoration*

## **Conservation Priorities Models for the American Pika in the Western United States**

**Michael Calkins\***, New Mexico State University, 2980 South Espina, P.O. Box 30003, MSC 4901, Las Cruces, NM 88003, 575-646-3292, conservation84@gmail.com; **Mark C. Andersen**; and **Kenneth G. Boykin**;

**Abstract:** The American pika (*Ochotona princeps*) is a montane species found among talus slopes and rockslides throughout the western United States. The pika suffers from insular populations, philopatry, limited dispersal, low genetic variability, and sensitivity to ambient temperatures above 25.5 C. Recently, local extinctions and observations of populations disappearing at lower elevations have been documented. Climate change is believed to be the main culprit behind this phenomenon. The objectives of our research were to (1) model the future distribution of suitable pika habitat across the western United States under increased temperature regimes to identify which areas of the pika's predicted geographic distribution may be more negatively affected by climate change than others, and (2) provide managers a means of prioritizing surveying and conservation efforts for the pika over their

entire United States distribution. We used maximum entropy with occurrence records from museums, state wildlife agencies, and natural heritage programs and environmental variables from the Western Gap Analysis Project and PRISM to develop the models. We modeled the future distribution of suitable pika habitat using 1 C-7 C temperature increases, and compared the changes in predicted suitable habitat for the 31 subspecies of pika located in the United States. Our results indicate that certain subspecies may be more susceptible to climate change than others. *O. p. goldmani* appears to be the most susceptible with no suitable habitat predicted for the subspecies at the present. The other most susceptible subspecies are predicted to be *O. p. clamosa*, *O. p. schisticeps*, and *O. p. nigrescens* with 9%, 5%, and 13% of their suitable habitat predicted to remain under a 3 C increase respectively. Our models do not predict the extinction risk or extirpation of pika subspecies, but simply provide a means for managers to identify areas of the pikas distribution that may be most susceptible to climate change in order to prioritize surveying and conservation efforts.

### *Pika Symposium*

## **Development of a GIS-Based Land Suitability Analysis Model for Choosing Programmatic Habitat Mitigation Sites in the Sacramento-San Joaquin Delta**

**Robert Capriola\***, Westervelt Ecological Services, 600 North Market Blvd. Suite 3, Sacramento, CA 95834, 916-764-5635, rcapriola@westervelt.com; and **Mike Lazano**;

**Abstract:** In January of 2009, Westervelt Ecological Services was chosen by the Department of Water Resources, Department of Fish and Game, and Reclamation District 830 (Jersey Island) to complete a GIS-based land suitability analysis model to help in choosing the locations of programmatic mitigation sites that may be used to offset unavoidable impacts to habitats caused by levee improvements being planned and carried out under the Delta Levee Flood Protection Program (AB360). Under the AB360 program, habitats are categorized into four distinct types as Shaded Riverine Aquatic (SRA), Riparian Forest (RF), Scrub Shrub (SS) or Freshwater Emergent Wetland (FEW). A mandate under the AB 360 program sets the goal of achieving net long-term habitat improvement with a net benefit for aquatic species in the Delta. The use of programmatic mitigation (habitat banking) is seen as the primary tool for achieving these purposes, and development of a scientifically-based model for choosing sites for restoration and protection is the first step in planning for their development. The model developed by Westervelt is based on GIS data layers grouped in categories such as biological, physical, legal, land use planning, and historic uses. These data layers (criteria) were chosen for their applicability to the establishment and protection of the target habitat types. Data layers such as soils, elevation, proximity to existing habitat, vegetative cover, endangered or threatened species locations, existing habitat conservation plans, cultural resources locations and county zoning were acquired or developed for the Delta area, and the data within the layers was then processed and rated for suitability to the long-term restoration and protection of the target habitat types. The models for each habitat type were run and the model outputs were mapped to identify high-priority mitigation sites on Jersey Island. Field visits were conducted to these sites to verify the data and assumptions of the models. The models allow users to create outputs that emphasize certain categories of information over others in order to focus attempts to locate sites for

programmatic mitigation for the Delta Levees Flood Protection Program.

*Techniques in GIS*

**Temperature Tests for Diurnal Live Trapping Shade Configurations**

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**Abstract:** Diurnal live trapping in desert environments requires protecting captured animals from high temperature extremes (>32 C). Internal trap temperatures resulting from ambient temperatures of 38 C and higher can be fatal to live-trapped rodents. Various cardboard shade structures are commonly used to moderate internal trap temperatures, but their relative effectiveness has not been reported. We compared three cardboard shade designs commonly used by biologists in the Mojave Desert: a brown A-frame, a white A-frame, and a brown tube. Shade treatments were tested from 21 April to 7 July 2007. Internal trap temperatures ( C) were recorded hourly with a datalogger. Traps were left closed to simulate internal trap temperature conditions of trapped rodents. There was no difference in internal trap temperature among the three shade treatments ( $F_{2,191} = 0.091$ ,  $P = 0.913$ ). There was a weak positive relationship between calendar date and internal trap temperature ( $r = 0.040 \pm 0.067$  [SE],  $F_{1,62} = 5.752$ ,  $R^2_{adj} = 0.070$ ,  $P < 0.001$ ). During April and May, the average high was 28.5 C; during June and July, the average high was 31.5 C. The higher internal trap temperatures during June and July may have resulted in part from a greater accumulation and release of residual heat from the soil during these months. Daytime heating of the traps occurred much faster during June and July and provides more risk of heat stress to captured animals. However, the California Department of Fish and Game's current trapping survey protocol for diurnal rodents is adequate in preventing heat stress to captured animals if stringently followed and all traps are closed when ambient temperature reaches 32 C.

*Poster Session*

**Integrating Ecology and Epidemiology to Assess the Risk of Disease Transmission at the Wildlife-Livestock Interface: The Case of Sierra Nevada Bighorn Sheep**

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**Abstract:** When livestock and wildlife are in close proximity, diseases can have severe impacts on livelihoods and biodiversity. A prime example of this conflict between conservation and livelihoods is the issue of disease transmission between domestic and bighorn sheep. Despite evidence that domestic sheep diseases threaten the persistence of bighorn sheep populations, the economic consequences of restricting domestic sheep



grazing has polarized the debate, with some arguing that disease risk posed by domestic sheep has been exaggerated and grazing restrictions should be eased. To help address this question we employed an interdisciplinary approach to construct an eco-epidemiologic model to assess how different management strategies affect the risk of respiratory disease transmission from domestic sheep to endangered Sierra Nevada bighorn sheep, and to predict population-level impacts of an outbreak. We evaluated efforts to minimize pathogen transmission and reduce interspecies contact, including closure of domestic sheep grazing allotments, grazing time reductions, and reduced probability of stray domestic sheep, and predicted the population-level impacts of an outbreak. Even when management strategies reduced risk of interspecies contact to less than 2% per year, our model predicted a 50% probability of a catastrophic respiratory disease outbreak during the next 10 bighorn sheep generations. Furthermore, the model predicted that the smallest Sierra Nevada bighorn sheep population would have a 33% probability of quasi-extinction if an outbreak were to occur in the near future. To eliminate all risk of contact and potential disease transmission, domestic sheep cannot be grazed on allotments that overlap with areas utilized by Sierra Nevada bighorn sheep. Our scientific findings provide a strong foundation on which to base recommendations, but interventions will succeed only if stakeholders are involved in the characterization of the problem and are willing to make the tradeoffs necessary to balance the needs of people and wildlife.

#### *Disease and Wildlife Management*

### **Small-Scale Movement Patterns of Tule Elk at Point Reyes National Seashore**

**McCrea Cobb\***, University of California at Berkeley, 137 Mulford Hall, Berkeley, CA 94720, 415-686-2848, mccrea.cobb@berkeley.edu; and **Reginald H. Barrett**;

**Abstract:** The small-scale movement behaviors of animals, especially large herbivores such as elk (*Cervus elaphus*), are not well understood. Large herbivore movement patterns may be affected by a number of biotic and abiotic factors. The distribution of available habitats affects movement patterns of large herbivores. Climate is known to influence large-scale annual migrations and habitat selection patterns of wildlife, but less is known about how weather affects hourly and daily movement patterns of large herbivores. Population density can affect a number of related aspects of large herbivore ecology including home range sizes, habitat and population dynamics. Six distinct tule elk (*Cervus elaphus nanmodes*) herds exist at Point Reyes National Seashore (PORE), California, at varying densities and habitat configurations. The movement behavior of tule elk, a formerly threatened species, has never been precisely quantified. The goals of this study were to 1) quantify the hourly, daily and monthly movements of tule elk at PORE and 2) quantify the influence of herd density, habitat, human development (trail and road distance) and weather (wind and rain) on hourly and daily tule elk movements. Ten tule elk were captured and fitted with Global Positioning System (GPS) collars that recorded hourly locations for approximately one year. We found that tule elk at PORE displayed daily and annual cycles in their hourly and daily movements, similar to other regions. PORE elk generally increased their movements during the morning and evening hours. Elk movements were longer during wet spring months and shorter during dry fall months. The reduction in tule elk movement during the fall

season correlated with annual grass senescence and may be related to selective pressures to conserve energy during this period. The increase in movements during the spring season corresponds with the peak of calving and may be related to parturition behavior. Contrary to results from northern climate elk populations, we found no evidence that precipitation affects PORE tule elk movements. However, tule elk movements increased during windy conditions. High density tule elk herds moved further than lower density herds on an hourly scale, but herd density did not influence elk movements on a daily scale. Elk slowed down in areas with high proportions of available grassland and in steeper terrain. Hourly movements of PORE elk were greater near roads and trails. Our results confirm that models of small scale movement patterns have the potential to address questions of how a species may respond to its environment.

*Climate Change Effects on Wildlife*

**Student Paper**

### **Translocation as a Conservation Strategy for Endangered Bakersfield Cactus**

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**Abstract:** Bakersfield cactus (*Opuntia basilaris* var. *treleasei*) is listed as Federal and California Endangered, primarily due to profound loss of historical habitat. Further habitat loss is ongoing and is impacting remaining Bakersfield cactus populations, which could reduce the number of remaining populations. A greater number of populations on protected lands will increase the long-term viability for this species. Toward this goal, we translocated 25 Bakersfield cactus pads and 10 cactus plants to the Bena Landfill Conservation Area in Kern County. The pads (naturally shed) and plants (small clumps consisting of no more than 5 pads) were collected from the nearby (approx. 5 km) Sand Ridge Preserve managed by the Center for Natural Lands Management. The translocation was conducted on October 20, 2009. The pads and plants were placed in a topographic orientation similar to that at the source site. Bent rebar pieces were installed around pads and plants to prevent disturbance by cattle. To date, all pads and plants are alive and none have been disturbed by rodents or other agents. Monitoring will continue to assess long-term survival and reproduction. If successful, translocation may constitute an effective strategy for increasing the number of Bakersfield cactus populations on conserved lands and increasing long-term security for this species.

*Large Scale Conservation Strategies (easements, landscape planning)*

### **Effects of Incubation Temperature on Development and Phenotype in the Western Pond Turtle, *Actinemys marmorata***

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**Abstract:** As part of an ongoing three-year study on the effects of temperature on developmental variables and phenotypic attributes, we collected and incubated eggs of the western pond turtle, *Actinemys marmorata*. Eggs from 23 nests were collected from a Lake County, CA location during peak nesting activity (early June-early July) in 2008 and 2009. Additionally, in 2009, temperature and humidity probes were planted in three nests fitted with predator exclosures and allowed to incubate under natural conditions for 75 days for comparison with ex situ incubation variables. Gravid females were captured and radio-tagged, and monitored daily to track nesting behaviors. Eggs were collected upon completion of nesting and transported within 24 hours (prior to chalking) to our Sonoma State University laboratory where they were placed in incubators at 26, 27, 28, 29, 30, and 31 C. Incubation temperatures were selected based on data from naturally incubated *A. marmorata* nests and published reports of incubation conditions in its close relative, the European pond turtle, *Emys orbicularis*. We analyzed the effects of these temperatures on hatching success, incubation duration, sex determination, hatchling mass, and juvenile growth rates under controlled conditions. Hatching success decreased significantly and incubation duration increased at the high and low extremes of the experimental temperatures. Additionally, endoscopic examination of the gonads of captive-raised juveniles from 2008-2009 verified the presumed M-F pattern of temperature-dependent sex determination (i.e., males developing at lower temperatures). We are currently analyzing hatchling mass and juvenile growth rate data to examine the relative effects of maternal/clutch effects and incubation temperature on these parameters.

*Poster Session*

**Student Paper**

### **Avian Response to Riparian Restoration Along the San Joaquin River, CA**

**Mark Dettling\***, PRBO Conservation Science, 3820 Cypress Dr. #11, Petaluma, CA 94954, 734-812-8441, mdettling@prbo.org; and **Christine A. Howell**;

**Abstract:** Biological diversity in California's Central Valley is concentrated in riparian areas, of which over 90% have been lost to changing land uses. The remaining riparian forests are increasingly important refuges for wildlife, and restoration of riverside areas is necessary to maintain healthy populations. A large riparian restoration project was begun in 2002 at the San Joaquin River National Wildlife Refuge. We studied changes in avian diversity, reproductive success, and use by rare species in remnant and restored areas during the 2007-2009 breeding seasons. Two rounds of five minute point counts were conducted at a total of 106 locations covering a range of restoration ages, as well as intact remnant riparian areas. Four sites were intensively searched for nests, one remnant and three restored. The number of individual birds and the number of species were higher in older restored areas than younger restored areas, although still not as high as the remnant areas. These measures also increased over time in restored sites, but not in remnant sites indicating that the restored areas are catching up to the remnant sites. Reproductive success was highest in the remnant site, followed by the restored sites in order of oldest to youngest. It appears that nest success is increasing with the age of restoration, although we were unable to detect this at the individual site level over the three year study. Least Bell's Vireos, an endangered species, and Yellow Warblers, a relatively rare breeder in the Central

Valley, have bred in restored areas of the refuge. We expect the trends of increasing diversity and nest success to continue as the restoration areas mature. Successful riparian restorations like this one will serve as a model for future work along the San Joaquin River.

