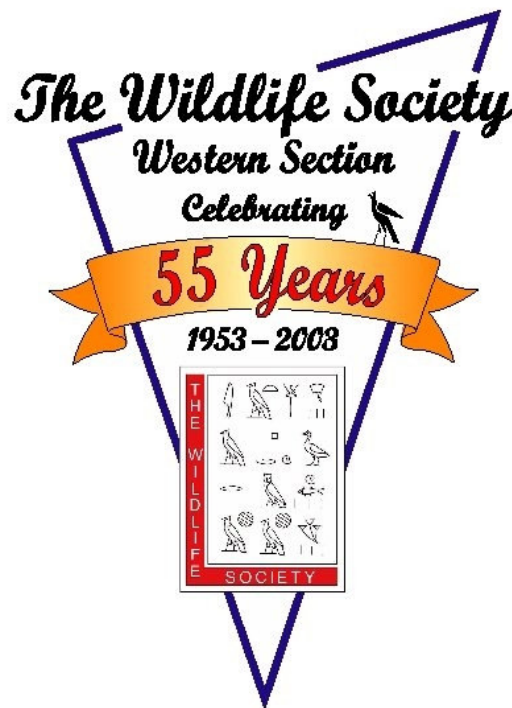


2008 Annual Conference

**The Western Section of
The Wildlife Society**

CONFERENCE THEME:

Excellence in Wildlife Stewardship through Science and Education



PLENARY SESSION THEME:

**The Role of Non-Governmental Organizations in
Wildlife Management and Conservation**

Program and Abstracts

February 6-9, 2008
Red Lion Hotel
Redding, California

DEDICATION

On June 8, 2007 Barrett A. Garrison passed away suddenly at the young age of 48. A dedicated father, husband, coach and scientist, Barry had a contagious passion for all aspects of his multi-faceted life. As a true professional at all levels, he led, mentored, questioned, researched, managed, and debated compassionately about wildlife and their management. He spoke often about ethics in the wildlife profession, always ready to lend a helping hand, idea or useful perspective to enhancing our understanding of wildlife. His enthusiasm for life and the profession he loved was contagious to everyone around him.

Barry was a charismatic and patient leader. He provided opportunities to others, and always followed up on delegated tasks. He believed in service and desired to improve the wildlife profession. He took on many active roles on the Western Section Executive Board, including President, Professional Development Committee Chair, Co-chair of the 2001 TWS Reno Annual Conference Arrangements Committee, and finally, Transactions Editor. Once active, he stayed committed to any task he accepted and enlisted the assistance of others whenever possible. He always maintained high standards for himself and others, taking each position and committee work to new levels. Barry took the lead in the movement to establish a full-time Director to increase and expand outreach and opportunities. He had a vision for the Section - to make our profession more tangible for future "Wildlifers" and more productive for his peers. Through this infectious passion for wildlife and the natural world, he helped non-biologists to better appreciate their surroundings and encouraged practicing biologists to learn more about whatever facet of the profession they were involved in.

Barry mentored countless students, peers, and many of his supervisors as well. He believed in people and knew that assigning a task or position to junior colleague would both challenge and nurture them while bringing a fresh perspective to the profession. He was personally responsible for engaging many of the past and present Executive Board's members to take on committee assignments and for initiating countless Section efforts.



He was a keen observer of both the natural environment and people. He knew how to pose a good question, and enjoyed designing a diverse array of research projects. He chose good collaborators, and followed through on projects, long after the fun and field-work was over. Barry was outstanding at analyzing the data and publishing the results.

His research efforts were some of his proudest accomplishments. Spending a combination of work and personal time, he regularly published peer-reviewed studies throughout his career, numbering nearly 40 papers at the time of his death. While birds and wildlife habitat relationships, especially oak-woodland community structure, were his passion, he also published valuable evaluations of management tools and predictive models. He also served as a manuscript reviewer for California Fish and Game Bulletin, Transactions of the Western Section of The Wildlife Society, and the Wilson Bulletin.

Barry was a Certified Wildlife Biologist. Additionally, he took personal professional development very seriously and took every opportunity to improve himself in all aspects of his life. He spent weeks every year in training and workshops, earning a Professional Development Certificate from The Wildlife Society in 2002 and in doing so, he became a more skilled biologist, scientist, and manager.

But Barry's observations, questions, and opinions extended well beyond science and nature. He had strong, well-informed opinions about politics, history, religion, sports, music, and current events. It was hard to win an argument with Barry, because he knew so much and had thought so deeply about so many things. After a stimulating and heated debate, he routinely thanked his opponent and offered kind words of genuine respect.

As a resource manager, he could bring together private industry representatives, conservationists, scientists and the public, to meet a sticky issue head-on. His goal was for everyone to walk away with a better understanding of the "bigger" picture, if not a better appreciation of the opposing views. Those who worked professionally with Barry always thought of him as one of their most respected colleagues. He was a renaissance man with a good-ol'-boy heart, in that he embraced new technologies and ideas, always mindful that a simple phone call could easily ensure a commitment, maintain a professional or personal connection, or clear the air.

Despite his impressive career and contributions to the wildlife profession, Barry was most proud of his role as a husband, son, brother, uncle, and especially, a father to Nicole and Christopher. He maintained close ties to his extended family, coached his kids' sports teams, led Cub Scouts, organized camping trips, and engaged in local community activities. His eyes always lit up whenever he spoke of his wife Cathie, and seemed to be in a constant state of disbelief at how lucky he was to have her by his side.

It goes without saying that Barry Garrison was an extraordinary man. It is also a given that it will be rough going without him around--we will all miss him dearly! But through his example, and the things that he taught us, we can continue to spread his passion, energy, and enthusiasm for life and the profession of wildlife management he so dearly loved. The world is a better place because of Barry. His memory will serve as a beacon, for all of us to strive to be the best we can be in everything we do.

We dedicate the 2008 Annual Meeting of The Western Section of The Wildlife Society to Barrett A. Garrison. Our deepest sympathy is expressed to Cathie, Nicole and Christopher, as well as other family and friends.

2008 Annual Conference

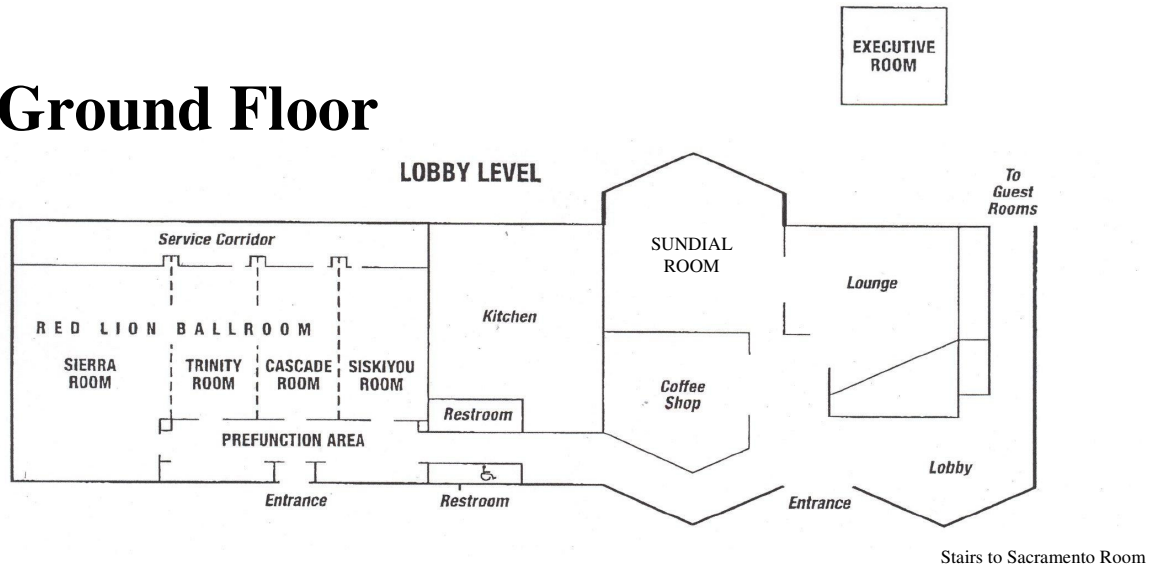
The Western Section of The Wildlife Society

**MAIN MEETING
Day and Room Designations**

Room	Wed. Afternoon	Wed. Evening	Thurs. Morning	Thurs. Afternoon	Thurs. Evening	Fri. Morning	Fri. Afternoon
Pre-Function Area	CONFERENCE REGISTRATION; SILENT AUCTION AND RAFFLE DISPLAY						
Sierra Room	Concurrent Session: Carnivores	Sacramento- Shasta Chapter	CONFERENCE PLENARY SESSION	Concurrent Session: Northern California	ANNUAL BANQUET, AWARDS, RAFFLE, SILENT AUCTION and ENTER- TAINMENT	Concurrent Session: Managed Forests	
Trinity Room	Concurrent Sessions: Military Lands	California North Coast Chapter		Concurrent Sessions: Habitat Restoration <u>Later:</u> Raptors II		Concurrent Session: Shorebirds & Waterfowl	Concurrent Session: Birds
Cascade Room	<u>Later:</u> Raptors I	SF Bay Area Chapter		Concurrent Session: Amphibians & Reptiles		Concurrent Session: Mammals	Concurrent Session: Southern California
Siskiyou Room	Vendors, Exhibitors, Refreshments		Vendors, Exhibitors, Refreshments			Vendors, Exhibitors, Refreshments	
Sundial Room		Posters, Welcome Mixer <u>Later:</u> San Joaquin Valley Chapter	Monterey 2009 planning meeting (immediately after Plenary Session)	Annual Business Meeting / Member's Forum	No-host Cocktail Reception (also poolside)	Career Fair and Student- Professional Lunch	
Sacramento Room (upstairs)	Forest Carnivore Working Group	California Central Coast Chapter	Speaker Practice until 3:00	Résumé Workshop		Half-day Statistics Workshop	Executive Board Meeting
Executive Room	Speaker Practice	Nevada Chapter	Full-day Statistics Workshop			Speaker Practice	
Coffee Garden Restaurant		Southern California Chapter					

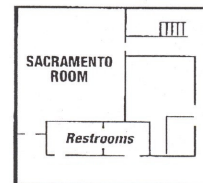
Redding Red Lion Hotel

Ground Floor



Note: At several places in the program, you will see references to the “Red Lion Ballroom.” That refers to various combinations of the Sierra, Trinity and Cascade Rooms.

Second Floor



PLEASE SILENCE YOUR
CELLULAR PHONE
BEFORE ENTERING
ANY SESSION...

2008 Annual Conference

The Western Section of The Wildlife Society

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**PLEASE SILENCE
YOUR CELLULAR PHONE
AND SIMILAR DEVICES...**

**The Western Section of the Wildlife Society
2008 Annual Conference
Schedule at a Glance**

Monday, February 4, 2008

5:00 p.m. to 7:30 p.m.	Northern Spotted Owl Symposium, Pre-Registration (Pre-Function Area)
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Tuesday, February 5, 2008

7:00 a.m. to 8:30 a.m.	Northern Spotted Owl Symposium Registration (Pre-Function Area)
7:15 a.m. to 8:30 a.m.	Light Breakfast (Trinity Room)
7:30 a.m. to 10:30 a.m.	Vendor and Exhibitor Setup (Siskiyou Room)
8:30 a.m. to 5:00 p.m.	Pre-Conference Symposium: The Northern Spotted Owl in the 21st Century: Confronting the Management Challenges of Cumulative Habitat Effects and the Barred Owl (Sierra Room)
10:30 a.m. to 10:50 a.m.	Break (snacks provided) (Siskiyou Room)
10:30 a.m. to 5:00 p.m.	Vendors and Exhibitors (Siskiyou Room)
12:00 p.m. to 1:00 p.m.	Lunch provided to Northern Spotted Owl Symposium participants (Sundial Room)
2:40 p.m. to 3:00 p.m.	Break (snacks provided) (Siskiyou Room)
4:00 p.m. to 5:00 p.m.	Poster Set-up (Sundial Room)
5:00 p.m. to 6:30 p.m.	Northern Spotted Owl Symposium Poster Session and Welcome Reception with light <i>Hors d'œuvres</i> , No-Host Bar (Sundial Room)

Wednesday, February 6, 2008

7:00 a.m. to 8:15 a.m.	California Red Fox Symposium Registration (Pre-Function Area)
7:15 a.m. to 8:30 a.m.	Symposia Light Breakfast (Siskiyou Room)
7:15 a.m. to 5:00 p.m.	Vendors and Exhibitors (Siskiyou Room)
8:00 a.m. to 12:00 p.m.	Northern Spotted Owl Symposium continues (Sierra Room)
8:00 a.m. to 12:00 p.m.	Pre-Conference Symposium: Managing California's Native Red Fox: Recent Findings and Implications (Trinity and Cascade Rooms)
9:00 a.m. to 5:00 p.m.	Annual Conference Registration (Pre-Function Area)
10:10 a.m. to 10:30 a.m.	Symposia Break (snacks provided) (Siskiyou Room)
12:00 p.m.	Northern Spotted Owl and California Red Fox Symposia conclude
12:00 p.m. to 1:00 p.m.	Lunch Break (lunch not provided)
1:00 p.m. to 5:10 p.m.	Concurrent Session: Ecology and Management of Carnivores (Sierra Room)
1:00 pm to 3:25 pm.	Concurrent Session: Conservation and Management of Military Lands (Trinity and Cascade Rooms)
3:25 p.m. to 4:00 p.m.	Break (snacks provided) (Siskiyou Room)
4:00 p.m. to 5:45 p.m.	Concurrent Session: Ecology and Management of Raptors (Trinity and Cascade Rooms)
4:00 p.m. to 5:10 p.m.	Concurrent Session: Ecology and Management of Carnivores continues (Sierra Room)
4:00 p.m. to 5:15 p.m.	Forest Carnivore Working Group (<i>unofficial meeting</i>) (Sacramento Room)
4:30 p.m. to 6:00 p.m.	Poster Set-up (Sundial Room)
6:00 p.m. to 7:45 p.m.	Annual Conference Poster Session and Welcome Reception with <i>Hors d'œuvres</i> , No-Host Bar (Sundial Room)
8:00 p.m. to 9:30 p.m.	Chapter Meetings (various locations; see Day and Room Designations for details; page 2)

Thursday, February 7, 2008

7:30 a.m. to 5:00 p.m.	Conference Registration (Pre-Function Area)
7:45 a.m. to 8:30 a.m.	Light Breakfast (Siskiyou Room)
7:45 a.m. to 5:00 p.m.	Vendors and Exhibitors (Siskiyou Room)
8:00 a.m. to 4:30 p.m.	Bayesian Statistics Workshop (Executive Room)
8:30 a.m. to 11:30 a.m.	Plenary Session (Red Lion Ballroom)
9:50 a.m. to 10:10 a.m.	Refreshment Break (Siskiyou Room)
11:30 a.m. to 11:45 a.m.	Monterey 2009 Planning Meeting (Sundial Room)
11:30 a.m. to 1:00 p.m.	Lunch Break (lunch not provided)
12:00 p.m. to 1:00 p.m.	HSU Alumni Assn, Wildlife Chapter Lunch (<i>unofficial meeting</i>) (Marie Callendar's: exit Red Lion, turn right/south, then cross Hilltop Drive)
1:00 p.m. to 3:35 p.m.	Concurrent Session: Management and Action in Northern California (Sierra Room)
1:00 p.m. to 3:35 p.m.	Concurrent Session: Amphibians and Reptiles (Cascade Room)
1:00 p.m. to 2:40 p.m.	Concurrent Session: Wildlife Response to Habitat Restoration (Trinity Room)
2:45 p.m. to 4:00 p.m.	Concurrent Session: Raptors and Regional Conservation Planning (Trinity Room)
4:00 p.m. to 5:15 p.m.	Annual Business Meeting and Member's Forum (Sundial Room)
4:00 p.m. to 6:00 p.m.	Résumé Workshop (Sacramento Room)

Thursday Evening:

5:30 p.m. to 6:45 p.m.	No-host Cocktail Reception (Sundial Room & Poolside – weather permitting)
7:00 p.m. to 11:00 p.m.	Banquet, Awards Ceremony, Raffle, Entertainment (Red Lion Ballroom) , requires ticket or symbol on name badge indicating payment

Friday, February 8, 2008

7:30 a.m. to 11:00 a.m.	Final Conference Registration (Pre-Function Area)
7:30 a.m. to 11:00 a.m.	Vendors and Exhibitors (Siskiyou Room)
7:30 a.m. to 8:30 a.m.	Light Breakfast (Siskiyou Room)
8:00 a.m. to 12:00 p.m.	Statistics Refresher Workshop (Sacramento Room)
8:30 a.m. to 2:30 p.m.	Concurrent Session: Managed Forests (Sierra Room)
8:30 a.m. to 12:00 p.m.	Concurrent Session: Ecology and Management of Shorebirds and Waterfowl (Trinity Room)
8:30 a.m. to 11:50 a.m.	Concurrent Session: Ecology and Management of Mammals (Cascade Room)
9:55 a.m. to 10:30 a.m.	Break (snacks provided) (Siskiyou Room)
9:30 a.m. to 12:00 p.m.	Career Fair (Sundial Room)
12:00 p.m. to 1:00 p.m.	Student/Professional Lunch (Sundial Room). Free to students and professionals who have ticket or symbol on name badge indicating advance registration
11:50 a.m. to 1:00 p.m.	Lunch Break (lunch not provided)
1:00 p.m. to 2:30 p.m.	Concurrent Session: Managed Forests (continues) (Sierra Room)
1:00 p.m. to 3:00 p.m.	Concurrent Session: Ecology and Management of Birds (Trinity Room)
1:00 p.m. to 3:00 p.m.	Concurrent Session: Understanding Southern California's Ecosystem and Biodiversity (Cascade Room)
3:30 p.m. to 5:30 p.m.	Western Section Executive Board Meeting (Sacramento Room)

Saturday, February 9, 2008

Field trips 1 and 2, meet in main lobby at 8:15 a.m. for logistics and ride-sharing. See pages 10 and 11 for specific details.

- 1: 8:30 a.m. to 1:45 p.m. – The Hidden Falls
- 2: 8:30 a.m. to 2:30 p.m. – The Renaissance Ranch
- 3: 10:00 a.m. to 5:00 p.m. – Turtle Bay Exploration Park (discover at your own pace)

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. Refreshments will be provided at the morning and afternoon breaks. Lunch will not be provided, except Tuesday for the Northern Spotted Owl Symposium. For information on local restaurants and services, inquire at the registration desk or look for the list in your registration packet.

Speaker Practice Room. The Executive Room will be available throughout the meeting (except Thursday) for speakers to practice their presentations. On Thursday, the Sacramento Room will be available for this purpose until 3:00 p.m. Obtain key from Registration Desk.

Exhibits and Vendor Displays. Exhibits will be displayed approximately 10:30 a.m. to 5:00 p.m. Tuesday, 7:15 a.m. to 5:00 p.m. Wednesday, 7:45 a.m. to 5:00 p.m. Thursday and 7:30 a.m. to 11:00 a.m. Friday in the Siskiyou Room.

Job Board. Job announcements can be posted and viewed at the job board in the Pre-Function Area 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 in the Pre-Function Area near the registration desk.

Plenary Session. The plenary session, titled “The Role of Non-Governmental Organizations in Wildlife Management and Conservation,” will be held on Thursday, February 7, from 8:30 a.m. to 11:30 a.m. in the Red Lion Ballroom. There will be no concurrent sessions during the plenary session.

Concurrent Sessions. Concurrent sessions will begin on Wednesday, February 6 at 1:00 p.m. in Sierra, Trinity, and Cascade Rooms, and will continue on Thursday afternoon and all day Friday.

Poster Sessions. Northern Spotted Owl Symposium posters will be available for viewing on Tuesday, February 5 between 5:00 p.m. and 6:30 p.m., concurrently with the Symposium Welcome Reception in the Sundial Room. Conference posters will be available for viewing on Wednesday, February 6 between 6:00 p.m. and 7:45 p.m., concurrently with the Conference Welcome Reception in the Sundial Room. Authors will be available to answer questions about their posters during the specified viewing times. Posters will also be available for viewing at other times and locations throughout the week.

Welcome Reception. A welcome reception will be held on Wednesday, February 6, from 6:00 p.m. to 7:45 p.m. in the Sundial Room, concurrently with the poster session. Light *Hors d'œuvres* will be served and a no-host bar will be available. A nominal fee is required to attend this event. Posters will also be available for viewing at other times during the meeting.

Annual Business Meeting and Member’s Forum. The Annual Business Meeting and Member’s Forum will be held on Thursday, February 7, from 4:00 p.m. to 5:15 p.m. in the Sundial Room. 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 the 2007 and 2008 Section budgets and other items of interest to the general membership. Attendance by all members is encouraged and will be rewarded.

Awards Banquet. The annual awards banquet will be held on Thursday, February 7 from 7:00 p.m. to 11:00 p.m. in the Red Lion Ballroom. **A ticket or symbol on your name badge indicating payment is required.** Awards will be presented, including the “Raymond F. Dasmann Professional of the Year,” “Conservationist of the Year” as well as the “James D. Yoakum Award for Outstanding Service and Commitment to The Western Section of The Wildlife Society” and a special announcement. The annual raffle/auction and dancing will follow.

Entertainment. “Gun-Shy” Steve and Shiya have both been performing professionally for most of their lives. Shiya began in a family band and Steve got his start in a band when he was 13. When their paths crossed about a year ago, it was a perfect match. They’re both well-versed in popular music of the last 50 years, and more importantly, they enjoy all aspects of that music. From 40's swing, 50's Doo-Wop and rock, the 60's revolution, the 70's and 80's glam, disco, and funk, the 90's and today's music, not to mention country music through the entire era, they love it all.

