
ASSOCIATION OF
FIELD ORNITHOLOGISTS
ANNUAL MEETING
August 12-14, 2010
WEBER STATE UNIVERSITY
OGDEN, UTAH
AFO2010

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AFO 2010

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9:00 a.m - 10:00 a.m.	Welcome/Plenary Speaker: Craig Benkman
10:30 a.m. - 12:30 p.m.	Concurrent Paper Sessions and Symposia
12:30 p.m. - 1:30 p.m.	Lunch
1:30 p.m. - 4:30 p.m.	Concurrent Paper Sessions and Symposia
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Saturday, August 14

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12:30 p.m. - 1:30 p.m.	Lunch
1:30 p.m. - 4:30 p.m.	Concurrent Paper Sessions and Symposia
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Monday, August 16

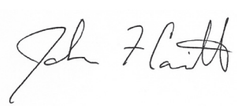
9:00 a.m. - 5:00 p.m.	Linking Communities, Wetlands and Migratory Birds - Conservation Planning Meetings; Ecotourism Meetings

Welcome from the Chair of the Local Organizing Committee

As Chair of the Local Organizing Committee, it is my pleasure to welcome you to the Association of Field Ornithologists Annual meeting, to Weber State University and to the spectacular Wasatch Range of the Rocky Mountains.
This year's meeting includes a diversity of scientific sessions, plenary sessions, symposia, social events and field trips. Your participation in this meeting provides significant contributions to the exchange of information and ideas that make scientific conferences worthwhile for all attendees. We hope that while you are visiting northern Utah you have an opportunity to explore our many ecosystems, including Great Salt Lake. Over 7.5 million birds, representing 257 species utilize Great Salt Lake each year. It is one of the most important sites in North America for migrating and breeding shorebirds, waterbirds and waterfowl and is listed as a site of Hemispheric Importance in the Western Hemisphere Shorebird Reserve Network.

I want to express my sincere appreciation to all the members of the Local Organizing Committee, but in particular, Valerie Frokjer, who has put in countless hours working through all the details that go into hosting a conference. Thanks also to David Bonter, President, and Scott Johnson, Vice President, of the Association of Field Ornithologists, for their support and assistance in planning and organizing this meeting. Andrew Farnsworth, Cornell Laboratory of Ornithology, put together an excellent scientific program which I am sure you will find both informative and stimulating. I want to acknowledge the superb assistance of Victoria Green, Jennifer Wozab and Amy Douangdara in the Office of Undergraduate Research for their help with administrative and logistical support. Jennifer Wozab and Monica Linford, Avian Ecology Laboratory, provided excellent assistance compiling and editing this program.
Let me also acknowledge the Avian Ecology Laboratory Shorebird Crew for volunteering their help during the conference.

Finally, thank you for your attendance and please let me know if there is anything we can do to make your visit to Weber State and northern Utah more enjoyable.



John F. Cavitt,
Professor, Department of Zoology and
Director, Office of Undergraduate Research
Weber State University

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Kris Purdy
Wasatch Audubon Society

Less Talbot
Wasatch Audubon Society

Scientific Program

Andrew Farnsworth, Chair
Cornell Laboratory of Ornithology, Ithaca, NY

John F. Cavitt
Weber State University, Ogden, UT

General Information

Registration

The Registration area is located on the fourth floor of the Shepherd Union Building at Weber State University. Conference staff will be available to check-in participants and guests, distribute conference materials and answer any questions that you may have.
Hours of operation for the Registration Desk:

Thursday, August 12:	8:00 a.m. – 5:00 p.m.
Friday, August 13:	7:00 a.m. – 5:00 p.m.
Saturday, August 14:	8:00 a.m. - 5:00 p.m.

Luggage

Participants wishing to check luggage will be able to do so at the Registration Desk.

On-campus Housing

On-campus housing check-in and check-out will be handled at the University Village Community Center. Once guests have checked-in, they can catch the WSU Shuttle (refer to transportation schedule) to the conference registration area in the Shepherd Union Building.

Check-out is at noon and guests should return their keys to the same check-in location. A luggage check will be available at the Shepherd Union for conference attendees. For special needs or arrangements, please contact the conference assistant on duty at 801-510-9796.

Emergency Information

In the event of an emergency, individuals should call 801-626-6460 for campus security. This number is automatically routed to 911 after hours.

The main campus number is 801-626-6000. Operators can route calls to any building or service including information and campus security.

Conference Meal Plan

For those attendees who have purchased the conference meal plan the following meals will be served:

Friday:

Breakfast:	8:00 – 9:00 a.m.
Lunch:	12:30 – 1:30 p.m.
Dinner:	5:00 – 6:00 p.m.

Saturday:

Breakfast:	8:00 – 9:00 a.m.
Lunch:	12:30 – 1:30 p.m.

All meals will be served buffet style in the main dining area of the Shepherd Union Building (ground level, in front of the Information Booth).

Transportation

Airport Shuttle

Shuttle service is available through Alta Shuttle for $24 each way from the Salt Lake International Airport. Call for reservations - 866-274-0225 or 801-274-0225.

Conference Shuttle Service

Conference shuttle service will be provided to and from University Village, Shepherd Union and Ogden Marriott. The University Village Shuttle will run approximately every 20 minutes (refer to transportation schedule for times). For those guests staying at the Ogden Marriott, the hotel will provide shuttle service to the Weber State University campus. The shuttle service will run upon request all day Thursday. On Friday and Saturday morning the Marriott shuttle will depart at 7:45a.m. and 8:30 a.m., and upon request. Please call 15 minutes prior to pick-up time to arrange transportation (801-627-1190).

Thursday August 12,

The Weber State University shuttle will be running from 8:00 a.m. – 6:00 p.m. every twenty minutes from University Village to the Shepherd Union Building. Please refer to the bus schedule for times.

Antelope Island Social

Bus service will be provided to and from the Antelope Island Social. This is the only way to get to the island. There will be two full size buses leaving from the Browning Center at 6:00 p.m. It will make one stop at the University Village at 6:10 p.m. and then continue onto the Ogden Marriott Hotel at 6:25 p.m. From the Ogden Marriott, it will continue onto Antelope Island for the social at 7:00 p.m. The buses will begin leaving from Antelope Island starting at 9:00 p.m. The last bus from Antelope Island will leave at 10:00 p.m.

Friday August 13,

Shuttle service will run from 7:30 a.m. - 9:30 a.m. The shuttle will begin running again from 12:00 p.m. – 2:00 p.m. The shuttle will again run in the evening for the poster session at the Ogden Eccles Conference Center, from 4:00 p.m. – 11:00 p.m. (Browning Center to University Village to the Ogden Eccles Conference Center). Please refer to the bus schedule for times.

Saturday August 14,

Shuttle service will run from 7:30 a.m. - 9:30 a.m. The shuttle will begin running again from 12:00 p.m. – 2:00 p.m. for lunch. The shuttle will again run in the evening for the banquet at the Ogden Marriott Hotel, from 4:00 p.m. – 10:00 p.m. (Browning Center to University Village to the Ogden Marriott Hotel). Please refer to the bus schedule for times.

Silent Auction

A silent auction will be held during the conference. Auction items will be located in Shepherd Union Building, room 405. Bidding begins Friday at 8:00 a.m. and ends Saturday following the oral presentation sessions (4:30 p.m.). Proceeds from the silent auction will support undergraduate research at Weber State University and the Universidad Autónoma de Nayarit in Tepic, Mexico. The Office of Undergraduate Research funds approximately 75 students a year conducting research in their related field of studies and to disseminate the research at professional meetings and conferences.

We would like to thank the following for their donations to the Silent Auction

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Melissa Mayntz, About.com
Guide to Birding / Wild Birds
http://birding.about.com/

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966 West 12th Street
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(801) 621-7595

Olive Garden
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Jennifer Wozab

Dr. Sam Zeveloff
Department of Zoology
Weber State University

Field Trip Information

All field trips will depart from University Village and the Ogden Marriott Hotel starting at 6:00am.