*Wildlife Response to Restoration*

### **Non-Native Cordgrass and the California Clapper Rail: Biogeographical Overlap Between an Invasive Plant and an Endangered Bird**

**Jules Evens\***, Avocet Research Associates, 65 Third Street, Suite 25, Point Reyes Station, CA 94956, 415 663-1148, jevens@svn.net; **Katy Zaremba**; and **Joy Albertson**;

**Abstract:** The federally endangered California Clapper Rail (*Rallus longirostris obsoletus*) is a tidal-marsh dependent bird whose distribution is restricted entirely to the San Francisco Bay estuary. The native cordgrass, *Spartina foliosa*, has long been recognized as a critical component of clapper rail habitat within the estuary. The distribution and abundance of the clapper rail has been monitored intermittently since the mid-1970s and that effort has increased since the early 1990s. The concurrent invasion of the bay's tidal marshes by non-native *Spartina alterniflora* and its clones has impacted clapper rail abundance and distribution in some areas of the estuary. In this paper we discuss: (1) habitat affinities and density estimates of rail in invaded and non-invaded marshes; (2) the distribution of non-native *Spartina* relative to that of the clapper rails over the last 15 years; and, (3) potential impacts of changing marsh ecology on rail distribution and abundance in both the near-term and the long-term.

*Climate Change Effects on Wildlife*

**Student Paper**

### **Status of the Marbled Murrelet in the Northwest Forest Plan Area: Ten Years of Population Monitoring**

**Gary Falxa\***, US Fish and Wildlife Service, 1655 Heindon Rd., Arcata, CA 95521, 707-825-5107, gary\_falxa@fws.gov; **Jim Baldwin**; **Thomas D. Bloxton**; **Monique Lance**; **Sherri L. Miller**; **Scott F. Pearson**; **Martin G. Raphael**; and **Craig Strong**;

**Abstract:** The Northwest Forest Plan is an ecosystem management plan for federal forest lands in the Pacific Northwest. To evaluate the Plan's effectiveness in conserving species associated with forests, we monitored Marbled Murrelet (*Brachyramphus marmoratus*) populations annually from 2000 to 2009 in near-shore marine waters associated with the Plan Area. We sampled murrelets from boats in coastal waters off Washington, Oregon, and northern California south to San Francisco Bay, using line transects and distance estimation. We divided the sample area of about 8,800 km<sup>2</sup> into five geographic subareas (conservation zones). From 2000 to 2009, population estimates for the area ranged from 17,400 to 23,700 birds, with a 2009 estimate of 17,800 (95% confidence interval: 14,200 to 21,300). We evaluated population trends for 2 time series: 2000-2009 and 2001-2009, excluding 2000 data from the second analysis because of potential biases associated with logistical problems that year. We found a population decline over the Plan area for both series. The estimated

average rate of annual decline for the Plan area was 2.4% (standard error: 0.82%) for 2000-2009, and 3.8% (standard error: 0.49%) for the 2001-2009 series. The annual rate estimates suggest a total decline during the analysis period of about 20% based on the 2000-2009 time series, or about 27% based on 2001-2009 data. Trend analyses at finer spatial scales are preliminary due to low power, but evidence for declines is strongest in northern Washington and northern Oregon.

*Large Scale Conservation Strategies (banking, easements, and landscape planning)*

### **The Effect of Burn Severity on the Response of Riparian Birds and Vegetation to Catastrophic Wildfire**

**Kimberly Ferree\***, USGS Western Ecological Research Center, San Diego, 4165 Spruance Road, Suite 200, San Diego, CA 92101, 619-225-6456, kferree@usgs.gov; and **Barbara, E. Kus**;

**Abstract:** We used the 2007 catastrophic wildfires in southern California as an opportunity to evaluate riparian bird and vegetation responses to wildfire at three drainages in San Diego County. Our goals were to 1) compare bird abundance over time at burned sites and one unburned reference site, 2) assess the effects of burn severity on bird abundance, and 3) quantify changes in vegetation structure in burned riparian. In 2008 and 2009, we counted birds at 24-40 points per drainage to calculate species abundance and recorded percent cover by height of vegetation along transects (N=100) centered on points. From 2008 to 2009, the abundance of 7 of 15 species (>20 detections/site) significantly changed at one of three burned sites; four increased and three decreased. In each case, abundance at the other two sites either followed the same trend or did not change. Bird abundance differed significantly by burn severity, expressed as low, moderate, or high, for 7 of 15 species in 2008, and 5 of 15 species in 2009. Rapid growth in understory and middle canopy vegetation from 2008 to 2009 allowed for less selective use of habitat by burn severity for most species. While broader use of the burned sites was observed for most species, changes in abundance were documented primarily for nomadic generalists, suggesting that recovery of species dependent on habitat structure is ongoing.

*Climate Change Effects on Wildlife*

### **Use of Baited Camera Stations for Monitoring Mammalian Biodiversity and Surveying Sensitive Species at Large Scales in Northern California Conifer Habitats**

**Brett Furnas\***, California Department of Fish and Game, 601 Locust Street, Redding, CA 96001, 530-225-3221, bfurnas@dfg.ca.gov; and **Pete Figura**;

**Abstract:** During August through November 2009 the California Department of Fish and Game placed baited camera stations at 70 plots in conifer habitats throughout the southern Cascades mountains of northern California. The purpose of this pilot project was two-fold. Forty of the plots were part of a larger biodiversity monitoring effort intended to track long-term occupancy and distribution trends of common species. These plots were spread widely across mostly middle elevation public and private timberlands. The remaining 30 plots were

part of a focused effort to fill-in information gaps on the distribution of sensitive species including Sierra Nevada red fox (*Vulpes vulpes necator*), fisher (*Martes pennanti*), American marten (*Martes americana*) and wolverine (*Gulo gulo*). These plots were selected based on habitat suitability models, historic locations, recent sighting and poorly surveyed areas for the focal species. For both types of surveys each plot consisted of 2 camera stations placed 1 mile apart. For biodiversity monitoring, camera stations were checked weekly for 2 weeks, and chicken, cat food, scent lure, apple, grain and salt were used as attractants. For sensitive species surveys, the sampling period was extended to 4 weeks, hair snares were added, and bait was restricted to chicken, cat food and scent lure.

The RECONYX passive infra red triggered digital cameras we used were well suited for the task because of their ability to store a large number of photos and capture images without startling animals. However, bear attacks on cameras were a serious problem. For biodiversity monitoring, our most commonly detected species were black bear, mule deer, gray fox, striped skunk, spotted skunk, coyote, douglas squirrel, northern flying squirrel, western gray squirrel, golden-mantled ground squirrel and yellow-pine chipmunk. Besides providing occupancy estimates these data should be useful for studying behavior and seasonal changes in daily activity. For the sensitive species surveys, we detected numerous marten, and at least 2 Sierra Nevada red fox in the Caribou Wilderness east of Mount Lassen. We are following up with genetic analyses of hair and scat collected from these stations to update information about population size and relatedness of the fox.

### *Nongame Mammals*

#### **Establishing the Baseline: Historical Biogeography of the American Pika**

**Kurt Galbreath**, Dept. of Biology, Western Washington University, MS 9160, Bellingham, WA 98225, 360-650-7344, kurt.galbreath@wwu.edu;

**Abstract:** Growing concern over the fate of American pikas in the face of ongoing climate warming highlights the need for a clear understanding of the distribution of evolutionarily significant lineages and the influence of past climate changes on population structure. Range-wide analysis of mitochondrial and nuclear DNA sequence variation demonstrates that pika populations in North America's Intermountain West are partitioned into 5 major lineages associated with different mountain provinces that have evolved along largely (but not completely) independent trajectories since the mid-Pleistocene. Range fluctuations associated with climatic oscillations have maintained cohesion of lineages across mountain ranges and permitted limited gene flow between neighboring lineages. Likewise, population size fluctuated with climate. Ecological niche modeling and molecular data together indicate particularly extensive range fluctuation for the Sierra Nevada lineage (associated with the Sierra Nevada Range and Great Basin). This lineage is likely to be at the greatest risk of range retraction under contemporary warming scenarios. Complete extirpation of the lineage would represent a substantial loss of evolutionary potential for American pikas.

#### *Pika Symposium*

## **Introduction and Range Expansion of the White-Tailed Ptarmigan in the Sierra Nevada, California**

**Jesus Garcia\***, California Department of Fish and Game, Wildlife Branch, 1812 Ninth Street, Sacramento, CA 95811, 916-445-3709, JGarcia@dfg.ca.gov; **Glenn P. Frederick**; and **R. J. Gutierrez**;

**Abstract:** During 1971 and 1972, 72 wild-trapped white-tailed ptarmigan were translocated from Colorado to California to provide an additional upland game bird hunting opportunity that did not exist in alpine habitats. The Colorado Division of Wildlife air-shipped the birds to California Department of Fish and Game (DFG) personnel who released them directly into the wild in two locations southwest of Bridgeport: Eagle Peak and Twin Lakes. Over time, white-tailed ptarmigan have dispersed along the Sierra Nevada crest north to Carson Pass (Alpine County) and south to Fresno County. Breeding success and range expansion increased to the extent that by 1989, a limited number of hunting permits, issued by lottery, were awarded by the DFG for a controlled hunting season. In 1991, the lottery was discontinued due to very low hunter interest. Today, the general season remains conservatively brief (nine days).

*Poster Session*

## **The Use of GPS Collars to Monitor Sierra Fishers: Preliminary Results**

**Jim Garner\***, USFS Pacific Southwest Research Station, 54325 McKinley Grove Rd, Shaver Lake, CA 93664, 559-841-6318, jdgarnier@fs.fed.us; **Tessa Smith**; **Rebecca Green**; **Craig Thompson**; and **Kathryn Purcell**;

**Abstract:** In February 2007, the USFS Pacific Southwest Research Station initiated a large-scale research program to fill gaps in our understanding of fisher (*Martes pennanti*) ecology and habitat requirements in the southern Sierra Nevada. In 2009 we deployed 12 experimental, miniature GPS collars on male fishers at two study sites in the southern Sierras. All animals are males weighing 3.2 - 4.3 kg which have been fitted with one of two different collar designs weighing approximately 40 and 75 grams each. Nine fishers were fitted with larger collars programmed to attempt 96 locations each during an 11 day cycle. Three fishers were fitted with the smaller models programmed to attempt 12 locations each during a five day cycle. Over the course of 433 collar-days for which data has been retrieved, these collars have recorded 1178 successful locations out of 3436 attempts (34.3% success rate), ranging from 22 to 275 locations per animal. On the Sierra National Forest study site a single large male carried a collar between March and June of 2009, documenting daily movements as well as multiple visits to known female den and rest sites. Between September and December 2009, we recorded 590 total locations documenting the movements and interactions of four adjacent, territorial males. On the Sequoia National Forest study site, five males were collared in October 2009. As of December 2009, we have recovered information from three of those collars resulting in a total of 314 successful locations detailing the movements of two adjacent males. The third collar has thus far underperformed expectations only collecting 2 accurate locations. Here we present our

methods, experience with the equipment, and preliminary observations concerning collar accuracy, notable animal behavior, and comparisons to other field techniques.

### *Techniques in GIS*

## **Recovering the Endangered Tipton Kangaroo Rat: Can Translocation Help?**

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**Abstract:** Several translocations have occurred with the endangered Tipton kangaroo rat (*Dipodomys nitratooides nitratooides*) in the past 15 years with limited success. We were asked by the U.S. Fish and Wildlife Service to move another population of kangaroo rats in 2006 because the donor site was permitted to be developed. In an effort to increase translocation success, we built wire-mesh cages for a portion of the kangaroo rats to test if animals kept in cages for 30 days (soft release) achieved greater survival than kangaroo rats released into artificial burrows without cages (hard release). We translocated 144 Tipton kangaroo rats to the Allensworth Ecological Reserve (AER), Tulare County, California, in December 2006, and we fitted 22 with radio transmitters. Of the 14 kangaroo rats that we collared and put in cages, one female died within the cage and one animal destroyed its transmitter and we do not know its fate. Of the remaining 12 kangaroo rats, seven (58.3%) survived for at least 30 days once free from being caged. In contrast, only three of eight (37.5%) kangaroo rats that were hard released survived  $\geq$  30 days, but the difference in survival rates of caged and non-caged animals was not significant. We also trapped annually late fall 2007-2009 to assess population status and found 15-23 Tipton kangaroo rats each year. We assessed genetic relatedness of any unmarked Tipton kangaroo rats to those translocated using microsatellite analysis of four loci. Although not found at the site during trapping before translocation, Heermann's kangaroo rats (*D. heermanni*) were found by summer 2007 and their numbers increased each year. We successfully re-established Tipton kangaroo rats to AER, although a large, and growing, population of Heermann's kangaroo rats may be suppressing the abundance of Tipton kangaroo rats.

### *Nongame Mammals*

## **Integrating Bird Habitat Suitability Indices into a Conservation Planning Framework for the San Joaquin River, California**

**Geoffrey Geupel\***, PRBO Conservation Science, 3820 Cypress Drive #11, Petaluma, CA 94954, 4158680655, ggeupel@prbo.org; **Nat E. Seavy**; **Tom Gardali**; **Greg H. Golet**; **Dennis Jongsmjit**; **Seth Paine**; **Sandi Matsumoto**; and **Diana Stralberg**;

**Abstract:** Ecological restoration and conservation may be enhanced by using ecologically-based methods for prioritizing actions. We used bird habitat suitability models developed for the entire Central Valley of California to 1) describe the habitat quality of 18 reaches of the San Joaquin River; 2) rank the habitat quality of the reaches; and 3) compare these



rankings to independently derived evaluations of wildlife habitat. For each reach, we averaged habitat suitability scores for multiple species to provide an aggregate measure for three species groups: Marsh Birds, Early-successional Riparian Birds, and Mid/Late-successional Riparian Birds. We found little evidence that the rankings of the 18 reaches for the three species groups were correlated – suggesting that any prioritization decisions will need to consider habitat suitability for all three groups of birds, rather than one group acting as a surrogate for the others. Of the three species groups, rankings from the Early-successional species group were most strongly correlated with the independent measure of existing habitat quality.

*Poster Session*

**Waterbird Distribution, Abundance, and Habitat Use in Seasonal Wetlands at the San Luis National Wildlife Refuge Complex**

**Kenneth Griggs\***, U.S. Fish and Wildlife Service, San Luis NWR Complex, 947-C W. Pacheco Blvd., Los Banos, CA 93635, 209-826-3508, kenneth\_griggs@fws.gov; **Robert Parris**; **Karl Stromayer**; and **Richard Albers**;

**Abstract:** Severe wetland loss worldwide has greatly increased the importance of remaining wetlands to wildlife. In California, nearly 95% of wetland habitats have been lost or degraded. Faced with these challenges, land managers seek to provide wetland habitats to ensure appropriate resources are available for dependent wildlife. The Grasslands Ecological Area, encompassing San Luis and Merced National Wildlife Refuges, in winter holds over 2 million waterfowl and 25,000 sandhill cranes, and is one of only 22 international shorebird reserves. To better understand species use of refuge wetlands and more effectively manage for waterbirds, we initiated a study to evaluate the composition and structure of seasonal wetland vegetation, waterbird species abundance, and the effectiveness of wetland management practices. We sampled vegetation in over 100 seasonal wetland units prior to flood-up and conducted bi-monthly waterbird surveys during flooded periods in the 2007-08 and 2008-09 seasons. These data, and detailed information on wetland management practices (e.g., timing of flood up and draw down, number of summer irrigations, history of discing, mowing, and burning), water quantity and quality, disturbance, and spatial features of wetlands, enabled us to describe the relationship of vegetation characteristics and other factors to the distribution, density, and abundance of waterbirds. Numbers of waterfowl, shorebirds, and other waterbirds fluctuated seasonally, and wetland use shifted spatially and temporally during the waterfowl hunting season. Time since discing and the number of irrigations had the greatest influence on the percent cover of desirable wetland food plants and subsequent waterbird use. The study's results have provided refuge wetland managers with information to make more effective decisions on work planning and management implementation, and they will have implications for other land managers in the larger landscape.