Raffle and Silent Auction. The annual raffle and a silent auction will be conducted during Thursday evening’s banquet, after the awards ceremony. The Executive Board decided to direct the proceeds of the 2008 raffle to the Garrison Family Education Fund (see Dedication). 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 and/or in the Siskiyou Room.

Career Fair and Student/Professional Lunch. The Career Fair will be held on Friday from 9:30 a.m. to 12:00 p.m. in the Sundial Room. This is an opportunity for students to meet prospective employers and discuss careers in the wildlife sciences. Professionals from the U.S. Fish and Wildlife Service, U.S. Forest Service, California Department of Fish and Game, and several consulting firms will be present at the Professional Lunch. The lunch, served at noon, is free to students and professionals who have indicated they will attend on their registration form, but a ticket or symbol on the conference name badge is required. All are invited to attend the Career Fair.

Student Presentation and Poster Contest. Awards will be given to the best student presentation and poster. Poster Awards will be announced during the banquet, presentation results will be announced on our website after the meeting.

Note regarding accessibility. The Redding Red Lion is an older facility, construction of which pre-dates the Americans with Disabilities Act. The Western Section of The Wildlife Society regrets that the Sacramento Room on the second floor may not be easily accessible to all meeting participants. For that reason, we have scheduled as few events in this room as possible. Please discuss any concerns with the Program Chair or any Executive Board Member.

Local Services. A listing of local services (banks, pharmacies, grocery stores, hospital, etc.) is available 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! Our informal policy 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...

Official Meetings:

Thursday, February 7

- 11:30 a.m. to 11:45 a.m.** Monterey 2009 planning meeting (Sundial Room)
- 4:00 p.m. to 5:15 p.m.** Annual Business meeting and Member’s Forum (Sundial Room)
- 4:00 p.m. to 6:00 p.m.** Student Résumé Workshop (Sacramento Room)

Friday, February 8

- 3:30 p.m. to 5:30 p.m.** Western Section Executive Board Meeting (Sacramento Room)

Unofficial Meetings:

Wednesday, February 6

- 4:00 p.m. to 5:15 p.m.** Forest Carnivore Working Group (Sacramento Room)

Thursday, February 7

- 12:00 p.m. to 1:00 p.m.,** Humboldt State University Alumni Association, Wildlife Chapter (Marie Callendar’s – go outside, turn right, walk about 300 feet, cross the street)

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 (the pre-conference Symposia are), 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 / Associate Wildlife Biologist programs is available from the TWS-Western Section Professional Development Committee or on the national TWS website at: www.wildlife.org

Eco-Groovy Coffee. The Western Section of The Wildlife Society and the Redding Red Lion are pleased to inform our members that the coffee being served at breakfast and all refreshment breaks is Shade-grown, Organic and Fair Trade Certified! Uncovering a coffee’s true potential has become a serious obsession at Tully’s (www.tullys.com). They have an overwhelming respect for the coffee bean – and for every set of hands it passes through on its journey from the field to your cup.

Recycled Paper. This program has been printed on “Aspen 100,” which is 100% post consumer, chlorine-free, acid-free, recycled paper.

FIELD TRIPS

All official field trips are scheduled for Saturday, February 9th.

1. “The Hidden Falls.” Join National Park Service staff for a 3.4 mile, round-trip hike to Whiskeytown Falls. Rangers and loggers kept these beautiful, 200-foot waterfalls secret for decades, as they didn’t have the resources to construct a trail and adequately protect this very interesting site. The falls were “rediscovered” in 2004, and since then, a very nice trail has been constructed. The NPS rates this trail as “moderate to difficult.” We say: “Not really. Take your time, you’ll probably sweat a bit, but it’s worth it.” It’s not an *easy* hike, but... Stroll through sugar pine, Douglas fir, Ponderosa pine, ferns, and incense cedar; look for birds, take some nice photos. Bring: Boots, binoculars, camera, hat, snacks, sunscreen and water. **Cost: Suggested donation \$5 per person (required \$5 per vehicle or family);** this assumes carpool and ridesharing. Give your driver a few bucks for fuel, too. Those continuing westward on Hwy. 299 to Humboldt/Mendocino/Del Norte may choose to drive directly from the trailhead without returning to Redding. Maximum group size: 40

Schedule:

8:15 a.m.	Meet in Red Lion lobby
8:30 a.m.	Coordinate ridesharing
8:45 a.m.	Depart Red Lion Hotel
9:15 a.m.	Meet NPS staff at Visitor Center on JFK Drive. Buy books, maps, etc.
10:15 a.m.	Arrive at Trailhead
12:45 p.m.	Return to Trailhead
1:45 p.m.	Return to Red Lion Hotel, Redding (optional)

2. “The Renaissance Ranch.” The Dye Creek Preserve could be called a renaissance ranch. It is 37,650 acres in size, and has quite a story to tell. The preserve has been managed by The Nature Conservancy since 1987. In addition to the Conservancy, stakeholders also include Multiple Use Managers, a hunting and wildlife management firm, and DeBraga Cattle Company, a cattle grazing company. Both of these companies actually have ties to Dye Creek dating back to the 1960’s. An education program for elementary and high school student participation also occurs on Dye Creek. Research and field studies have also been an integral part of this ranch since the late 1960’s. Some of the longest, ongoing studies of blue oaks and black-tailed deer are conducted on Dye Creek.

Additional extensive studies have focused on such topics as Native American archaeology, wild pigs, doves, coyotes and fire regimes, to name a few. This is a ranch that actively supports and manages its rangeland resources for multiple uses. Dye Creek is proof-positive that seemingly divergent interests can cooperate together for a common goal. Bring: Boots, binoculars, camera, hat, snacks, sunscreen and water. Moderate difficulty, rocky trail, 300 foot elevation gain; sturdy shoes required. This trip may be particularly well-suited to those departing Saturday morning for Sacramento or the Bay Area – it’s a bit remote from Redding, but just a short distance from Interstate 5 on your way south. No cost. Maximum group size: 35

Schedule:

- 8:15 a.m. Meet in Red Lion lobby, coordinate ridesharing
- 8:30 a.m. Depart hotel
- 9:25 a.m. Arrival (45 minute drive south of Redding)
- 9:30 a.m. Coffee, orientation
- 10:00 a.m. Presentations by representatives of The Nature Conservancy, Multiple Use Managers, U.C. Berkeley
- 11:00 a.m. Nature walk up Dye Creek canyon. This walk is a must for anyone who appreciates wild California and can envision Ishi walking these pristine watersheds (Moderate difficulty)
- 1:30 p.m. Depart
- 2:30 p.m. Return to Red Lion Hotel, Redding (optional)

3. “Turtle Bay.” Spanning the Sacramento River and only about a mile from the Red Lion Hotel, the Turtle Bay Exploration Park is an award-winning, “300-acre campus containing educational and entertaining activities that interpret the relationship between humans and nature.” Facilities include a museum, art gallery, wildlife exhibits, aviary and the McConnell Arboretum and Gardens. The two main portions of the park are connected by the world-famous Sundial Bridge, designed by Santiago Calatrava. This trip is at your own pace; you can get a glimpse in two hours, or see it ALL in about six hours (they’re open from 10:00 a.m. to 5:00 p.m.). You decide... Bring: binoculars, hat, camera, sunscreen and comfortable shoes. Food and beverages and a nice souvenir/bookshop are available. Cost: \$12 normal admission. TWS has arranged a discounted admission of \$8 if you show your official conference name badge at the ticket office. Maximum group size: none

Schedule (Optional. This is an “at your own pace” trip):

- 9:30 a.m. Meet in Red Lion lobby, coordinate ridesharing
- 9:45 a.m. Depart Red Lion
- 10:00 a.m. Arrive, orient, start visit, depart at your leisure

Please sign up for Field Trips 1 and 2 in advance to ensure space. HOWEVER, be advised that last year in Monterey, we had more than 50% “no-shows.” Frankly, that’s unprofessional and unfair! If you can’t make it, don’t sign up. If you’re not sure, don’t sign up. If you sign up and later change plans, cross your name off the list and make room for someone else. THANK YOU.

EXHIBITORS

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Siskiyou Room for more information.

See details on page 69, and visit the table in the

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All proceeds/donations from the 2008 Annual Conference Raffle and Silent Auction will honor a valued member of our Western Section community by being donated to The Garrison Family Education Fund.

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California Red Fox Symposium:

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North State Resources, Inc.

Redding Area Information:

Bob Carey
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CONTRIBUTED PAPERS SESSION CHAIRS:

Amphibians and Reptiles: Dave Cook, Sonoma County Water Agency

Conservation and Management of Military Lands: Kirsten Christopherson, Beale Air Force Base

Ecology and Management of Birds: Amy Fesnock, U.S. Fish and Wildlife Service

Ecology and Management of Carnivores: Ben Sacks, Sacramento State University

Ecology and Management of Mammals: Steve Kohlmann, Tierra Resource Management

Ecology and Management of Raptors: Jeff Lincer, WRI Field Station

Ecology and Management of Shorebirds and Waterfowl: Ahmed Soliman, California Department of Fish and Game

Ecology and Management of Wildlife in Managed Forests: Keith Hamm, Green Diamond Resource Company

Management and Action in Northern California: Joe DiDonato, East Bay Regional Park District

Raptors & Regional Conservation Planning: Jeff Lincer, WRI Field Station

Understanding Southern California's Ecosystem and Species Diversity: Melissa Busby, EcoSystems Restoration Associates

Wildlife Response to Restoration: Chrissy Howell, PRBO Conservation Science

Posters: Amy Fesnock, U.S. Fish and Wildlife Service

Workshops:

Bayesian Statistics Workshop - An Introduction to Bayesian Statistical Analysis and Inference: Howard Stauffer, Humboldt State University

Statistics Refresher - Review of Traditional Frequentist Statistical Analysis and Inference and an Overview of Contemporary Statistical Methods: Howard Stauffer, Humboldt State University

**Concurrent Session:
Ecology and Management of Carnivores**

Wednesday, February 6, 2008

1:00 p.m. to 5:10 p.m.

Sierra Room

Chair: Dr. Ben Sacks, Sacramento State University

- | | |
|--------------------------|--|
| 1:00 to 1:05 p.m. | Session introduction and announcements |
| 1:05 to 1:25 p.m. | <i>Estimating detection probabilities for fishers using non-invasive protocols: Implications for survey protocols</i>
Keith M. Slauson and William J. Zielinski |
| 1:25 to 1:45 p.m. | <i>Forensic methods and DNA evidence of intraguild predation on fishers (<u>Martes pennanti</u>) in California</i>
(Student Paper)
Greta M. Wengert , Mourad W. Gabriel and Janet E. Foley |
| 1:45 to 2:05 p.m. | <i>Pathogens associated with fishers (<u>Martes pennanti</u>) and their sympatric mesocarnivores in Northern California</i>
(Student Paper)
Mourad W. Gabriel , Greta M. Wengert, J. Mark Higley, Sean Matthews, Janet E. Foley, and Richard N. Brown |
| 2:05 to 2:25 p.m. | <i>Movement behavior and habitat preferences of American badgers (<u>Taxidea taxus</u>) in California: First steps in directing management</i>
Jessie Quinn |
| 2:25 to 2:45 p.m. | <i>Home range size and food habits of ringtails (<u>Bassariscus astutus</u>) in a Central Valley riparian forest, Sutter County, California</i>
David T. Wyatt |
| 2:45 to 3:05 p.m. | <i>Wolverine range, climatic requirements, and the likely effects of climate change on wolverine distribution</i>
Kevin S. McKelvey , Jeffrey P. Copeland, Michael K. Schwartz, Samuel A. Cushman, Patrick Gonzalez, and Keith B. Aubry |
| 3:05 to 3:25 p.m. | Discussion, questions and answers |
| 3:25 to 4:00 p.m. | Refreshment break (Siskiyou Room) |
| 4:00 to 4:20 p.m. | <i>Space utilization and urban-association of bobcats (<u>Lynx rufus</u>) in Orange County</i>
Erin E. Boydston |

4:20 to 4:40 p.m.	<i>Population structure of California black bear (<u><i>Ursus americanus</i></u>): Genetic evidence of a translocation and a natural colonization event</i> (Student Paper) Sarah Brown , Doug Updike and Holly Ernest
4:40 to 5:00 p.m.	<i>Assessing the conservation status of the native Sacramento Valley red fox</i> Heiko U. Wittmer and Ben Sacks
5:00 to 5:10 p.m.	Additional discussion, questions and answers
5:10 p.m.	Session concludes

Mark your calendars!

CNPS 2009 Conservation Conference:
Strategies and Solutions

January 17 – 19, 2009 (Immediately preceding
the TWS Western Section conference)

Where: Sacramento Convention Center and
Sheraton Hotel

Description: You won't want to miss this event that will convene the greater community of conservationists in one forum to learn about strategies and solutions for conservation in the 21st century. Coordinated by CNPS and jointly sponsored by environmental consulting firms, non-profits and state and federal agencies, the conference will offer concurrent and plenary sessions, symposia, workshops, banquet, photography contest, and exhibit hall. Visit cnps.org for details!

Volunteers for planning and implementation of this conference are needed! Contact Josie Crawford, jcrawford@cnps.org to learn more.

Strategies & Solutions



**CONSERVATION
CONFERENCE**

**Concurrent Session:
Conservation and Management of Military Lands**

Wednesday, February 6, 2008

1:00 p.m. to 3:25 p.m.

Trinity and Cascade Rooms

Chair: Kirsten Christopherson, Beale Air Force Base

- | | |
|--------------------------|--|
| 1:00 to 1:05 p.m. | Session introduction and announcements |
| 1:05 to 1:25 p.m. | <i>Fort Hunter Liggett Natural Resources and Conservation Program</i>
Jason Bachiero, Jim Kilber, Jackie Hancock, Wally Haussamen, and Elizabeth Reese Clark |
| 1:25 to 1:45 p.m. | <i>Special Area Management Plans: A comprehensive approach to wetland management</i>
Steve Leach and Kirsten Christopherson |
| 1:45 to 2:05 p.m. | <i>The Department of Defense Partners in Flight program: The conservation and management of migratory and resident landbirds and their habitats on DOD lands</i>
Tiffany Shepherd |
| 2:05 to 2:25 p.m. | <i>Comparison of electric fence configurations used for predator management at Vandenberg Air Force Base</i>
Julie Howar and Dan P. Robinette |
| 2:25 to 2:45 p.m. | <i>Riparian-breeding bird diversity, population dynamics, and responses to seasonal rainfall in Upper Salinas Valley, California</i>
Nellie Thorngate |
| 2:45 to 3:05 p.m. | <i>Automated monitoring and assessment of bat and bird populations on military lands</i>
Joseph M. Szewczak |
| 3:05 to 3:25 p.m. | Discussion, questions and answers |
| 3:25 p.m. | Session concludes |

***Please join us tonight for the
Welcome Mixer and Poster Session!***

**Concurrent Session:
Ecology and Management of Raptors**

**Wednesday, February 6, 2008
4:00 p.m. to 5:45 p.m.
Trinity and Cascade Rooms**

Chair: Dr. Jeff Lincer, WRI Field Station

- 4:00 to 4:05 p.m.** **Session introduction and announcements**
- 4:05 to 4:25 p.m.** *Nesting burrowing owls on two sites in the Altamont Pass Wind Resource Area in eastern Alameda County in 2006 and 2007*
John H. Barclay and Lindsay M. Harman
- 4:25 to 4:45 p.m.** *Factors influencing migratory decisions of western burrowing owls in Southern Arizona*
Mark S. Ogonowski and Courtney J. Conway
- 4:45 to 5:05 p.m.** *Winter roadside raptor surveys in the northern Central Valley of California, 2006-2007: A pilot-study*
Zach Smith
- 5:05 to 5:25 p.m.** *Evaluation of burrowing owl monitoring techniques and comparison of populations – Yolo County, California*
Cristina L. Buss and Barrett A. Garrison
- 5:25 to 5:45 p.m.** **Discussion, questions and answers**
- 5:45 p.m.** **Session concludes**

**PLEASE SILENCE
YOUR CELLULAR PHONE
AND SIMILAR DEVICES...**

POSTER SESSION

February 6, 2008, 6:00 to 7:45 p.m.
The Sundial Room

Chair: Amy Fesnock, U.S. Fish and Wildlife Service

Western pond turtle conservation strategy

Don T. Ashton, Hartwell H. Welsh, Jr. and Garth R. Hodgson

River Otter Network: long-term monitoring of ecosystem health

Jeff Black

Using noninvasive techniques to study stress hormones and genetics in river otters in northern California

Kristin E. Brzeski, Jennifer A. Terry, Erin N. Atkin, Brian S. Arbogast, Jeff M. Black, and Micaela Szykman Gunther (Student Poster)

Fog deters birds from high-voltage roost

Kellie Collins, Steve Yonge and Ron Critchlow

Intersexual variation in the foraging ecology of Western wood-pewees: Females do work harder

Alissa Fogg, T. Luke George and Kathryn Purcell (Student Poster)

Rapid field pathogen tests are not sensitive enough for use on fishers (Martes

pennanti) Mourad W. Gabriel, Greta M. Wengert, Janet E. Foley, and Richard N. Brown (Student Poster)

Breeding biology and seasonal movement of urban Steller's jays

Pia O. Gabriel and Jeffrey M. Black (Student Poster)

Nest site characteristics of the Western pond turtle (Clemmys marmorata): Implications for species management

Rebecca Gordon, Matthew Bettelheim, Nick Geist, and Alexandra Dallaran (Student Poster)

Exploratory risk taking behavior in Steller's jays (Cyanocitta stelleri)

Lindsay G. Greene, Pia O. Gabriel and Jeffrey M. Black (Student Poster)

Shorebird populations and habitat use during a dry and a wet spring at the Sacramento National Wildlife Refuge, California

Jennifer E. Isola, Mike A. Wolder and Cliff L. Feldheim

Influence of mate presence on Steller's jay (Cyanocitta stelleri) cache concealment effort

Ryan Kalinowski, Pia Gabriel and Jeffrey Black

Changing environments are putting the squeeze on pygmy rabbit habitat

Eveline Sequin Larrucea and Peter F. Brussard (Student Poster)

The importance of fruit to Swainson's thrushes, Catharus ustulatus, during fall migration: A field test of plasma metabolite analysis

Amy Leist

Lake Merritt Canada goose management study

Rosalyn Stewart and Ken Schwartz

Batrachochytrium dendrobatidis sampling of Emys marmorata in a Sierran pond

Trish Tatarian, Amy Fesnock and Greg Tatarian

Factors influencing vigilance while feeding in reintroduced California condors (Gymnogyps californianus)

Christopher West

Wintering duck response to trail use at former San Francisco Bay salt ponds

Heather R. White and Lynne Trulio (Student Poster)

San Joaquin Valley Natural Communities Conference

Thursday, March 20, 2008, 9:00 a.m. to 5:00 p.m.

California State University, Bakersfield

Registration \$30.00

This one-day conference is an opportunity for biologists conducting research, management, regulation and conservation activities in the San Joaquin Valley to exchange information, ideas, results, and the progress of their work on natural communities, wildlife and plants.

Presentations are limited to 20 minutes, including time for questions and answers. Written papers are not required, but may be available for attendees at the presenter's discretion.

The conference registration fee of \$30.00 includes abstract package, morning and afternoon refreshments, lunch, and campus parking.

If you would like to be added to the e-mail distribution list to receive more information and a registration form, please contact Christine Van Horn Job at "cvanhornjob@bak.rr.com", and you will be added to the list. Thank you for your interest.

Sponsored by:
San Joaquin Valley Chapter, The Wildlife Society
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California State University, Bakersfield

PLENARY SESSION

Thursday, February 7, 2008

8:30-11:30 a.m.