Deseret Ranch

Enjoy a birding adventure on Deseret Land & Livestock, the largest ranch in Utah. This working ranch encompasses over 250,000 acres of diverse habitats including sub-alpine meadow, mountain forest, sage steppe, wet meadow, wetland marsh, ponds, lakes and riparian streams with a bird list of 260 species. Expect a day list of 100 species or more, such as Ferruginous Hawk, Sandhill Crane, Sage Grouse, Sage Thrasher, Brewer's and Sage Sparrows, Hammond's, Gray, Dusky, Olive-sided and Cordilleran Flycatchers, American Dipper, Lazuli Bunting, Caspian Tern, and migrant warblers. Lunch will be provided but please bring plenty of water and snacks.

Birding the Great Salt Lake

Over 7.5 million birds, representing 257 species utilize Great Salt Lake each year. It is one of the most important sites in North America for migrating and breeding shorebirds, waterbirds and waterfowl and is listed as a site of Hemispheric Importance in the Western Hemisphere Shorebird Reserve Network. This trip will explore some of the key birding sites around the lake including the Bear River Migratory Bird Refuge, Antelope Island State Park and Great Salt Lake Shorelands Preserve. This trip will be the best opportunity to witness the spectacular fall shorebird migration. Expect a day list including American White Pelican, Long-billed Curlew, Snowy Plover, Western Sandpiper, Wilson's Phalarope, Red-necked Phalarope, Marbled Godwit, American Avocet, and Caspian Terns, to name just a few. Lunch will be provided but please bring plenty of water and snacks.

Music and the Spoken Word

Visitors to the AFO 2010 Conference may attend a live broadcast of "Music & the Spoken Word," featuring the Mormon Tabernacle Choir. The 360 members of the Mormon Tabernacle Choir represent men and women from many different backgrounds and professions. They reflect a medley of unique lives and experiences and are brought together by their love of singing and their faith. Their incomparable voices are the common chord that unites to form the choral group known all over the world as the Mormon Tabernacle Choir.

Music and the Spoken Word has become the world's longest-running continuous network broadcast; first broadcast on July 15, 1929 from same location it is today, the Tabernacle on Temple Square in downtown Salt Lake City. The program is carried on more than 2,000 radio and television stations around the world. The broadcast will be Sunday, August 15, 2010. This field trip leaves at 8:00am. The performance is from 9:30am to 10:00am. Expected arrival time at WSU will be approximately 11:00 a.m..

Early Morning Birding Trips

Each morning during the conference (August 12 -14), attendees may register to participate in local area birding trips. These trips will be led by the Wasatch Audubon Society and will explore some of the local birding spots. Each trip will depart at 6:00 a.m. and return by 8:00 a.m.. Those wishing to attend must sign-up at the Registration Desk. Space is limited to only 13 participants.

Scientific Program Information

Oral Sessions

All oral sessions will be held on the 4th floor of the Shepherd Union Building (rooms 404A and 404B). Each presentation will be limited to 20-minutes. Session rooms are equipped with a laptop computer and a LCD projector. All presentations should be loaded on the room-assigned laptop at least 20 minutes before the start of your session. Please name your PowerPoint file using the following format Day_Time_Last Name (e.g. Sat_1030_Smith.ppt).

As a courtesy to presenters, we request that all attendees turn off cell phones during oral sessions.

Symposia

Top Cited Journal of Field Ornithology Publications

This special symposium highlights the most widely cited publications within the Journal of Field Ornithology during the last 5 years. Authors will present data from these publications or highlight new developments since their publication.

Sagebrush-Shrubsteppe

The sagebrush – shrubsteppe is a dominant vegetation type within the Great Basin and parts of the Great Plains of North America. Habitat loss, degradation and development have severely impacted this eco-region for many bird populations. This symposium will examine the conservation of these habitats and the avifauna found within them.

Snowy Plover

The Snowy Plover is a small shorebird that specializes on beaches, playas and mudflats in North America. Throughout its range, the Snowy Plover is listed as a species of conservation concern. This symposium will discuss their population status, behavior, and ecology in order to better understand this unique species.

Waterbirds in the West

Waterbirds throughout western North America face an array of threats including wetland loss, water diversion, predation, contaminants as well as conflicts with fisheries and aquaculture. This symposium will examine their distribution, occurrence, population status and ecology.

Best Student Paper

The 2009 Association of Field Ornithologists Best Student Paper Award was received by Lauren F. Rae, Greg W. Mitchell, Robert A. Mauck, Christopher G. Guglielmo, and D. Ryan Norris,for the paper, "Radio transmitters do not affect the body condition of Savannah sparrows during the fall premigratory period." This paper will be presented Saturday, August 14 at 11:50 a.m.

Poster Session

All posters will be displayed at the Eccles Conference Center, 2415 Washington Blvd, Ogden, UT. Posters will be hung by conference staff before the event. Please bring your poster to the registration area no later than 1:00 p.m. on Friday, August 13 to have it transported to the event. Make sure your poster has your name on it.

Please remove your poster after the Poster Session is complete by 10:00 p.m. Posters left after 10:00 p.m. will be discarded.

Plenary Sessions

Craig Benkman

Professor and Robert B. Berry Distinguished Chair in Ecology, University of Wyoming

Friday, August 13
9:00 a.m. - 10:00 a.m.

"The Rise and Fall of Crossbills"

Craig Benkman is a Professor and Robert B. Berry Distinguished Chair in Ecology in the Department of Zoology and Physiology, University of Wyoming. Before moving to Wyoming in 2004, Craig was on the faculty at New Mexico State University. He was an undergraduate at UC Berkeley, completed his M.S with Russell Balda, Northern Arizona University, his Ph.D. with Ronald Pulliam, State University of New York at Albany, and postdoctoral fellowships with Peter Grant, Princeton University, and Dolph Schluter, University of British Columbia. Craig has served on several editorial boards, including Evolution and The American Naturalist, and is now the editor of the Natural History Miscellany section of The American Naturalist. He has published about 70 papers, with a recent focus on co-evolution between crossbills and conifers and ecological speciation in crossbills.

Charles Duncan

Director of the Western Hemisphere Shorebird Reserve Network and past AFO President

Saturday, August 14
9:00 a.m. - 10:00 a.m.

"The Shorebird Recovery Project: Site-based Conservation, Science and Success Measures at a Hemispheric Scale"

Charles Duncan is Director of the Shorebird Recovery Project at the Manomet Center for Conservation Sciences and also serves as Director of the Executive Office of the Western Hemisphere Shorebird Reserve Network. His professional training was in theoretical organic chemistry (B. A., Rice University; Ph. D., Yale University; postdoctoral fellowship, the University of Virginia). He had a long career in academia at the University of Maine at Machias, where in addition to his chemistry responsibilities, he founded and ran the Institute for Field Ornithology for many years. He served as president of the Association of Field Ornithologists from 1998-2000. In 1999, he made a career shift, joining The Nature Conservancy's Migratory Bird Program as conservation ornithologist. In 2002, the American Birding Association honored him with the "Chandler Robbins Award for Education and Conservation," and in 2003 began at Manomet.

John P. O'Neill

Alexander Skutch Medal Presentation

This year's banquet will feature the presentation of the Alexander Skutch Medal. The Skutch Medal recognizes career accomplishments, particularly in research relating to life history studies of Neotropical birds. A goal of the award is to recognize individuals whose careers will stand as models of excellence in Neotropical ornithology.