*Shorebirds and Wetlands*

## Restoring Vegetation Structure for Wildlife Habitat in the Floodway

**Tom Griggs**, River Partners, 580 Vallombrosa Ave., Chico, CA 95926, 530-894-5401 ext 231, tgriggs@riverpartners.org;

**Abstract:** When designing a riparian restoration planting, vegetation structure is an important design feature for targeted wildlife habitat. The understory component is especially important – shrubs and vines, such as blackberry and rose are essential habitat components for nesting cover and food. However, restoring riparian habitat is viewed by floodway managers as interfering with the conveyance of flood waters and potentially threatening public safety. The dense vegetation cover on the floor of the restoration is important wildlife habitat, and it affects flood water conveyance at certain velocities and depths. In an effort to dispel some of the concerns about vegetation slowing flood flows, a flume experiment was designed to test the behavior of four understory woody species: Blackberry, Sandbar Willow, Rose, and Mulefat, under a range of velocities and depths. Results indicate that these species bend under flood flows and become more streamlined. Flow velocity increased over the top of the canopies. Meanwhile, flow velocity decreases under the canopy, lowering soil erosion, when compared to bare soil. These results generate many possibilities for using these flexible-stemmed species for flood management and for high quality wildlife habitat.

### *Wildlife Response to Restoration*

## Genetic Variation Among Populations of *Gambelia sila* with Emphasis on a Purported Hybrid Zone

**Adam Grimes\***, California State University Bakersfield, 7304 Canada Ct, Bakersfield, CA 93308, 661-399-6863, agrimes1@gmail.com; **David J. Germano**; **Paul T. Smith**; and **Gwynne N. Corrigan**;

**Abstract:** The blunt-nosed leopard lizard (*Gambelia sila*) is a federally and state-listed endangered endemic, found only in the San Joaquin Valley and the surrounding foothills of central California. Habitat degradation has profoundly impacted the historic distribution and population of *G. sila*. Decreased population size and gene flow among adjacent populations could result in undesirable biological effects often associated with inbreeding. To assess the genetic diversity of *G. sila*, we sequenced 682 base pairs of the mitochondrial cytochrome oxidase b (Cytb) gene from 34 individuals representing six natural populations, including 14 individuals collected from the canyons leading into the Cuyama Valley in Ventura and Santa Barbara Counties where possible introgression occurs with hybrids of *G. wislizenii* to the east. We found 13 mitochondrial DNA haplotypes among the 34 sequences. Phylogenetic analysis indicated that the 13 haplotypes are partitioned into three major clades that correspond geographically as northern, central, and southern haplotype groups. All lizards from the purported hybrid zone fell within the southern clade, and all possessed the *G. sila* mitochondrial DNA signature, suggesting one-way compatibility between male

*G. wislizenii* and female *G. sila*, or more likely that all lizards in the canyons are simply true *G. sila* (not hybrids) and should be protected as such.

### *Amphibians and Reptiles*

## **Habitat Characteristics of Yellow-Billed Cuckoo Along the Sacramento River, California**

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**Abstract:** The global degradation of wildlife habitat by humans has created the need for and interest in the field of restoration ecology. The overarching goal of restoring degraded lands aims to create a more natural state either through planting native vegetation or restoring physical ecosystem processes. Restoring lands also strives to create habitat for wildlife with the hopes of sustaining and increasing populations that have been negatively impacted by habitat loss. The ongoing restoration effort along the Sacramento River, California, has identified a suite of target wildlife species that indicate habitat health and help to measure restoration success by their use of newly created habitats. Yellow-billed Cuckoo are one such species, although are not readily detected in bird surveys due to their cryptic nature. I investigated cuckoo presence and absence along the Sacramento River, California in the 2007 and 2008 breeding season for this species. I investigated variables at various spatial scales to see what habitat features cuckoos were associated with. I found that where cuckoos were present there was significantly higher shrub area, particularly willow shrub area, than at randomly selected control points. Willow shrubs were an important member of the vegetative species composition where cuckoos were detected, and cottonwood forests comprised a higher percentage of the landscape composition than any other habitat type. As many species of birds select habitat on more than one scale, the results of this research indicate that cuckoos may be using habitat features at various spatial scales when selecting habitat on the breeding ground. The results of this study will help land managers and restoration biologists design restoration that might be suitable for cuckoo occupancy, though this study does not examine habitat use by cuckoos.

### *Wildlife Response to Restoration*

## **Managing for the Future: Changing Species on Public Lands**

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**Abstract:** We examined the effects of climate change on bird communities in California using a suite of focal species. We then evaluated how projected changes in species richness indices vary among different public landowners including local, state, and federal entities.

Species occurrence data were obtained from long-term inventory projects encompassing thousands of records and covering all major geographic regions of the state. Future climatic conditions were derived from regional climate models, with change values added to current 800-m PRISM datasets, allowing for relatively high spatial resolution. Changes in predicted probabilities of individual species showed high variation, and changes also varied geographically. In general, more conifer species exhibited decreases in predicted probability of occurrence, while oak woodland species tended to increase, but there was high variation among species. To examine patterns in predicted changes, current and future species richness maps were created for all species and for groups of habitat-associated species. Species richness is projected to increase on lands managed by the USDA Forest Service. All other land categories are projected to have a decrease in species richness with the greatest decreases on Department of Defense lands. Our results indicate that bird distributions and communities are likely to change in response to climate change and public land owners should consider management strategies for these changes. More broadly, our results show that this type of modeling approach could be implemented to identify and target areas of potentially high conservation value in a changing climate.

#### *Climate Change Effects on Wildlife*

### **Skewed Sex Ratio and Breeding System Shift in a California Population of Southwestern Willow Flycatchers (*Empidonax traillii extimus*)**

**Scarlett Howell\***, USGS Western Ecological Research Center, 4165 Spruance Road, Suite 200, San Diego, CA 92101, 619-225-6423, showell@usgs.gov; and **Barbara E. Kus**;

**Abstract:** The endangered southwestern willow flycatcher in California is restricted primarily to three populations, two of which have declined steeply in recent years. We collected lifetime data for color-banded flycatchers from 2000-2009 at Marine Corps Base Camp Pendleton, where flycatchers have declined from 25 territories in 2004 to 12 territories in 2009, despite high annual productivity in most years. During this period, we observed a shift in the breeding system from primarily monogamous to polygynous, associated with an unequal annual mortality rate between sexes and lower male recruitment. The annual male mortality rate averaged 56% from 2002-2004, compared to 29% for females during the same period. Additionally, fewer male recruits entered the breeding population during this period compared to females. These factors combined created a female-biased sex ratio favoring polygyny. The percent of paired males that were polygynous increased from 14% in 2001 to 75% in 2005. After 2005, female mortality increased compared to males, culminating in an equal sex ratio by 2008, and a return to a primarily monogamous system by 2009. The flexibility of flycatchers to alter their breeding system in response to a changing sex ratio may have allowed this declining population to persist during years with fewer males.

#### *Poster Session*

### **Seasonal Abundance and Distribution of Non-Breeding Long-billed Curlews at the San Luis National Wildlife Refuge Complex**

**Marianne Huizing\***, California State University, Stanislaus, One University Circle, Turlock, CA 95382, 1-209-417-0720, mhuizing1@csustan.edu; **Kenneth Griggs**; and **Ann K. Kohlhaas**;

**Abstract:** Long-billed curlews (*Numenius americanus*) are listed as a "Bird of Conservation Concern" by the United States Fish and Wildlife Service (USFWS) and are listed as "Highly Imperiled" in the U.S. conservation plans for shorebirds. The Central Valley is a regionally important area for migratory curlews and for non-breeding curlews that remain year long. Curlews continue to be threatened by the loss of habitat due to increased urbanization and the conversion of native uplands, wetlands, and agricultural land into less suitable crops. We surveyed for curlews from October 2008 to September 2009 at the San Luis National Wildlife Refuge (NWR) and Merced NWR in an effort to understand their seasonal distribution and abundance on refuge land. A total of 48 sites were surveyed once every two week period. Survey site habitats were broadly classified as native upland, altered upland, irrigated pasture, flooded wetland and vernal pools. A total of 1858 curlews were counted during the surveys. Curlews were most abundant on refuge land from late winter to early summer (February to June) with the highest number of curlews observed in February. Number of curlews decreased during the mid-summer months (July to August), but increased numbers were counted in September. Curlews were most often observed on native upland. The next most commonly used habitat was altered upland; irrigated pasture and wetlands were used the least.

*Poster Session*

**Demographics and Ecology of the Coast Horned Lizard (*Phrynosoma blainvillii*) at Atwell Island, Tulare County, California**

**Susan Hult\***, Bureau of Land Management, 3801 Pegasus Drive, Bakersfield, CA 93308, 661-391-6065, susan\_hult@blm.gov; and **David J. Germano**;

**Abstract:** In April 2009, we began collecting demographic and ecological data on a population of Coast Horned Lizards (*Phrynosoma blainvillii*) on a 138 ha patch of remnant habitat in the southern San Joaquin Valley in Tulare County, California.

Peak activity for adults was April and May, but most adults were scarce by June. Hatchlings and juveniles were active from the end of July until early November. Average adult male size was 69.7 mm SVL and 20.8 g mass (n = 18). Adult females averaged 74.4 mm SVL and 25.6 g mass (n = 14). The smallest hatchling found above ground was 29.0 mm SVL and 1.5 g. Various sizes of young found July-October suggest that females lay eggs over a span of three months. Daily activity periods varied during the spring, summer, and fall months. We found lizards active between 19 C and 31 C in the spring and fall. Two of the most important variables for determining presence/absence of horned lizards are the presence of ant mounds and in the Central Valley, alkali flat habitat. At the study site, however, ants are dispersed without obvious mounds and there are no alkali flats, yet there is a large population of Coast Horned Lizards.

*Amphibians and Reptiles*

## **Southern Sea Otter Health and its Management Implications**

**David Jessup\***, California Department of Fish and Game, 1451 Shaffer Rd., Santa Cruz, CA 95060, 831-469-1726, djessup@ospr.dfg.ca.gov; **Melissa Miller**; **Tim Tinker**; **James E. Estes**; **Michelle Staedler**; **Christine K. Johnson**; **Patricia A. Conrad**; and **Jonna A.K. Mazet**;

**Abstract:** The failure of the Southern sea otter (*Enhydra lutris nereis*) to recover as predicted almost 2 decades ago has caused Federal and State conservation agencies and NGO's to reconsider a number of previous assumptions. In the course of research on causes of mortality and sea otter ecology it has become evident that various forms of pollution, most of them connected to human activities on land, are significantly contributing to the problem. These pollutants include, but are not limited to; protozoal oocysts, fecal bacteria, persistent organic pollutants, oil, nutrients and sediments that contribute to harmful algal blooms, and most recently cyanobacteria. The problems are demonstrably worse near the more populated areas adjacent to Estero Bay and in Monterey Bay and can be characterized in two words; Environmental Degradation.

Many, but not all, also pose significant risk to human health and to the sustainability of healthy marine ecosystems and the businesses that depend on them. It is clear that significant public education and outreach is needed to motivate people and the governments and agencies they elect to tackle the problems and mitigate them. Many, but not all, of these pollutants do not come from specific point sources that fall under clear regulation. Review of policy, regulatory and enforcement options is needed. Sea otters have a very important role as a keystone species in kelp forest ecosystems, but their role as a sentinel species and one that can motivate change be even more important.

*Disease and Wildlife Management*

## **Low Wind Speeds and Hoary Bat (*Lasiurus cinereus*) Mortality at the Montezuma Hills Wind Energy Region in Central California**

**Dave Johnston\***, H. T. Harvey & Associates, 983 University Avenue, Los Gatos, CA 95032, 408-458-3226, djohnston@harveyecology.com; **Judd A. Howell**; **Scott B. Terrill**; and **James Castle**;

**Abstract:** Wind energy is becoming increasingly important as an alternative energy source, yet wind turbines in many areas of the United States and Canada are responsible for bat mortality. Most of the bats killed by wind turbines are migratory Lasurine bats (e.g., hoary bats [*Lasiurus cinereus*]) during their fall migration; however, a clear understanding about why bats are killed more at some areas than others has been elusive. Furthermore, few studies on wind turbine bat mortality have been conducted in California and none have included daily carcass searches to improve the accuracy of mortality assessment. Recent studies on wind energy impacts to bats in Alberta suggest that wind speed may influence bat mortality from turbines, and that by changing the cut-in speed at which point turbine rotors begin turning in low winds, bat mortalities can be reduced. As a part of a larger 2-year study to investigate wind energy impacts to birds and bats, we investigated the relationship between wind speed and bat mortality at Montezuma Hills near the confluence

of the Sacramento and San Joaquin Rivers in Central California. This larger study comprised carcass searches at 48 turbines, radar sampling at 2 points, night vision observations at 2 points, and acoustic surveys at 8 stations for birds and 8 stations for bats using Avisoft full-spectrum software for recording and analysis. Survey techniques were conducted for 4, 10-day periods between August 15 and October 15, 2009. During the first season for this study, we found that low wind speed was an important predictor of bat mortality for two migratory species, the hoary bat and the Brazilian free-tailed bat (*Tadarida brasiliensis*). Although no western red bats (*Lasiurus blossevillii*) were recovered during carcass searches during our 2009 season for this study, earlier turbine related mortality records for the western red bat at Montezuma Hills suggest that this species was also killed during very low wind speeds. The relationship between bat mortality and distance to tree groves, moonlight, cloud cover, temperature, and barometric pressure will also be presented.