Red Lion Ballroom

The Role of Non-Governmental Organizations in Wildlife Management and Conservation

Chair: Rhys Evans, TWS Western Section President-elect

- | | |
|---------------------|---|
| 8:30 to 8:35 a.m. | General introduction and announcements |
| 8:35 to 8:55 a.m. | <i>The Wildlife Society update</i>
Dr. Michael Hutchins, Executive Director and CEO,
The Wildlife Society |
| 8:55 to 9:00 a.m. | Plenary introduction Rhys Evans |
| 9:00 to 9:25 a.m. | <i>Land trusts and conservation easements in wildlife
conservation</i>
Dr. John Bernstein, Vice President of Conservation,
Pacific Forest Trust |
| 9:25 to 9:50 a.m. | <i>Roles for science-based NGOs in wildlife management
and conservation</i>
Dr. Wayne Spencer, Senior Conservation Biologist,
Conservation Biology Institute |
| 9:50 to 10:10 a.m. | Refreshment break (Siskiyou Room) |
| 10:10 to 10:35 a.m. | <i>The use of advocacy tools to aid in wildlife conservation</i>
Ms. Kim Delfino, J.D, California Program Director,
Defenders of Wildlife |
| 10:35 to 10:55 a.m. | <i>The role of scientific / professional societies in wildlife
management and conservation</i>
Dr. Michael Hutchins, Executive Director/CEO, The
Wildlife Society |
| 10:55 to 11:15 a.m. | Panel discussion |
| 11:15 to 11:30 a.m. | <i>Monterey 2009: An update</i>
Cynthia Perrine, TWS Western Section Past-President |

*Immediately followed by a Monterey 2009 organizational meeting in the
Sundial Room – all in attendance will be rewarded (and will be asked to help)*

**Concurrent Session:
Management and Action in Northern California**

**Thursday, February 7, 2008
1:00 p.m. to 3:35 p.m.
Sierra Room**

Chair: Joe DiDonato, East Bay Regional Park District

- 1:00 to 1:05 p.m.:** **Session introduction and announcements**
- 1:05 to 1:25 p.m.:** *Recovery of the Cascades frog and other lake basin fauna following removal of introduced trout*
(Student Paper)
Karen Pope and Sharon Lawler
- 1:25 to 1:45 p.m.:** *Assessing monitoring techniques for bird populations in Sierra Nevada montane meadows*
Amy K. Tegeler-Amones, Joseph M. Szewczak, Heather A. Mathewson, Michael L. Morrison, and Chris Stermer
- 1:45 to 2:05 p.m.:** *Monitoring avian species diversity in montane conifer and sagebrush habitats in northern California using automated recorders*
Brett J. Furnas and Richard L. Callas
- 2:05 to 2:25 p.m.:** *Birds of the East Bay grassland*
Michele R. Hammond, Sasha Gennet, Devii Rao, Reginald H. Barrett, James Bartolome, Christine O. Gaber, and Peter Hopkinson
- 2:25 to 2:45 p.m.:** *Small mammal habitat associations in East Bay Regional Park District grasslands* (Student Paper)
Christine O. Gaber, Reginald H. Barrett, James W. Bartolome, Michelle R. Hammond, and Peter Hopkinson
- 2:45 to 3:05 p.m.:** *The ecological role of the California ground squirrel (Spermophilus beecheyi)*
Colleen M. Lenihan
- 3:05 to 3:25 p.m.:** *Nature Preservation Partnerships*
Dave Riensche
- 3:25 to 3:35 p.m.:** **Discussion, questions and answers**
- 3:35 p.m.** **Session concludes**

**Concurrent Session:
Wildlife Response to Restoration**

**Thursday, February 7, 2008
1:00 p.m. to 2:40 p.m.
Trinity Room**

Chair: Dr. Chrissy Howell, PRBO Conservation Science

- 1:00 to 1:05 p.m.** **Session introduction and announcements**
- 1:05 to 1:25 p.m.** *Expected wildlife response to active management of Sagebrush-grass communities*
Kent McAdoo and Brad Schultz
- 1:25 to 1:45 p.m.** *Fecundity estimates and variation in populations of Salt-marsh song sparrows*
Parvaneh Abbaspour, Christine A. Howell, Julian Wood, and Nadav Nur
- 1:45 to 2:05 p.m.** *Reintroduction of riparian brush rabbits at the San Joaquin River National Wildlife Refuge*
Patrick Kelly, Matthew Lloyd, Laurissa Hamilton, Scott Phillips, and Daniel Williams
- 2:05 to 2:25 p.m.** *Locally extirpated species return! Songbird restoration success stories*
Christine A. Howell, Mark Dettling and Julian Wood
- 2:25 to 2:40 p.m.** **Discussion, questions and answers**
- 2:40 p.m.** **Session concludes**

NO BREAK, directly into next session

CALIFORNIA CENTRAL COAST CHAPTER
announces their first “Research Round Table.”

An informal arena for presenting current research and management projects with break-out sessions for further discussion.

Wednesday, February 27th at Cal Poly, San Luis Obispo
Contact Maeton Freel for more information: mcfreel@verizon.net

**Concurrent Session:
Raptors and Regional Conservation Planning**

**Thursday, February 7, 2008
2:45 p.m. to 4:00 p.m.
Trinity Room**

Chair: Dr. Jeff Lincer, WRI Field Station

2:45 to 2:50 p.m. Session introduction and announcements

**2:50 to 3:10 p.m. *Prairie falcons and habitat conservation plans in the East San Francisco Bay Area*
Douglas A. Bell**

**3:10 to 3:30 p.m. *Changes in wintering range of the rough-legged hawk in North America*
Edward Pandolfino**

**3:30 to 3:50 p.m. *Raptors and HCPs; San Diego's MSCP*
Jeffrey L. Lincer and John D. Bittner**

3:50 to 4:00 p.m. Discussion, questions and answers

4:00 p.m. Session concludes

**PLEASE SILENCE
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AND SIMILAR DEVICES...**

**Concurrent Session:
Amphibians and Reptiles**

**Thursday, February 7, 2008
1:00 p.m. to 3:35 p.m.
Cascade Room**

Chair: Dave Cook, Sonoma County Water Agency

- 1:00 to 1:05 p.m.** **Session introduction and announcements**
- 1:05 to 1:25 p.m.** *Habitat characteristics of the Shasta salamander*
Len Lindstrand III
- 1:25 to 1:45 p.m.** *Microhabitat characteristics associated with oviposition sites of the California red-legged frog*
Jeff A. Alvarez, David G. Cook, Michael G. van Hattem, and Lisa E. Paterson
- 1:45 to 2:05 p.m.** *Breeding phenology of the Northern red-legged frog (Rana aurora) at Humboldt Bay National Wildlife Refuge*
Michael van Hattem, Jamie B. Bettaso and Justin M. Garwood
- 2:05 to 2:25 p.m.** *Home range, seasonal movements and habitat use of mountain yellow-legged frogs (Rana muscosa) in a Northern Sierra Nevada stream*
Greta M. Wengert, Mourad W. Gabriel and Jamie B. Bettaso
- 2:25 to 2:45 p.m.** *Phylogeography of the San Francisco garter snake (Thamnophis sirtalis tetrataenia)*
Tammy Lim, Eric Routman and Karen Swaim (Student Paper)
- 2:45 to 3:05 p.m.** *San Francisco garter snake (Thamnophis sirtalis tetrataenia) mark-recapture analysis: Preliminary results*
Ricka Stoelting and Karen Swaim
- 3:05 to 3:25 p.m.** *Factors influencing lotic breeding amphibians in the East Bay Regional Park District*
Steven Bobzien and Sarah K. Kupferberg
- 3:25 to 3:35 p.m.** **Discussion, questions and answers; Session concludes**

**Please join us for the...
Annual Member Meeting (Sundial Room) or
Student Résumé Workshop (Sacramento Room)**

**Concurrent Session:
Managed Forests**

**Friday, February 8, 2008
8:30 a.m. to 2:30 p.m.
Sierra Room**

Chair: Keith Hamm, Green Diamond Resource Company

- 8:30 to 8:35 a.m.** **Session introduction and announcements**
- 8:35 to 8:55 a.m.** *Western gray squirrels as disease reservoirs*
Nathan Nieto and Janet Foley
- 8:55 to 9:15 a.m.** *Evaluating an existing fisher rest site model for use on managed forest lands in North-central California*
Steven E. Self and Daniel J. Ball
- 9:15 to 9:35 a.m.** *Distribution of the amphibian assemblages of zero-order basins and their relationships to the landscape mosaic in the Mill Creek watershed, Del Norte County, CA*
Hartwell H. Welsh, Jr. and Garth R. Hodgson
- 9:35 to 9:55 a.m.** *Stand-level habitat use of fisher (Martes pennanti) in the managed forests of the Hoopa Valley Reservation, California*
Sean M. Matthews and J. Mark Higley
- 9:55 to 10:30 a.m.** **Refreshment break (Siskiyou Room)**
Note: Vendors will close after this break
- 10:30 to 10:50 a.m.** *Use of habitat and nests by Tamias ochrogenys and association with tick-borne disease*
Janet Foley and Nathan Nieto
- 10:50 to 11:10 a.m.** *Preliminary results of a long-term monitoring program for dusky-footed woodrats*
Bryan J. Yost, Keith A. Hamm and Lowell V. Diller
- 11:10 to 11:30 a.m.** *Fisher (Martes pennanti) presence, physical attributes and condition within two industrially managed forests of Northern California*
Matthew A. Reno, Khris Rulon and Cajun James
- 11:30 to 11:50 a.m.** *Den site characteristics and home range size of female fisher (Martes pennanti) within two industrially managed forests in northern California*
Khris R. Rulon, Matthew A. Reno and Cajun James
- 11:50 a.m. to 1:00 p.m.** **Lunch break**

1:00 to 1:05 p.m.	Secondary introduction and announcements
1:05 to 1:25 p.m.	<i>The northern spotted owl in the 21st Century: Symposium overview</i> Lowell Diller, Rich Klug, Scott Osborn, and Brian Woodbridge
1:25 to 1:45 p.m.	<i>Tree vole nest abundance and habitat associations in managed forests</i> Keith A. Hamm, Lowell V. Diller and Bryan J. Yost
1:45 to 2:05 p.m.	<i>Response of small mammals to Ponderosa pine restoration in northeastern California</i> T. Luke George and Steve Zack
2:05 to 2:30 p.m.	Discussion, questions and answers
2:30 p.m.	Session concludes

TWS Certification Program

Certification of wildlife biologists is a service provided by The Wildlife Society for wildlife professionals and the public, who may desire a peer evaluation statement.

The Wildlife Society is committed to the sound stewardship of wildlife resources under the guidance of well-educated, experienced, and dedicated wildlife biologists. To further this aim, The Wildlife Society has established standards for certifying the credentials of qualified wildlife biologists.

A professional wildlife biologist is a person with the educational background and demonstrated expertise in the art and science of applying the principles of ecology to the conservation and management of wildlife and its habitats. An applicant for professional certification who demonstrates this expertise through education and experience, and is judged to be able to represent the profession as an ethical practitioner will be designated as a Certified Wildlife Biologist (CWB).

An applicant for professional certification who has limited experience but who has completed the rigorous academic standards and is judged to be able to represent the profession as an ethical practitioner will be designated as an Associate Wildlife Biologist (AWB). After sufficient experience is gained, the AWB may apply for the more advanced level of certification.

Please visit the TWS “National” website (www.wildlife.org) for additional details, or contact your TWS-West Professional Development Committee.

**Concurrent Session:
Ecology and Management of Shorebirds and Waterfowl**

**Friday, February 8, 2008
8:30 a.m. to 12:00 p.m.
Trinity Room**

Chair: Ahmed Soliman, California Department of Fish and Game

Co-chair: Dr. Mark Colwell, Humboldt State University

- 8:30 to 8:35 a.m.:** Session introduction and announcements
- 8:35 to 8:55 a.m.:** *Testing clover cultivation and grassland fertilization as a tool to attract migratory Aleutian geese to alternate feeding areas* (Student Paper)
Dominic C. Bachman, Jeffrey M. Black and Matt D. Johnson
- 8:55 to 9:15 a.m.:** *Population status of the Tule greater white-fronted goose*
Daniel R. Yparraguirre and Melanie L. Weaver
- 9:15 to 9:35 a.m.:** *Factors influencing the distribution and use of Aleutian geese during spring-staging* (Student Paper)
Kyle A. Spragens, Jeffrey M. Black and Matthew D. Johnson
- 9:35 to 9:55 a.m.:** *Population dynamics of Canada geese from Northeastern California*
Shaun L. Oldenburger, Daniel R. Yparraguirre and Melanie Weaver
- 9:55 to 10:30 a.m.:** Refreshment break (Siskiyou Room)
Note: Vendors will close after this break
- 10:30 to 10:50 a.m.:** *Breeding patch dynamics of the Western snowy plover (Charadrius alexandrinus nivosus) in Humboldt County, California* (Student Paper)
Noah S. Burrell and Mark A. Colwell
- 10:50 to 11:10 a.m.:** *Waterfowl use on managed wetlands during the non-breeding period at the Sacramento National Wildlife Refuge Complex, Sacramento Valley, California*
Mike A. Wolder, J.G. Mensik, J.G. Silveira, N.M. Carpenter, and J. E. Isola
- 11:10 to 11:30 a.m.:** *The impact of predator exclosures on snowy plover nesting success: A 7-year study* (Student Paper)
Michael A. Hardy and Mark A. Colwell
- 11:30 to 11:50 a.m.:** *Ammophila arenaria influences snowy plover nest-site selection* (Student Paper)
Jordan J. Muir and Mark A. Colwell
- 11:50 a.m. to 12:00 p.m.:** Discussion, questions and answers
- 12:00 p.m.:** Session concludes

**Concurrent Session:
Ecology and Management of Mammals**

Friday, February 8, 2008
8:30 a.m. to 11:50 a.m.
Cascade Room

Chair: Dr. Steve Kohlmann, Tierra Resource Management

- | | |
|---------------------|--|
| 8:30 to 8:35 a.m. | Session introduction and announcements |
| 8:35 to 8:55 a.m. | <i>Using verified reports to estimate relative abundance for urban mesopredators</i>
Christine A. Klinkowski , Michael J. Kutilek, John O. Matson, Paula Messina, and Shannon M. Bros |
| 8:55 to 9:15 a.m. | <i>Initial response of small mammals to experimental removal of coarse woody debris in a California oak woodland</i>
William D. Tietje and James M. Zingo |
| 9:15 to 9:35 a.m. | <i>Further testing of an acoustic deterrent to reduce bat mortality from wind turbines</i>
Joseph M. Szewczak and Edward B. Arnett |
| 9:35 to 9:55 a.m. | <i>Effects of repeated captures on body mass and long-term survival of dusky-footed woodrats</i>
James M. Zingo and William D. Tietje |
| 9:55 to 10:30 a.m.: | Refreshment break (Siskiyou Room)
Note: Vendors will close after this break |
| 10:30 to 10:50 a.m. | <i>Spatial population dynamics of Tule elk at Point Reyes National Seashore, California</i> (Student Paper)
McCrea A. Cobb , Reginald H. Barrett, Natalie B. Gates, and Peter J. Gogan |
| 10:50 to 11:10 a.m. | <i>The response of San Gabriel Mountains bighorn sheep to fire</i>
Steve Holl , Vernon C. Bleich and Heather E. Johnson |
| 11:10 to 11:30 a.m. | <i>The use of Science-based predator control literature for enhancing bighorn sheep, mule deer and pronghorn in Nevada</i>
James D. Yoakum |
| 11:30 to 11:50 a.m. | Discussion, questions and answers |
| 11:50 a.m. | Session concludes |

**Concurrent Session:
Ecology and Management of Birds**

**Friday, February 8, 2008
1:00 to 3:00 p.m.
Trinity Room**

Chair: Amy Fesnock, U.S. Fish and Wildlife Service

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| 1:00 to 1:05 p.m. | Session introduction and announcements |
| 1:05 to 1:25 p.m. | <i>Using molt cycles to categorize age in tropical birds: An integrative new system</i> (Student Paper)
Jared D. Wolfe, T. Brandt Ryder and Peter Pyle |
| 1:25 to 1:45 p.m. | <i>Current purple martin distribution and nesting habitat characteristics at Shasta Lake, California</i>
Len Lindstrand III |
| 1:45 to 2:05 p.m. | <i>Recovering the purple martin from remnant population in urban Sacramento: Accomplishments, challenges and opportunities</i>
Daniel A. Airola, Dan Kopp, Stan Kostka, and Kevin Thomas |
| 2:05 to 2:25 p.m. | <i>The bank swallow on the Sacramento River: Monitoring and conservation activities, 1986-2007</i>
Ronald W. Schlorff and Joseph G. Silveira |
| 2:25 to 2:45 p.m. | <i>Comparison of geographic, ecological and anthropogenic factors on bird richness and abundance in riparian habitat</i>
J.C. Uyehara and Chris Farmer |
| 2:45 to 3:00 p.m. | Discussion, questions and answers |
| 3:00 p.m. | Session concludes |

Be on the lookout for TWS Certification Workshops to be offered in SF Bay and Sacramento areas in early May (check website for details). See additional details on page 30. If you'd like to attend a similar workshop in another area, contact your Chapter Representative...

Concurrent Session:
Understanding Southern California's Ecosystem and Species Diversity

Friday, February 8, 2008
1:00 to 3:00 p.m.
Cascade Room

Chair: Melissa Busby, EcoSystems Restoration Associates

- 1:00 to 1:05 p.m.:** **Session introduction and announcements**
- 1:05 to 1:25 p.m.:** *Monitoring and maintenance approach to accomplish riparian restoration goals for Goat Canyon Sediment Basins Riparian Restoration Project*
Richard Burg, James Prine, Linnea Spears-Lebrun, Erin Riley, and Suellen Lynn
- 1:25 to 1:45 p.m.:** *Recovery of an endangered bird and 3,000 acres of riparian habitat on the Santa Ana River*
Richard Zembal
- 1:45 to 2:05 p.m.:** *CoyoteBytes.org: A website to inform urban coyote management*
Robert M. Timm, Karin Tuxen-Bettmann and Nina Maggi Kelly
- 2:05 to 2:25 p.m.:** *Analysis of San Joaquin kit fox element data within the California Natural Diversity Database: A case for data reliability*
Howard O. Clark, Jr., **Darren P. Newman** and Susan I. Hagen
- 2:25 to 2:45 p.m.:** *Maintaining and restoring Southern California's wildlife movement corridors*
Melissa A. Busby, Darin A. Busby and D. Erik LaCoste
- 2:45 to 3:00 p.m.:** **Discussion, questions and answers**
- 3:00 p.m.:** **Session concludes**

JOIN US NEXT YEAR IN SACRAMENTO!
January 17-20 – California Native Plant Society
January 20-23 – TWS Western Section

CONCURRENT SESSION ABSTRACTS

Presenting author shown in bold

Fecundity estimates and variation in populations of salt-marsh song sparrows

Parvaneh ABBASPOUR, Christine A. HOWELL, Julian WOOD, and Nadav NUR, PRBO Conservation Science, 3820 Cypress Drive, Suite 11, Petaluma, CA 94954; (503) 502-1893; E-mails: pabbaspour@prbo.org, chowell@prbo.org, jwood@prbo.org, nnur@prbo.org

Abstract: 85% of tidal salt marsh habitat has been lost in the San Francisco Bay Estuary over 150 years. Three sub-species of song sparrows endemic to marshes have been designated California Species of Special Concern. Since 1996, PRBO Conservation Science has monitored these at-risk populations at remnant and recently restored marshes. Evaluating population stability of birds relies on measuring reproductive success; calculations of nest survivorship are often presented as a reproductive metric. While these estimates provide important information on detected nest survival, they may be misleading productivity estimates for multiply-brooded species, species with a propensity to re-nest after nest-failure, or for populations suffering high rates of nest failure. Seasonal fecundity, measured as the number of young fledged per female over the entire breeding season, is a more robust estimate of productivity and is recognized as a key parameter in assessing fitness and population viability. To determine seasonal fecundity and evaluate contributing factors such as nest survival, clutch size and breeding response, we collected detailed observations of individually color-marked birds over multiple seasons from three populations in the North San Francisco Bay. Data collected from over 100 females reveal the range of variation in reproductive parameters among individuals and between populations.

Recovering the purple martin from remnant population in urban Sacramento: Accomplishments, challenges and opportunities

Daniel A. AIROLA, Airola Environmental Consulting, 2700 6th Avenue, Sacramento, CA 95818; Dan KOPP, ECORP Consulting, 2525 Warren Dr., Rocklin, CA 95677; Stan KOSTKA, 28603 Kunde Rd., Arlington, WA 98223; and Kevin THOMAS, ECORP Consulting, 2525 Warren Dr., Rocklin, CA 95677; E-mail: d.airola@sbcglobal.net

Abstract: The purple martin has been eliminated from the Central Valley except for a remnant bridge-nesting population in Sacramento. During 2004-2007, the population declined by 40% to 106 pairs. Several urban mortality sources raise concerns, including vehicle collisions and feral cat predation. Color-banding has shown the importance of adult mortality in determining breeding populations. Camera monitoring in 2007 showed normal productivity. Management has included discouraging incompatible land uses and installing perches to reduce collisions. Installing wire "nest guards" to reduce nestling fallout has modestly increased reproduction. Proposed construction projects at 6 sites that support 70% of the population indicate the population's vulnerability. Construction mitigation has usually been limited to nest site exclusion, which does not address reproductive loss resulting from displacement. Project-related habitat changes, and resulting increased nest site competition with European starlings, also are under-appreciated. A multi-agency management strategy is needed to protect and productively manage colonies. Given recent trends, the strategy of protecting bridge sites should be augmented with a rural nest box program. Recovery of the Central Valley purple martin population is feasible, but will require greater commitment than the largely volunteer-based effort to date.

Microhabitat characteristics associated with oviposition sites of the California red-legged frog

Jeff A. ALVAREZ, The Wildlife Project, P.O. Box 579805, Modesto, CA 95357, (209) 815-5660; David G. COOK, Sonoma County Water Agency, P.O. Box 11628, Santa Rosa, CA 95406; Michael G. Van HATTEM, California Department of Fish and Game, 619 Second Street, Eureka, CA 95501; and Lisa E. PATERSON, Lawrence Livermore National Laboratory, P.O. Box 808, Livermore, CA; E-mails: jeff@thewildlifeproject.com, dcook@scwa.ca.gov, mvanhattem@dfg.ca.gov, patersonL@llnl.gov

Abstract: Understanding aspects of the reproductive natural history of threatened and endangered species is crucial in facilitating species recovery. We evaluated various microhabitat associations related to the oviposition sites of California red-legged frogs (*Rana draytonii*). Because California red-legged frogs utilize various habitat types in the course of reproduction, we investigated a range of lentic and lotic habitat types under degraded to natural conditions in west-central California. We found frogs in pond, creek, and channelized stream habitats oviposited egg masses within an average of 0.5 meters (n = 270) of the shoreline edge, while frogs in marsh habitat showed no association with the shoreline. California red-legged frogs typically attached their egg masses (n = 435) to emergent substrate (63%) comprised of various types of vegetation. Cattail (29%) represented the most frequently utilized substrate, with a variety of other vegetation also being used including spikerush (17%), annual grasses (10%), and woody debris (8%). Water depth surrounding egg masses averaged 0.26 m (n = 483) and ranged from zero (egg resting on soil) to 0.81 m. Understanding the factors related to the reproductive needs of this species can contribute to creating, managing, or preserving appropriate habitat and promoting recovery.