The 2010 Skutch Medal recipient will be John P. O'Neill. Dr. O'Neill is renowned as one of America's foremost bird illustrators, and his fieldwork in Peru has led to the discovery of more species of birds than any other living naturalist, including three new genera. During his more than thirty-five years of expeditions and explorations in South America, John O'Neill has mentored and trained more than a hundred students from U.S. and Peruvian universities, leading to many bi-national collaborations, publications, and discoveries.

Among his many accomplishments is the recent publication of “Birds of Peru”, an outstanding field guide to the birds of this remarkable country.

Although many people write books, many fewer have books written about them. John O'Neill falls in the latter category, with Don Stap's book "A Parrot without a Name" (Knopf, 1990), chronicling how O'Neill's unique brand of expeditionary science has helped place the Louisiana State University Museum of Natural Science at the forefront of Neotropical Ornithology. O'Neill earned his Master's and Doctorate degrees at LSU, and worked as the Curator of Higher Vertebrates at the LSU Museum of Natural Science for several years. He then served as the Director for 5 years. Realizing that he had no time for his painting, he decided to step down to focus on his artwork and organizing expeditions for the Museum.

In addition to scientific publications and pursuits, O'Neill has made his life’s work accessible to the public through hundreds of articles and paintings published in magazines, books, non-profit newsletters, newspapers, and exhibited in museums throughout the U.S. and many foreign countries. O'Neill's paintings are in the collections of the Houston Museum of Natural Science, the Beijing Natural History Museum, and the Denver Museum of Natural History, among others.

Oral Presentation Schedule

Friday, August 13	Session A - 404A Chair: Michael J. Braun	Session B - 404B Sagebrush - Shrubsteppe Symposium Chair: Russ Norvell
10:30 a.m.	THE IMPACT OF DNA SEQUENCE ALIGNMENT METHOD ON ESTIMATES OF THE AVIAN TREE OF LIFE Michael J. Braun*, Kevin Liu, Tandy Warnow, C. Randal Linder, and Edward L. Braun	RESTORATION IMPACTS ON SHRUBSTEPPE BIRDS AND A CALL FOR PLANNING AT WATERSHED SCALES. Russ Norvell
10:50 a.m.	STUDYING SUPPLEMENTAL FEEDING BEHAVIOR WITH RADIO FREQUENCY IDENTIFICATION (RFID) David N. Bonter*, Eli S. Bridge, and Benjamin Zuckerberg	PERSPECTIVES ON SAGEBRUSH SONGBIRD HABITAT AND CONSERVATION Anna Chalfoun
11:10 a.m.	A BIRD CONSERVATION STRATEGY FOR THE "YURIRIÁ" LAGOON NATURAL AREA OF MICHOACÁN, MEXICO Leonardo Chapa-Vargas*, Arturo Javier Salgado-Ortiz, and Karina Monzalvo-Santos	RAPTOR NESTING ECOLOGY IN THE WEST DESERT OF UTAH Steven J. Slater* and Jeff P. Smith
11:30 a.m.	SPATIAL AND TEMPORAL ASSOCIATIONS OF MALE REEVES'S PHEASANTS TO DIFFERENT FOREST EDGES IN THE DABIE MOUNTAINS OF CENTRAL CHINA Ji-Liang Xu*, Xiao-Hui Zhang, Zheng-Wang Zhang, Guang-Mei Zheng, and Yong Wang	STATE OF SHARP-TAILED GROUSE IN NORTHERN UTAH Ron D. Greer, Darren Debloois, Dave Olsen, Terry Messmer, and Jolene Rose
11:50 a.m.	MOLT TIMING IN RELATION TO REPRODUCTIVE STATUS AND ENVIRONMENTAL CUES IN KENTUCKY WARBLERS (OPORORNIS FORMOSUS). M. Victoria McDonald	
12:10 p.m.	S,G NATAL PHILOPATRY IN A NEOTROPICAL MIGRATORY SONGBIRD Matt Mckim-Louder* and Jeffrey P. Hoover	
12:30-1:30	**LUNCH**	

Friday, August 13	Session A - 404A Chair: David Bonter	Session B - 404B Snowy Plover Symposium Chair: Suzanne Fellows
1:30 p.m.	S,G POST-FLEDGING DISPERSAL TIMING AND NATAL HOME RANGE SIZE OF TWO SONGBIRD SPECIES IN AN URBANIZING LANDSCAPE Ian Ausprey* and Amanda Rodewald	CONSERVATION STATUS OF SNOWY PLOVERS IN NORTH AMERICA: RESULTS OF A RANGE-WIDE SURVEY. James E. Lyons*, Brad A. Andres, John F. Cavitt, Elise Elliott-Smith, Suzanne D. Fellows, Bill Howe, Stefani Melvin, Eduardo Palacios, J. Andrew Royle, and Sue Thomas
1:50 p.m.	S,G ROLE OF TOPOGRAPHY, CANOPY STRUCTURE, AND FLORISTICS IN NEST-SITE SELECTION AND NESTING SUCCESS OF CANOPY SONGBIRDS Felicity L. Newell* and Amanda D. Rodewald	PATTERNS OF MOVEMENT AND THE DYNAMICS OF THE POPULATION OF THE SNOWY PLOVER WITHIN THE MARISMAS NATIONALES Carlos Villar*, Paulina Martínez; Jonathan Vargas; Lidiana Ortega; Juan Pablo Ramírez, David Molina, Emmanuel Miramontes, and John Cavitt
2:10 p.m.	S,G POTENTIAL FOR BIRD CONSERVATION OF TREE VEGETATION TYPES AT THE HUASTECA REGION OF SAN LUIS POTOSÍ, MEXICO Victor Hugo Mendoza-Rodriguez* and Leonardo Chapa Vargas	ADULT SEX RATIO, SURVIVAL, AND MATING OPPORTUNITY IN THE SNOWY PLOVER. Lynne E. Stenzel*, Gary W. Page, Jane C. Warriner, John S. Warriner, Kristina K. Neuman, Douglas E. George, Carleton R. Eyster, and Frances C. Bidstrup
2:30 p.m.	**BREAK**	
2:50 p.m.	S,G THE POPULATION STRUCTURE AND POST-GLACIAL EXPANSION OF THE BOREAL CHICKADEE (POECILE HUDSONICUS) Linda Lait* and Theresa Burg	COMPARATIVE STUDY OF METHODS USED TO TRAP NESTING SNOWY PLOVERS (CHARADRIUS ALEXANDRINUS). Lucas K. Hall* and John F. Cavitt
3:10 p.m.	S,G *CATHARUS* THRUSHES AS BIOINDICATORS OF MERCURY HOTPOTS: FROM THE CATSKILLS TO THE CARIBBEAN Jason M. Townsend*, Charles T. Driscoll, Christopher C. Rimmer, and Kent P. McFarland	SNOWY PLOVER NESTING SUCCESS AND NEST DENSITY AT GREAT SALT LAKE, UTAH. Christian Edwards*, Greg Farley, and John Cavitt
3:30 p.m.	**2009 AFO Best Student Paper Presentation** S,G RADIO TRANSMITTERS DO NOT AFFECT THE BODY CONDITION OF SAVANNAH SPARROWS DURING THE FALL PRE-MIGRATORY PERIOD Lauren F. Rae, Greg W. Mitchell*, and D. Ryan Norris, Christopher G. Guglielmo, and Robert A. Mauck	FACTORS AFFECTING PIPING PLOVER PRODUCTIVITY AT A LARGE PRAIRIE ALKALINE LAKE Cheri Gratto-Trevor*
3:50 p.m.		CONSERVATION PLAN FOR THE SNOWY PLOVER IN NORTH AMERICA (CHARADRIUS ALEXANDRINUS NIVOSUS AND C. A. TENUIROSTRIS), EXCLUDING THE PACIFIC COAST POPULATION. Robert K. Murphy* and William H. Howe