### *Nongame Mammals*

#### **Assessing California Spotted Owl Response to Forest Management Treatments and Wildfire**

**John Keane\***, Pacific Southwest Research Station, 1731 Research Park Drive, Davis, CA 95670, 530-759-1704, jkeane@fs.fed.us; **James Baldwin**; **Ross A. Gerrard**; **Claire V. Gallagher**; **Paula A. Shaklee**; and **Gretchen Jehle**;

**Abstract:** Forests in western North America have changed in structure and function over the past 150 years a result of fire suppression, which has altered the primary natural disturbance agent in these ecosystems, and other management activities such as timber harvest and grazing. Current management strategies proposed to restore and conserve these ecosystems are often politically controversial as a result of uncertainty regarding the effects of proposed treatments on species of concern and ecosystem processes. Uncertainty surrounding the effects of fuels and vegetation management on California spotted owl (CSO) population viability has been at the heart of the controversy to develop ecologically sound and socially acceptable forest management strategies in the Sierra Nevada, California. The objective of our work is to assess the effects of fuels-vegetation management and wildfire on CSOs across a 1900 km<sup>2</sup> study area in the northern Sierra Nevada.

### *Raptors*

#### **Evaluating Survey Methods and Sampling Designs for Monitoring Great Gray Owls in the Sierra Nevada, California**

**John Keane\***, Pacific southwest Research Station, USDA Forest Service, 1731 Research Park Drive, Davis, CA 95618, 530-759-1704, jkeane@fs.fed.us; **Joseph R. Medley**; **Eric P.A. Jepsen**; **Ryan Byrnes**; and **Holly B. Ernest**;

**Abstract:** Great gray owls (*Strix nebulosa*) are a State-endangered species in California with

a limited distribution in the Yosemite region of the Sierra Nevada and an estimated population size of 100-200 individuals. The objectives of our work are to evaluate the efficacy of existing survey protocols and to use this information to inform development of monitoring strategies for this population of owls. We conducted nocturnal broadcast and diurnal meadow search surveys at historic and randomly selected owl sites on the Stanislaus National Forest and in Yosemite National Park between 2004-2009. Single-visit probabilities of detection ranged from 0.40-0.68 for broadcast surveys and 0.10-0.89 for meadow searches with variation associated with site status (historic vs random) and ownership. Given the small population size of owls, managers have expressed interest in monitoring both the small number of occupied sites, as well as monitor for owls at random sites. To inform future monitoring efforts, we use our survey method assessment results to evaluate options for future monitoring designs.

### *Raptors*

#### **Influence of Climate on Timing of Nest Initiation in Least Bell's Vireos**

**Barbara Kus**, USGS Western Ecological Research Center, 4165 Spruance Road, Suite 200, San Diego, CA 92101, 619-225-6421, barbara\_kus@usgs.gov;

**Abstract:** Anticipating response to changing climate is a high priority need in endangered species management. I examined relationships between date of nest initiation in Least Bell's Vireos, which influences seasonal productivity, and five climate variables shown to influence migration timing in other species: Southern Oscillation Index (SOI), Multivariate ENSO Index (MEI), North Atlantic Oscillation Index (NAOI), local temperature, and local precipitation, averaged over three months (Jan-Mar) preceding vireo arrival on their breeding grounds. Precipitation and temperature were stronger than the global climate indices as predictors of annual (1) median and (2) earliest lay date of first egg for vireos in San Diego County, CA, from 1987-2009. Temperature, particularly in March, influenced both median and earliest lay dates, explaining 42% and 54% of their inter-annual variability. Total precipitation in January and February predicted earliest, but not median, lay date. No significant trends in temperature, precipitation, median or earliest lay date of vireos were detected during the study period; however, the relationships between timing of nest initiation and local climate variables provide a tool for predicting and tracking response of Least Bell's Vireos to future climate change.

### *Climate Change Effects on Wildlife*

#### **Climate Threats to the American Pika: Modeling Historical Persistence for 21st Century Projections**

**Scott Loarie**, Carnegie Institution for Science, Department of Global Ecology, Stanford, California 94305

**Abstract:** The American pika is generally restricted to alpine ecosystems that are vulnerable to warming climates. The recent disappearance of pikas from several Great Basin sites has



raised concerns that pikas may be threatened by climate change. In order to quantify the threat of contemporary climate change, we developed projections of future pika persistence under a range of climate change scenarios. We compiled multiple sets of historical surveys from 438 pika sites and employed a novel Bayesian approach to model climate impacts, which has three advantages over alternative niche-modeling approaches. First, we modeled persistence as a temporal process to avoid making frequently criticized space-for-time substitutions. Second, we estimated persistence probabilities rather than relative suitability indices. Third, we accommodated uncertainty in both climate change and pika persistence. Temperature was positively correlated with historic pika extirpations. Using projections from 16 global climate models and 3 emission scenarios, we project a substantial probability (>0.5) that climate change from mid-high emissions will extirpate pikas from 47% (21-59%) of our study sites by 2100 – an increase from 29% (15-33%) under low emissions. The majority of these extirpations will occur west of the Rocky Mountains. These results suggest that climate threats to the American pika in the 21st century may be severe.

### *Pika Symposium*

### **Aging Bell's Vireos in the Hand : A Test of Morphometric Characteristics**

**Suellen Lynn\***, U.S. Geological Survey, 4165 Spruance Road, Suite 200, San Diego, CA 92101, 619-225-6437, [suellen\\_lynn@usgs.gov](mailto:suellen_lynn@usgs.gov); and **Barbara E. Kus**;

**Abstract:** Accurately aging organisms in demographic studies is essential to determining survivorship and productivity by age cohort. Many passerines are difficult to age accurately once juvenile characteristics, such as natal plumage and incomplete skull ossification, are no longer present. Although adult flight feathers often have a different shape and quality than juvenile feathers, these differences can be subtle and only detectable with the bird in hand. Like many passerines, Bell's vireos retain their juvenile flight feathers through the first breeding season. Pyle (1997) suggests that the length and shape of the tenth primary feather (p10) may be useful in distinguishing hatch-year and second-year Bell's vireos from older individuals (after-second-year). To test this, we captured adult least Bell's vireos that had been originally banded as nestlings and measured the extent of p10 beyond the tip of the longest primary covert (N = 76) and scored the tip as rounded or pointed. We also took photographs of the p10s of 18 captured vireos and had nine observers independently score the shapes side-by-side. We found that length of p10 did not differ by age. Inter-observer variability was high in determining the shape of 7 of the 18 p10s in photos. However, when at least eight of the nine observers agreed, we were able to accurately age vireos by p10 shape 91% of the time. With practice, the shape of p10, although subtle, can be useful in determining the age of Bell's Vireos.

### *Poster Session*

### **The Spread and Control of *Dittrichia graveolens***

**Meg Marriott**, USFWS, 9500 Thornton Avenue, Newark, CA 94560, 510-377-1041, [meg\\_marriott@fws.gov](mailto:meg_marriott@fws.gov);

**Abstract:** This poster summarizes the current information on *Dittrichia graveolens*, a rapidly expanding invasive weed, new to California within the last 15 years. This plant invades disturbed areas throughout many habitat types including marsh/upland ecotones. It poses a potential threat to wildlife and wildlife habitat as it forms dense stands/monocultures that can choke out native competitors. This poster presents background information on the weed, as well as a biological summary and an in-depth section on techniques/methods for control.

*Poster Session*

### **Annual Abundance and Productivity Indices of Five Temperate Migrants at Rocky Point Bird Observatory: A Pacific Coastal Migration Monitoring Station**

**Ronald Melcer Jr.\***, Rocky Point Bird Observatory, c/o 954A Queens Ave, Victoria, BC V8T 1M6, (916) 296-6729, rmelcer@calpoly.edu; **Rachel J. Gardiner**; and **Ann Nightingale**;

**Abstract:** Rocky Point Bird Observatory, located on the southern tip of Vancouver Island, B.C., is the only Pacific coastal member of the Canadian Migration Monitoring Network and provides important information on coastal and western landbird populations. We selected five temperate migrant species: Fox Sparrow (*Passerella iliaca*), Golden-crowned Sparrow (*Zonotrichia atricapilla*), Lincoln's Sparrow (*Melospiza lincolni*), Savannah Sparrow (*Passerculus sandwichensis*), and Dark-eyed Junco (*Junco hyemalis*). Using simple linear models, we calculated trends and productivity estimates for each species from constant-effort mist-net data (2000-2009). All species except Savannah Sparrow (-11.5%,  $P=0.048$ ) showed non-significant trends in abundance and productivity ( $p>.05$ ). Breeding Bird Survey (BBS) coverage in the Northern Pacific Rainforest region is poor for these species, and results varied or were not available. Average annual productivity of Savannah Sparrow was 0.66, SE 0.04, and annual productivity declined throughout the study period. These data suggest that for four species, populations currently sampled by our fall efforts are not experiencing significant declines in overall abundance or productivity. They also provide valuable information on Golden-crowned Sparrow, a species absent from BBS and Monitoring Avian Productivity and Survivorship analyses.

*Poster Session*

### **Thermal Regimes of Talus Fields Enhance American Pika's Resilience to Warming**

**Constance Millar**, USDA Forest Service, PSW Research Station, 800 Buchanan St., Albany, CA 94710, 510-559-6435, cmillar@fs.fed.us; and **Robert D. Westfall\***; **Andrew Smith**;

**Abstract:** Patterned-ground and related periglacial features are emblematic of cold and dry arctic environments. Unusual internal and autonomous thermal and micro-climatic regimes of these landforms are beginning to be understood, primarily from studies at high latitudes. Rock-dwelling species of pikas (*Ochotona*) have long been known for their talus habitats. We are investigating thermal regimes of these landforms for their role in habitat quality and

refugial environment for American pika (*O. princeps*) in California. We deployed 112 thermochrons into four active pika talus fields of eastern Sierra Nevada: two low and two high taluses on paired granitic and metamorphic substrates. At each location, four transects extended from the talus forefield up the talus slopes. Thermochrons were installed at surface and matrix (1m below surface) locations along each transect. We retrieved data and report thermal trends based on hourly readings for summer 2009. Our primary findings are: 1) matrix temperatures were lower than surface by 1-2 C; 2) surface temperatures had significantly higher daily fluctuations compared to matrix; 3) maximum surface temperatures at the two low elevation talus fields exceeded 40 C; 4) for both surface and matrix locations, temperatures were cooler at lower elevations in each talus field, creating positive lapse rates to 12 C/1000m elevation; 5) conditions for positive lapse rates collapsed during cool, overcast days, during at which time lapse rates were near 0 C/1000m; 6) forefield (vegetation) locations directly adjacent to the lowest talus borders had the coldest mean temperatures, but high daily fluctuations. In sum, thermal environments of talus fields, especially rock matrices, appear to mitigate hot summer external air temperatures, especially low in the talus fields where pika haypiles are built, and from which forays to vegetation are conducted. While we have yet to retrieve intensive data for winter, our records from related talus research suggest that talus surface locations covered by snow remain near 0 C whereas sub-surface matrix locations remain much colder, to -8 C. Thus, pikas are protected from winter cold by building, and remaining at, surface haypiles. Such locations, however, may be at increasing risk in areas where snowpacks are decreasing and/or melting earlier in spring.

### *Pika Symposium*

## **Web 2.0 as a Framework for Adaptive Management and Conservation of Landscapes**

**Douglas Miller\***, Penn State University, Center for Environmental Informatics, 2217 Earth-Engineering Sciences Bldg., University Park, PA 16802, 814-863-7207, miller@cei.psu.edu;

**Abstract:** We are in the initial stages of a new generation of dynamic, interactive capability in the Web environment that will serve 21<sup>st</sup> Century land managers in a host of roles. Web 2.0, or the 2<sup>nd</sup> generation Web, emphasizes information sharing, interoperability, user-centered design, and collaboration/social networking. When combined with the expanded capabilities in web-based geospatial technology of the past 4-5 years, the Web 2.0 paradigm provides significant opportunities to create knowledge discovery tools and interfaces for a wide range of land management applications. These Web tools provide data visualization and exploration capabilities as well as more advanced functionality including interactive scenario analysis and collaborative decision making capabilities.

The capability to visualize, explore, and ultimately understand the spatial and temporal relationships between physical habitat locations and the nature and characteristics of species populations and distributions is critical if land management and conservation efforts are to be targeted effectively. This paper will review the Web 2.0 paradigm, provide example tools and a potential overarching framework for the application of these technologies to the challenge of land conservation and habitat management in the coming decades.

**Evidence for a Novel Form of "Harmful Algal Bloom": Cyanotoxin Transfer from Land to Sea Otters**

**Melissa Miller\***, CDFG-OSPR, MWVCRC-1451 Shaffer Road, Santa Cruz, CA 95060, (831) 469-1746, mmiller@ospr.dfg.ca.gov; **Abdou Mekebri**; **Dave Crane**; **Stori Oates**; **David Jessup**; **Tim Tinker**; **Michelle Staedler**; **Woutrina Miller**; **Sharon Toy-Choutka**; **Clare Domink**; **Dane Hardin**; and **Raphael Kudela**;

**Abstract:** "Super-blooms" of freshwater cyanobacteria ("blue-green algae") with production of potent and environmentally persistent cyanotoxins, called "microcystins" are an emerging global health issue of impaired freshwater habitat. Despite increases of these toxic bloom events in lakes, reservoirs and rivers worldwide, surveillance of the marine environment for secondary impacts has been minimal, although marine outflows of microcystin-contaminated freshwater have been documented in several countries. Here we describe deaths of marine mammals due to microcystin intoxication and provide evidence implicating land-sea flow with trophic transfer through marine invertebrates as the most likely route of exposure. Sea otters dying due to microcystin intoxication were often clustered near river mouths, embayments and harbors; areas with potential to receive and retain concentrated plumes of contaminated fresh water. Microcystin was detected in freshwater outflows of three nutrient-impaired watersheds flowing into Monterey Bay after a major storm event. Radio-tagged sea otters that died due to microcystin intoxication consumed a high proportion of marine bivalves in their diet. Finally, in laboratory studies, marine bivalves consumed by both sea otters and humans exhibited significant uptake and slow depuration of freshwater microcystins, suggesting a potentially serious environmental and public health threat that extends from the lowest trophic levels of nutrient-impaired freshwater habitat to top marine predators at the land-sea interface.

*Disease and Wildlife Management*

**Effects of Enhancement Actions on Habitat Use by the San Francisco Garter Snake at Mori Point, Pacifica, California, 2004-2008**

**Jeffrey J Mitchell**, Swaim Biological Inc., 4435 First St., PMB 312, Livermore, CA 94551, 415-350-4143, jeffmitchell003@hotmail.com; **Tammy C. Lim**; and **Karen Swaim**;

**Abstract:** The federally and California state endangered San Francisco garter snake (*Thamnophis sirtalis tetrataenia*) inhabits ponds, wetlands, and adjacent upland habitats in San Mateo County, California. We estimated the relative abundance of San Francisco garter snakes at Mori Point, a natural area administered by the Golden Gate National Recreation Area in Pacifica, prior to and following a habitat enhancement project. The project involved the enlargement or creation of four small ponds intended to provide breeding habitat for the snake's primary prey item, the California red-legged frog (*Rana draytonii*). We conducted a series of three drift fence - funnel trap surveys in 2004, 2006 and 2008 in order to collect data

on relative abundance and habitat use by both species. Relative capture rates of both the San Francisco garter snake and California red-legged frog increased following the construction of the ponds. Although small sample sizes and annual differences in environmental variables prevented a statistically significant comparison between years, our results suggest a post-enhancement increase of snake activity in the area.