Fort Hunter Liggett Natural Resources and Conservation Program

Jason BACHIERO, Jim KILBER and Jackie HANCOCK, Albion Environmental, Inc., 1414 Soquel Ave. Suite 205, Santa Cruz, CA 95602, (831) 386-3330; Wally HAUSSAMEN and Elizabeth REESE CLARK, Department of the Army, P.O. Box 7090, Fort Hunter Liggett, CA 93928; E-mails: jason.bachiero@liggett-emh1.army.mil, jim.kilber@liggett-emh1.army.mil, jackie.hancock@liggett-emh1.army.mil, wally.haussamen@liggett-emh1.army.mil, liz.clark@liggett-emh1.army.mil

Abstract: Fort Hunter Liggett (FHL), a 65,587 ha Army Reserve installation in southern Monterey County, has been used for military training since 1940. Current training includes small arms fire, tank gunnery, and vehicle and aviation maneuvers. Landscape features include the San Antonio and Nacimiento Rivers, grassland, woodland, and chaparral habitats extending west to the Santa Lucia Mountains Coast Ridge. We summarize natural resources conservation activities, which began in 1950, designed to facilitate FHL training missions and conserve natural resources. Conservation activities are described in an Integrated Natural Resources Management Plan (INRMP) and a USFWS Biological Opinion. We summarize the public hunting and fishing activities which were recently revised to require the use of non-lead bullet ammunition beginning in 2007 and non-lead shot ammunition beginning in 2008. Our program includes deer, elk, pig, upland game and waterfowl management, a wood duck nest box program and annual monitoring of several protected species including two pairs of nesting bald eagles, the northern-most population of arroyo toad and the locally endemic purple amole and Santa Lucia mint. The program also includes operating a Monitoring Avian Productivity and Survivorship (MAPS) station, habitat management and restoration, and invasive plant control.

Testing clover cultivation and grassland fertilization as a tool to attract migratory Aleutian geese to alternate feeding areas

Student Paper. Dominic C. BACHMAN, Jeffrey M. BLACK and Matt D. JOHNSON, Humboldt State University, 1 Harpst St., Arcata, CA 95521, (707) 498-2927; E-mails: dominicbachman@hotmail.com, jmb7002@humboldt.edu, mdj6@humboldt.edu

Abstract: The rapidly rising population of Aleutian cackling geese (*Branta hutchinsii leucopareia*) has sparked concerns over how public lands and goose populations in Northwestern California and Southwestern Oregon should be managed. The Humboldt Bay NWR is investigating tools such as livestock grazing and fertilizer treatments on public lands managed primarily for geese as a means to attract geese onto public lands and away from farmers' pastures. We conducted a field experiment to assess goose grazing pressure on several habitat treatments on the refuge. During spring 2006-2007 goose grazing intensity was quantified using dropping counts in a total of 42 study plots. Fourteen plots were fertilized with slow release fertilizer and fourteen were mechanically cultivated with Berseem clover (*Trifolium alexandrinum*); the remainder were left as controls with local grasses and forbs. Pasture surface height, plant species composition and pasture quality and quantity levels were quantified for each treatment. Overall use of the fertilized plots was higher than in the control areas. Crude protein levels

were highest in the clover-cultivated areas. This research may be used as a guiding tool for habitat managers wishing to attract geese to alternative foraging sites.

Nesting burrowing owls on two sites in the Altamont Pass Wind Resource Area in Eastern Alameda County in 2006 and 2007

John H. BARCLAY and Lindsay M. HARMAN, Albion Environmental, Inc., 1414 Soquel Avenue, No. 205, Santa Cruz, CA 95062, (831) 469-9120; E-mails: jbarclay@albionenvironmental.com, lharman@albionenvironmental.com

Abstract: We censused nesting burrowing owls (*Athene cunicularia*) on the East Bay Regional Parks District's Souza and Vasco Caves parcels (5.63 km²) and along a Department of Water Resources (DWR) reservoir/pipeline project (5.84 km²) in the Altamont Pass Wind Resource Area (APWRA) in eastern Alameda County in 2006 and 2007. We recorded 25 pairs of burrowing owls in 2006 and 21 pairs in 2007 on the Souza/Vasco Caves parcels and 31 pairs in 2006 and 46 pairs in 2007 on the DWR project. We estimated minimum 75% nesting success (percent pairs producing ≥ 1 young) in 2006 and 51% in 2007. We estimated minimum productivity of 3.59 young/pair in 2006 and 1.78 young/pair in 2007. Nesting burrowing owls were not uniformly distributed in the landscape and tended to occur on the lower portions of slopes around the margins of basins and drainages. Average density (both years) of burrowing owl pairs on the Souza/Vasco parcels was 4.1 pairs/km² and 6.6 pairs/km² on the DWR project. Both areas and years combined yielded an average density of 5.4 pairs/km² that suggests there could be several hundred pairs of burrowing owls nesting in the 165 km² APWRA.

Prairie falcons and habitat conservation plans in the East San Francisco Bay Area

Douglas A. BELL, East Bay Regional Park District, 2950 Peralta Oaks Court, Oakland, CA, 94605, (510) 544-2341; E-mail: dbell@ebparks.org

Abstract: The prairie falcon (*Falco mexicanus*) has declined in the East San Francisco Bay Area. Loss of rangeland and grassland habitat through human development and changing land use patterns have likely contributed to this decline. Studies on diet, foraging habits and home range all support the hypothesis that prairie falcons may serve as a sensitive indicator species for the overall integrity of rangeland at the landscape level. The East Bay Regional Park District is radio-tracking adult prairie falcons nesting in the east county areas to locate key foraging habitats and identify the ecologically most valuable parcels of rangeland for inclusion in habitat conservation planning efforts. By identifying and preserving the key foraging habitats of a wide-ranging indicator species such as the prairie falcon it may be possible to lend umbrella protection to an entire assemblage of grassland animals. In the east county areas this may include burrowing owl, golden eagle, kit fox, California tiger salamander and red-legged frog. Preliminary results of this multi-year study will be presented, along with examples of how the data are assisting the District and other organizations with land acquisition and management efforts, including the East Contra Costa County Habitat Conservation Plan.

Factors influencing lotic breeding amphibians in the East Bay Regional Park District

Steven BOBZIEN, Ecological Services Coordinator, East Bay Regional Park District, 2950 Peralta Oaks Court, Oakland, CA 94605; and Sarah K. KUPFERBERG, Ph.D., Ecologist, Questa Engineering Corp., P.O. Box 70356, Brickyard Cove Rd., Suite 206, Pt. Richmond, CA 94807; E-mails: sbobzien@ebparks.org, skupferberg@pacbell.net

Abstract: The East Bay supports a diverse assemblage of herpetofauna where 12 amphibian and 30 reptilian species range within East Bay Regional Park District (District) lands. These include terrestrial, semi-aquatic, and aquatic taxa. Several species are polytypic with regional variation. Many factors, including habitat loss and fragmentation, contaminants, extended periods of drought, and the introduction of non-native predators have been implicated in contributing to the sudden and rapid decline of amphibians. Several species can be particularly vulnerable to anthropogenic and natural environmental conditions. Within the District five taxa: California newt (*Taricha torosa*), Western toad (*Bufo boreas*),

Pacific tree frog (*Hyla regilla*), California red-legged frog (*Rana draytonii*) and foothill yellow-legged frog (*Rana boylei*) are lotic breeding species. Since 1990 we have been monitoring their populations and have established over 100 stations within 42 streams. At each location data were gathered on a variety of abiotic and biotic variables. These include stream gradient and flow which can influence geomorphic process, hydrologic regime, and biological suitability of these lotic breeding species.

Space utilization and urban-association of bobcats (Lynx rufus) in Orange County

Erin E. BOYDSTON, USGS Western Ecological Research Center, 320 Commerce, Suite 150, Irvine, CA 92602, 714-508-4704; Lisa M. LYREN, U.S. Geological Survey, 6010 Hidden Valley Road, Carlsbad, CA 92011, (760) 931-1101; Emily RUELL and Kevin CROOKS, Colorado State University Fish, Wildlife, and Conservation Biology, Fort Collins, CO 80523 (970) 491-7936; E-mails: eboydston@usgs.gov, llyren@usgs.gov, eruell@lamar.colostate.edu, kcrooks@cnr.colostate.edu

Abstract: Home ranges of carnivores inhabiting developed landscapes may be larger due to the interspersed of good habitat with poor quality areas, or smaller if truncated by hard edges such as roads and urban edges. We examined space utilization patterns among bobcats across a network of nature reserves in the most densely human-populated county in Southern California. Using GPS-telemetry collars during 2002-2007, we tracked 19 male and 14 female bobcats up to 6 months each and obtained at least 182 high-quality GPS locations per individual. MCP home ranges averaged $9.2 \text{ km}^2 \pm 2.2 \text{ km}^2 \text{ SEM}$ for males and $5.4 \text{ km}^2 \pm 1.9 \text{ km}^2 \text{ SEM}$ for females. Most bobcats had less than 30% of their GPS-locations and home ranges outside natural habitat with some individuals not utilizing any developed areas. Males had higher levels of urban-association than females. Home ranges tended to be smaller for females as urban-association increased, but home range size was unrelated to urban-association among males. Bobcats with overlapping home ranges sometimes responded differently to the same roadway, with the road apparently a barrier to one individual but permeable to another. Continued research on bobcats in complex fragmented landscapes is necessary to elucidate the determinants of home range characteristics.

Population structure of California black bear (Ursus americanus): Genetic evidence of a translocation and a natural colonization event

Student Paper. Sarah BROWN; Wildlife and Ecology Unit, Veterinary Genetics Laboratory, University of California, Davis, One Shields Ave., Davis, CA 95616, (530) 754-7932; Doug UPDIKE, California Department of Fish and Game, 1812 Ninth St, Sacramento, CA 95814; and Holly ERNEST, Wildlife and Ecology Unit, Veterinary Genetics Laboratory; University of California, Davis, One Shields Ave., Davis, CA 95616, (530) 754-8245; E-mails: skbrown@ucdavis.edu, dupdike@dfg.ca.gov, hbernest@ucdavis.edu

Abstract: We surveyed the genetic diversity and population structure of California black bears (*Ursus americanus*). Samples (N = 543) were obtained from CDFG (2002-2006) and USFWS (1990-2001). DNA was extracted and analyzed using 12 microsatellite markers. Overall genetic diversity (observed heterozygosity, $H_o = 0.53$). Population genetic structure was supported by tests of population differentiation ($P < 0.001$). Subdivisions were observed genetically, and the following represent populations; 1) north coast/Klamath, 2) Cascade/northern Sierra Nevada, 3) central Sierra Nevada/southern California, and 4) southern Sierra Nevada/central coast. For (southern sierra with both the north sierra and the north coast) gene flow was associated with a genetic pattern of isolation by distance. Genetic patterns in the southern California and the central coast regions displayed evidence of colonization events corresponding with central Sierra Nevada and southern Sierra Nevada populations (respectively) as source populations. The southern California colonization signature may be associated with a translocation from Yosemite region to the San Bernardino Mountains in the 1930's (Burgdoff 1933).

Monitoring and maintenance approach to accomplish riparian restoration goals for Goat Canyon Sediment Basins riparian restoration project

Richard BURG, California State Parks, 8885 Rio San Diego Drive, San Diego, CA 92108, (619) 204-0182; James PRINE, Linnea SPEARS-LEBRUN, Erin RILEY and Suellen LYNN, EDAW, 1420 Kettner Blvd., Suite 620, San Diego, CA 92101, (619) 233-1454; E-mails: rburg@parks.ca.gov, james.prine@edaw.com

Abstract: The California Department of Parks and Recreation and EDAW are coordinating to perform monitoring and adaptive maintenance and management to achieve riparian restoration goals for 23.3 acres of riparian scrub and woodland in Border Field State Park. The restoration program is serving as mitigation for the loss of habitat resulting from installation of two sediment basins. The sediment basins were installed to address unnatural sediment loads in the Tijuana River Hydrologic Unit (watershed) and protect downstream saline emergent wetland habitats. Monitoring and maintenance have been performed for two years after installation and total native cover is over 100 percent based on combined cover from the vegetation strata. As part of the holistic 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 have been taken as a tool in conjunction with ground-truthing to track vegetation changes over time. The monitoring data has contributed to maintenance and management decisions regarding supplemental planting, weed control priorities, irrigation use, and attainment of project goals.

Breeding patch dynamics of the Western snowy plover (*Charadrius alexandrinus nivosus*) in Humboldt County, California

Student Paper. Noah S. BURRELL and Mark A. COLWELL, Wildlife Department, Humboldt State University, 1 Harpst St., Arcata, CA 95521, (707) 822-8867; E-mails: nsb4580@hotmail.com, mac3@humboldt.edu

Abstract: Effective management of threatened bird populations relies on identifying factors contributing to population limitation and ameliorating those factors. The U.S. Fish and Wildlife Service has identified three factors acting to limit productivity of the Western Snowy plover (*Charadrius alexandrinus nivosus*): predation, habitat loss owing to exotic species, and human disturbance. Using direct and indirect measures of habitat quality, we examined the dynamics of plover occupancy, abundance and per capita reproductive success at 16 locations in Humboldt County, CA from 2001-07, and compared these measures to indices of limiting factors. Both between and within years, we observed a significant negative correlation between corvid predation risk and per capita reproductive success between breeding sites. Similarly, human activity was negatively correlated with per capita reproductive success throughout the breeding locations. However, variation in available nesting habitat did not predict plover occupancy, abundance or reproductive success. Moreover, we failed to observe a significant relationship between any of the limiting factors and either occupancy or abundance of plovers between breeding sites. These habitat differences between breeding locations suggest the importance of developing effective management actions specific to the breeding site.

Maintaining and restoring Southern California's wildlife movement corridors

Melissa A. BUSBY, Darin A BUSBY and D. Erik LaCOSTE, EcoSystems Restoration Associates, 8954 Rio San Diego Drive Suite 610, San Diego, CA 92108, (619) 291-1475; E-mail: Melissa.Busby@tcb.aecom.com

Abstract: Wildlife biologists and environmental planners have become increasingly aware of the importance of restoring wildlife movement corridors, especially in Southern California where the urban environment dominates the natural one. In most cases, the restoration of these wildlife corridors is initiated as compensatory mitigation for development projects, especially for roadway improvement projects, and involves modifying the urban environment to encourage its use by wildlife. However, some of these projects are intended to maintain the wildlife movement corridor through the enhancement,

restoration, or creation of suitable habitat in areas that have been modified by some level of human disturbance. EcoSystems Restoration Associates has been involved in wildlife movement studies, wildlife corridor evaluations, and wildlife corridor restoration throughout Southern California, from the deserts of Imperial Valley to the canyons along the coast and in the mountains. Through thorough research as well as innovative design, implementation, and monitoring, ERA has developed a strong foundation for future wildlife movement studies and corridor restoration.

Evaluation of burrowing owl monitoring techniques and comparison of populations – Yolo County, California

Cristina L. BUSS and Barry A. GARRISON, California Department of Fish & Game, 1900 Lehigh Drive, Davis, CA, (209) 304-5609; E-mail: clbuss@gmail.com

Abstract: The burrowing owl is a Species of Special Concern to California due to statewide population declines and habitat loss. In 2005-2006 we performed transect surveys to monitor owls in the Yolo Bypass Wildlife Area (Yolo County, CA), which is subject to seasonal flooding. In 2006 we installed 50 nest boxes above floodwater levels, and monitored owl presence at historic burrows and nest boxes. In 2006-2007 we used playback broadcasts combined with visual surveys to detect owl sites, and compared monitoring techniques. During the breeding season (April-August) we banded owls in the Wildlife Area and in Wildhorse Golf Course (Davis, Yolo County, CA) to monitor dispersal between the populations. Wildhorse Golf Course is heavily managed, with many nest boxes, and serves as a reference site to the Wildlife Area. Twenty monitored nesting attempts in the Wildlife Area resulted in 60 confirmed juveniles, all from natural burrows. Twelve monitored nesting attempts at Wildhorse Golf Course resulted in 63 confirmed juveniles, from both natural burrows and nest boxes. The lack of productivity in the Wildlife Area's nest boxes may reflect this year's low precipitation and the relatively recent installation of the nest boxes.

Analysis of San Joaquin kit fox element data within the California Natural Diversity Database: A case for data reliability

Howard O. CLARK, Jr., **Darren P. NEWMAN** and Susan I. HAGEN, H. T. Harvey & Associates, 423 W Fallbrook Ave, Ste 202, Fresno, CA 93711, (559) 449-1423; E-mails: dnewman@harveyecology.com, shagen@harveyecology.com

Abstract: Our analyses of the kit fox sighting elements in the California Natural Diversity Database and other data suggest the possible misidentification of coyote pups as kit fox. During the summer months, coyote pups look remarkably similar to adult kit foxes; both have black-tipped tails and large ears relative to the body size. As coyote pups grow, there is a period of time where the pup weight approximates that of an adult kit fox. With an average weight increase of about 0.31 kg/week, coyote pups are ~2 kg during June, July, and August. During this time, juvenile coyotes superficially resemble kit foxes during spotlighting sessions, and it may be challenging for biologists to differentiate coyote pups from kit foxes at a time when both are present on the landscape.

Spatial population dynamics of Tule elk at Point Reyes National Seashore, California

Student Paper. McCrea A. COBB and Reginald H. BARRETT, University of California at Berkeley, 137 Mulford Hall, Berkeley, CA 94720; Natalie B. GATES, National Park Service, Point Reyes National Seashore, CA 94956; and Peter J. GOGAN, U.S. Geological Survey, Northern Rocky Mountain Science Center, Bozeman, MT 59717; E-mails: mcobb@nature.berkeley.edu, rbarrett@nature.berkeley.edu, natalie_gates@nps.gov, peter_gogan@usgs.gov

Abstract: Limited opportunities exist for researchers to examine the population dynamics of wild free-ranging ungulates from establishment to carrying capacity. Two populations of Tule elk (*Cervus elaphus nanodes*) currently exist at Point Reyes National Seashore: a closed population near carrying capacity and a low density, free-ranging population that was recently established through reintroduction efforts. This unique situation provided a chance to investigate the theoretical mechanisms driving the population

changes of a large herbivore, while also assisting resource managers to more effectively manage Tule elk. From 2005 to the present, we have monitored radio telemetry and GPS-collared adult female Tule elk to examine small-scale spatial usage patterns and survival rates in both populations. We captured and radio-collared calves to estimate first-year calf survival rates, and determine causes of mortality. Preliminary results show large fluctuations in calf survival rates between populations and years. Adult survival rates were high in 2005 and 2006 but recently declined, possibly due to drier weather. Elk exhibited diurnal shifts in habitat usage, which may be related to human presence. Future work will focus on incorporating these data into a spatial population dynamics model to predict future population growth and range expansions of Tule elk at Point Reyes.

The northern spotted owl in the 21st Century: Symposium overview

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Abstract: Since the northern spotted owl (NSO) was federally listed as threatened in 1990, timber management projects in the species' range have been subject to either the Endangered Species Act Section 9 take prohibition or the Section 10 incidental take authorization of approved Habitat Conservation Plans (HCP). Under both general approaches, the goal was to perpetuate habitat for the species on managed timberlands. However, no long-term monitoring has been associated with the no-take projects and the efficacy of HCPs has not been thoroughly reviewed. In addition to habitat concerns, the expansion of barred owls into the NSO's range has complicated survey techniques and the determination of site occupancy for NSOs. A one-and-a-half day symposium immediately preceding the Western Section Annual Conference was organized to review new scientific information on the NSO, as well as the effects of barred owls on surveys and site occupancy. Panels of scientific experts and agency personnel discussed the implications of the new information and initiated discussions of new strategies for the conservation of the NSO in California. This presentation will review highlights from the symposium, including recommendations and conclusions from the panel discussions.

Use of habitat and nests by Tamias ochrogenys and association with tick-borne disease

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Abstract: Chipmunks, *Tamias spp.*, are important hosts of *Ixodes spp.* ticks and play a role in maintaining tick-borne infection. *Tamias ochrogenys* inhabits redwood and Douglas fir forest in Mendocino County, with a preference for old forest with extensive downed woody debris. Our data document that, among rodents in Mendocino County, only tree squirrels have a higher risk of infection with a zoonotic tick-borne disease, granulocytic anaplasmosis, than chipmunks which have an odds ratio of 4, compared to other rodents. Chipmunks supported human-biting tick species including *I. pacificus*, *I. angustus*, and *Dermacentor occidentalis*. We affixed radio collars and used radio-telemetry to observe diurnal and nocturnal activity and habitat use of chipmunks in Hendy Woods State Park, comprising predominantly redwood, live oak, and Douglas fir forests. We observed moderate dispersal distances with animals occasionally moving between transects and habitat types. Nests tended to be under decayed logs. Chipmunks may contaminate habitat in both disturbed and old growth forest, and support ticks in nests and on the forest floor. Thus the nest/forest floor interface may be an important location for tick-borne infection to be maintained and then create a health risk for humans and other animals.