Oral Presentation Schedule

Saturday, August 14	Session A – 404A Chair: J. Daniel Lambert	Session B – 404B Top Cited Symposium Chair: David Bonter
10:30 a.m.	PHYSIOLOGICAL AND ENVIRONMENTAL FACTORS INFLUENCING THE DISEASE COSTS OF INBREEDING IN COOPERATIVE CROWS Andrea Townsend*, Anne Clark, Kevin McGowan, and Irby Lovette	EFFECTS OF LAND USE ON THE POPULATION DYNAMICS OF BURROWING OWLS IN EASTERN WASHINGTON Courtney J. Conway
10:50 a.m.	RANGE EXPANSION AND LEAD EXPOSURE OF ARIZONA-RELEASED CALIFORNIA CONDORS Chris N. Parish*, Keith Day, Kathy Sullivan, Eddie Feltes, & Grainger Hunt	SEX DETERMINATION IN THE WESTERN SUBSPECIES OF RED-TAILED HAWKS (BUTEO JAMAICENSIS CALURUS) USING DNA ANALYSIS AND MORPHOMETRICS. Kara C. Donohue and Alfred M. Dufty, Jr.
11:10 a.m.	DOES CLUTCH SIZE INCREASE OR DECREASE WITH INCREASING ELEVATION? Kathryn L. Purcell	MEASURING STRESS IN BIRDS USING COUNTS OF WHITE BLOOD CELLS: AN OUTLINE WITH AN EMPHASIS ON EFFECTS OF HANDLING TIME. Andy Davis
11:30 a.m.	ARE CORRECTED COUNTS USEFUL FOR GRASSLAND BIRDS? Brenda C. Dale*, and Catherine Jardine	USING EGG FLOTATION AND EGGSHELL EVIDENCE TO DETERMINE AGE AND FATE OF SHOREBIRD NESTS. Todd J. Mabee
11:50 a.m.	DISCORDANCE BETWEEN NESTLING AND MATERNAL SUCCESS IN COMMON GRACKLES J. Dylan Maddox	MORTALITY FACTORS AND PREDATORS OF SPOTTED TOWHEE NESTS IN THE SACRAMENTO VALLEY, CALIFORNIA Stacy L. Small
12:10 p.m.	S,G OFFSPRING QUALITY VS. QUANTITY: HATCHING ASYNCHRONY IN THE HOUSE WREN (TROGLODYTES AEDON) REVISITED E. Keith Bowers*, Scott K. Sakaluk, and Charles F. Thompson	
12:30 p.m.	**LUNCH**	
Saturday, August 14	**Session A – 404A Chair: W. Gregory Shriver**	**Session B – 404B Waterbirds Symposium Chair: Stephanie L. Jones**
1:30 p.m.	S,G SECRETIVE MARSH BIRD RESPONSE TO PRESCRIBED FIRE IN MID-ATLANTIC TIDAL MARSHES Rebecca A. Kern*, W. Gregory Shriver, Jacob L. Bowman, Laura R. Mitchell, and Dixie L. Birch	THE WESTERN COLONIAL WATERBIRD SURVEY DESIGN AND PROCESS. Stephanie L. Jones*, Jenny D. Hoskins, Tara S. Zimmerman, William H. Howe, and Nanette Seto

Saturday, August 14	Session A – 404A Chair: W. Gregory Shriver	Session B – 404B Waterbirds Symposium Chair: Stephanie L. Jones
1:50 p.m.	S,G THE EFFECT OF WATERFOWL IMPOUNDMENTS ON SORA AND VIRGINIA RAIL POPULATIONS Ellen Robertson* and Brian Olsen	RECENT AND HISTORIC COLONIAL WATERBIRD USE AT GREAT SALT LAKE, UTAH. John Neill*
2:10 p.m	S,G EFFECT OF PRESCRIBED BURNING FOR MANAGEMENT OF THE RED-COCKADED WOODPECKER ON THE AVIAN COMMUNITY IN THE SAM HOUSTON NATIONAL FOREST. Mallory J. Brodrick* and Diane L.H. Neudorf	DISTRIBUTION AND OCCURRENCE OF COLONIAL WATERBIRDS IN UTAH. Ed Parker*, Valerie Frokjer, Monica Linford and John F. Cavitt
2:30 p.m.	**BREAK**	
2:50 p.m.	DO HOUSE WRENS RECOGNIZE AND AVOID THE ODOR OF MUSTLELID NEST PREDATORS? L. Scott Johnson*, Shannon Murphy, and Gordon Parrish	MONITORING IDAHO'S COLONIAL WATERBIRDS: ROLE OF THE IDAHO BIRD INVENTORY AND SURVEY. Colleen E. Moulton
3:10 p.m.	MOLT PATTERNS AND AGE AND SEX DETERMINATION OF LANDBIRDS ON SAIPAN, NORTHERN MARIANA ISLANDS Paul Radley, Andrea Crary*, James Bradley, Christina Carter, and Peter Pyle	DISTRIBUTION OF COLONIAL WATERBIRDS IN SOUTHERN OREGON: SURVEY RESULTS FROM 2009 AND 2010 Karen F. Hussey*, Jaime L. Stephens, Jennifer Hoskins, and Bob Altman
3:30 p.m.	RAPID REPERTOIRE TURNOVER IN RED-EYED VIREOS D. James Mountjoy*, Jacob D. Scholl and E. Laine Badger	CUTLER RESERVOIR: AN IBA OF HEMISPHERIC IMPORTANCE FOR WHITE-FACED IBIS B. Dixon, L. Richardson, C. Cockinos and K. Sullivan
3:50 p.m.	THE FIRST RECORDS AND BREEDING BIOLOGY OF THE MADAGASCAR RED FOUDI (FOUDIA MADAGASCARIENSIS) AT RANOMAFANA NATIONAL PARK, MADAGASCAR Rasamison Solohery	EFFECTS OF NEST TIMING AND PHOTOPERIOD ON REPRODUCTIVE SUCCESS AND CHICK DEVELOPMENT IN FRANKLIN'S GULL. Mark E. Clark*, Wendy L. Reed, Shawn Weissenfluh and Emily A. Davenport
4:10 p.m.		DISTRIBUTIONAL AND STATUS SHIFT OF RED-NECKED GREBES IN SOUTH DAKOTA. Nancy Drilling

Poster Session

P1 [S,U] BRIDGE SELECTION BY NESTING CLIFF SWALLOWS IN THE DENVER METROPOLITAN AREA

Melissa Beers, Wanda Sowa and Dr. Christy Carello*

P2 NESTING AND BREEDING ECOLOGY OF RED-WATTLED LAPWING: VANELLUS INDI CUS IN AGRICULTURAL AREAS IN PUNJAB, INDIA

Manoj Kumar and K S Khera*

P3 PROVISIONING BEHAVIOR OF MALE AND FEMALE GRASSHOPPER SPARROWS

Gary Ritchison and Jen Adler*

P4 [S,G] NO EVIDENCE FOR HOST-PARASITE FLANGE COLOR MATCHING IN BROOD PARASITIC BROWN-HEADED COWBIRDS (MOLOTHRUS ATER) AND THEIR HOSTS

Rebecca Croston, Mark Hauber, Christopher Tonra, and Sacha Heath*

P5 INTRASPECIFIC BROOD PARASITISM AS A COST TO COLONIALITY IN AMERICAN AVO CETS: THE OCCURRENCE AND FREQUENCY OF ABOVE-MODAL CLUTCHES ON ISLANDS AT GREAT SALT LAKE.

Monica Linford and John F. Cavitt*

P6 LACK OF FATHER-SON CORRELATION AMONG ACOUSTIC ELEMENTS OF THE ERRITORIAL YODELS OF COMMON LOONS (GAVIA IMMER) SUPPORT IDEA THAT INDIVIDUALLY-RECOGNIZABLE PARAMETERS ARE DETERMINED BY ACOUSTIC ENVIRONMENT.