*Amphibians and Reptiles & Poster Session*

### **Introduction the California Pika Consortium**

**T.L. Morelli**, Department of Environmental Science, Policy, and Management, U.C. Berkeley, Berkeley, California 94720

**Abstract:** The American pika (*Ochotona princeps*) is a small lagomorph that inhabit the rocky mountain slopes of western North America. Specialized physiological and behavioral adaptations that enable pikas to tolerate cold environments also render them highly sensitive to warm temperatures. Vulnerability to warming coupled with relatively smaller land area available at higher elevations has raised concern for persistence of pikas and other montane small mammals in the face of climate change. Limited information exists about the relationship between climate and the American pika or other high-elevation mammals. Pikas have been petitioned for endangered species listing under federal and California state laws, increasing the need for an interdisciplinary collaborative effort across the western United States to foster research, monitoring, education, conservation, and adaptation planning for pikas and other high-elevation species.

The California Pika Consortium (CPC) was formed out of discussions at the first California Pika Summit, held November 10, 2009, in Davis, CA. The CPC is dedicated to the following goals: sharing information among research scientists, agency biologists, and conservation groups focused on the American pika and other high-elevation species in California; coordinating with similar efforts in other regions and on other *Ochotona* species; and fostering collaborations to provide the best available science to management and policy applications and to increase the efficiency, effectiveness, and policy impact of future research, monitoring, and conservation efforts on the American pika. The focus of the CPC is on California pika research and conservation, but the consortium will draw on and provide information to groups working in other areas of the American pika's geographic range. Efforts of the CPC are the responsibility of consortium work groups, which are comprised of volunteers with specific expertise and interests. Current work groups of the CPC include Conservation, Health, Geomorphology and Habitat Mapping, Database Coordination, and Research Coordination. Despite being in its earliest stage, the CPC already has 31 members from 19 organizations.

*Pika Symposium*

**Hibernation Periods and Potential Influence of Climate Change on Den Entry and Den Emergence by Black Bears in the Central Sierra Nevada**

**Brady Neiles\***, UC Berkeley, 51354 Old Corral Ranch Rd, Oakhurst, CA 93644, 6052227823, brady.neiles@hotmail.com; **Rick A. Swietzer**; and **Reginald H. Barrett**;

**Abstract:** Black bears (*Ursus americanus*) are common throughout the Sierra Nevada mountain range in California, often becoming dormant during winter. Multiple factors are known to influence denning chronology (entry and emergence from den sites) of black bears including elevation, forage availability, and climate. We hypothesize that the likely trend for warmer winter temperatures and decreased snow pack in the Sierra Nevada due to climate change will alter the denning chronology of black bears in this region. Altered behavior may be identified by delayed entry and earlier emergence from dens. Automatic cameras have previously been used to investigate denning behavior by black bears, and we used these devices to assess the timing of den entry and den emergence, and the mean duration of hibernation by bears during winter 2007-08 and winter 2008-09. We will use a literature review to estimate historical variables associated with hibernation and den use by black bears in the Sierra Nevada for comparison to our data. As part of a larger study focused on the biology of fishers (*Martes pennanti*) in the southern Sierra Nevada, we are using automatic digital cameras to survey for forest carnivores in the Bass Lake Ranger District of the Sierra National Forest. Camera stations baited with venison and scent lures are established near the center points of 1 km<sup>2</sup> grid cells, and checked and rebaited every 8 days for approximately 1 month periods/station. Black bears are the most commonly detected carnivore, therefore allowing us to assess when bears emerge from hibernation during spring, and when they enter dens and cease visiting cameras in early winter. During survey year 1 (Oct 25, 2007 to Oct 14, 2008), 219 grid cells were surveyed, compared to 345 grid cells in year 2 (Oct 15, 2008 to Oct 14, 2009). Black bears were detected at 101 grids during year 1, with most detections occurring between 1044 m and 2451 m elevation. Bear detections were absent from all cameras located above >1500 m during January and February, whereas several lower elevation cameras were visited by bears during this period. More detailed analyses are underway and will be presented.

*Poster Session*

## **California's Climate Adaptation Strategy**

**Amber Pairis**, California Department of Fish and Game

**Abstract:** California's Climate Adaptation Strategy (CAS) final report, is a first-of-its-kind comprehensive, multi-sector analysis that will enhance the state's management of climate impacts from sea level rise, increased temperatures, shifting precipitation and extreme natural events. The CAS final report summarizes the latest science on how climate change could impact the state and provides recommendations on how to manage against those threats. It focuses on seven different sectors - public health, biodiversity and habitat, ocean and coastal resources, water management, agriculture, forestry, and transportation and energy infrastructure - and lays out several recommendations focused on reducing climate risks to people, the environment and infrastructure. The Department of Fish and Game is an important a part of the climate change solution and has been working collaboratively with stakeholders on the creation of this strategy. In crafting these strategies, the

Department has focused on actions that seek to maintain healthy, connected, genetically diverse populations; improve and enhance ecosystem functions; reduce non-climate stressors on ecosystems; develop adaptive management models for game and commercial species management; and adopt adaptation approaches that reduce risks to species and habitats while providing opportunities for adjusting to new conditions. Detailed planning and subsequent actions are still needed to finalize and implement these strategies however; the aggressive efforts that California is taking are important first steps in climate change adaptation planning and serve as a model to other states and nations grappling with these issues.

*Plenary Speaker*

### **California Essential Habitat Connectivity Project**

**Monica Parisi\***, California Department of Fish and Game, 1416 Ninth Street, Suite 1280, Sacramento, CA 95814, (916) 653-9767, mparisi@dfg.ca.gov; and **Amy Pettler**;

**Abstract:** The California Department of Fish and Game (CDFG) and the California Department of Transportation (Caltrans) - responding to recent legislation and to internal conservation and transportation planning needs - have commissioned a team of technical consultants to produce a statewide assessment of essential habitat connectivity by February of 2010, using the best available science, data sets, spatial analyses and modeling techniques. The project outline included the following steps:: 1) establish a multidisciplinary team of agencies and organizations representing land ownership and management, infrastructure planning, and wildlife regulation; 2) construct a statewide wildlife habitat connectivity map using a geographic (GIS) based modeling approach; 3.) assess the biological value of identified connectivity areas; and 4) develop a strategic plan that helps varied end users interpret and use the statewide map and outlines a methodology necessary for completing connectivity analyses at finer spatial scales. The modeled analysis uses a least cost corridor method to connect large blocks of intact habitat having high ecological integrity. Methods and results are presented and compared with earlier statewide expert-driven approaches for identifying important connectivity areas such as Missing Linkages (2001), with statewide efforts to prioritize areas of high biological value such as CDFG's Areas of Conservation Emphasis (ACE II), with regional connectivity analyses that use both ecological integrity and focal species-based approaches, and with existing reserve networks for Natural Community Conservation Plans (NCCPs) and Habitat Conservation Plans (HCPs). Recommendations for use of this product in conservation and transportation/infrastructure planning are also highlighted.

*Large Scale Conservation Strategies (easements, landscape planning)*

### **Dispersal in Fragmented Habitats: Using Genetic Markers to Understand Long Term Movement Patterns**

**Mary Peacock\***, University of Nevada, Reno, 1664 N. Virginia, Reno, NV 89557, 7757841958, mpeacock@unr.nevada.edu; **Susan J. Merideth**; **Chris Ray**; **Eileen Hickey**; and **Peter F.**

**Brussard;**

**Abstract:** The North American pika (*Ochotona princeps*) is being considered for listing under the United States Endangered Species Act in the state of California due to population declines attributable to reductions in winter snow pack likely caused by global warming trends. Pikas are talus obligates found in alpine environments throughout western North American. Talus (rocky slopes) habitat is naturally fragmented and as such represents a model system for examining the relationship between habitat spatial structure and gene flow. We used data from 14 polymorphic microsatellite markers with alleles identified by both repeat size and SNP polymorphisms to characterize total genetic variation, allelic richness, gene diversity, and population genetic structure among pika populations within and between two adjacent mountain ranges in Nevada that differ in overall size and total amount of suitable habitat. We found that the pika populations in these insular mountain ranges had relatively high levels of genetic diversity despite conspicuous habitat fragmentation at both local and mountain range wide spatial scales. Pika populations also had higher genetic diversity and lower genetic differentiation among populations within a single isolated mountain range than would be expected if pikas were strictly philopatric. We did not find a significant correlation between geographic and genetic distance within mountain ranges, but a significant relationship between ranges suggests that unsuitable, low-elevation habitat between mountain ranges is a significant contemporary barrier to gene flow. These data have direct bearing on extinction risk assessment and suggest pikas may have larger effective population sizes than expected which may help buffer populations against extinction at least in the short term.

*Pika Symposium*

### **Resurveying Historic Pika Populations in California: Results and Lessons from the Grinnell Resurvey Project**

**John Perrine\***, California Polytechnic State University, Biological Sciences Department, San Luis Obispo, CA 93407-0401, 805 756-2368, jperrine@calpoly.edu; and **James L. Patton;**

**Abstract:** Records of American Pika occurrence from the early 1900s are valuable for assessing the long-term dynamics of this species. Now that pika are of conservation concern, documenting the locations and fates of these historic populations is especially important. As part of the Grinnell Resurvey Project centered at UC Berkeley's Museum of Vertebrate Zoology, we have located records of pika occurrence based on historic field notes, specimens, and annotated maps from faunal surveys in the Yosemite (1914-1919) and Lassen (1923-1929) regions. In the Yosemite region, preliminary resurveys in 2002-2005 suggested a 150m retraction of pika's lower elevational limit. However, this pattern was caused by the apparent extirpation of a single historic site and may not reflect pika status at other sites at this elevation. Another Grinnell-era pika site at this elevation remains to be resurveyed. Moreover, an exhaustive documentation of historic pika observations in the Yosemite field notes has not yet been conducted, so additional records may yet emerge. In the Lassen region, the historic field notes identified 19 historic pika sites, including sites not represented by specimens nor noted in the historic monograph. We resurveyed 17 of these



sites in summer 2009 and concluded that 10 of them were currently occupied. Our efforts to document these historic sites and assess their current status are ongoing. While our results to date are informative for pika monitoring, they must be interpreted with caution. We will address the inherent limitations of such resurveys and the implications for pika monitoring and conservation.

### *Pika Symposium*

## **California Tiger Salamander Larval Growth Rate Observations**

**Brian Pittman\***, Environmental Science Associates, 1425 N. McDowell Blvd., Ste 200, Petaluma, CA 94954, 707-795-0915, bpittman@esassoc.com; and **Natasha Dvorak**;

**Abstract:** In 2007, a shallow 0.5-acre pond was inadvertently created by the California Department of Water Resources (DWR) near Dyer Road (Alameda County, CA) during geological excavation studies for the proposed Dyer Reservoir. The seasonal pond was inert in 2008; however, in February 2009, California tiger salamander (*Ambystoma californiense*) egg masses were detected. Beginning on 24 April, 2009, California tiger salamander larvae were captured and relocated to a nearby stock pond. We performed dip net and seining surveys at seven day intervals and captured a total of 2,699 larvae during six sampling events (28 person days). The large sample population allowed characterization of two separate length classes (51 mm and 76 mm), which increased in size by 4 mm to 11 mm (average = 7.7 mm) per week during consecutive sampling events from 24 April to 15 May, 2009. The survey effort provides insight into California tiger salamander larval growth rates, pond exit strategies and capture techniques.

### *Amphibians and Reptiles*

## **Does Clutch Size Decrease with Increasing Elevation?**

**Kathryn Purcell**, USFS Pacific Southwest Research Station, 2081 E. Sierra Avenue, Fresno, CA 93710, 559-868-6233, kpurcell@fs.fed.us;

**Abstract:** A fundamental paradigm of avian reproductive ecology is that clutch size increases with latitude but the relationship between clutch size and altitude is less clear. I examined clutch sizes of seven species nesting across an elevational gradient in the Sierra Nevada, California. Clutch size decreased with increasing elevation for three open-nesting species (Cassin's Vireo, Dark-eyed Junco, and Dusky Flycatcher). Two other open-nesting species (American Robin and Hammond's Flycatcher) showed no significant response but followed the same pattern. In contrast, clutch size did not vary with elevation in two cavity-nesting species (White-headed Woodpecker and Mountain Chickadee). These results suggest that the response of cavity nesters to environmental conditions that vary with elevation differs from that of open nesters. Cavity nesters breed earlier and tend to be single brooded and are therefore less constrained by the shorter period over which conditions are considered suitable for breeding at higher elevations. Reduced thermoregulatory costs relative to open-cup nesting species due to the insulation of cavities and larger brood sizes

may allow cavity nesters to lay similar-sized clutches at different elevations. The factors regulating clutch size patterns across latitudinal and elevational gradients appear to differ.  
*Neotropical Migrants*

### **A Passel of Pikas in Lava Beds at Low Elevation**

**Chris Ray**, University of Colorado, 334 UCB, Boulder, CO 80309-0334, 303-489-8863, [cray@colorado.edu](mailto:cray@colorado.edu);

**Abstract:** In response to recent evidence that the American pika is disappearing from lower elevation habitats in portions of the western US, Lava Beds National Monument and research partners conducted surveys during 2005 and 2006 to study the distribution of pikas throughout this low-elevation Monument. Surveys were designed to estimate the detection probability and local habitat preferences of the species, and were conducted within rocky habitats associated either with cave features (cave sites) or with lava flows of various ages (flow sites). Results indicated a high prevalence of site use by pikas, especially in the summer of 2006, when pikas used nearly 80% of 58 surveyed sites (79% of cave sites and 77% of flow sites). Cave sites were used less (mean = 31%) than flow sites (51%) during two additional survey periods (summer 2005 and fall 2006). Repeated surveys during 2006 revealed a very high probability of detecting site use (0.97). The best model of site use included only predictors based on the vegetation available within each 452-sq-m survey site. The best predictor of site use was the ratio of graminoids to other vegetation (both measured as percent cover), and this predictor was negatively related to site use. Site use was positively related to the percent cover of forbs and to the number or cover of certain shrubs (fernbush and sagebrush). Sites closer to a talus-vegetation interface were more likely to be used, as were sites at higher elevations (range 1256-1804 m) and those with deeper crevices in which pikas might escape exposure to weather. Total vegetation cover was not a good predictor of site use, so the predictive ability of certain aspects of the vegetation suggests either important effects of forage quality or more subtle effects of microclimate on both vegetation and site use. The fact that pikas were less likely to use cave sites, which were significantly cooler and less variable in temperature than other sites, suggests that pikas are not limited to cooler microclimates within the Monument. However, pikas may be able to access cooler microclimates within the deeper crevices available in many flow sites. Microclimates within these deep crevices have yet to be characterized.