Monitoring avian species diversity in montane conifer and sagebrush habitats in Northern California using automated recorders

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Abstract: The California Department of Fish and Game conducted surveys of birds, small mammals, and vegetation at 608 randomly selected plots throughout the Klamath, Southern Cascade and Modoc ecoregions of northern California from 2002-2007. Digital and analog automated recording systems were used to record bird vocalizations and document bird species occupancy at study plots during the breeding season. Recording devices were set to record for two, 5-minute periods on 3 consecutive days. Initial analysis of the data indicates this technique can be used to detect a variety of bird species and to monitor changes in their distribution over time. The recording devices documented more than 160 different bird species within the study area. Power analysis suggests that in order to monitor approximately 50 bird species, a sample of 700 plots is needed to detect a 50% decrease ($\beta = 0.2$, $\alpha = 0.1$) in the proportion of occupied sites between two time periods separated by 10-20 years. Automated recording devices have some advantages over traditional breeding bird surveys including creation of a permanent and verifiable record of birds present and the ability to efficiently collect samples at comparable times of the day.

Small mammal habitat associations in East Bay Regional Park District grasslands

Student Paper. Christine O. GABER, Reginald H. BARRETT, James W. BARTOLOME, Michelle R. HAMMOND, and Peter HOPKINSON, University of California, Berkeley, 137 Mulford Hall #3114, Berkeley, CA 94720, (510) 642-4364; E-mails: gaber@nature.berkeley.edu, rbarrett@nature.berkeley.edu, jwbart@nature.berkeley.edu, mhammond@nature.berkeley.edu, phopkin@nature.berkeley.edu

Abstract: As part of an ongoing, long-term grassland ecology study on East Bay Regional Park District lands, we collect presence/absence data for California ground squirrel (*Spermophilus beecheyi*), California vole (*Microtus californicus*), and Botta's pocket gopher (*Thomomys bottae*). We analyzed 2004 and 2006 data using nonparametric multiplicative regression in HyperNiche to create habitat models and estimate the likelihood of occurrence of these three species on our plots relative to the following environmental variables: livestock grazing, soil texture and chemistry, vegetation characteristics, topographic attributes, and study plot location within a particular park. HyperNiche identified habitat models that predicted species presence for California vole and Botta's pocket gopher. Low clay soils and the presence of sheep grazing predicted California vole presence in 2004. In 2006, soil characteristics, but not grazing treatment, were selected as predictors in the best model for this species. Study plot locations were the only variables included in the best models for pocket gophers in 2004. In 2006, our pocket gopher model included low clay, higher elevation and study plot location. Interannual variability in rainfall and other conditions may affect the importance of environmental variables in predicting species presence year to year.

Pathogens associated with fishers (*Martes pennanti*) and their sympatric mesocarnivores in Northern California

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Abstract: The conservation of a species requires the understanding of many ecological factors, including health risks from infectious pathogens that have the potential to limit the success of management efforts. We evaluated a population of fishers in northern California, currently a candidate species meriting listing under the federal Endangered Species Act, and their sympatric mesocarnivores. Our analysis includes samples from 76 fishers and 65 mesocarnivores including striped skunks, spotted skunks, ringtails, gray foxes, and raccoons, trapped between December 2004, and March 2007, near Hoopa, CA. We report pathogenic exposures to canine distemper virus (CDV), canine parvovirus (CPV), canine herpes virus (CHV), canine adenovirus (CAV2), West Nile virus (WNV), *Toxoplasma gondii* (TG), *Anaplasma phagocytophilum* (AP), and none were exposed to *Bartonella spp.* or *Yersinia pestis*. Twenty seven of 145 fecal samples were PCR-positive and product sequences matched CPV sequences from Genbank. There was no significant difference between seroprevalence of CDV, CPV, CAV, CHV, WNV or CPV active infections between fishers sampled in the area and their sympatric mesocarnivores. Surveillance of wildlife health in species that are sympatric with at-risk wildlife may be beneficial in conservation management efforts.

Response of small mammals to Ponderosa pine restoration in northeastern California

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Abstract: We examined the response of small mammals to experimental treatments designed to accelerate the development of late-seral-stage forest structure in eastside pine forests on the Gooseneck Adaptive Management Area in Klamath National Forest. Small mammal populations were monitored using mark-recapture methods on 20 experimental units before and after two different thinning treatments and a prescribed burning treatment that were applied 1998 and 2001. *Tamias senex*, the most common species we captured and one generally associated with high canopy closure, was initially more abundant on one of the thinning treatments but that difference declined over time. *T. senex* survival declined in the year following thinning or burning treatments on a unit but showed no long-term response to the treatments. *Tamias amoenus*, increased dramatically on both the thinned and the burned units but the response lagged the treatments by 3-4 years. *Spermophilus lateralis* also increased on the thinned and the burned treatments 1-2 years after the treatments. *Tamiasciurus douglasii* varied greatly from year-to-year but showed no consistent response to the treatments. *Peromyscus maniculatus* showed a positive response to the thin and burn treatment 5 years after the burn was applied.

Tree vole nest abundance and habitat associations in managed forests

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Abstract: Currently, two species of tree vole are recognized within California. The northern species is commonly referred to as the red tree vole (*Phenacomys longicaudus* = *Arborimus longicaudus*) and the southern species as the Sonoma tree vole (*Arborimus pomo*). The current line of demarcation for these species is believed to be the Klamath River. We studied nest abundance of Sonoma tree voles on forests owned and managed by Green Diamond Resource Company. During 2001-2004, crews surveyed 68 10-ha grids using line transect methods to detect nests of arboreal species. Forest stands ranged in age from 23 to 123 years. We located 886 nests of tree dwelling species, of which, 129 were characterized as vole nests based on physical evidence. Approximately 47% of the vole nests were classified as recently occupied. Ninety percent of vole nests were found in Douglas-fir trees and nest tree DBH ranged from 6 to 64 inches. Detection probabilities of nests, results of habitat sampling at the nest tree and grid level and challenges to monitoring this secretive and highly specialized arboreal mammal will also be presented.

Birds of the East Bay grassland

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Abstract: We are conducting a long-term study on grassland ecology of the Eastern San Francisco Bay area. We are developing a baseline vegetation and wildlife dataset for Valley Grassland habitat and examining the effects of livestock grazing on the plant and wildlife communities. We have 35 grazed and 17 ungrazed grassland plots throughout EBRPD and Parks RFTA land. We conducted line-point surveys for vegetation and point count surveys for birds. We chose to focus on species with direct nesting and foraging associations to grassland habitat: Western meadowlark (*Sturnella neglecta*), savannah sparrow (*Passerculus sandwichensis*), horned lark (*Eremophila alpestris*) and grasshopper sparrow (*Ammodramus savannarum*). Preliminary analyses suggest no consistent trends over the years 2004-2007. Livestock grazing does not appear to negatively impact any of the species within our grassland bird guild, but appears to positively affect the guild overall. Larger grassland patch size and low diversity of habitat types at a landscape scale appears to favor these bird species.

The impact of predator exclosures on snowy plover nesting success: A 7-year study

Student Paper. Michael A. HARDY and Mark A. COLWELL, Wildlife Department, Humboldt State University, 1 Harpst St., Arcata, CA 95521, (707) 822-8867; E-mails: mah60@humboldt.edu, mac3@humboldt.edu

Abstract: Nest predation has been identified as a major threat to ground-nesting birds, and predator exclosure cages have been used extensively in North America to protect the nests of threatened plovers. Exclosures are generally effective at reducing egg predation, but sometimes have unintended consequences, including increased predation of incubating adults. We evaluated the effectiveness of exclosures at enhancing productivity of threatened Western snowy plovers (*Charadrius alexandrinus nivosus*) breeding in coastal northern California from 2001-2007. In coastal beach habitats, exclosed nests survived better than unexclosed nests and exclosed beach nests survived as well or better than unexclosed nests in higher-quality habitat on gravel bars of the lower Eel River. There was no significant difference in partial clutch loss or hatchability between exclosed and unexclosed beach nests, but exclosed nests suffered from higher rates of nest abandonment. Although exclosures can greatly increase nest survival, increased nest abandonment or predation of incubating adults can potentially outweigh any positive effects. Consequently, use of exclosures must be considered carefully, especially when dealing with small or threatened populations.

The response of San Gabriel Mountains bighorn sheep to fire

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Abstract: During winter and spring, bighorn sheep (*Ovis canadensis nelsoni*) in the San Gabriel Mountains occur on chaparral-dominated ranges from 3,000-5,500 feet elevation. We evaluated the response of this population to periodic conflagrations that burn in this mountain range. A resource selection model identified a strong, positive relationship between the springtime distribution of bighorn sheep within 15 years of a fire, and a strong negative relationship beginning 15 years following fire. We compared recruitment rates on burned and unburned ranges following two fires. Recruitment rates on the burned ranges exceeded those on unburned ranges in only one year after two fires; however, the differences did not occur during the same years post-fire. Recruitment rates on burned ranges did not exceed unburned ranges three years following fires. We hypothesize that the inability to detect consistent differences in recruitment rates was associated with different movement patterns among bighorn sheep. Rates of increase on burned ranges remained substantially higher than unburned ranges up to nine years post fire. The distribution of bighorn sheep and the consistently higher rates of increase following fires

demonstrate that wildfires or prescribed burning will increase bighorn sheep habitat availability and suitability in the San Gabriel Mountains.

Comparison of electric fence configurations used for predator management at Vandenberg Air Force Base

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Abstract: The California least tern (*Sternula antillarum browni*) is an endangered colonial seabird that nests on open sandy beaches, leaving it vulnerable to coyote predation. Vandenberg Air Force Base maintains electric fences around its tern colony to deter coyotes. To be an effective deterrent, overnight fence voltage must be >3.0 kV. We tested three fence configurations: 1) solar powered with battery back-up to maintain overnight voltage, 2) solar/battery set-up with voltage regulator to increase battery charge and decrease daytime fence voltage, and 3) hard-wired with power from a nearby facility. All three configurations showed quadratic relationships between voltage and time of day, with voltage being lowest at dawn and dusk. While dawn and dusk voltage was usually >3.0 kV, overcast weather conditions could result in voltage reductions to <3.0 kV on both solar configurations. The hard-wired configuration consistently maintained voltage >3.0 kV. Of the environmental variables measured, air temperature explained most variability in fence voltage. All three configurations were effective in deterring coyotes; however, coyotes were occasionally able to breach the fence regardless of configuration. Overall, electric fences are effective management tools, greatly reducing the need for lethal predator management.

Reintroduction of riparian brush rabbits at the San Joaquin River National Wildlife Refuge

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Abstract: Since 2002, endangered riparian brush rabbits (*Sylvilagus bachmani riparius*), bred under controlled but semi-natural conditions as part of a multi-agency recovery project, have been reintroduced to the San Joaquin River National Wildlife Refuge and adjacent lands in Stanislaus County, California. Concurrent with the reintroduction program, a large-scale riparian habitat restoration program has been implemented to restore floodplain ecosystem health and functionality, as well as a flood management measure throughout the refuge, and it is expected to benefit also the brush rabbits and other sensitive species. The reintroduction and habitat restoration programs were tested by a large wildfire in 2004 and by extensive flooding in 2005 and 2006, but the flooding events helped tailor restoration prescriptions to better counteract flooding and increase survival probability for the brush rabbits. We report on the use of restored and unrestored habitat on the refuge by brush rabbits, with special attention paid to the restoration prescriptions that were customized to benefit the brush rabbits.

Using verified reports to estimate relative abundance for urban mesopredators

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Abstract: The present study used verified phone call reports and their human demographic influences to assess the relative abundance of some mesopredators in urban areas. We assessed relative abundance of raccoons, opossums, and skunks using nuisance phone call reports of wildlife made to Brevard Animal Services, Florida over four years (2000, 2003, 2004 and 2005). We divided the area (Brevard County) into 2.0 km² quadrats in a geographic information system (GIS) and obtained land cover and mean human demographic information within these quadrats. We then used quadrat sampling to estimate abundance from verified phone call reports per capita. We compared the results of verified reports per capita to the results of total calls per capita (all available calls including verified and unverified) to

determine if all reports could be used. For verified reports, raccoon abundance was higher in residential and industrial categories, but lower in wetland categories. Opossum abundance was higher in residential areas, but lower in areas with barren land. Skunk abundance was higher in commercial, medium density residential, and upland non-forested categories, but lower in high density residential areas. Bias removal techniques appeared successful and results showed mesopredators used habitats based on availability in urban, but not rural areas.

Special Area Management Plans: A comprehensive approach to wetland management

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Abstract: Beale Air Force Base (Beale) in Yuba County, California is developing a comprehensive aquatic resource management and permitting plan to improve the process of developing, permitting and implementing projects on the base. Beale has challenging environmental compliance issues because vernal pools and other seasonal wetlands that are habitat for listed species are dispersed across the 23,000-acre facility. Projects at Beale often undergo lengthy environmental analysis and permitting processes to address these resources, but there is no comprehensive prioritization of resources that would encourage conservation of the most important resources. To improve the planning, regulatory review, and mitigation process for future projects on the base, Beale has partnered with the Army Corps of Engineers to develop and implement a Special Area Management Plan (SAMP). This plan would consider the functional integrity of aquatic resources within the base to encourage avoidance, preservation, and enhancement of the most sensitive and high integrity resources. This presentation will describe the methods used to develop a base-wide inventory of aquatic resources, evaluate the functional integrity of these resources and the process that is being developed to address future project permitting on Beale under the federal Clean Water Act and the federal Endangered Species Act.

The ecological role of the California ground squirrel (*Spermophilus beecheyi*)

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Abstract: Burrowing, herbivorous mammals are remarkably similar in their effect on the structure of grassland communities and ecosystem processes worldwide. Ground squirrels influence the grassland ecosystem directly as prey, and indirectly through burrowing and foraging activities, suggesting a high level of interactivity. I investigated the effect of California ground squirrels on community structure and function by comparing the flora and fauna of paired colony and off-colony sites. Avian point counts revealed a pattern of higher avian species richness, diversity, and significantly higher abundance of birds on colony sites. Raptor presence distinctly separated colony from off-colony sites, while a low abundance of ground gleaning and nesting passerines indicated off-colony sites. Colony sites exhibited lower plant diversity and richness, shorter vegetation, less residual dry matter and more open ground. Small mammals demonstrated a pattern of lower abundance, richness and diversity on colony sites. Colony sites attracted more terrestrial predators with significantly more carnivore species and a higher frequency of snakes that prey on squirrels. Generally considered a rangeland pest, I review the ecological role of the squirrel as prey and ecosystem engineer within the context of interactivity and recommend that a contemporary approach towards the management of this squirrel may benefit grassland conservation.

Phylogeography of the San Francisco garter snake (*Thamnophis sirtalis tetrataenia*)

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Abstract: The San Francisco garter snake (SFGS) is a federally endangered subspecies that displays a striking color pattern noticeably different from all other subspecies of *Thamnophis sirtalis*. It is still uncertain whether or not this morphologic variation is supported by corresponding genetic variation. To resolve this, we are analyzing the phylogeography of *T. sirtalis* in the Bay Area. We are also comparing the *T. sirtalis* complex to the genetic variation in other syntopically occurring garter snakes as well as generating evidence supporting or refuting speculations that the SFGS may be hybridizing or introgressing with other species of garter snakes. We have genetic samples from more than 400 individuals of all three species of garter snakes (*T. sirtalis*, *T. elegans* and *T. atratus*) that occur in the greater San Francisco Bay Area. We sequenced a mitochondrial DNA locus, cytochrome b and found that there are no haplotypes exclusive to SFGS. We have also analyzed 5 microsatellite loci to determine the degree of genetic isolation among species and subspecies. Preliminary microsatellite analyses indicate that most of the variation in these loci is between individuals rather than between subspecies or populations.

Raptors and HCPs; San Diego's MSCP

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Abstract: Having a scientific basis to determine if a Habitat Conservation Plan (HCP) is working requires a defensible monitoring program. If environmental management decisions are to be made in a timely manner, biological trends need to be identified and adaptive management steps taken. San Diego's Multiple Species Conservation Plan (MSCP) is one such subregional HCP for southwestern San Diego County, and encompasses 12 jurisdictions and 582,000 acres. Raptor monitoring was recognized as a critical component of the MSCP. Its Biological Monitoring Plan, specifically, identified the Burrowing Owl (*Speotyto cunicularia hypugaea*), Golden Eagle (*Aquila chrysaetos*), and Northern Harrier (*Circus cyaneus*) for grassland monitoring. Raptor species considered "covered" by the MSCP also included: Bald Eagle (*Haliaeetus leucocephalus*), Cooper's Hawk (*Accipiter cooperii*), Ferruginous Hawk (*Buteo regalis*), Peregrine Falcon (*Falco peregrinus*), and Swainson's Hawk (*Buteo swainsoni*). Although once widely distributed and relatively common grassland and forest birds, most of the subject species have significantly declined in California over the last fifty years. They have been, and continue to be, the classic "miners' canary," revealing changes (such as habitat loss and disturbance) long before humans can notice, and properly plan for, them. Based on three years of monitoring at 45 locations, we developed and recommended a long-term monitoring program for raptors.

Habitat characteristics of the Shasta salamander

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Abstract: The Shasta salamander (*Hydromantes shastae*) is a state-listed threatened species endemic to a small region of the southeastern Klamath Mountains generally located north and northeast of Redding, Shasta County, California. This species has long been known to occur in habitats associated with limestone formations and was recently found to occur in various non-limestone habitats. Following discovery of the species in non-limestone habitats, two survey efforts were conducted to determine the extent of non-limestone habitat occurrences and further define the species' geographic range. Work since those efforts has included additional surveys in non-limestone habitat, detailed plot-based descriptions at non-limestone habitat Shasta salamander discovery sites, and surveys to determine the species' elevational range. The current known habitat characteristics, geographic range, and elevation range for the Shasta salamander will be summarized and discussed.

Current purple martin distribution and nesting habitat characteristics at Shasta Lake, California

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Abstract: The purple martin (*Progne subis*) is a local and rare spring migrant currently designated as a

bird species of special concern by the CDFG. In interior northern California, the only recent known breeding records include scattered locations in central Siskiyou and eastern Shasta counties, and a regular population at Shasta Lake. Purple martins have been known to nest at Shasta Lake for at least 30 years, but no recent studies have been conducted on the population. During 2007, surveys for purple martins were performed to evaluate the current distribution, population status, and nesting habitat characteristics at Shasta Lake. Eleven nest colonies were found at 8 locations, ranging between 1 and 3 pairs, with 1 or 2 individual nest trees. With 1 exception, each colony was located in submerged conifer snags. Collectively, 38 individuals were observed, while 18 nesting pairs and 16 nest cavities were confirmed. When compared to previous surveys, these results indicate that purple martin population levels at Shasta Lake are stable. This is an important component of the overall northern California purple martin population, as these results show that based on previously developed population estimates, Shasta Lake represents between 14 and 51% of the interior northern California population.

Stand-level habitat use of fisher (Martes pennanti) in the managed forests of the Hoopa Valley Reservation, California

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Abstract: The distinct population segment of the fisher (*Martes pennanti*) in the Pacific states is currently listed as a candidate for federal protection under the Endangered Species Act. The fisher is also culturally significant to the Hupa people and occurs in relatively large numbers on the reservation. Field work is currently underway to describe fisher denning and resting habitats and habitats used during periods of activity in order to maintain or enhance critical habitat types while implementing the tribe's forest management plan. Fishers were located using triangulation from known reference points and using homing during 2004-2007. Habitat types were classified based on tree composition and timber management history. Euclidean distance analysis was used to test for nonrandom habitat use and univariate t-tests were used to test for significant difference between ranked habitat types. These results will assist in directing future timber management and fisher conservation activities on the Hoopa Valley Reservation and other industrial forests with similar habitat elements.

Expected wildlife response to active management of sagebrush-grass communities

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Abstract: Because of the high risk of fire-triggered conversion to large cheatgrass monocultures, active vegetation management of some Great Basin sagebrush-grass communities is being recommended by some scientists. Active management, taking direct control of landscapes, is mandatory when plant community functionality, habitat diversity, and wildfire impact reduction are at stake. Bioregional historians indicated that anthropogenic influences before Euro-American settlement have even influenced the plant communities that we now refer to as "natural." Implications to wildlife of such active plant community management must be considered; wildlife species in sagebrush habitat communities have diverse habitat requirements. Some species, like sage sparrows, require considerable sagebrush canopy cover, while others, like sagebrush voles, prefer areas with greater perennial grass cover. We hypothesize that if active management was properly implemented, a resulting continuum of perennial herbaceous, herbaceous-shrub, shrub-herbaceous, and shrub-dominated habitats could be created. We anticipate that creating a mosaic of habitats with multiple-aged stands of sagebrush and varying degrees of herbaceous and shrub cover would provide the vegetation diversity components required by diverse wildlife species. The highest priorities for active management should be driven by the risk of crossing an ecological threshold (such as cheatgrass invasion) and the opportunity to apply effective vegetation management treatments.

Wolverine range, climatic requirements, and the likely effect of climate change on wolverine distribution

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Abstract: Wolverine distribution, both current and historical, is limited to a narrow climatic zone characterized by persistent spring snow. Because it has been hypothesized that wolverines require persistent spring snow for denning, we assembled geographic locations for all verified wolverine dens worldwide and overlaid these locations on areas of persistent spring snow based on MODIS imagery. Virtually all (>99%) dens occur within areas persistently snow covered through May 15. Wolverine use of these areas, however, is not limited to denning activity. In 6 telemetry studies in the contiguous U. S. most (91%) of the year-around telemetry locations (male and female) fell within these same areas. Genetic analyses of wolverines in the northern Rocky Mountains show that dispersal paths are strongly associated with these areas as well. The best model indicated that wolverines traveled 20 km in areas defined by spring snow for every 1 km outside of this zone. Year around habitat use, current and historical range, and dispersal patterns show that, in addition to being necessary for denning, the area defined by persistent spring snow represents a constraining climatic zone. We infer that changes are likely to wolverine distribution and population status in North America given projected climate change.