Chelsey Evans, Jay Mager, and Charles Walcott*

P7 MALE COMMON LOONS (GAVIA IMMER) YODEL MORE FREQUENTLY EARLY IN THE BREEDING SEASON BUT ENCODE GREATER AGGRESSIVE MOTIVATION WITHIN YODELS WHEN COSTS OF LOSING OFFSPRING ARE HIGH.

Jay Mager, Katie Klotz, and Kimberly Trinkle*

P8 [S,G] EXCREMENTS AS MEASURES OF HEAVY METAL POLLUTION OF GREAT TIT IN MARI TIME PINE FOREST

Costa, R.A., Eeva, T. and Vingada, J.V.*

P9 FACTORS THAT AFFECT EGG MASS IN TREE SWALLOWS

Michael P. Lombardo, Marci Baiz, Lisa Bol, Kyle Burgher, Angel Hayden, Liberty High tower, Maegen Kish, Bradley J. Houdek, Mat thew Romeyn, and Patrick A. Thorpe*

P10 BODY MASS OF EASTERN BLUEBIRDS DURING WINTER IN TENNESSEE

David Pitts

P11 INNATE IMMUNITY IN NESTLING AND ADULT TREE SWALLOWS (TACHYCINETA BICOLOR)

Patrick A. Thorpe, Tammy Stambaugh, Brad J. Houdek and Michael P. Lombardo*

P12 [S,U] FOREST STRUCTURE AND TERRITORY SIZE RELATIONSHIP IN THE NEOTROPICAL UNDERSTORY INSECTIVORE WHITE-BREASTED WOOD-WREN HENICORHINA LEUCOSTICTA

Luis Esteban Vargas, Natalie Viviana Sánchez and Gerardo Ávalos*

P13 SHOREBIRDS SURVEY IN MARISMAS NACIONALES, NAYARIT, MÉXICO

Jonathan Vargas-Vega, David Molina, Emmanuel Miramontes, Paulina Martínez Sarabia, Lidiana Ortega Solís, Carlos Villar Rodríguez, Víctor Hugo Vázquez Moran, Javier Gómez, Juan Pablo Ramírez-Silva, and John F. Cavitt

P14 [S,U] COMPARISON OF REPRODUCTIVE SUCCESS OF SNOWY PLOVER (CHARADRIUS ALEXANDRINUS) AT RESERVA DE LA BIOSFERA, MARISMAS NACIONALES, NAYARIT, MÉXICO, AND THE GREAT SALT LAKE UTAH.

Jonathan Vargas, Carlos Villar, Juan Pablo Ramirez, and John F. Cavitt.

P15 [S,U] NEST SITE SELECTION OF THE SNOWY PLOVER (CHARADRIUS ALEXANDRINUS) IN THE MARISMAS NACIONALES, NAYARIT, MEXICO AND GREAT SALT LAKE, UTAH.

Paulina Martinez, Carlos Villar, Juan Pablo Ramirez, and John F. Cavitt

P16 INCUBATION BEHAVIOR OF SNOWY PLOVER AT GREAT SALT LAKE.

Kristen Ellis and John F. Cavitt*

P17 [S,G] INTERPRETING BREEDING BIRD SURVEY DATA IN THE FACE OF CLIMATE CHANGE

Christopher J.W. McClure, Nathan D.Burkett-Cadena, Russell A. Ligon, and Geoffrey E. Hill*

P18 VOCAL DYNAMICS OF A COMPLEX AVIAN HYBRID ZONE

C.M. Curry and M.A. Patten*

P19 SWAINSON'S THRUSH MIGRATION: TRACKING OFFSHORE MIGRATION BY FLIGHT CALL

Michael Powers, Anne Klingensmith, Andrew Farnsworth and Nick Lethaby

P20 ACOUSTIC MONITORING OF FLIGHT CALLS DESCRIBES PHENOLOGY OF NOCTURNAL MIGRATION OVER ITHACA

Anne E. Klingensmith, Michael E. Powers, and Andrew Farnsworth Cornell Lab of Ornithology, Ithaca, NY 14830. Benjamin van Doren, White Plains High School White Plains, NY 10603.

P21 [S,G] KEY FACTORS DETERMINING THE SPATIAL DISTRIBUTION OF WEAVER BIRD NESTS AT MPALA RESEARCH STATION, LAIKIPIA, KENYA

Maria A. Echeverry-Galvis, Jennifer K. Peterson, Rajmonda Sulo and Kadambari Devarajan*

P22 [S,U] EFFECTS OF SUMMER GONDOLA OPERATION ON BIRD POPULATIONS IN A HIGH ELEVATION WETLAND SYSTEM

Matthew R Stoddard, Christy Ann Carello and Heide Andersen*

P23 [S,G] GENETIC VARIATION AMONG AND BETWEEN FRANKLIN GULL (LARUS PIPIX CAN) POPULATIONS

AnnMarie Krmpotich, Katherine Mehl and Rebecca Simmons*

Abstracts

[S,G] POST-FLEDGING DISPERSAL TIMING AND NATAL HOME RANGE SIZE OF TWO SONGBIRD SPECIES IN AN URBANIZING LANDSCAPE

Ian Ausprey and Amanda Rodewald, School of Environment and Natural Resources, The Ohio State University, Columbus, OH 43210*

Despite a growing literature regarding the survivorship and habitat use of juvenile birds, little is known about spatial ecology during the post-fledging period. Substantial variation in movement patterns over a wide range of temporal and spatial scales has been reported for juvenile birds, yet the ecological factors explaining that variation remain unclear. From 2008 – 2009 we used radio telemetry to track movements of fledgling Northern Cardinals (Cardinalis cardinalis) (N = 20) and Acadian Flycatchers (Empidonax virescens) (N = 11) in a network of riparian forests embedded within an urbanizing landscape in central Ohio. Cardinal natal home ranges were less than half the size of those of flycatchers (0.93 +/- 0.13 ha v. 1.91 +/- 0.24 ha) and were not related to condition at time of fledging, conspecific territory density at the natal site, fledging day, or preferred habitat features. Flycatcher natal home range size was positively related to honeysuckle (Lonicera maackii) cover and numbers of saplings and mature trees. During the study period, 70% of the cardinals dispersed from natal sites at an average of 46 +/- 2 days post-fledging. Dispersal patterns varied among individuals, with birds either dispersing locally within their natal forest fragments or making extended movements into the surrounding landscape matrix. Cardinals tended to disperse later from sites with high conspecific densities. Collectively, our results suggest that habitat features and conspecific interactions influence fledgling movements, but these patterns are not easily generalized across species.

[S,U] *BRIDGE SELECTION BY NESTING CLIFF SWALLOWS IN THE DENVER METROPOLITAN AREA*

Melissa Beers, Wanda Sowa and Christy Carello, Department of Biology, Metropolitan State College of Denver, Campus Box 53, P.O. Box 173362, Denver, CO 80217-3362*

Cliff Swallows frequently nest under bridges that span rivers and creeks in the Denver metropolitan area. Our objective was to determine what aspects of bridge use, construction and neighboring habitat are important for nest site selection by Cliff Swallows. We predicted that the most important aspect of bridges for swallow nest site selection was the type of traffic on top of the bridge. We expected that pedestrian bridges would be preferred over vehicular bridges because there would be less noise, vibrations and air pollution. We counted intact swallow nests and swallow nest remnants on the underside of 66 bridges. We also qualitatively evaluated bridge construction material and categorized the adjacent vegetation buffer as either wild-type or maintained. We found that the most important factor for nest site selection by Cliff Swallows was bridge construction material and not bridge traffic. Sixty five percent of bridges constructed out of concrete had swallow nests where as only 2% of wood bridges had nests. In addition, the texture of the concrete was a strong predictor of nest site selection. Significantly more swallow nests were found on bridges with smooth concrete versus bridges with rough or medium concrete ($t = 2.03$; $P = 0.053$). Finally, we found significantly more swallow nests on bridges that had a wild-type buffer adjacent to the bridge ($t = 2.20$, $P = 0.012$). In order to provide adequate habitat for nesting Cliff Swallows, we recommend that new bridges use concrete with a smooth texture on the underside and have an adjacent wild-type buffer.