*Pika Symposium*

### **Keys to Successful Large Scale Conservation Plans Utilizing the NCCP Act**

**Ronald Rempel**, San Diego Management and Monitoring Program, 823 C Ave, Coronado, CA 92118, 916-663-9264, [rrempel2@msn.com](mailto:rrempel2@msn.com);

**Abstract:** Various authors have attempted to identify how to develop conservation plans at a regional scale, with their primary focus being on how to design preserves and fund land acquisitions and preserve management. The NCCP Act (Fish and Game Code Section 2800

et seq.) provides general direction on what factors (connectivity, ecosystem function, etc.) have to be considered during the development of a natural community conservation plan and to some extent it also provides guidance regarding the role of adaptive management but little guidance on how to implement plans over the 50 to 100 years of plans' permits is provided. Since the first NCCP was approved in 1995, much has been learned about what makes a plan successful and often it is not the details of the plan but rather how the plan is actually implemented. Key elements to successful plan implementation include: (1) partnerships; (2) local non-governmental entity participation in plan implementation; (3) a broadly supported and focused adaptive management program; (4) a monitoring program that can be modified and adapted; (5) involvement of the academic community; and (6) wildlife agency engagement in the adaptive management and monitoring programs. Three large-scale NCCPs were reviewed to identify: (1) lessons learned; (2) what evolution and adaptation to plans occurred as wildlife agencies learned from each preceding plan; (3) what specific components of a plan helped or hindered the implementation; and (4) where agencies should focus their efforts if conservation planning is to be successful at conserving species, habitats and ecosystem function. The early and potential long-term indicators of success were identified.

*Large Scale Conservation Strategies (easements, landscape planning)*

### **Multi-tiered Monitoring for Landscape Conservation Plans**

**Ronald Rempel**, San Diego Management and Monitoring Program, 823 C Ave, Coronado, CA 92118, 916-663-9264, rrempe12@msn.com;

**Abstract:** The advent of large scale conservation plans with multiple landowners, land managers, agencies, permittees and stakeholder groups is creating significant challenges for implementing regional, preserve and effectiveness monitoring. Challenges occur at multiple levels within and between agencies, between land managers, and within the environmental and development community.

Various authors, Atkinson et al. (2004), Regan et al (2006), McEachern et. al (2007) have described the multiple aspects of monitoring and adaptive management within the context of Natural Community Conservation Plans. Each author focused on a particular level of monitoring but how the various levels should/could be integrated still needs to be effectively addressed. The challenge faced by large scale conservation plans is how to develop a cost effective and easily understood approach to multiple tiers of monitoring that are adaptive in approach and result in improved outcomes for species and habitats.

A multi-tiered monitoring program must be based on understanding: (1) how plan goals relate to questions that can be answered by a specific monitoring approach; (2) what changes preserve managers must be able to detect that would trigger adaptive management actions; and (3) how to monitor the effectiveness of adaptive management actions at meeting a stated goal/objective/question. Each tier of monitoring may occur at a different scale, may be focused on a species, habitat, or stressors or combination of species, habitats, stressors or other factors. With the anticipated effects of global climate change, the specific design of various monitoring efforts will become more challenging.

*Large Scale Conservation Strategies (easements, landscape planning)*

## Removal of Winter Grazing Increases Patch Colonization Rates of California Black Rails

**Orien Richmond\***, UC Berkeley, 137 Mulford Hall #3114, Berkeley, CA 94720-3114, 415-608-5973, orien@berkeley.edu; **Jerry Tecklin**; and **Steven R. Beissinger**;

**Abstract:** The secretive and state-threatened California black rail (*Laterallus jamaicensis coturniculus*) inhabits the edges of shallow, densely vegetated marshes and is thought to be sensitive to edge-related disturbances such as livestock grazing, particularly leading up to and during the breeding season (approximately March-July). Grazed sites are expected to have greater annual variation in vegetation cover and therefore higher rail turnover rates than non-grazed sites. We applied single-species, multiseason occupancy models to examine monthly turnover events of black rails in a network of 25 small marshes (11 winter-grazed only and 14 ungrazed) in the Sierra Nevada foothills, where ranching has been a dominant land use for well over a century. Using presence/absence and habitat data from 11 months of surveys from June 2007 to October 2008, we tested whether winter grazing, area, isolation, and seasonal vs. permanent water regimes influenced monthly colonization and extinction probabilities. We found that rail colonization rates were lower in the presence of winter grazing and increased with marsh area. Local extinction rates, however, were positively related to isolation and seasonal water regimes but did not differ strongly between grazed and ungrazed marshes. Black rail detection probabilities were high ( $0.92 \pm 0.021$ ) and did not differ by season. Winter-grazed sites had significantly lower vegetation cover than ungrazed sites, presumably reducing habitat quality for rails. Thus, our finding that local extinction rates did not differ between these treatments was unexpected. Black rails in the foothills are dependent on irrigation-fed wetlands maintained by the livestock industry. Nevertheless, the removal of winter livestock grazing resulted in increased vegetation cover during the Black rail breeding season and was associated with increased colonization rates. Since black rails are year-round residents in the Sierra foothills, we recommend that land managers avoid overgrazing in any season. The removal of winter grazing appears to increase habitat use by black rails and could be used in some key areas as part of a regional management strategy.

*Shorebirds and Wetlands*

Student Paper

## Monitoring Trends in a Breeding Bird Assemblage with Implications for Riparian Conservation

**David Riensche\***, East Bay Regional Park District, 2950 Peralta Oaks Court, P.O. Box 5381,, Oakland, CA 94605, 510-544-2319, driensche@ebparks.org; **Marty Marrow**; **Maggie Clark**; and **Christopher L. Kitting**;

**Abstract:** Monitoring canaries in coal mines, and other bird populations, can uncover limits in habitat management. Over 14 years, a breeding bird assemblage showed substantial declines at a suburban wetland park in Central California. Of the seventy bird species observed here, twenty-five species were known to breed, and four are classified as riparian

focal species for conservation. Species richness (S), species diversity (H') and species evenness (J') showed little variability among years, however total individuals of all species territories combined (N) showed statistically significant declines. Breeding bird censuses conducted from 1994 to 2008 showed substantial declines in eleven out of twenty-five species, those of notable conservation interest include common yellowthroat (*Geothlypis trichas*), Wilson's warbler (*Wilsonia pusilla*), and song sparrow (*Melospiza melodia*). These changes were not related to any measurable alteration in vegetation on the plot, but may be related to changes in habitat surrounding the site, or precipitation/climate. To our knowledge, this is the first long-term breeding bird census of a riparian habitat along the eastern shoreline of San Francisco Bay, California. Management recommendations to benefit the avifauna include adaptive management during monitoring, and expansion of the park's riparian habitat by enhancing plants in surrounding area restorations.

*Neotropical Migrants & Poster Session*

**Influence of Temperature and Climate on Spring Arrival Time of Migratory Birds in Southern California**

**Michelle Rogne\***, USGS Western Ecological Research Center, 4165 Spruance Road Suite 200, San Diego, CA 92101, 619-225-6450, mrogne@usgs.gov; and **Barbara E. Kus**;

**Abstract:** Climate change is predicted to influence arrival time on the breeding grounds which can in turn influence breeding success. We analyzed capture dates between April 1 and May 20 for five common migrant species (Yellow-breasted Chat, Black-headed Grosbeak, Pacific-slope Flycatcher, Least Bell's Vireo, Yellow Warbler) at two MAPS stations at Marine Corps Base Camp Pendleton to determine if arrival date of migrant birds breeding in southern California is influenced by temperature and climate. We calculated median arrival period and compared it to mean monthly temperature and climate indices for the North Atlantic Oscillation (NAOI) and El Nino Southern Oscillation (SOI, MEI) at the onset of spring migration (March-April), the duration of spring migration (March-May) and the individual months during and preceding migration (February, March, April, May). Using linear regression, we found arrival time for black-headed grosbeak was correlated ( $P \leq 0.10$ ) with the SOI and NAOI, and for Pacific-slope Flycatcher was correlated with all climate indices. The median arrival period for yellow warblers was significantly correlated with temperature in the month prior to the onset of migration (February). Temperature and climate indices can be used to detect which species show a response to changes in climate and may provide a tool for managing migrant species.

*Poster Session*

**Climate Change and Extinctions: How to Prioritize?**

**Terry L. Root.** Jerry Yang & Yamazaki Environmental & Energy Building - 4205  
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Over the last 100 years our globe has warmed ~0.8°C and the warming continues to escalate. Depending on policies and new technologies we implement, global average temperature at the later part of 21<sup>st</sup> Century could be only a degree or 2 hotter than today, or up 6° or higher. Because of time lags that are expected with implementing different policies and the ability to exchange new technologies, temperature up to around 2050 will most likely be between 2° and 4°C. Animals have already begun adapting to our rapidly rising temperatures, but as the temperatures continue to increase both higher and faster, animals are going to need even more help adapting. We need to be creative in figuring out how to help the adaptation. Perhaps having non-place-based refuges, for example. Without such help and creative solutions a very large proportion of animals will most likely be facing extinction.

*Plenary Speaker*

### **Disease Surveillance in the California Deer Population Between 1990 and 2007**

**Annette Roug\***, Wildlife Health Center, University of California, Davis, One Shields Ave, Davis, CA 95616, 9497016087, [aroug@ucdavis.edu](mailto:aroug@ucdavis.edu); **Christine Kreuder-Johnson**; **Steve Torres**; and **Pamela Swift**;

**Abstract:** Deer in California were routinely tested for exposure to six pathogens from 1990 to 2007: bluetongue, epizootic hemorrhagic disease (EHD), leptospirosis, anaplasmosis, bovine viral diarrhea (BVD) and brucellosis. We evaluated the relationship between the risk of exposure to these pathogens and the factors age, sex, deer subspecies and capture location. The overall prevalence over the entire study period was 13.77% for bluetongue, 16.83% for EHD, 6.62% for *Leptospira*, 15.91% for *Anaplasma* and 21.03% for BVD. Antibodies against *Brucella* were only detected in 4 deer throughout the study period. Antibodies against bluetongue and EHD were most prevalent in the desert burro deer (*Odocoileus hemionus eremicus*) and southern mule deer (*Odocoileus hemionus fuliginatus*) populations of southern California as well as in all deer over 2 years of age. Antibodies against *Leptospira* and *Anaplasma* were most prevalent in the black-tailed deer (*Odocoileus hemionus columbianus*) of coastal California as well as all deer types found in central northern California. Antibodies against BVD were most prevalent in the Rocky Mountain mule deer (*Odocoileus hemionus hemionus*) of eastern California. The distribution and seroprevalence of bluetongue, EHD, *Leptospira*, and *Brucella* largely agreed with previous observations. The seroprevalence for *Anaplasma* was slightly lower than detected in previous studies. As for BVD, there is to our knowledge only limited information available on the seroprevalence in California deer. The highest seroprevalence for BVD were found in eastern California. These areas contain large tracts of federal land grazed by livestock and, therefore, contact between deer and livestock is possible. Findings from this study will help to establish baseline values for future comparisons of pathogen exposure in deer, inform upon long-term trends in the health of deer populations and provide relevant information on the distribution of diseases that can be shared between wildlife and livestock.

*Disease and Wildlife Management*

**Student Paper**

## **A Risk Analysis of Brucella Transmission Among Bison, Elk, and Cattle in the Northern Greater Yellowstone Area (GYA).**

**Brant Schumaker\***, University of California, Davis, One Shields Ave., Davis, CA 95618, (530) 752-3566, theschu@ucdavis.edu; **P.J. White; John Treanor; Rebecca K. Frey; Jonna A.K. Mazet; and Tim E. Carpenter;**

**Abstract:** No spatially explicit risk assessment of transmission risk of brucellosis among elk, bison, and cattle in the Greater Yellowstone Area (GYA) has ever been performed. This presentation will focus on the characterization of current spatio-temporal bacterial shedding probabilities on the northern GYA landscape from bison and elk populations. We assessed the probability of shedding in two-month intervals from January to June based on mild, average, and severe winter snowfall patterns. Shedding maps will show the varying probabilities by season, snowfall, and across the landscape. Future steps will be taken to increase the detail of this risk assessment as well as to look at interspecies disease transmission and the effect of various risk management strategies in the northern GYA.

*Disease and Wildlife Management*

**Student Paper**

## **Limb Malformations in the California Red-Legged Frog Observed in Contra Costa County, California**

**Mary Shea\***, Contra Costa Water District, 1330 Concord Blvd, Concord, CA , 925-240-2372, MShea@ccwater.com; **Jeff A Alvarez; and Pieter Johnson;**

**Abstract:** Since the 1940's mass malformations in populations of native amphibians have been reported in over 60 species. More recently, the cause of some mass malformations has been identified as infection within pre-metamorphic amphibians of the parasitic flatworm, *Ribeiroia ondatrae*. Trematode-influenced malformation has been reported for western species of amphibians, including Pacific treefrog (*Hyla regilla*), Western Toad, (*Bufo boreas*), California newt (*Taricha torosa*), tiger salamander (*Ambystoma tigrinum*), Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*), and northern leopard frog (*Rana pipiens*). In 2009, a research team from Colorado State University conducted field studies in wetlands in central California. At one site in eastern Contra Costa County, limb malformations were observed in the California red-legged frog (*Rana draytonii*). This is the first known observation of malformation by *Ribeiroia* in this federally threatened frog. Eutrophication of wetlands, often caused by agricultural and ranching activities, has been shown to improve conditions that increase the density and production of the parasite. Management of habitat for special-status amphibians should consider approaches to reduce factors that lead to eutrophication caused by nutrient loading.