***Ammophila arenaria* influences snowy plover nest-site selection**

Student Paper. **Jordan J. MUIR** and Mark A. COLWELL, Wildlife Department, Humboldt State University, 1 Harpst St., Arcata, CA 95521, (707) 269-7142; E-mails: telainad@att.net, mac3@humboldt.edu

Abstract: The Western snowy plover (*Charadrius alexandrinus nivosus*) is listed as threatened along the Pacific Coast of the U.S., and its population decline has been attributed, in part, to habitat loss associated with the spread of European beachgrass (*Ammophila arenaria*). *Ammophila* degrades plover breeding habitat by converting open, sparsely vegetated nesting areas to dense vegetation, which may restrict the ability of plovers to detect approaching predators. Little information exists, however, documenting the relationship between *Ammophila* cover and plover nest-site selection. Consequently, we investigated the percent of *Ammophila* cover around plover nests, scrapes, and random points in Humboldt County, California during 2005 and 2006. Nests and scrapes had significantly less *Ammophila* cover than random points at a variety of spatial scales (≤ 100 m) of analysis; nests also had less cover than scrapes. Incubating plovers left nests when observers approached to within a mean distance of 80 \pm 33 m. Nesting in open habitats, relatively free of *Ammophila* may facilitate early detection of predators and reduce nest loss to predators. These results are the first to provide quantitative data that snowy plovers select nesting habitats that are open, and they indicate a minimum size at which restoration projects should be undertaken.

Western gray squirrels as disease reservoirs

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Abstract: Western gray squirrels (*Sciurus griseus*) have been implicated recently as the reservoir of Lyme disease and there is evidence that sciurids may be hosts of another tick-borne pathogen, *A. phagocytophilum*. The purpose of this study was to determine whether sciurids from different areas and habitats of northern California were infested with ticks or exposed to or infected with *A. phagocytophilum* using PCR and serology. Sciurids of nine tree- and ground-dwelling species were assessed. Arboreal squirrels (western and eastern gray squirrels, *Sciurus griseus* and *S. carolinensis*, and Douglas squirrels, *Tamiasciurus douglasii*) but not northern flying squirrels (*Glaucomys sabrinus*) had greater evidence of exposure than semi-arboreal or ground dwelling sciurids (California ground squirrels, *Spermophilus beecheyi*, and chipmunks, *Tamias spp.*). Western gray squirrels had the most extensive exposure (70.7% seroprevalence and 12.1% PCR prevalence). Positive squirrels were identified in all regions where

squirrels were collected. A logistic regression identified being a western gray squirrel and from the north coastal region of California as having the highest risk. Eight of nine sciurid species had evidence of infestation with ticks that could vector *A. phagocytophilum*. Extensive exposure from multiple areas suggests sciurids may be important in the maintenance of tick-borne disease in California.

Factors influencing migratory decisions of western burrowing owls in southern Arizona

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Abstract: Migratory patterns of many birds have changed in recent decades, presumably due to environmental changes linked to altered climate and land-use. We used experimental food supplementation to determine if food abundance affects migratory tendency of individual western burrowing owls (*Athene cunicularia hypugaea*) at two study sites in southern Arizona. We also examined the effect of annual fecundity, burrow availability, and body size on migratory tendency with logistic regression. Food-supplemented males were slightly less likely to migrate but food-supplemented females were significantly more likely to migrate than controls. Annual fecundity was negatively related to migratory tendency for owls fledging at least 1 owlet. Owls were less migratory at our agricultural study site, females were more likely to migrate than males at our urban study site, and larger owls were less likely to migrate. We also used logistic regression to examine the association between the migratory tendency of parents and their offspring, and found that variation in migratory tendency was likely due to environmental factors or a combination of environmental factors and non-additive genetic variation. Our study demonstrates that environmental factors can alter the migratory behavior of individual burrowing owls and suggests that behavioral plasticity may underlie some cases of altered migratory behavior.

Population dynamics of Canada geese from Northeastern California

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Abstract: Most resident Canada goose populations have increased in North America. However, the Canada goose population of Northeastern California has not increased in the last 50 years, and may have decreased during this time period. Since harvest is thought to be additive in most goose populations, we investigated the population dynamics to determine if harvest has negatively impacted this population. From 1949 to 2003, California Department Fish & Game's Waterfowl Investigations Program banded 25,489 adults on molting and nesting areas in Northeastern California. Furthermore, annual surveys for Canada goose production were conducted on a subset of wetland areas in Northeastern California. Survival analysis in Program MARK has indicated that decade, season lengths, bag limits, and hunter numbers have influenced survival. Yet, adult survival rates have varied little (0.68–0.76) with large fluctuations in harvest rates (0.11–0.38) in the last 50 years. We suspect that partial compensation is occurring from harvest in Northeastern California. Recruitment has decreased over time, possibly limiting this population. We caution against further liberalization of the hunting season since recent immature annual survival rates are not available.

Changes in wintering range of the rough-legged hawk in North America

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Abstract: We used Christmas Bird Count (CBC) data to demonstrate a significant shift in the winter distribution of the rough-legged hawk (*Buteo lagopus*) in North America from the late 1970s to the early-2000s. Data from nearly 300 CBC circles reveal significant decreases in rough-legged hawk abundance on the East and West coasts, and throughout the southern extent of this species winter range. Abundance increased significantly in the

northern portions of the Great Plains. This range shift seems to be correlated with a decrease in the number of December days with significant snow cover in the north-central portions of the continent. During this same period, the red-tailed hawk (*Buteo jamaicensis*) increased in winter abundance throughout the range of the rough-legged hawk, with particularly large increases in the northern edges of the red-tailed hawk's winter range. Therefore, the winter range shift we observed for the rough-legged hawk may be related both to climate changes and to competitive effects from increases in red-tailed hawks.

Recovery of the Cascades frog and other lake basin fauna following removal of introduced trout

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Abstract: We conducted a four-year (2003-2006), 16-lake experiment in the Trinity Alps Wilderness of Northern California to assess whether changes in abundance of introduced trout in wilderness lakes could aid amphibian recovery. We also tested whether trout predation of larval amphibians and aquatic invertebrates suppresses prey subsidies from lakes to terrestrial predators. Treatments were: trout removal, stocking suspended, and continued stocking. We also had four fishless control basins. We found that non-native trout suppress numbers of the declining Cascades frog and other amphibians, as well as large-bodied aquatic insects such as mayflies and caddisflies. After trout removals, these groups showed a marked increase in abundance. We found increased survival, population growth rate, and recruitment of Cascades frogs at the trout removal lakes compared to the trout-containing lakes and fishless control lakes. Over 110 species of birds and large numbers of bats used the lake basins during the snow-free season. A larger ratio of large- to small-bodied bat calls were recorded at lakes with high emergence of large-bodied insects and low densities of introduced trout. Overall, results showed that introduced trout affect local species composition, as well as ecosystem subsidies from aquatic to terrestrial communities.

Movement behavior and habitat preferences of American badgers (*Taxidea taxus*) in California: First steps in directing management

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Abstract: The American badger is currently listed as a Species of Special Concern in California. Badgers can be particularly sensitive to the effects of habitat fragmentation, and anecdotal reports suggest that badger populations seem to have declined or disappeared locally in several parts of the state. Guidelines for assessing, monitoring, and managing badgers are currently lacking, in part due to a paucity of data on basic badger ecology in California. As part of the UC Davis Wildlife Health Center/California Department of Fish and Game Resource Assessment Program, I investigated movement behavior and habitat use of 10 radio-implanted badgers in a fragmented landscape in Monterey County. These data revealed home range sizes between 1 and 26 sq. km, and habitat preferences that differed for denning and foraging. Movement patterns exhibited seasonal variation. These results will help determine management actions that are likely necessary to maintain extant badger populations, and also identify additional data needed in order to develop more effective and informed management.

Fisher (*Martes pennanti*) presence, physical attributes and condition within two industrially managed forests of Northern California

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Abstract: This study documented the presence, physical attributes, and condition of fishers (*Martes pennanti*) located on industrially managed timberlands in northern California. Sierra Pacific Industries in cooperation with the California Department of Fish and Game trapped thirty fishers during 2006 and 2007. This presentation will review the fisher demographic data collected and trapping efforts undertaken

during this study. Twenty-six fishers (18M, 8F) were identified in the Hayfork Summit study area of Trinity County, and 4 fishers (1M, 3F) were identified in the Sacramento Canyon study area of Shasta County. Size, age, physical condition, and disease exposure were recorded for each fisher. Male fisher (n=19) weight ranged from 3.0 to 5.0 kg and female fisher (n=11) weight ranged from 1.7 to 2.4 kg. Laboratory results from 2006 determined male fisher (n=12) age ranged from 1 to 8 years and female fisher (n=8) age ranged from 2 to 9 years. Laboratory results from 2007 will be discussed if available. This information is part of a larger study that examined fisher den sites and home range characteristics on industrially managed timberlands in northern California.

Nature Preservation Partnerships

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Abstract: The East Bay Regional Park District operates more than 98,000 acres of parklands in the nation's 4th largest metropolitan area. Managing wildlife species in this urban setting poses many challenges. Public relations, education, and citizen conservationist activities are three keys to meeting those challenges and creating sound resource management decisions. Since 2001, we have been providing the public with the training, tools, and inspiration necessary to mobilize an army of dedicated wildlife volunteers. Volunteers participate in numerous conservation and field research activities. Projects include: creating and managing nesting habitat for endangered birds, planting tree seedlings to enhance the regeneration of oak woodlands, monitoring riparian songbirds, grassland dwelling reptiles, and wetland nesting birds. This presentation will highlight the efforts made to involve volunteers in our field research and habitat conservation projects, and provide insights on how others might emulate our model. To date, more than 6,242 volunteers have contributed 23,984 hours of support. These volunteer activities have saved the District approximately \$743,504 and have provided the vehicle to generate more than \$350,000 in grant funds. Thanks to the strength in numbers that our volunteers provide, we are implementing management strategies that benefit wildlife and park users.

Den site characteristics and home range size of female fisher (*Martes pennanti*) within two industrially managed forests in northern California

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Abstract: Wildlife managers question the potential impacts of industrial timberland management on den sites and home range size of fishers (*Martes pennanti*) in California. While questions of the long-term consequences that industrial forest management may have on fisher exist, few studies have directly measured and analyzed these effects. Sierra Pacific Industries, in cooperation with CDFG, characterized den sites and quantified female fisher home range size in two study areas within Northern California industrial timberland. From January 2006 to June 2007 eleven female fishers were radio-collared; three from Sacramento Canyon in Shasta County and nine from Hayfork Summit in Trinity County. The collared female fishers were tracked to 93 tree structures. Fifty-one of these sites were identified as maternal dens, ten as natal dens, and thirty-two as resting structures. All natal dens were located in live or dead trees from both hardwood and conifer species. Field tracking results were combined with aerial tracking observations to estimate 100% minimum convex polygon home ranges. Home range size varied for each fisher tracked, with a range from 49 to 2,762 hectares. This information is part of a larger study documenting the presence, physical attributes, and condition of fishers in industrial timberlands in northern California.

The bank swallow on the Sacramento River: Monitoring and conservation activities, 1986-2007

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Abstract: The bank swallow was listed as a State threatened bird in 1989. Sacramento Valley riparian systems provide habitat for 80 percent of the State's population. Following population research in 1986-87, annual monitoring began in 1988. Each June, Department and cooperator personnel, including staff of the Sacramento National Wildlife Refuge, conduct boat surveys of bank swallow habitat on the Sacramento River to locate colonies. Counts are made of active nesting burrows. From burrow count data, pair numbers are estimated using a nest occupancy factor. Monitoring surveys cover about 100 miles where the greatest numbers exist; sparser colonies, on another 100 miles, are estimated from previous year's counts, as annual fluctuation there is low. Beginning in 1986, the population of bank swallows on the Sacramento River declined gradually from about 13,000 pairs to about 5,000 pairs in 1998. From 1999 to 2007, the population has generally increased to the current 9,000 pairs. Annual monitoring on the Sacramento River is the only activity tracking the breeding population status of the bank swallow in the area of greatest concentration. Monitoring data are used by the Department and other agencies for recovery planning. Threats to bank swallow habitat, and conservation planning strategies are also discussed.

Evaluating an existing fisher rest site model for use on managed forest lands in North-central California

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Abstract: A model exists to potentially monitor the development of fisher rest site habitat in the southern Sierra Nevada (Zielinski *et al.* 2006). The model predicts the probability whether a site (a small area of forest about 1.0 ha in size) would be a fisher rest site, with probabilities ranging from 0.00 to 1.00, using 0.50 as the authors' recommended cutoff point. We use data collected from fisher rest sites of three male fishers from managed forest lands in the Klamath/Cascades region of northern California (Self and Kerns (1995, unpublished data) to populate the model. Of the thirty-four rest sites evaluated, the model predicted one to qualify as a rest site, with the others receiving values less than 0.50. The highest value for any rest site was 0.52, and the average and median values were 0.16 and 0.17 respectively. Given the model's apparent propensity to under-estimate the value of existing fisher rest sites, combined with the authors' caution in using the model in other areas, we agree that the predictions of this model for areas outside the southern Sierra Nevada must be viewed with caution.

The Department of Defense Partners in Flight program: The conservation and management of migratory and resident landbirds and their habitats on DOD lands

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Abstract: Managing more than 25 million acres of land on hundreds of installations, the Department of Defense plays a key role in bird conservation and has been a member of the Partners in Flight initiative since 1991. Department of Defense lands represent a critical network of habitats for Neotropical migratory birds, offering these birds migratory stopover areas for resting and feeding, and suitable sites for nesting and rearing their young. The DoD is proud of its policy to promote and support its partnership role in the protection and conservation of resident and migratory birds and their habitats by protecting vital habitat, enhancing biodiversity, and maintaining healthy and productive natural systems on DoD lands consistent with the military mission. This presentation will describe the DoD PIF program with an emphasis on current focal areas including Bird/Animal Aircraft Strike Hazard (BASH), Migratory Bird Treaty Act regulatory matters, and Coordinated Bird Monitoring. The presentation will also provide specific examples of bird conservation projects taking place on military installations.

Estimating detection probabilities for fishers using non-invasive protocols: Implications for survey protocols

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Abstract: Surveys using non-invasive detection devices continue to be important in the research and management of fishers. However, survey protocols have not been quantitatively evaluated using new methods for occupancy estimation. We used data from standardized survey protocols for fishers to: 1. estimate detection probabilities 2. investigate factors causing detection heterogeneity 3. evaluate effects of spatial or temporal changes to survey protocols. We found three significant sources of detection heterogeneity, within sample unit visit-dependency, visit-specific detection probabilities, and survey season. Incorporating covariates to account for detection heterogeneity significantly increased accuracy of estimates. Probability of detection varied by visit, generally increasing throughout the survey duration. Fishers had a lower probability of detection during the summer season (July-September), compared to all other seasons. We recommend that existing survey protocols for fishers (Zielinski and Kucera 1995) be amended to account for season-specific differences in detection probability. Finally, we recommend that protocols with the appropriate precision of detection be used for conducting large-scale monitoring efforts ($P \geq 0.80$) versus small-scale pre-project surveys ($P \geq 0.95$) to match the relative consequences of failure of detection to the objectives of each type of effort.

Winter roadside raptor surveys in the northern Central Valley of California, 2006-2007: A pilot-study
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Abstract: During the winter of 2006-2007, monthly roadside raptor surveys were conducted at several sites throughout California's Central Valley to determine open-country raptor diversity and abundance. Average birds/survey km. (bpk) across all sites was 1.6 bpk. January surveys produced the highest bpk (1.7), while those in November (1.4) and February (1.5) produced the lowest. Red-tailed hawks (*Buteo jamaicensis*) were the most common raptor (46.5% of all birds recorded) followed by American kestrels (*Falco sparverius*) (22.2%) and Northern harriers (*Circus cyaneus*) (9.7%). Coordinated monitoring of winter raptor populations in the Central Valley will hopefully provide indices of raptor density as well as highlight preferred raptor habitat in this rapidly changing landscape. In addition, the data will be included in the Winter Raptor Survey, a continent-wide effort of the Hawk Migration Association of North America (HMANA) to monitor winter populations. Future objectives of the project include increasing the geographic extent and number of survey routes and comparing raptor density and diversity across varied habitats (cropland, rangeland, grassland) and land-uses (military base, NWRs and private land).

Factors influencing the distribution and use of Aleutian geese during spring-staging

Student Paper. **Kyle A. SPRAGENS**, Jeffrey M. BLACK and Matthew D. JOHNSON, Humboldt State University, 1 Harpst St, Arcata, CA 95521, (707) 826-3582; E-mails: kas48@humboldt.edu, jmb7002@humboldt.edu, mdj6@humboldt.edu

Abstract: Agricultural-geese dilemmas are an increasing issue in North America. Arctic nesting geese are dependent on the acquisition of nutrient rich foods to aid in their spring migration and subsequent nesting attempt. The recovered population of the Aleutian cackling goose (*Branta hutchinsii leucopareia*) makes use of livestock grazed lands on the Northern California coast for spring forage. We investigated the differences between land management on the observed distribution and use of Aleutian geese during the spring-staging period. Surveys of goose use and intensity were conducted and compared to land use across the Arcata Bottoms region. Grass samples were collected from four cattle ranches, two dairy farms, and two public land areas to analyze differences in available protein and fiber among the different land types. Spatial characteristics of fields and farms, including distances from roosts, tidal sloughs, roads, structures, and amount of available freshwater, were collected using GIS. Land type characteristics were additionally compared to past years collected goose data, 1998 to present, to analyze patterns of use.

Understanding foraging habitat requirements of the Aleutian goose will be important in future management decisions.

San Francisco garter snake (Thamnophis sirtalis tetrataenia) mark-recapture analysis: Preliminary results

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Abstract: Both the Recovery Plan for the San Francisco Garter Snake (FWS, 1985) and the San Francisco Garter Snake Five Year Review (FWS, 2006) list research on life history and population status of San Francisco garter snakes (*Thamnophis sirtalis tetrataenia*; hereafter, SFGS) as necessary to adequately implement and monitor success of recovery tasks for this federally and state-endangered species. Swaim Biological, in coordination with LSA Associates, is conducting a multi-year, mark-recapture survey on one population of SFGS in an effort to estimate their population size and structure and to document changes over time in these data. Here we present our first year of demographic data and compare this to data from previous studies at the site. We also make recommendations for future SFGS population-level surveys in order to bring consistency to assessments of SFGS status throughout the snake's range.

Automated monitoring and assessment of bat and bird populations on military lands

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Abstract: All public land jurisdictions must monitor and manage sensitive species. For many species, this work accrues high costs because of the requisite specialized skills for the monitoring personnel. In addition, sensitive species are typically rare and require greater survey effort (thus higher cost) to acquire reliable data compared to more common species, particularly over the extensive landscapes of U.S. military installations. For species that emit acoustic signals, automated monitoring and analysis can provide a cost-effective solution to more confidently assess activity and confirm presence or absence of sensitive species, provide consistency by eliminating variability in the skill level of monitoring personnel, and operate continuously to better detect rare species that intermittent survey efforts may miss. Automated acoustic monitoring entails 1) autonomous field recording hardware, 2) software to automate signal detection and extract defining signal parameters, 3) a comprehensive library of reference recordings from target and sympatric species to cover their range of signals under various conditions, and 4) decision making software to interpret signal parameter data to generate a species identification. Our SERDP supported (SI-1394) team has developed and deployed a functioning automated monitoring system with correct classification rates exceeding 90% for many bird and bat species.

Further testing of an acoustic deterrent to reduce bat mortality from wind turbines

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Abstract: Bat mortality at wind energy facilities continues to raise concern as a significant threat to many bat populations and impede or prevent potential carbon-neutral power development. We previously demonstrated that selected regimes of ultrasound could generate an uncomfortable or disorienting airspace that can deter bats from occupying such a treated airspace. To investigate whether bats could habituate to this acoustic treatment, we monitored foraging activity at six different pond sites during August and September in AZ and CA for at least two nights to establish baseline activity levels, and then for five to seven days of continuous treatment with the ultrasonic sound regime active. We measured activity in the same way each night by counting visual passes of bats entering and leaving the recorded view from a Sony DCR-TRV520 Nightshot video camera equipped with high intensity infrared lamps. For the same one hour period each night the mean activity as a percentage of pretreatment activity was

9.8 \pm 2.3, 6.2 \pm 1.3, 6.3 \pm 1.1, 5.2 \pm 1.5, 6.7 \pm 1.0, and 3.3 \pm 0.0 for days 1, 3, 4, 5, 6, and 7 of treatment, respectively. We conclude that bats do not habituate or accommodate to continued broadcast of deterring ultrasound.

Assessing monitoring techniques for bird populations in Sierra Nevada montane meadows

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Abstract: Point count surveys are widely used to infer avian species richness. Recent advancements in bioacoustic technology enable automated survey alternatives that can expand the landscape coverage with equivalent personnel resources. We compared standard point count surveys with automated recording units (ARU's) for detecting avian species. We sampled bird species richness at 112 point count stations in fourteen Sierra Nevada montane meadows, May-August 2006, with each point surveyed eight times. We placed twelve ARU's at 50 point count stations throughout the field season and left them at each location for seven concurrent days. We compared species richness, by meadow, between point counts and ARU's. Species accumulation curves showed an asymptote in species richness was achieved for both methods. ARU's proved to be a practical and comparable alternative to traditional point count data collection for species richness. Advantages provided by ARU's include fewer personnel hours per survey, the ability to record for long durations in the field (increasing the potential detection of rare species), and permanent documentation of survey data to scrutinize for questionable or unexpected results.