STUDYING SUPPLEMENTAL FEEDING BEHAVIOR WITH RADIO FREQUENCY IDENTIFICATION (RFID)

David N. Bonter, Cornell Lab of Ornithology, 159 Sapsucker Woods Road, Ithaca, NY 14850; Eli S. Bridge, Center for Spatial Analysis, University of Oklahoma, 101 David L Boren Blvd, Norman, OK, 73019; and Benjamin Zuckerberg, Cornell Lab of Ornithology, 159 Sapsucker Woods Road, Ithaca, NY 14850*

Radio Frequency Identification (RFID) technology can be used to remotely and automatically monitor bird behavior. The cost of implementing a large-scale RFID network, however, can be prohibitive. To overcome this barrier, we developed a simple, low-cost RFID reader/datalogger (<$40) that can be mounted on birdfeeders, nest boxes, nests, or any location repeatedly visited by birds fitted with small RFID transponders (i.e. PIT tags). To demonstrate the potential of this low-cost RFID reader, we attached prototype readers to seven bird feeders and monitored feeding behavior by wintering birds in central New York. PIT tags were attached to 70 Black-capped Chickadees (Poecile atricapillus), 20 Tufted Titmice (Baeolophous bicolor), 13 White-breasted Nuthatches (Sitta carolinensis), and 18 House Finches (Carpodacus mexicanus). The RFID feeder systems recorded 524,772 visits by tagged birds between November 1, 2009 and April 15, 2010. Individual birds were recorded visiting RFID feeders up to 203 times per day. Some individual birds moved hundreds of meters between RFID systems, permanently emigrating from the initial banding location. Feeding behavior shifted between forest edge and interior sites in response to temperature changes. Because the presence/absence of individual birds was recorded on a daily basis, this technology provides remarkably detailed data for survival analysis.

[S,G] OFFSPRING QUALITY VS. QUANTITY: HATCHING ASYNCHRONY IN THE HOUSE WREN (TROGLODYTES AEDON) REVISITED

E. Keith Bowers, Scott K. Sakaluk, and Charles F. Thompson; Behavior, Ecology, Evolution, and Systematics Section, School of Biological Sciences, Illinois State University, Normal, IL 61790-4120*

The clutches of many altricial birds hatch asynchrony over several days, creating a post-hatching hierarchy in nestling size. Conversely, females may hatch their eggs synchronously within 24 h, causing all nestlings to be similar in size. In a population of house wrens (Troglodytes aedon) in which asynchronous and synchronous hatching occurs, we tested the hypothesis that these distinct hatching patterns reflect differing strategies of maternal investment in offspring. We predicted that asynchronous hatching would create greater within-brood variation in measures of nestling condition than synchronous hatching, and that nestling condition is related to the order in which nestlings hatch from their eggs. Nestling mass and size were more variable in asynchronous than in synchronous broods post-hatching and prior to fledging. Prior to fledging, mass and tarsus length declined with hatching order in asynchronous, but not synchronous, broods (synchrony*hatch-order interaction on nestling mass $p = 0.0004$, tarsus length $p < 0.0001$). First-hatched nestlings in asynchronous broods were significantly heavier than those in synchronous broods ($p = 0.001$) and had marginally longer tarsi ($p = 0.08$), while late- and last-hatched nestlings in asynchronous broods were significantly smaller than those in synchronous broods (both p-values = 0.04). Because nestling mass and tarsus length at this time are positively correlated with survival and recruitment to subsequent breeding populations, these results are consistent with the hypothesis that females hatching their eggs asynchronously bias investment toward early-hatching offspring and females hatching their eggs synchronously provide all their offspring with equal prospects for survival and future reproduction.

THE IMPACT OF DNA SEQUENCE ALIGNMENT METHOD ON ESTIMATES OF THE AVIAN TREE OF LIFE

Michael J. Braun, Dept. of Vertebrate Zoology, National Museum of Natural History, Smithsonian Institution, 4210 Silver Hill Rd., Suitland MD 20746; Kevin Liu and Tandy Warnow, Department of Computer Sciences, The University of Texas at Austin, One University Station C0500, Austin, TX 78712; C. Randal Linder, Section of Integrative Biology, School of Biological Sciences, The University of Texas at Austin, One University Station C0930, Austin, TX 78712; and Edward L. Braun, Department of Biology, University of Florida, Gainesville, FL 32611*

Recent estimates of the phylogeny of birds based on molecular sequence data (e.g., Ericson et al. 2006, Hackett et al. 2008) differ dramatically from most previous estimates and potentially provide important new insights into avian relationships, morphological and ecological adaptation and biogeography. However, several molecular estimates depend heavily on non-coding DNA elements that vary in length and must be aligned before analysis can proceed. In phylogenetics, such alignments have typically been adjusted manually, introducing the possibility of observer error or bias. Recent advances in multiple sequence alignment have resulted in computer algorithms that produce much improved alignments, allowing us to probe the impact of completely automated alignments on the inferred tree. We tested six automated alignment methods on the largest available molecular dataset (Hackett et al. 2008), and found that five of them produced alignments and trees very similar to each other and to the published tree based on the manually curated alignment. The outlier was ClustalW, an older method that produced a slightly divergent tree that was nevertheless much more similar to the tree based on manual alignment than to any previous estimate. We also tested the effect of starting trees on an automated method (SATé) that iterates between alignment and tree estimation. Whether we started with very divergent trees from previous estimates or even with randomly generated trees, we always recovered trees very similar to the published tree based on the manually curated alignment.

S,G EFFECT OF PRESCRIBED BURNING FOR MANAGEMENT OF THE RED-COCKADED WOODPECKER ON THE AVIAN COMMUNITY IN THE SAM HOUSTON NATIONAL FOREST

Mallory J. Brodrick and Diane L.H. Neudorf, Department of Biological Sciences, Sam Houston State University, Huntsville, TX 77341*

During the past century there has been a drastic change in vegetation due to fire suppression in the southern pine ecosystem that has had negative impacts on many avian species. In particular, the red-cockaded woodpecker (Picoides borealis) was affected so severely it was placed on the endangered species list in 1970. As a mandated part of its federal recovery plan, the U.S. Forest Service actively manages red-cockaded woodpecker habitat in the Sam Houston National Forest through prescribed burning and mechanical removal of understory. We investigated the effects of three prescribed burning regimes on the avian community. Avian species richness, diversity and abundance were documented in areas burned annually, every 5 to 7 years (irregularly burned) and in areas not burned for well over 25 years (wilderness areas), through year-round point count surveys. Areas burned annually had the highest species diversity and wilderness areas had the lowest species diversity but these differences were not statistically significant. Guild and seasonal analyses showed that there were a few differences between species among treatments. Year round resident assemblages in irregularly and annually burned areas were different by comparison of the wilderness area. Most insectivore foraging guilds had the highest maximum abundances in the annually burned areas, which is likely due to the increased insect densities that occur in areas maintained by fire. In summary, our results indicate that different fire regimes provide a range of habitats, which host a variety of species compositions and abundances.

PERSPECTIVES ON SAGEBRUSH SONGBIRD HABITAT AND CONSERVATION.

Anna Chalfoun, Wyoming Cooperative Fish & Wildlife Research Unit, Department of Zoology & Physiology, University of Wyoming, Laramie, WY 82071.