*Poster Session*

## **Carnivore Use of Forest Roads in the Redwood Region of Northwestern California**

**Keith Slauson\***, Pacific Southwest Research Station, 1700 Bayview Drive, Arcata, CA 95521,

**Abstract:** The effect of roads on wildlife habitat depends on how the roads modify the habitat and how a species of interest responds to these novel landscape features. In coastal forests in the Redwood region, forest roads modify habitat by fragmenting patches of forest, dense shrub cover, creating linear openings. For mammalian carnivores, road networks create edge habitat that should benefit habitat generalists more than species that specialize on structurally complex forest habitats. To investigate this hypothesis, we compared the use of forest roads to natural linear features (stream courses) by species of carnivores in the interior of forest stands in the fog-influenced forests of Northwestern California. Twenty total "landscapes", defined by 2.5 km radius circles, were selected in 3 categories: old growth (n = 7), mixed old growth / second growth (n = 6), and second growth (n = 7). In each landscape a remotely triggered camera was established on a forest road and paired with another camera at a stream course (>150 m from the nearest road). Each camera was maintained for 70 days with the following sequence of application of attractants: first 30 days -- no lure or bait; second 30 days -- bobcat, gray fox and fisher urine; and final 10 days - scent lure and chicken bait. We detected 10 species of carnivores, which we placed into 4 guilds based on their habitat specificity: generalists (cougar, gray fox, bobcat, long-tailed weasel), forest generalists (black bear, spotted skunk), forest specialists (fisher, marten), and riparian specialists (raccoon, mink). Road use, based on both detection rates without bait and direction of travel on roads, was dominated by generalists and forest generalists. Both forest specialists and riparian specialists made little use of roads, and were only detected on roads when attracted there using lure and bait. Generalists were rarely detected in the forest interiors along stream courses. Roads may increase the risk of intraguild predation for forest specialists if encounters with larger-bodied Carnivores are more likely to occur on roads, where they are more vulnerable due to reduced escape cover (e.g., dense shrubs, tree boles) than in forest interiors.

#### *Nongame Mammals*

### **Cadmium Toxicity in Birds: Updating the Toxicity Reference Value Used in Predictive Ecological Risk Assessments in California**

**Becky Stanton\***, CA Department of Fish and Game, OSPR, 1700 K Street, Suite 250, Sacramento, CA 95811, 916-327-0916, bstanton@ospr.dfg.ca.gov; **Regina Donohoe**; **Sonce de Vries**; **Michael Eichelberger**; and **Michael Anderson**;

**Abstract:** The current understanding of cadmium impacts to avian species has been improved by recent studies and the extensive literature review completed during the development of the U.S. Environmental Protection Agency Ecological Soil Screening Levels (Eco-SSLs). Therefore, we sought to update the cadmium toxicity reference value (TRV) for birds used by regulatory agencies and resource trustees in California for predictive ecological risk assessments. We surveyed the available secondary and primary literature sources to identify the lowest, ecologically relevant no-observed-adverse-effect levels (NOAELs) for oral exposure of birds to cadmium. Review focused on evaluating TRVs between the currently used TRV (0.08 mg/kg/d) and the Eco-SSL TRV (1.47 mg/kg/d), considering the application of an updated ingestion rate model (Nagy et al., 2001) and



uncertainty factors. After consideration of the endpoints and evaluation of the experimental results, we propose an ecologically protective NOAEL TRV of 0.7 mg/kg/d, based primarily on the kidney toxicity data in wood ducks (Mayack et al., 1981), but supported by other studies that indicate the kidney is a critical target organ for cadmium toxicity. This TRV is also protective of reproductive effects (Leach et al., 1979), another sensitive endpoint for cadmium toxicity. In addition, a lowest observable adverse effect level (LOAEL) of 1.0 mg/kg/d was identified based on kidney nephrosis in The current understanding of cadmium impacts to avian species has been improved by recent studies and the extensive literature review completed during the development of the U.S. Environmental Protection Agency Ecological Soil Screening Levels (Eco-SSLs). Therefore, we sought to update the cadmium toxicity reference value (TRV) for birds used by regulatory agencies and resource trustees in California for predictive ecological risk assessments. We surveyed the available secondary and primary literature sources to identify the lowest, ecologically relevant no-observed-adverse-effect levels (NOAELs) for oral exposure of birds to cadmium. Review focused on evaluating TRVs between the currently used TRV (0.08 mg/kg/d) and the Eco-SSL TRV (1.47 mg/kg/d), considering the application of an updated ingestion rate model (Nagy et al., 2001) and uncertainty factors. After consideration of the endpoints and evaluation of the experimental results, we propose an ecologically protective NOAEL TRV of 0.7 mg/kg/d, based primarily on the kidney toxicity data in wood ducks (Mayack et al., 1981), but supported by other studies that indicate the kidney is a critical target organ for cadmium toxicity. This TRV is also protective of reproductive effects (Leach et al., 1979), another sensitive endpoint for cadmium toxicity. In addition, a lowest observable adverse effect level (LOAEL) of 1.0 mg/kg/d was identified based on kidney nephrosis in mallards (Cain et al., 1983). Overall, these updated TRVs incorporate more recent studies and reviews on cadmium toxicity in birds while establishing thresholds based on ecologically relevant endpoints.

### *Neotropical Migrants*

## **Predatory Leeches (*Hirudinida*) May Contribute to Amphibian Declines in the Lassen Region, California**

**Jonathan Stead\***, URS, 1333 Broadway, Suite 800, OAKLAND, CA 94612, 510 874 3058, jon\_sterad@urscorp.com; and **Karen L. Pope**;

**Abstract:** Reasons for declines in *Rana cascadae* populations in the Lassen region of California have not been elucidated. An understanding of common, widespread causes and local community interactions may be necessary to fully understand proximal causes of the declines. Based on existing literature and observations made throughout the California range of *R. cascadae*, we propose that a proliferation of freshwater leeches may be adversely affecting Lassen's *R. cascadae* populations. We conducted surveys to document co-occurrences of *R. cascadae* and leeches, determine if leeches were predating or parasitizing *R. cascadae* eggs, and identify the leech species. We found *R. cascadae* at 4 of 21 sites and leeches at 9 sites, including all sites with *R. cascadae*. The predatory leech *Haemopsis marmorata*, frequented *R. cascadae* egg masses, was observed probing or tearing at eggs on 24 occasions, and was 10 times more common in 1m<sup>2</sup> plots centered on egg masses than in similar plots

without egg masses. Six species of leech were identified, only 3 of which have been previously documented from the Lassen region. We believe a better understanding of this poorly studied taxon is needed, in addition to studies of the effects of freshwater leeches on survival and recruitment of amphibians.

### *Amphibians and Reptiles*

## **Managing for Shorebird Resiliency within the South Bay Salt Pond Restoration Project**

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**Abstract:** The restoration of ~16,500 acres (6,677 ha) of former commercial salt evaporator ponds in the San Francisco Bay area is currently underway. Some of this land will be returned to tidal action for the benefit of endangered marsh species. However, this area also contains some of the most important pond habitat for waterbirds on the Pacific Flyway, in particular supporting more than a million shorebirds throughout the year. Tidal marsh restoration creates a challenge for the South Bay Salt Pond Restoration Project to maintain comparable numbers and diversity of birds within a smaller footprint of ponds. This consideration is a key component of the project's adaptive management plan.

Our current understanding of waterbird use of managed ponds indicates different foraging guilds require different water salinities and depths, thus pond design includes considerations for varying these parameters depending on target species. Also, the location of the pond within the overall complex is important in maintaining target salinity levels.

Other considerations for the design and management of ponds include island habitat, water quality, and fish entrainment. Design of islands--used both as high-tide refugia and nesting sites-- varies depending on target species. We are trying to understand water circulation patterns within ponds to minimize low dissolved oxygen "dead zones," and have designed ponds to minimize water residence times and reduce the chance of fish kills. Managed ponds are resource intensive, requiring high up-front construction costs as well as perpetual maintenance. In San Francisco Bay, however, ponds managed for waterbirds need to be retained in the landscape, and the design and management of these ponds will require ongoing monitoring and adaptive management.

### *Shorebirds and Wetlands*

## **Creating Habitat in California's Rice Fields for Migrating Shorebirds: Potential for a Novel Approach**

**Khara Strum\***, PRBO Conservation Science, 3820 Cypress Dr. #11, Petaluma, CA, CA 94954, 330-607-4290, kstrum@prbo.org; **Dave Feliz**; **Catherine Hickey**; **Rodd Kelsey**; and **Matthew E. Reiter**;

**Abstract:** The Central Valley provides important habitat to nonbreeding shorebirds. Once

containing over 4 million acres of natural wetlands, the Central Valley has since lost over 90% of this essential habitat. The Sacramento Valley is one of two sites of international importance to nonbreeding shorebirds in the Central Valley; at least 10% of a biogeographic population of shorebirds uses the Sacramento Valley during migration or winter. Currently, rice crop production provides over 190,000 acres of flooded habitat in the Sacramento Valley in winter, but little flooded habitat is available during fall migration. Rice fields are managed to increase crop yield during the growing season and decomposition of rice stubble post-harvest, using water allocation and mechanical techniques. A novel management approach used at the Yolo Bypass Wildlife Area includes an annual crop rotation of white rice, wild rice, and fallow fields. This regime has the potential to provide both agronomic benefits and critical habitat for migrating shorebirds. During fall 2009, we created shallow flooded habitat in two fallow fields at the wildlife area and monitored shorebird response over a two-month period during migration. We will present results of the preliminary study and suggest how our results may be used to develop policies to enhance habitat for shorebirds during migration.

#### *Shorebirds and Wetlands*

### **Distribution, Site Occupancy, and Habitat Selection by Pacific Fishers in the Sierra National Forest, California**

**Rick Sweitzer\***, University of California, Berkeley, Department of Environmental Science, Policy, and Management,, Berkeley, CA 94720, 559-642-4539, rasweitzer@berkeley.edu; and **Reginald H. Barrett**;

**Abstract:** Pacific fishers were formerly widespread in mixed conifer forests across mountainous areas of northwestern California and in the Sierra Nevada of eastern California. These animals are now much reduced in California and it is possible that the isolated population of fishers in the southern Sierra Nevada will continue to decline as the USDA Forest Service implements fuel reduction measures to mitigate risk of catastrophic wildfire. As part of an 8 year study that is evaluating the effects of fuel reduction treatments on the overall biology of fishers, we are using surveys with digital cameras to determine the current distribution limit of fishers in the Sierra Nevada, and to identify the types of habitats selected by fishers in Bass Lake Ranger District of the Sierra National Forest south of Yosemite National Park. Our methods are that high resolution digital cameras are placed in suitable habitats near the center points of 1km<sup>2</sup> grid cells.

#### *Nongame Mammals*

### **Bats, Cows, and Water; Eat a Burger, Save a Bat**

**Daniel Taylor**, Bat Conservation International, 7325 Cuvier Street, La Jolla, CA 92037, 858-551-5105, dtaylor@batcon.org;

**Abstract:** In arid western environments, bats are especially dependent on free water, particularly pregnant and lactating females. In the hottest and driest environments, bats can lose up to 30% of their body weight daily. Bats must drink on the wing from pooled or

slow-moving water, further restricting the number of suitable drinking sites available to them. Because livestock water troughs and stock ponds provide pooled water and are well-distributed across the landscape, they have become an essential resource for bats, and in the case of stock ponds, for endangered amphibians as well. The decline in natural water sources due to development, climate change, and other factors will likely make these sites even more critical in the future. Unfortunately, because they were not designed with wildlife in mind, livestock troughs usually lack escape structures and frequently drown bats, birds, and other animals that fall in while attempting to drink or bathe, and fencing, bracing, and other obstructions often impede or block wildlife access to the water's surface. In addition, many stock tanks and troughs are not well-maintained, and dry out during heat waves and drought, when wildlife water needs are greatest. Fortunately, wildlife escape structures can be easily and inexpensively constructed and installed, eliminating wildlife mortality and improving water quality for livestock. Fencing and bracing methods exist that can facilitate wildlife access while meeting livestock management objectives, and simple strategies can be implemented to greatly increase the value of stock ponds to cows, bats, endangered amphibians, and other wildlife. Bat Conservation International's Water for Wildlife Project has been working with public and private partners across the west to raise awareness about the importance of range water developments to wildlife, and to teach ranchers and range and wildlife managers about these and other methods for improving access and safety for bats and other wildlife at range water developments.

#### *Nongame Mammals*

#### **Determining Optimal Translocation Conditions and Potential Competitive Interactions for the Endangered Tipton Kangaroo Rat (*Dipodomys nitratooides nitratooides*) and the Heermann's Kangaroo Rat (*D. heermanni*)**

**Erin Tennant\***, Dept. of Biology, California State University Bakersfield, 9001 Stockdale Hwy, Bakersfield, CA 93311, (661) 477-9239, etennant@dfg.ca.gov; and **David J. Germano**;

**Abstract:** In 2006, 144 Tipton kangaroo rats (*Dipodomys nitratooides nitratooides*) were translocated to Allensworth Ecological Reserve in Tulare County, California due to development at the donor site. Since the original translocation effort in 2006, low numbers of *D. n. nitratooides* have persisted on the site. Although no kangaroo rats were trapped on the site prior to the translocation effort, Heermann's kangaroo rats (*Dipodomys heermanni*) were found in 2007 and numbers have greatly increased in subsequent years. Because of the potential for the larger Heermann's kangaroo rat (HKR) to competitively exclude the smaller Tipton kangaroo rat (TKR), we initiated a study to examine potential competitive interactions between these two species. In August 2009, we erected a 1.5 ha enclosure at the translocation site. We trapped 5 HKR and 5 TKR in September 2009 and fitted them with radio transmitters. We followed them intensively inside the exclusion area to compile data on home range size, overlap, and behavioral interactions. In October 2009, we trapped both inside and outside the exclusion area over 6 nights. We removed all HKR trapped inside the exclusion area (n = 29) and translocated them along with an additional 14 HKR to a southern parcel of Allensworth Ecological Reserve following the same methods as the original 2006 TKR translocation. We present preliminary results on home range, behavioral observations, and translocation survivorship of kangaroo rats. In the future, we will determine the effect

of the removal of HKR on the population abundance of TKR inside the exclusion area, and the overall success of HKR at the translocation site.

*Nongame Mammals*

**Student Paper**

## **70 Years of Vegetation Dynamics and Climate Change in the Sierra Nevada**

**James Thorne**, Department Environmental Science and Policy, UC Davis, , Davis, CA 95616;

**Abstract:** The 1930s Wieslander Vegetation Type (VTM) project surveyed landcover for over 50,000 km<sup>2</sup> of the central and northern Sierra Nevada Mountains. Comparison of the historic maps and plot data to modern counterparts permits assessment of vegetation change by area occupied, by elevation of ecotones, by transition of vegetation types, and by estimates of change in forest structure. Scales were standardized between historic and contemporary maps with a 300m grid. For each grid cell the majority vegetation type in each time period was identified. Historic temperature and precipitation by monthly 30-year averages around 1934 and current time were assigned to estimate changes in climate in every cell. Changes in area by vegetation type, ecotone elevation and a transition matrix were assessed to identify changes that could be related to climate change. This talk will focus on differential response by vegetation types across the elevational gradient, and how those could be related to measured change in climate.