Riparian-breeding bird diversity, population dynamics, and responses to seasonal rainfall in upper Salinas Valley, California

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Abstract: In 2004 an avian monitoring program was established at the California Army National Guard Camp Roberts training facility in the upper Salinas Valley, CA to detect species of concern and to study patterns of avian diversity, abundance and productivity. Breeding season data were collected at two riparian sites between 2004 and 2007 using Monitoring Avian Productivity and Survival mark-recapture protocols. 1606 individuals of 49 species were captured, including 21 neotropical migrants and 10 riparian focal species. Thirty-six species exhibited breeding condition, including 13 neotropical migrants and six riparian focal species. Two species of special interest were captured: willow flycatcher (*Empidonax traillii*) and tricolored blackbird (*Agelaius tricolor*). Number of breeding bird species was significantly correlated with winter rainfall ($r_s = 1.000$, $P = 0.05$). Avian abundance and productivity were almost always moderately to significantly correlated with winter rainfall. These preliminary results suggest that Camp Roberts riparian habitat plays an important role for birds during the breeding season, but that local bird populations may be vulnerable to drought events. Management and enhancement of riparian habitat will increase its value for riparian-associated birds, and continued monitoring will elucidate patterns of avian population dynamics and responses to weather and other ecological variables.

Initial response of small mammals to experimental removal of coarse woody debris in a California oak woodland

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Abstract: Coarse woody debris (CWD) is considered an important habitat component for small mammals, but it also represents a fuel source for wildfires and is sometimes removed or reduced during fire management activities. Removing CWD may be beneficial for fire management but also might be detrimental to wildlife. Therefore, we studied the effects of experimental removal of CWD on survival, body mass, and capture rates of small mammals. On 22 1.1-ha study plots in mixed blue oak-coast live oak woodland habitat in Coastal Central California, small mammals have been live trapped each spring and fall since 1993. In mid-late winter 2007, we measured CWD and other habitat attributes on each study plot and subsequently removed CWD from 11 of the 22 plots. We conducted a single post-treatment trapping session in April-May 2007. Preliminary results indicate that small mammals were more likely to be encountered at sampling points with CWD present compared to points where no CWD was found. Further, capture-recapture survival models indicated that CWD was an important habitat factor for some small mammal species. We will discuss the initial effects of CWD removal on small mammals in this study area.

CoyoteBytes.org: A website to inform urban coyote management

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Abstract: Conflicts between urban coyotes and humans have increased in recent years. We know of >110 incidents in California, most within the past decade, where humans were bitten by coyotes. However, few data are available on incidents of coyote attack on pets. We suspect many conflicts occur because of human behaviors that results in coyote habituation; with informed management, most are preventable. We have developed a website, <http://www.CoyoteBytes.org>, to provide management recommendations to homeowners and municipal officials to reduce coyote conflicts in suburban areas. Additionally, website visitors may submit first-hand reports describing conflicts and encounters. The web site contains an incident map, an Internet-enabled webGIS tool, allowing coyote incidents to be mapped by type of incident and by progress through time. This should help homeowners better understand how to prevent suburban coyote conflicts, thus reducing the incidence of misuse of pesticides in ill-conceived efforts to control coyotes. The information being collected will allow a more complete analysis of this problem, thereby improving management recommendations. A better understanding of the problem, as well as of impacts of management strategies currently in use, should aid decision-making in cities and counties' attempts to find appropriate solutions.

Comparison of geographic, ecological and anthropogenic factors on bird richness and abundance in riparian habitat

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Abstract: We modeled the association of bird richness and abundance with environmental factors in riparian habitat of Santa Barbara, Ventura, and western Los Angeles counties. We assumed that avian richness and abundance were determined independently at each site. We tested three hypotheses: (1) Richness is correlated with the structural complexity and number of habitat types near the site; (2) Abundance is determined by the area of each habitat; (3) Anthropogenic activities affect richness and abundance differently when compared to natural areas. We used GIS variables and point-count data from 231 stations in 2003 and 65 stations in 2004. To test the first hypothesis, we used vegetation type within 1000 m and geomorphology factors (watershed, watershed size, stream order, elevation, precipitation, temperature, and distance to coast). For the second hypothesis, available habitat was indirectly tested with drainage size, stream order, floodplain, and areas without cover. Lastly, we combined anthropogenic activities with those factors selected in the previous models. Anthropogenic variables were proportion and types of human development within 1000m, number of upstream dams, human population, distance

to major roads, and time since last fire. Preliminary results indicate that very few variables explain the majority of observed variation in richness and abundance.

Breeding phenology of the Northern red-legged frog (Rana aurora) at Humboldt Bay National Wildlife Refuge

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Abstract: Developmental stages, specifically egg masses, are an excellent life stage to study breeding biology due to their static nature. The northern red-legged frog (*Rana aurora*) has received little attention in California despite its relatively constricted range and numerous potential population stressors. We studied the breeding phenology of the northern red-legged frog at Humboldt Bay National Wildlife Refuge from November 2006 to April 2007. Surveys were conducted 1-2 times per week for a total of 23 survey efforts over 21 weeks. Oviposition microhabitat data and abiotic information was collected at each egg mass location. Egg masses (N=237) were individually monitored and their fate was determined. Our results suggest that northern red-legged frogs have a prolonged breeding season that exceeded three months (first egg masses seen on December 17, 2006 to last egg mass seen on March 25, 2007). However, an explosive breeding event (82 new egg masses in three nights) in February, following four weeks of limited production, suggests these frogs are using environmental cues to oviposit egg masses during favorable conditions. These results will contribute to the baseline knowledge of the northern red-legged frog in California and assist resource managers in making informed decisions to best conserve this species.

Distribution of the amphibian assemblages of zero-order basins and their relationships to the landscape mosaic in the Mill Creek watershed, Del Norte County, CA

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Abstract: Headwaters amphibians have excellent potential as biological indicators of ecosystem status because of high site fidelity, sensitivity to disturbance, long lives, and ease of sampling. Furthermore, they offer large cost savings compared with sampling for other potential vertebrate indicator species. Amphibians occur in large numbers in healthy forest ecosystems and play an important role in regulating invertebrate communities and thus indirectly have strong effects on the carbon sequestration dynamics of forest litter and soils. In 2006 we conducted time-constrained upland searches, and aquatic area-constrained searches at 28 zero-order sites in four forest seral stages of redwood forest at Mill Creek and adjacent parklands. Results showed significant differences in species numbers and assemblage composition between stands on the heavily logged Mill Creek property and those on adjacent parklands. For example, in the upland, we averaged 5.5 animals per hour on the property versus 12.7 animals per hour in the parkland. We suggest that as the managed forests on the property recover, amphibian numbers will approach that of adjacent late-seral forests. We intend to compare these baseline values with future monitoring of these assemblages over decades in order to track changes in the Mill Creek biota as forests recover late-seral conditions.

Forensic methods and DNA evidence of intraguild predation on fishers (Martes pennanti) in California

Student Paper. Greta M. WENGERT, U.C. Davis, Graduate Group of Ecology, Davis, CA 95616, (707) 845-7848; **Mourad W. GABRIEL**, Integral Ecology Research Center, 102 Larson Heights Road, McKinleyville, CA 95519, (707) 845-7847; and **Janet E. FOLEY**, Department of Veterinary Medicine and Epidemiology, UC Davis, Davis, CA 95616, (707) 754-9740; E-mails: gmwengert@ucdavis.edu,

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Abstract: Intraguild predation within fisher (*Martes pennanti*) communities has not been adequately documented in the literature. In most accounts, observers have suspected potential predators based only on puncture wounds and visual clues at a predation scene, which can be misleading in determining the predator species. Furthermore, forensic DNA evidence of intraguild predation is absent from the literature. We generated a field protocol for documenting and collecting forensic DNA evidence of predation on fishers through different fisher research projects in California. In addition to physical evidence such as bite wound measurements and non-fisher fur at the scene, our protocol suggests collecting matted fur, swabs of bite wounds, and swabbing nails and teeth. Through evidence collected at the scene of several fisher mortalities, we have been able to identify predators of fishers through three types of samples: matted fisher fur with predator saliva, predator fur left on and nearby the carcass, and swabs of the interior of bite wounds. Here, we report the first DNA documentation of intraguild predation on fishers by another predator.

Home range, seasonal movements and habitat use of Mountain yellow-legged frogs (*Rana muscosa*) in a Northern Sierra Nevada stream

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Abstract: Mountain yellow-legged frogs (*Rana muscosa*) inhabit the Sierra Nevada Mountains of California and Nevada where they occupy aquatic habitats at elevations ranging from 1400 to 3700m. To date, no published information on the home range or movement patterns of this species within lower-elevation streams of the northern Sierra Nevada Mountains exists. In this study, we quantified the movement patterns, home range, and microhabitat associations of mountain yellow-legged frogs within a stream in Plumas National Forest, with particular attention to movements out of the main stream channel and into the forest. From July 2005 through September 2007, fifty individual mountain yellow-legged frogs were affixed with radio transmitters and tracked throughout the year. We found differences in movements and home ranges between the seasons. Microhabitat use also varied with season. Documented movements away from the creek were infrequent and never exceeded 22m, but were more common in late spring and mid-winter, possibly because off-creek refugia were more abundant. Results of this study will provide more insight into the conservation needs of this rare species in managed forests.

Assessing the conservation status of the native Sacramento Valley red fox

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Abstract: Recent results from genetic studies have shown that red foxes in the Sacramento Valley are native to California. Furthermore, new genetic findings indicate reduced levels of genetic diversity raising concerns about the health and long-term viability of this population. To address these concerns, we have initiated a study to determine population size and structure, threats, reproductive health, survival rates and habitat use of red foxes in the Sacramento Valley. Such information is required to develop effective management strategies across their current distribution. In this talk, we present preliminary results on the distribution of these foxes based on an interactive, web based approach with strong community involvement. We will then outline our plans to expand field and lab-based investigations over the next several years.

Waterfowl use on managed wetlands during the non-breeding period at the Sacramento National Wildlife Refuge complex, Sacramento Valley, California

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Abstract: California's Sacramento Valley is a major wintering area for waterfowl, supporting about 40% of total ducks and 50% of total geese in the Pacific Flyway during mid-winter. Managed wetlands play an essential role by providing high-quality forage, emergent vegetation cover, loafing sites, and resting areas. Waterfowl use at the Sacramento National Wildlife Refuge Complex was surveyed during the non-breeding period (August-April), 1994-2006. A total of 510 surveys were conducted on four refuges, which include approximately 270 individual management units. Average waterfowl densities (ducks and geese combined per acre) among refuges ranged from 51-188 birds on seasonally flooded wetlands (SF), 21-53 birds on semi-permanent wetlands (SP), and 7-30 birds on permanent wetlands (PW). When densities were compared within refuges on non-hunted units, waterfowl use was 65-89% less on PW and 26-64% less on SP wetlands compared to SF wetlands. Use was 21-69% less on PW than SP. Factors affecting waterfowl use on these areas include habitat productivity, plant species composition, water depth, specific habitat features, and human disturbance. Management considerations are offered for improving waterfowl use on the different wetland types. However, reduced wintering waterfowl use should be considered when making decisions to convert SF to SP or PW habitat.

Using molt cycles to categorize age in tropical birds: An integrative new system

Student Paper. **Jared D. WOLFE**, Humboldt State University, 1 Harpst Street, Arcata, CA 95521, (707) 980-9790; T. Brandt RYDER, University of Missouri-St. Louis, 1 University Blvd., St. Louis, MO 63121, (314) 973-4689; and Peter PYLE, Institute for Bird Populations, P.O. Box 1346; Point Reyes Station, CA 94956, (415) 663 2053; E-mails: jdwolfe80@yahoo.com, pipridae@umsl.edu, ppyle@birdpop.org

Abstract: Methods to accurately differentiate age classes are essential for the long-term monitoring of resident New World tropical bird species. Molt and plumage criteria have long been used to accurately age temperate birds and recent studies have shown that similar criteria can be used to categorize tropical individuals into age classes. Application of temperate age-classification models to the Neotropics has been hindered because annual life cycle events of tropical taxa are not always in concordance with temperate age-classification nomenclature. Here we detail a categorical age class system for tropical birds using molt cycles, and examine implications of the system using case studies. Our proposed, cycle-based age-classification system can be used for all birds, including temperate species, and provides a framework for investigating questions that address the dynamics of tropical bird populations which could ultimately influence management decisions.

Home range size and food habits of ringtails (*Bassariscus astutus*) in a Central Valley riparian forest, Sutter County, California

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Abstract: Few home range and/or food habits studies have been conducted of ringtails (*Bassariscus astutus*) in California and in particular the Central Valley. During 1990 and 1991, a radiotelemetry study was conducted on eight ringtails (four males, four females) to determine home range sizes in riparian forest. Additionally, 172 ringtail droppings were collected from December 1989 through November 1990 and examined for their contents. All research was conducted within the mature riparian forest along the Feather River at the Abbott Lake Unit of the Feather River Wildlife Area, Sutter County, California. Ringtail home range sizes ranged from 5.3 to 21.4 ha with an average of 12.0 ha with a total of 733 distinct radiotelemetry fixes for the eight ringtails. The fecal analysis revealed that although mammals were the most consumed items on an annual basis, mammals were dominant food items only during the winter and spring periods while fruits were dominant during the summer and autumn periods. The

opportunistic nature of this omnivorous diet combined with the small home range sizes for these ringtails is interesting considering the fragmented nature of the Central Valley's remaining riparian forests and the on-going efforts at restoration of this habitat.

The use of science-based predator control literature for enhancing bighorn sheep, mule deer and pronghorn in Nevada

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Abstract: During 2007, a bill was introduced in the Nevada Legislature to increase the predator control program for enhancing big game populations. The Assembly bill evoked much public interest; however, technical information relative to predator/prey relations was not readily available. Consequently, conservation organizations requested a concise but comprehensive review of science-based literature regarding the influence of predator control programs on bighorn sheep, mule deer, and pronghorn in Nevada and adjacent states. Therefore, this report was accomplished documenting more than 55 technical publications. Case histories, findings, and management recommendations were provided for various predator control programs to enhance big game.

Preliminary results of a long-term monitoring program for dusky-footed woodrats

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Abstract: Dusky-footed woodrats (*Neotoma fuscipes*) are an endemic, arboreal rodent found in Northwestern California. The species is a key prey item for northern spotted owls in this region, and studies conducted under a Habitat Conservation Plan for Green Diamond Resource Company lands indicate that this species comprises approximately 48% of the owl's diet by frequency. We initiated a long-term monitoring study to estimate woodrat occupancy along 11 road-based transects covering 10 miles each because little is known about changes in woodrat occupancy over time. During 2004-2007, crews live-trapped for 17,600 trap nights and captured 835 individuals a total of 1417 times. Trapping results indicate capture variation among transects between years. Woodrat numbers in all eleven transects were greatest in 2004 with 293 captures. Woodrat captures decreased through 2006 and showed a slight increase in 2007 at 194 captures. Preliminary results of habitat types and stand ages will be presented using GIS analysis. Collecting long-term occupancy data on woodrats will be used as a covariate in future efforts modeling demographic parameters of spotted owls and resource selection by this species.

Population status of the Tule greater white-fronted goose

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Abstract: The existence of a large, dark form of white-fronted geese has presented a challenge to waterfowl taxonomy and management in the Pacific Flyway for decades. Past studies in California have improved our knowledge of Tule goose winter distribution and habitat use. However, only direct counts have been used to describe abundance. Most observers have characterized Tule geese as shy and clannish, occurring most commonly in small groups and showing preferences for heavily vegetated marshes. Thus detection probabilities, and a complete estimate of abundance, are unknown. From 2003-2006, we radio-marked 160 Tule geese and used ground surveys to obtain samples of marked and unmarked geese. We used a modified Lincoln-Peterson estimator (PROGRAM NOREMARK) to estimate population size. Our estimates indicate that the number of Tule geese is small relative to other goose populations in the Pacific Flyway. Indices to harvest indicate that harvest is small, but management for Tule geese will continue to be a challenge due to large numbers of Pacific Greater white-fronted geese and the difficulties in obtaining precise estimates of Tule goose vital rates.

Recovery of an endangered bird and 3,000 acres of riparian habitat on the Santa Ana River

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Abstract: Encompassing 3,200 square miles, the Santa Ana River Watershed is the largest drainage in coastal southern California. Since 1997, the Santa Ana River Watershed Program has been working to reverse past damage to the river, restore its natural functions, and invest people in the river's resources through control of invasive species, restoration of riparian habitat, and wildlife management emphasizing rare and endangered species. About half of the riparian habitat on the river had been replaced by giant reed, *Arundo donax*. We are gradually replacing the weeds with native cover and recovering migratory songbird populations as well. Approximately 3,000 acres of giant reed and associated weeds have been removed and native riparian habitat has expanded into at least 60% of the reclaimed floodplain. Migratory songbird populations including the endangered least Bell's vireo, *Vireo bellii pusillus*, have greatly benefited with the increased habitat and our management efforts. By 2004, the vireo population on the Santa Ana River at 837 territories had become the largest in existence and grew to 992 territories in 2005. The US Fish and Wildlife Service recommended the vireo for downlisting to threatened status in 2006 based upon such success.

Effects of repeated captures on body mass and long-term survival of dusky-footed woodrats

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Abstract: Trapping bouts involving repeated captures are routinely used to assess small mammal demography, habitat associations, and response to land use. Some mark-recapture analysis programs require high sampling effort (e.g., trap nights) within primary sampling periods to estimate parameters with precision adequate for strong inference. However, relatively little is known about the effects of trapping and handling on small mammal body mass and survival and, therefore, on small mammal ecology and demography. On 22 1.1-ha study plots in blue oak-coast live oak habitat in Coastal Central California, small mammals have been live trapped each spring and fall since 1993. Trapping bouts consisted of 5 trap nights during 1993-1997 and 3 nights thereafter. Captured animals were ear-tagged, sexed, aged, weighed, and released at site of capture. We will evaluate mass changes for dusky-footed woodrats (*Neotoma fuscipes*) by number of trap nights, sex, age, and habitat association. We will model long-term survival of trapped woodrats as a function of number of trap nights, sex, age, and year using Program MARK. Information from this study may help to minimize adverse effects of repeated captures on small mammals.

POSTER SESSION ABSTRACTS

Poster title: *Western pond turtle conservation strategy*

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California Department of Fish and Game has recently commissioned Redwood Sciences Laboratory to develop a conservation strategy for the Western pond turtle. California has a wide variety of biogeographic regions, and an even greater number of conservation issues for this charismatic poikilotherm. Using an interactive map of California we describe many of the conservation issues across the state and provide an opportunity for turtle researchers, scholars, consultants, and enthusiasts to add concerns based on their experiences with the species. This interactive map will help us establish and maintain communication with interested parties during development of a strategy for the conservation of Western pond turtle populations throughout California.

Poster Title: *River Otter Network: long-term monitoring of ecosystem health*

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Abstract: Many river otter (*Lontra canadensis*) populations in North America and beyond have suffered dramatic declines due to human impacts. Little information exists about river otter populations in the Pacific Northwest. Are they threatened or thriving? Since 1999, the HSU Wildlife Department has facilitated an ongoing study to monitor the distribution and demography of river otters in coastal and inland areas in Humboldt & Del Norte counties, CA. The study is an example of citizen science in action; records are supplied by students, professionals, and many outdoor enthusiasts likely to encounter otters in the wild. Data are sent via the internet or mail. Records include: date, time, location, number of adults and young, behavior and habitat information. Records are mapped using GIS software. Over 1,200 observations have been recorded in a variety of sites, including fresh, brackish and salt water habitats. Between 8-17 litters were recorded each year; mean litter size 2.3 (n = 53). Group size ranged from 1 to 9 individuals. Monitoring river otters, a top carnivore in the food chain, may provide a useful measure of ecosystem health. The network (otters@humboldt.edu) is providing a unique database to assist fisheries and wildlife managers.

Poster Title: *Using noninvasive techniques to study stress hormones and genetics in river otters in Northern California.*

Kristin E. BRZESKI, Jennifer A. TERRY, Erin N. ATKIN, Brian S. ARBOGAST, Jeff M. BLACK, and Micaela SZYKMAN GUNTHER, Humboldt State University, 1 Harpst St., Arcata, CA, 95521; E-mails: kristin.brzeski@gmail.com, jat35@humboldt.edu, ena2@humboldt.edu, bsa@humboldt.edu, jmb7002@humboldt.edu, ms147@humboldt.edu

(Student Poster)

Abstract: North American river otters (*Lontra canadensis*) are useful indicators of environmental health. They are thought to be susceptible to habitat disturbance, including seasonal runoff, which causes changes in turbidity and contamination. Otters subjected to degraded environments are likely to exhibit increases in glucocorticoid stress hormone levels. Long-term stress may have deleterious effects such as decreased reproduction and increased susceptibility to disease. Questions regarding the ecology and behavior of river otters have, until recently, been difficult to address. The elusive nature of river otters makes behavioral and ecological studies difficult to conduct without invasive techniques. We will extract DNA and hormones from scat using validated methods. Genotyping individual otters by microsatellite analysis will enable us 1) to determine relatedness within the Humboldt Bay population, 2) to examine gene flow across northwest California, and 3) to evaluate sociality and seasonal movements of these coastal otters. Water quality data and scat samples will be collected from known latrine sites from multiple otter groups

for 12 consecutive months to evaluate seasonal water quality variation, stress and seasonal latrine site use. Establishing non-invasive methods to investigate ecological questions are essential for research on secretive, low-density mammals like otters.