Commensurate with widespread habitat loss and degradation, songbirds that breed within sagebrush habitats are one of the fastest declining groups of birds in North America. While attention and resources have been largely focused on high profile species such as the greater sage-grouse, recent efforts have also emphasized the importance of research and conservation efforts geared towards non-game sagebrush species. Critical information for the maintenance of healthy sagebrush songbird populations will include habitat quality at multiple spatial scales, especially in light of the desire of many management entities to utilize sage-grouse as an “umbrella species”. For example, based on intensive work in south-central Montana, Brewer’s sparrows, which are considered one of the three sagebrush-obligate passerines, preferentially settled and had higher quality offspring and higher re-nesting rates in taller, higher shrub cover areas. Such sites also supported higher avian species richness, yet are now extremely rare within shrub-steppe landscapes. At the nest patch (5-m radius) scale, Brewer’s sparrows preferred and had higher nest success in patches containing higher densities of potential nest shrubs. Pairs also altered attributes of their nest patches in re-nest attempts following nest predation which increased the probability of re-nest success, suggesting that maintaining some variation in microhabitat structure within a landscape may be important. Together, these results and those of other on-going work in Wyoming suggest that the maintenance and restoration of tall, high-shrub cover sagebrush areas along with gradients in shrub structure will be imperative for healthy sagebrush bird populations.

EFFECTS OF NEST TIMING AND PHOTOPERIOD ON REPRODUCTIVE SUCCESS AND CHICK DEVELOPMENT IN FRANKLIN’S GULL.

Mark E. Clark, Wendy L. Reed, Shawn Weissenfluh and Emily A. Davenport. Department of Biological Sciences, North Dakota State University Fargo, ND 58108-6050*

We observed a seasonal decline in size at hatching in Franklin’s gull (Larus pipixcan) chicks, which we hypothesized was due to seasonal variation in egg components or photoperiod. We obtained fresh eggs both early and late in the nesting season from a colony nesting in North Dakota and artificially incubated the eggs under short and long daylength photoperiods to test our hypothesis. We found that a chick’s tarsus size at hatch was affected by both photoperiod and laying period. However, the chick’s absolute size (i.e., total mass) did not change with photoperiod or laying period. Furthermore, analysis of gross egg components (i.e., yolk, albumen, shell and water mass) revealed no differences related to when eggs were laid. Our results indicate that photoperiod interacts with maternal components in eggs to alter embryonic development. Consequences of altered embryonic development on chick performance and recruitment are unclear. However, observations of chicks in the colony suggest that post-hatching growth and survival vary with timing of nesting and condition at hatch.

EFFECTS OF LAND USE ON THE POPULATION DYNAMICS OF BURROWING OWLS IN EASTERN WASHINGTON

Courtney J. Conway, U.S. Geological Survey, Arizona Cooperative Fish & Wildlife Research Unit, School of Natural Resources and the Environment, University of Arizona, Tucson, AZ 85721

Burrowing Owls (Athene cunicularia) have declined in the northern half of their breeding distribution and the extent of population declines differs among land uses. We compared demographic parameters between two study areas in southeastern Washington that differed in elevation and land use. Density of Burrowing Owl nests was higher in a study area dominated by agriculture (0.67 nests/km2) compared to an urban study area (0.28 nests/km2). We failed to detect differences in clutch size (8.6 and 8.4 eggs) but nesting success was higher in the agricultural study area (51% compared to 41%). The number of fledglings per nesting attempt was higher in the agricultural study area (2.02 compared to 1.47), but we failed to detect a difference in the number of fledglings per successful nest (3.20 and 3.10). Both natal recruitment (4% and 8%, respectively) and annual return rate of adults (30% and 39% respectively) were lower in the agricultural study area than in the urban area. A lower proportion of adult male owls over-wintered in the agricultural area (17.4% vs. 8.4% in the urban area), and adult males were >7 times more likely to overwinter than were adult females. Due to high burrow fidelity from year to year, and over-wintering tendency of some owls in Washington, we suggest that nest burrows receive greater protection than is currently required by state and federal laws in order to halt declines in numbers of Burrowing Owls. In particular, we suggest that legal protection of nest burrows be extended to the non-breeding season.

S,G EXCREMENTS AS MEASURES OF HEAVY METAL POLLUTION OF GREAT TIT IN MARITIME PINE FOREST

R. A. Costa, Departamento de Biologia, Universidade do Minho, Campus de Gualtar, 4710-057 Braga, Portugal; Eeva, T., Section of Ecology, University of Turku, 20014 Turku, Finland; and Vingada, J.V., Departamento de Biologia, Universidade do Minho, Campus de Gualtar, 4710-057 Braga, Portugal and Sociedade Portuguesa de Vida Selvagem, Estação de Campo de Quiaios, Apartado 16 EC Quiaios 3081-101 Figueira da Foz, Portugal*

Although air pollution is known to produce direct and indirect effects on forest passerines, information on the effects of emissions from paper and pulp industry is scarce. This long-term (7 yr) study compared Great tit breeding parameters from paper and pulp industry sites with those from rural sites in maritime pine forests on the west coast of Portugal. Considering that nestlings are potential good monitors for terrestrial point-source pollution, the objective of this study was to determine the concentrations of heavy metals in the excreta of 15-day-old great tits and to relate heavy metal levels, calcium levels, breeding parameters and condition of Parus major nestlings across study areas. We found higher levels of mercury on the excrements of 15-day old great tit nestlings from the industrial area when compared to samples from the rural sites. However, we also found that Great tits laid more eggs and produced more fledglings in the industrial areas. Furthermore, the overall abundance of caterpillar biomass was significantly higher in the industrial area. With respect to ground arthropod abundance, beetles and millipedes were significantly more abundant in the industrial area. The presence of mercury in the industrial site was not expected since no mercury emissions were recently reported by the paper and pulp facilities. Our results suggest that there are no direct toxic effects of emissions from paper industry on the study species. However, invertebrate food availability is related to the pollution levels, which indirectly affect the breeding performance of the Great tit.

S,G NO EVIDENCE FOR HOST-PARASITE FLANGE COLOR MATCHING IN BROOD PARASITIC BROWN-HEADED COWBIRDS (MOLOTHRUS ATER) AND THEIR HOSTS.

Rebecca Croston, Graduate Program in Biology, Evolutionary Biology, Ecology, and Behavior Subprogram, Graduate Center, CUNY, and Mark Hauber Department of Psychology, Hunter College and Graduate Program in Biology, Evolutionary Biology, Ecology, and Behavior Subprogram, Graduate Center, CUNY, NY, NY,10065, and Christopher Tonra and Sacha Heath, PRBO Conservation Science, Petaluma, California 94954*

Nestlings of brood parasitic Brown-headed Cowbirds (Molothrus ater) are polymorphic for rictal flange color, while nestlings of their hosts are monomorphic within species. Because of this, flange color could be used to signal species identity to hosts, driving cowbirds to preferentially parasitize hosts whose nestlings match those of their own. By analyzing digital photographs of cowbird nestlings in the Sierra Nevadas, California, I tested for flange color matching among host and parasitic nestlings occupying the same nest. If cowbirds are preferentially parasitizing hosts with flange colors matching their own, cowbird nestlings found in the nests of hosts with differing flange colors will themselves have significantly different flange colors. I compared the red, green, and blue color values of the rictal flanges of cowbirds found in Yellow Warbler (Dendroica petechia) and Song Sparrow (Melospiza melodia) nests using a nested repeated measures ANOVA. Like cowbird eggs, cowbird nestling flanges are nonmimetic. My results indicate that there is no significant difference between the flange colors of cowbird nestlings found in the nests of these two hosts, and there is therefore no evidence that cowbirds are parasitizing hosts selectively based on nestling flange color matching. That flanges are non-matching may result from 1) dampened selective pressure on hosts to develop nestling discrimination because of differential costs of cowbird parasitism, and 2) dampened selective pressure on cowbirds themselves because rejection occurs in few cowbird hosts and host flange color varies.