*Plenary Speaker*

## **Effects of a Prescribed Fire on Amphibians and Reptiles in a California Oak Woodland**

**Bill Tietje\***, UC Berkeley, 2156 Sierra Way, Suite C, San Luis Obispo, CA 93401, 805/781-5938, btietje@co.slo.ca.us; and **Jim M Zingo**;

**Abstract:** Information on effects of prescribed fire to amphibians and reptiles in oak (*Quercus spp.*) woodlands is largely lacking. From late January-May in 1995-1999, we studied the effects of a prescribed fire to herpetofauna in a blue oak (*Q. douglasii*)-coast live oak (*Q. agrifolia*) woodland of San Luis Obispo County. We used plywood coverboards to sample herpetofauna on eight 5.8-ha plots. We made 9-14 visits to each plot each year, for a total of 63,104 coverboard visits. A light-intensity (3-4 on a scale of 10) prescribed fire was conducted in October 1997, treating four of the eight study plots. Fire-induced reductions in the cover of grass, shrubs, and coarse woody debris were 70%, 8%, and 35%, respectively. We recorded approximately 6,500 observations of 15 species of herpetofauna (11 reptile and 4 amphibian spp.) Most "captures" were of Western skink (*Eumeces skiltonianus*), Western fence lizard (*Sceloporus occidentalis*), and slender salamander (*Batrachoseps sp.*). In our presentation, we will report species-specific evaluation of our data in relation to the intensity of the fire and habitat relationships. We will also discuss the application of our results to the occurrence of more intense fire in oak woodlands, and to other woodland

types.

### *Amphibians and Reptiles*

#### **Ranch Sustainability Analysis System**

**Bill Tietje\***, UC Berkeley, 2156 Sierra Way, Suite C, San Luis Obispo, CA 93401, 805/781-5938, btietje@co.slo.ca.us; **Jim M Zingo**; and **Royce E Larsen**;

**Abstract:** Over 80% of California oak woodlands occur on private ranchland. Ranchers continue to come under intense pressure and scrutiny from environmentalists and the public in general to demonstrate their stewardship of the land and natural resources they manage. Ranchers feel that the solution often chosen to address the public's natural resource concerns is simply more regulations, imposing a financial and philosophical burden on ranchers; in fact, they threaten their very existence. It is therefore vital for ranchers to be able to demonstrate that they are good stewards of natural resources and yet be able to earn a living from the land they own. A Ranching Sustainability Analysis (RSA) system is being developed by UC Cooperative Extension (CE) through the efforts of a committee of local private landowners and ranch managers. Supporting the RSA, CE Workshops and Tailgate Meetings stimulate discussion and interest in sustainable ranching among people with diverse experiences and backgrounds. We feel that a win-win is in the making. That is, if ranching is sustained, so also will oak woodlands and associated wildlife habitat values be maintained. This poster will further show how the RSA System works and future directions for the project.

*Poster Session*

#### **Entrapment of San Joaquin Kit Foxes in Sports Netting**

**Christine Van Horn Job\***, CSU-Stanislaus, Endangered Species Recovery Program, P.O. Box 9622, Bakersfield, CA 93389, 661-835-7810, cvanhornjob@esrp.csustan.edu; and **Brian L. Cypher**;

**Abstract:** San Joaquin kit foxes (*Vulpes macrotis mutica*) are listed as Federal Endangered and California Threatened, primarily due to profound habitat loss. Interestingly, a population likely comprising several hundred kit foxes occurs in the city of Bakersfield. This urban population appears to be thriving, despite being subjected to novel hazards not present in non-urban habitats. One such hazard is sports netting, such as soccer nets, baseball batting cage nets, and even low-hanging volleyball nets. On 19 occasions that we are aware of, kit foxes have become inescapably entangled in such nets. At least 10 of these were pups under 1 year old. In at least 9 of the 19 occasions, the foxes were found dead in the nets or died soon after. In 9 other occasions, the foxes survived. Of the 9 survivors, 2 of these foxes suffered injuries requiring medical attention followed by rehabilitation prior to release, and a third fox required a leg amputation precluding subsequent release and she remains in captivity. Although the hazard posed by nets does not appear to be limiting the Bakersfield

kit fox population, it is undesirable and easily prevented. Nets can simply be taken down at the end of the day or the bottoms of the nets can be raised to avoid entanglement by kit foxes.

*Poster Session*

**Impacts, Lessons Learned, and Restoration Efforts Associated with a Large Oil Well Blowout in Western Kern County**

**Julie Vance\***, California Department of Fish and Game, 1234 E. Shaw Ave., Fresno, CA 93710, 5592434014, [jvance@dfg.ca.gov](mailto:jvance@dfg.ca.gov); **Randi McCormick**; **Michael J. Anderson**; **Matthew Zafonte**; **Mike Ammann**; and **Brad Noblitt**;

**Abstract:** On June 11, 2008, a well blowout occurred in the Cymric Oilfield, near McKittrick in Western Kern County, California. The blowout caused a mixture of oil, steam, and water to be distributed to varying degrees over at least 936 acres before being brought under control. A unified incident command jointly led by the Department of Fish and Game's (DFG) Office of Spill Prevention and Response (OSPR) staff and Chevron was established for response and cleanup. The affected area of saltbush scrub habitat was mapped by DFG and Chevron biologists as receiving heavy, medium, and light oiling. Clean-up actions were complicated by the presence of listed species such as the State Threatened San Joaquin antelope squirrel (*Ammospermophilus nelsoni*) within the impact area. A determination was made to use heavy equipment to remove soil and vegetation within the heavily oiled areas. Moderately oiled areas were lightly disturbed through raking of soils and trimming of affected portions of shrubs, and lightly oiled areas were not physically manipulated or disturbed. Because the ability for natural vegetative recovery in the spill area was uncertain, an *Atriplex polycarpa* germination and early growth response study was conducted. Oiled soils used in the growth study were collected at the impact site and had 26,000 - 35,000 mg/kg of Total Petroleum Hydrocarbons (TPH). While the vegetation within the spill area incurred significant immediate impacts, the growth study indicated that saltbush germination should not be impaired by crude oil residues in the soils, provided that a seed source is present. Further, subsequent vegetation and photo point surveys in the impact area indicate that natural recovery is occurring across the site, although regrowth of saltbush in the most heavily oiled areas is concentrated in locations where rainfall runoff accumulates. The blowout occurred while ambient temperatures were high (>100°F); long-term impacts and the ability for recovery may have been quite different if conditions were cool and wet at the time of the spill. Starting in the winter of 2009/2010, a long-term saltbush restoration project will be undertaken in the nearby Lokern area as a means to partially offset injuries associated with the blowout.

*Wildlife Response to Restoration*

**Adaptive Capacity of Pikas: Physiological and Behavioral Responses to Changing Microclimate**

**Edward West**, West Ecosystems Analysis, Inc., 2515 Bombadil Lane, Davis, Ca 95616, 530 574-2878, [ewest@westecosystems.com](mailto:ewest@westecosystems.com);

**Abstract:** Pikas (*Ochotona princeps*) have been purported to be endangered by global warming. A low thermal conductance enables survival through alpine winters without hibernation but constrains activity during warm summer periods. Rising ambient temperatures can potentially result in thermal degradation and loss of currently occupied habitat. However, seasonal changes in thermal conductance and adaptive shifts in individuals' thermal neutral zones, coupled with fine-tuned behavioral thermoregulation may allow pikas to track and broadly adapt to changing microclimate conditions. Here I present an analysis of the adaptive capacity of pikas to elevated temperatures based on thermal energetics and climate space modeling. Subtalus refuge temperatures appear to largely define the critical limits of survival for the species throughout its range.

### *Pika Symposium*

## **Predictive Modeling of Northern Spotted Owl Core Areas and Home Ranges**

**Elizabeth Willy\***, U. S. Fish and Wildlife Service, 1936 California Avenue, Klamath Falls, OR 97601, 541-885-2525, Elizabeth\_Willy@fws.gov; **Brian Woodbridge**; **Jeffrey R. Dunk**; and **Douglas Miller**;

**Abstract:** The U.S. Fish and Wildlife Service's (USFWS) evaluation of potential impacts of forest management proposals on the federally listed northern spotted owl (*Strix occidentalis caurina*) (NSO) are based on quantification of habitat conditions within a set of concentric circles centered on NSO activity centers, including the estimated core (0.8 kilometer radius) and home range areas (2.1 kilometer radius). Our primary objective was to develop a model to predict NSO core areas and home ranges by incorporating both foraging habitat selection and patterns of space use by NSO. To examine the relationship between spatial patterns of NSO activity and abiotic features (terrain) and biological features (forest vegetation), we modeled three scenarios (abiotic only, vegetation only, and abiotic plus vegetation) using Maximum Entropy (Maxent) to generate suitability surfaces. We then used Zonation, a reserve selection model, with the Maxent suitability surface as a base layer, to generate predicted core areas and home ranges. We compared the percentage of telemetry points occurring within our predicted core areas and home ranges to the percentage of telemetry points occurring within the circular buffers the USFWS currently uses for 70 NSO activity centers. Additional comparisons were made between the proportion of values of the suitability surfaces within the predicted core areas and home ranges to the values within the circular buffers. Preliminary results indicate that our approach is an improvement over the circle-based approach currently used by the USFWS.

### *Raptors*

## **Protecting the American Pika under the Federal and California Endangered Species Acts**

**Shaye Wolf**, Center for Biological Diversity, 351 California Street, Suite 600, San Francisco, CA 94104, 415-632-5301, swolf@biologicaldiversity.org;



**Abstract:** The U.S. Endangered Species Act provides time-tested, enforceable, and immediately available tools for protecting species like the American pika that are threatened by climate change. We discuss applications of the U.S. and California Endangered Species Acts for implementing mitigation (greenhouse gas reduction) and adaptation (increasing resilience to climate change) measures to benefit listed species, in addition to promoting research, increasing public awareness, and building capacity to address climate change. Specifically we examine how ESA protections including consultation, critical habitat designation, and recovery planning can help the American pika to better survive in a warming world. Because the ESA is the only legal tool with the explicit science-based mandate to prevent species extinction from climate change threats, it provides an essential complement and backstop to other tools addressing climate change.

*Pika Symposium*

**Investigating the Status of American Pika (*Ochotona princeps*) at Historic Northern Sierra Sites**

**David Wright**, CDFG, North Central Region, 1701 Nimbus Rd, Suite A, Rancho Cordova, CA 95670, 916 358 2945, dwright@dfg.ca.gov;

**Abstract:** We researched historic locations of the American pika (*Ochotona princeps*) in the northern Sierra Nevada of California. Historic locations were considered those documented more than 25 years ago. Most historic sites were found by searching electronic databases of museum specimens. UC Berkeley Museum of Vertebrate Zoology historic field notes also were searched for reliable and geographically precise references to pika (coney, conies). A few historic locales have been found by other methods. To date we have been able to identify about two dozen records of varying spatial precision within the North Central Region of the CDFG. About a third of these are not yet in the California Natural Diversity Data Base (CNDDDB). Most records date from before 1960. We have begun revisiting and surveying historic sites using a protocol developed to maximize pika detection. So far we have revisited 6 sites and have reports or evidence from 2 others. Pika or pika sign have been found at 7 of these 8 historic sites. This ongoing work should complement and extend the research of the Grinnell Resurvey Project.

*Pika Symposium*

**Preliminary Results of the *Masticophis (=Coluber) lateralis euryxanthus* Taxonomy: Morphology Review**

**Milton Yacelga**, Swaim Biological Inc., 4435 First St., PMB 312, Livermore, CA 94551, 9254558770, myacelga@swaimbio.com; **Tammy C. Lim**; and **Karen Swaim**;

**Abstract:** The California whipsnake, *Masticophis lateralis*, is composed of two subspecies: the

chaparral whipsnake (*M. l. lateralis*) and the Alameda whipsnake (*M. l. euryxanthus*). The latter was differentiated in 1954 (Riemer) based on eight morphological characters from six individuals collected within the subspecies' supposed range in Alameda and Contra Costa counties. We reevaluated the validity of these characters in distinguishing *M. l. euryxanthus* from *M. l. lateralis*. We analyzed a total of 11 different morphological characters (three characters added to account for potential asymmetry) from 291 whipsnakes distributed throughout California and Baja California, Mexico.

Some characters showed differences along subspecies lines. However, interpopulation overlap in the distribution of these characters was extensive. Clinal variation may be more descriptive of the distribution of some characters. Further complicating the issue, there is evidence from some snakes recaptured in successive years suggesting that some of Riemer's diagnostic characters may be to some degree ontogenetic. Our data suggest that the morphological characters we evaluated do not provide a diagnostic distinction between these two currently recognized subspecies. Data on molecular variation and geographic and ecological correlates are being analyzed to gain a better understanding of its taxonomic status.

#### *Amphibians and Reptiles & Poster Session*

### **Using Noninvasive Genetic Sampling to Estimate Population Characteristics of the Point Arena Mountain Beaver (*Aplodontia rufa nigra*) in California**

**William Zielinski\***, US Forest Service, 1700 Bayview Dr., Arcata, CA 95521, 707.825.2959, [bzielinski@fs.fed.us](mailto:bzielinski@fs.fed.us); **Fredrick V. Schlexer**; **T. Luke George**; **Kristine L. Pilgrim**; and **Michael K. Schwartz**;

**Abstract:** The Point Arena mountain beaver (*Aplodontia rufa nigra*) is a federally listed endangered subspecies for which very little demographic information is available. We summarize the results of 3 years of monitoring two populations in Manchester State Park (MSP), Mendocino County, California. We developed a method to noninvasively sample DNA, using hair snares, and used the data from genetic identification in a mark-recapture analysis to estimate population size and survival. Estimates were generated using Pollock's robust analysis, which assumes population closure within years and open population structure between years. We monitored two well-known populations within MSP, at Alder Creek and Kinney Beach, in 2006, 2007 and 2008 resulting in population estimates (SEs) of 13.0 (1.10), 11.94 (1.05), and 11.94 (1.05) at Alder Creek and 13.03(1.10), 7.60 (0.83), and 13.03 (1.10) at Kinney Beach. Annual survival [SE] was almost twice as high at Alder (0.62 [0.11]) as Kinney (0.37 [0.11]). Sex ratios ranged from 7:4:1 (male:female:unknown) at Alder Creek in 2006 to 3:4:0 at Kinney Beach in 2007. Although there is no significant trend in population size across the 3-year period in either population, we are concerned about the surprisingly small population sizes and, thus, their vulnerability to stochastic processes. These estimates highlight the need for more information about the distribution and connectivity of these populations with other populations within the subspecies' spatially-limited (85 km<sup>2</sup>) geographic range.

#### *Nongame Mammals*