Poster Title: *Fog deters birds from high-voltage roost*

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Abstract: Nuisance bird species congregate and roost in electric substations. Pacific Gas and Electric Co. (PG&E; San Francisco, California), like many American electric utilities, experiences problems with this phenomena. One of the biggest problem locations within transmission substations is at high-voltage series capacitor banks. The associated accumulation of bird excrement on substation equipment presents serious risks to system reliability because under the right conditions, the bird excrement is conductive and can cause a system outage. PG&E is using a non-toxic organic compound (methyl-anthranilate - an EPA approved food grade aerosol that smells like grape flavoring) to deter 50,000 to 70,000 starlings, blackbirds, finches and sparrows from roosting on high voltage equipment in the Central Valley. This is the first time the compound has been used on high voltage equipment.

Poster Title: *Intersexual variation in the foraging ecology of Western wood-pewees: Females do work harder*

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(Student Poster)

Abstract: In avian foraging studies, data on males and females are frequently pooled. While this may increase sample size, it can also obscure important differences in foraging behavior and habitat use. To investigate intersexual variation in foraging use and behavior, we completed 57 observations (31 male and 26 female) of Western wood-pewees (*Contopus sordidulus*) breeding along the edges of 5 montane meadows in the southern Sierra Nevada. Birds were observed for up to 20 min. and the rate of attack (no. attacks/min.) was calculated. We also recorded several behavioral and habitat characteristics pertaining to the used substrate. Results suggest that female pewees forage at a higher rate than males ($= 2.53 \pm 0.18$ SE and 1.02 ± 0.08 SE attacks/min), fly shorter distances to prey, and spend more time in the lower canopy and understory. Females also foraged from shorter substrates than males and from trees with smaller mean diameter. By understanding foraging behavior and habitat needs of both male and female pewees, we can more effectively manage for both sexes and potentially include other species that use ecotonal habitat in Sierran montane meadows.

Poster Title: *Rapid field pathogen tests are not sensitive enough for use on fishers (*Martes pennanti*)*
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(Student Poster)

Abstract: Fishers in the Pacific states were recently designated a distinct population segment that warrants listing under the federal Endangered Species Act. We have documented pathogenic exposures and infections of fishers and sympatric ringtails, raccoons, gray foxes, spotted skunks, and striped skunks. We used commercially available IDEXX SNAP® tests developed for rapid detection of canine parvovirus (CPV), *Anaplasma phagocytophilum* (AP) (agent causing granulocytic anaplasmosis) and *Borrelia burgdorferi* (BB) (agent causing Lyme disease) infections in domestic dogs. We compared polymerase chain reaction (PCR) detection results of CPV to SNAP® Parvo Antigen Test results and indirect fluorescent antibody (IFA) serology for AP and BB to results from SNAP® 4DX serological tests. Ninety CPV SNAP® tests were run on 66 fisher and 24 sympatric mesocarnivore samples. All results from CPV SNAP® test were negative while PCR detected 17 positive fecal samples. The 4DX SNAP® tests detected antibodies to AP and BB in two and one of the samples respectively, as compared to positive results obtained by IFA in 16 and 6 samples for AP and BB, respectively. We conclude that rapid field testing for pathogens may provide a high level of false negatives to be useful in making management and conservation decisions concerning fishers.

Poster Title: *Breeding biology and seasonal movement of urban Steller's jays*

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(Student Poster)

Abstract: Steller's jays as opportunistic omnivores have successfully adapted to anthropogenic environments throughout much of their range. While jays are important nest predators on species of concern such as the marbled murrelet in Northern California, managers are interested in links between human activity in parks and wilderness areas and the distribution and activities of jays. The basic social unit in the Steller's jay is the breeding pair that defends the area around its nest site year round in a loose form of territoriality, described as site-centered dominance. This social relationship and the high tolerance of residents towards neighbors and transients intruding into their territory for food and nesting material creates a pattern of overlapping home ranges among neighboring pairs. We investigated home ranges of breeding pairs in suburban neighborhoods along the fringe of the redwood forest throughout Arcata (Humboldt County, CA). This marked jay population experiences a highly heterogeneous habitat. Patchy food sources and high social tolerance of jays facilitate regular assemblages of neighboring birds. We show that home range sizes and movement patterns of birds can change dramatically with season, breeding status and availability of natural and anthropogenic foods.

Poster Title: *Nest site characteristics of the Western pond turtle (*Clemmys marmorata*): Implications for species management*

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Abstract: The Western Pond Turtle (WPT), *Clemmys marmorata*, a California Species of Special Concern, has been declining throughout its range for at least 20 years. Habitat alteration and lack of recruitment are noted as primary causes (Jennings & Hayes, 1994). There is a particular lack of data concerning nesting patterns of WPT throughout their range. We have collected data on two very different nesting localities in Northern California: one is adjacent to the Sonoma County coast, the other further inland at a vernal lake in Lake County. We collected data during the 2007 nesting season focused on a range of nest site characteristics, including number, location, and arrangement of nests, degree of depredation, and timing of nesting. At both sites the nests were heavily preyed upon, suggesting recruitment is of concern, even in the middle of the species' range, where it is thought to be least at risk. These data imply that suitable nesting habitat adjacent to WPT populations needs to be adequately protected, as they are fundamental to conserving and bolstering populations of this species.

Poster Title: *Exploratory risk taking behavior in Steller's jays (Cyanocitta stelleri)*

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(Student Poster)

Abstract: Locating high quality resources is critical to maximizing individual reproductive success (Prop and Black 1998, Temple 2004). In long-lived species improvements in reproductive potential may require continual reassessment of alternative mates and breeding locations (Black 1996). Individuals with a high propensity to take risks and explore or exploit an unknown or neighboring territory might be better suited to prospecting for potentially higher quality habitat. Alternatively, an individual's motivation or need to investigate alternatives and bear the costs of exploration may depend on the quality of the explorer's own territory and resources. In this study individuals were captured, measured, and temporarily placed in an aviary equipped with trees and catching locations, simulating arrival in a foreign territory, to determine variation in exploratory behavior among individual Steller's jays. The purpose of this study is to gain a greater knowledge of the behavioral dynamics of animal populations, including how an individual's propensity to take risks may facilitate their success at locating and establishing a territory. The results of this study will be included in a larger study addressing factors that influence fidelity to mates and territories in Steller's jays.

Poster Title: *Shorebird populations and habitat use during a dry and a wet spring at the Sacramento National Wildlife Refuge, California*

Jennifer E. ISOLA and Mike A. WOLDER, U.S. Fish & Wildlife Service, Sacramento National Wildlife Refuge Complex, 752 County Road 99W, Willows, CA, (530) 934-2801; and Cliff L. FELDHEIM, Center for Natural Lands Management, Sacramento, CA, (916) 372-8134; E-mails: jennifer_isola@fws.gov, mike_wolder@fws.gov, cfeldheim@cnlm.org.

Abstract: Sacramento National Wildlife Refuge (SNWR) provides important wetland habitat for both resident and migratory shorebirds, particularly during spring migration when California's Central Valley (Valley) supports an average population of 335,000 shorebirds. SNWR provides various wetland types, including seasonally-flooded marsh, watergrass, semi-permanent/permanent pond and vernal pool. Shorebirds were surveyed on SNWR during the springs of 1997 and 1998. During the dry spring of 1997, Valley wetland and flooded agricultural habitats were limited as they dried up quickly, and SNWR's spring shorebird count peaked at 36,361. Conversely, during the wet spring of 1998, Valley habitats were more abundant and remained flooded for a longer period, and SNWR's spring shorebird count peaked at 4,503. During both years, most species preferred seasonally-flooded marsh and/or vernal pool, but some larger species preferred watergrass. Semi-permanent/permanent pond was selected against by all species during both years. Although vernal pool comprised less than two percent of the total habitat acres, it held the highest density of shorebirds and was preferred by more species than the other wetland types. Results indicate that wetland managers targeting benefits for spring shorebirds should consider more active wetland management during dry springs and conserve vernal pool habitats in their natural state.

Poster Title: *Influence of mate presence on Steller's jay (Cyanocitta stelleri) cache concealment effort*

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Abstract: Steller's jays often store food and return to retrieve the stored items at a later time. Between caching and consumption, stored food has the potential to be stolen by mates and other conspecifics. We investigated whether Steller's jays adjust cache concealment effort when in the presence of a mate, and if there is a difference in concealment adjustment between the sexes. We recorded the distance traveled from food sources to caching locations in urban Arcata, California, USA. Caching distances were documented for all individuals when alone and when in the presence of a mate. We found that both sexes

traveled a shorter distance to caching locations when alone than when a mate was present. These results suggest that pair members adjust their choice of caching locations to conceal food from their mates.

Poster Title: *Changing environments are putting the squeeze on pygmy rabbit habitat*

Eveline SEQUIN LARRUCEA and Peter F. BRUSSARD, University of Nevada at Reno, Biology Department, Mail Stop 314, Reno, NV 89557; E-mail: esequin@unr.nevada.edu

(Student Poster)

Abstract: We revisited 105 historic pygmy rabbit (*Brachylagus idahoensis*) sites in Nevada and California and determined current presence/absence of pygmy rabbits. We also assessed each location for signs of current agricultural use, fire, livestock grazing, urbanization, and the presence of pinyon-juniper. Pygmy rabbits were present at 36% of the sites, and the mean elevation of extant sites was 121 meters higher than the mean of extirpated sites. Fourteen percent of sites showed signs of pinyon-juniper woodland conversion with only one of these sites still harboring pygmy rabbits. Historic sites also showed evidence of recent fires (16%), urbanization (13%), and agricultural conversion (6%). Over the last century fire frequency reduction due to grazing and fire suppression allowed sagebrush to move into areas historically dominated by grasslands as well as allowed pinyon-juniper to expand into sagebrush communities. On a local scale this shifted pygmy rabbit habitat to lower elevations. However, occupied sites overall have increased in mean elevation, closely corresponding to the predicted elevation increase with the rise in average global temperature. Warming temperatures may continue to raise the lower elevation boundary of habitable sites and increase the amount of habitat lost from fire, while higher elevation sites are being impacted by pinyon-juniper encroachment.

Poster Title: *The importance of fruit to Swainson's thrushes, Catharus ustulatus, during fall migration: A field test of plasma metabolite analysis*

Amy LEIST, Humboldt State University, 1675 Sky Mountain Rd. #135, Reno, NV 89523, (502) 759-1132; E-mail: amyleist@yahoo.com

Abstract: I evaluated the hypothesis that fruit availability significantly influences stopover habitat quality for fall migrating Swainson's thrushes (*Catharus ustulatus*) in coastal northern California. I analyzed plasma metabolites (triglycerides, α -hydroxy-butyrate, and glycerol) to assess the condition of Swainson's thrushes during migration in two habitats: native dune forest with abundant fruit (Lanphere Dunes unit of the Humboldt Bay National Wildlife Refuge) and riparian habitat with a significantly lower abundance of native fruits (Mad River County Park). In both habitats I collected blood samples from birds captured in mist nets and quantified dominant vegetation and fruit abundance in September and October, 2005 and 2006. I used stepwise ANCOVA to examine the difference in plasma metabolite concentrations between each habitat while controlling for confounding variables. In support of the hypothesis, α -hydroxy-butyrate concentrations were significantly higher in birds captured at Mad River County Park than birds caught at Lanphere Dunes, and fruit availability and diversity was lower at Mad River County Park than Lanphere Dunes. Concentrations of triglycerides and glycerol were not statistically different between the sites. Further work should couple plasma metabolite analysis with other techniques, such as radio telemetry or sampling of insect abundance, to more fully examine stopover habitat quality.

Poster Title: *Lake Merritt Canada goose management study*

Rosalyn STEWART, Jones & Stokes, 9775 Businesspark Avenue, San Diego, CA 92104, (858) 578-8964; and Ken SCHWARTZ, Jones & Stokes, 268 Grand Avenue, Oakland, CA 94610; E-mails: rstewart@jsanet.com, kschwartz@jsanet.com

Abstract: The Canada goose population at Lake Merritt has grown significantly over the past few decades. Attracted by open expanses of turf grass and the lake's open water, the goose population ranges from 200-400 birds in the winter months to nearly 2,000 in the summer months. A study was conducted that surveyed the local goose population, their daily and seasonal movements, reproduction and molting cycles, and waste patterns. Based on this inventory, management approaches were identified to balance

resource and wildlife protection with other activities at the lake. The general conclusion of the study was that the influence of Canada goose waste on water quality is nominal, given numerous other watershed inputs. Additionally, contact with Canada goose feces may pose only a minimal threat of human illness. Although concern has been raised about the public health and safety impacts of Canada geese, the aesthetic and recreational impacts of goose waste are more real. Potential management approaches considered in the study include discontinuance of feeding, geese exclusion areas through temporary fencing, waste collection, vegetated strips, dog hazing, and egg oiling and addling.

Poster Title: *Batrachochytrium dendrobatidis* sampling of *Emys marmorata* in a Sierran pond

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Abstract: As global temperatures increase, the severity and frequency of emerging infectious diseases in wildlife may also increase. *Chytridiomycosis*, caused by the fungus *Batrachochytrium dendrobatidis*, is an emerging infectious disease that has been correlated with the decline and extinction of 230 amphibian species worldwide. *B. dendrobatidis* is harbored in the ventral keratinized skin of adult amphibians, known as alpha-keratin, and can vary per species. *B. dendrobatidis* can also be harbored in a reservoir host. Although *B. dendrobatidis* has not yet been detected in non-amphibian hosts, it is possible that other poikilotherm animals with keratinized surfaces could harbor infections and play a role in the persistence and spread of the disease. For example, turtles have alpha-keratin on the interstices of their epidermis, which we postulated could possibly support chytrid fungus. We sampled 23 western pond turtles (*Emys marmorata*) from a known infected site. All 23 individuals sampled at this site in 2007 were negative for *B. dendrobatidis*.

Poster Title: *Factors influencing vigilance while feeding in reintroduced California condors (Gymnogyps californianus)*

Christopher WEST, Humboldt State University, 1 Harpst St., Arcata, CA 95521, (831)238-1274; E-mail: christopherjwest@yahoo.com

Pressure from potential predators makes vigilance critical for an individual's survival, especially during times of vulnerability. California condors (*Gymnogyps californianus*), with their heavy bodies and large, broad wings, are slow to take-off. This makes vigilance an essential survival behavior for condors due to their susceptibility when feeding on carcasses. Relatively high overall mortality among reintroduced condors has raised questions regarding the suitability of release candidates. Reduction in this overall mortality is of primary concern to the California Condor Recovery Program. I investigated factors influencing vigilance in 31 reintroduced California condors while feeding on proffered carcasses at a primary release site in Southern California. I measured individual vigilance and a suite of factors previously shown to influence vigilance. I will present preliminary results of my current study, focusing on the effects of feeding group dynamics, ease of escape, and rearing methodologies. Examination of survival behaviors such as vigilance may allow for more rapid identification of problematic behaviors in release candidates, as well as providing insight for aviculturists and field managers regarding foci for future management efforts.

Poster Title: *Wintering duck response to trail use at former San Francisco Bay salt ponds*

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(Student Poster)

Abstract: The South Bay Salt Pond Restoration Project, at over 15,000 acres, is the largest tidal wetland restoration project on the west coast of the United States. As part of this project, some areas that have never experienced human trail use will be opened to trail-based recreation. Before these areas are opened,

we are examining the potential impact trail use may have on the migratory ducks that use adjacent ponds for foraging and resting. We are creating trail use disturbances on levees next to ponds that have never been opened to public access and measuring the change in distribution of wintering ducks on the ponds before and after disturbance during the 2006-2007 and 2007-2008 fall and winter seasons. Preliminary results, from the first year of study, show that areas up to 80 meters from the levee have fewer ducks after the disturbance compared to before. Ruddy ducks showed the most significant change in distribution in the area 0-40m from trail use ($p=0.02$). Also, duck movement in response to trail use seems to be influenced by tide level in San Francisco Bay and hunting in the nearby area.

Go Carbon Neutral!

For the first time at an annual meeting, the Western Section will be providing attendees the opportunity to offset their carbon footprint for attendance at the meeting, by contributing to one of three important habitat restoration projects. To help fight climate change, we will be offering for sale carbon credits that can be purchased for a minimum of \$5.00, with proceeds going to purchase trees that will be planted by volunteers to restore degraded habitats or habitats destroyed by wildfires this past year in California. As planted trees grow, they absorb carbon dioxide from the atmosphere, providing part of the solution for global warming, while simultaneously resulting in other benefits for the environment, such as restoring wildlife habitat, enhancing air and water quality, and stabilizing slopes. Forests play an important role in the global carbon cycle, so tree planting is an important part of “carbon neutral” or “offsetting” activities. It’s not the only solution.

Information will be available to help attendees determine their footprint for attendance to the conference taking into consideration their mode of transportation and distance traveled. Volunteers who contribute will receive a green wildlife “footprint” pin to proudly display on their nametag signifying their carbon neutrality. Buyers can designate the project to which they want to direct their contribution: 1) Tree planting at Hallelujah Junction Wildlife Area in Plumas County where there was a catastrophic wildlife this past spring; 2) Riparian forest restoration on the Sacramento River; or 3) Replanting areas at the Rancho Jamul Ecological Reserve, in San Diego County that was devastated by wildfires this past fall. The Section will collect the funds and purchase trees that will be donated to an agency or organization that will do the planting. A follow-up report will be published in a future newsletter to include acres planted, success rate, and photographs of restored habitats.

Please consider a contribution to the carbon offset fund during the meeting to help reduce our impacts in a socially and environmentally responsible way.

PLENARY SESSION ABSTRACTS

Land trusts and conservation easements in wildlife conservation

John BERNSTEIN, Vice President for Conservation, The Pacific Forest Trust, The Presidio, 1001-A O'Reilly Avenue, San Francisco, CA 94129, (415) 561.0700 x12; E-mail: jbernstein@pacificforest.org

Abstract: Conservation easements are a relatively new but powerful tool for wildlife conservation. They have been used to protect millions of acres over the last four decades, and promise perpetual habitat conservation through relatively simple legal means. They are attractive to landowners and managers because they require a relatively low input of manhours and management time. However, it is important to understand their limitations and where they may be used to advantage.

The use of advocacy tools to aid in wildlife conservation

Kim DELFINO, California Program Director, Defenders of Wildlife, 1303 J Street, Suite 270, Sacramento, CA 95814; (916) 313-5800 ex. 109; E-mail: kdelfino@defenders.org

Abstract: Non-Governmental Organizations (NGOs) work on wildlife management and conservation in a wide variety of ways. This discussion will focus on how NGOs influence management and conservation through education and advocacy. In particular, the discussion will include a review of advocacy tools such as litigation, legislative and administrative policy-making, coalition building, media, and education. It will also examine the relationship between NGOs, scientists and wildlife agency personnel in the context of wildlife advocacy work.

The role of scientific / professional societies in wildlife management and conservation

Michael HUTCHINS, Executive Director/CEO, The Wildlife Society, Bethesda, MD 20814

Abstract: In this talk, I provide a broad overview of the contributions of scientific/professional societies, such as The Wildlife Society, to contemporary wildlife management and conservation. The core activities of scientific/professional societies are reviewed, including their role in influencing relevant government policies and legislation; providing opportunities for networking, professional development, and collaboration; providing a mechanism for synthesizing, analyzing, and disseminating critical information on wildlife and habitat management and conservation; facilitating reasoned debate on controversial issues; recognizing excellence in the field; promoting the role and appropriate use of science in society; and collectively exploring cutting edge solutions to key challenges facing wildlife and their habitats today. I will also present some ideas for what The Wildlife Society might do to increase its impact in the future.

Roles for science-based NGOs in wildlife management and conservation

Wayne D. SPENCER, Senior Conservation Biologist, Conservation Biology Institute, 815 Madison Ave., San Diego, CA 92116, (619) 296-0164; E-mail: wdspencer@consbio.org

Abstract: Sustaining our wildlife legacy through the 21st Century will require a multi-pronged campaign involving government agencies, non-governmental organizations (NGOs), and universities working synergistically. In this campaign, conservation NGOs have the freedom to play key roles that other institutions cannot or will not play due to differing constraints, mandates, and motivations. All types of conservation NGOs--from advocacy groups to land conservancies to scientific institutions--are necessary and complementary to each other, and to the agencies with which they sometimes clash. Science-based NGOs like the Conservation Biology Institute (CBI) support our allies (governmental and nongovernmental) by providing them with facts, logic, and the focus they need to play their roles effectively. CBI's mission is to provide scientific expertise to support conservation and recovery of biological diversity in its natural state through applied research, education, planning, and community

service. We tackle applied science challenges that other institutions are poorly positioned to handle, but we revel in collaborating broadly with our colleagues in other institutions. We embrace that conservation biology and wildlife management are at their hearts advocacy sciences, but we advocate only for using science to inform conservation decisions. Our effectiveness requires utmost objectivity and transparency in applying and interpreting science, even where such honesty may inconvenience or even irritate our conservation allies. The need for this independent science niche has expanded rapidly in recent years, and will likely continue expanding. We therefore welcome increased collaboration, and even increased competition, if it will help the cause.

We'll see you next year in Sacramento!

Presentations I really want to see...

[illegible]



Future Meeting Dates:

- 2008 National Meeting of TWS, November 8-12, Miami, Florida (see above)
- 2009 Annual Meeting of TWS West, January 21-23, Sacramento (preceded by a joint meeting with the California Native Plant Society)
- 2009 National Meeting of TWS, September 20-24, Monterey
- 2010 Annual Meeting of TWS West, Fresno or Visalia area
- 2011 Annual Meeting of TWS West, Southern California
- ...Where should we go next? Talk to your Chapter Representative!