VOCAL DYNAMICS OF A COMPLEX AVIAN HYBRID ZONE

C.M. Curry and M.A. Patten, Department of Zoology and Oklahoma Biological Survey, University of Oklahoma, Norman, OK 73019*

Hybrid zones are areas where two species contact secondarily and interbreed. The Black-crested Titmouse (Baeolophus atricristatus) and Tufted Titmouse (B. bicolor) contact and interbreed in Texas (TX) and southwestern Oklahoma (OK). We describe and compare variation in songs between the two species and their hybrids. Black-crested Titmouse and hybrids have higher-frequency songs and fewer notes per song phrase compared to Tufted Titmouse. Vegetation structure is expected to influence song differences as well. We also show that the hybrid zone location appears to be stable in TX when compared to previous records. The hybrid zone in southwestern OK is younger and may have different vocal dynamics compared to the TX zone. Work in future field seasons will compare genetic variation in the hybrid zones; determine how mate choice is affected by song differences across the hybrid zone; and test the bounded hybrid superiority and tension zone models of hybrid zone maintenance for the two contact areas.

ARE CORRECTED COUNTS USEFUL FOR GRASSLAND BIRDS?

Brenda C. Dale, Environment Canada - Canadian Wildlife Service, 200 - 4999 98th Av NW, Edmonton, AB, Canada T6B 2X3, and Catherine Jardine, 9 Clement Place, St. Catherines, ON, Canada L2S 2J8*

Researchers are currently encouraged to statistical approaches to adjust index counts of bird populations to estimate population density. We explored the utility of distance (Distance 6.0) and time to removal (SURVIV) adjustment methods using a 4 year / three observer grassland bird data where cues were collected in 3 distance and 3 time intervals. We had sufficient records to generate adjusted counts for only 12 species. The distribution of detections for 11 of these species showed avoidance so that valid calculations of densities using distance analysis were not possible. Furthermore the distribution of detections varied by observer even when raw counts did not. The removal method found detection probabilities of 0.81 to 0.98 (mean 0.92) indicating most individuals are detected in open habitats and corrected values differ little from raw indices. There was evidence that the closed population assumption was violated and these probabilities are based on cue frequency and lack a distance element. Therefore assumptions of both methods were unrealistic. We recommend further exploration using a known population (broadcast recordings) or collection of data in finer time or space intervals. Until better adjustment techniques are available we suggest that, for grasslands, it is acceptable to use unadjusted indices collected by observers who train together using a study design that controls for observer.

MEASURING STRESS IN BIRDS USING COUNTS OF WHITE BLOOD CELLS: AN OUTLINE WITH AN EMPHASIS ON EFFECTS OF HANDLING TIME.

Andy Davis, Warnell School of Forestry and Natural Resources, The University of Georgia, Athens, GA 30602

Ecologists and field ornithologists are becoming increasingly interested in understanding how and when their study animals become stressed. Common questions asked include are birds in fragmented habitats stressed, does increased reproductive effort cause stress to animals, or do backpack transmitters cause stress? The conventional way of answering such questions involves assessing levels of stress hormone in blood samples, however this is logistically difficult since capture of wild animals invokes an immediate stress response, such that a researcher must sample the animal within 2 minutes of capture to obtain baseline measures of stress. For this reason, a number of alternative measures have emerged that are not as time-sensitive. One is counts of white blood cells from blood smears. Specifically, the numbers of two cells - heterophils and lymphocytes, are both directly related to the level of stress hormones in animals such that the ratio of the two (the heterophil/lymphocyte ratio) can serve as an index of stress. This presentation will describe the results of a paper published in the Journal of Field Ornithology in 2005 that demonstrated how this 'hematological stress index' is not affected by routine handling of birds for up to one hour, which makes it highly useful to field ornithologists. Subsequent work will also be presented, which includes a review of 150 studies that use this method across all animal taxa, other experimental work by the author with non-avian subjects, and a study published later in the Journal of Field Ornithology that highlights the utility of this approach for answering stress-related questions.

CUTLER RESERVOIR: AN IBA OF HEMISPHERIC IMPORTANCE FOR WHITE FACED IBIS.

B. Dixon and L. Richardson, Bridgerland Audubon Society, C. Cockinos and K. Sullivan, Utah State University, Logan UT

White faced ibis appeared at Cutler Reservoir in northern Utah in large numbers following the high precipitation years of the mid 1980s that flooded out traditional rookeries around the edges of the Great Salt Lake. Cutler Reservoir was designated an Important Bird Area in 2004 based on documented populations of this and other species. Anecdotal evidence of thousands of ibis utilizing a rookery in Cutler Reservoir led to volunteer efforts to document ibis numbers beginning in 2005. A non invasive census technique was developed to minimize disturbance to the rookery, and rookery populations reached more than 8,000 birds in 2006. The rookery was totally abandoned for unknown reasons in 2007, but recovered slowly in 2008 and 2009. More frequent counts during May and June parallel the pattern of nesting and brooding behavior reported in the literature. Future threats to the rookery may increase with greater use of motorized recreation, increased populations of predators, and lack of formal protection. Populations are far above the 1% threshold necessary for designation as an IBA of Hemispheric Significance. A Globally Significant designation may give the rookery the attention necessary to justify greater protection.

SEX DETERMINATION IN THE WESTERN SUBSPECIES OF RED-TAILED HAWKS (BUTEO JAMAICENSIS CALURUS) USING DNA ANALYSIS AND MORPHOMETRICS.

Kara C. Donohue and Alfred M. Dufty, Jr., Department of Biology, Boise State University, Boise, ID 83725-1515

Currently the sex of Red-tailed hawks (Buteo jamaicensis) cannot be determined by in-hand methods. Males and females do not differ in plumage and overlap in size. During migration, we collected feather samples and morphological measurements from birds at four sites in the Western United States. Sex was determined for individual birds using sex-specific DNA markers and Polymerase Chain Reaction was used to identify these DNA markers. Through Discriminant Function Analysis, we created equations for determining the sex of Red-tailed hawks using in-hand measurements based on the DNA-determined sexes. We formed two equations, one for adults, which was 98% accurate, and one for hatch-year birds, which was 97% accurate. Our results will aid future studies looking at intra- and intersexual differences in the Western Red-tailed hawk.

DISTRIBUTIONAL AND STATUS SHIFT OF RED-NECKED GREBES IN SOUTH DAKOTA.

Nancy Drilling, Rocky Mountain Bird Observatory, 230 Cherry St., Fort Collins, CO 80521.

South Dakota is located at the extreme southern edge of the North American breeding range of the Red-necked Grebe. During 2005-2007, the distribution and breeding status of Red-necked Grebes were recorded as part of a state-wide colonial waterbird inventory. Compared to historical records, Red-necked Grebe breeding distribution has shifted to the northeast, concentrated in two counties. Although now found in a smaller area, the species is more common than previously recorded, with 60 pairs confirmed breeding at 45 sites. This compares to only 10 records in the previous 50 years. Possible reasons for the apparent distributional shift and concurrent increase in population size include distributional changes in wetland abundance because of wet-dry climate cycles, natural fluctuations at the edge of the breeding range, better reporting, or region-wide population increase and expansion. Whatever the cause, 69% of South Dakota's grebes breed in privately-owned wetlands, making them susceptible to drainage of potholes and destruction of breeding reedbeds.

S,G KEY FACTORS DETERMINING THE SPATIAL DISTRIBUTION OF WEAVER BIRD NESTS AT MPALA RESEARCH STATION, LAIKIPIA, KENYA

Maria A. Echeverry-Galvis and Jennifer K. Peterson, Ecology and Evolutionary Biology, Princeton University, Princeton, NJ; Rajmonda Sulo, National Center for Data Mining, The University of Illinois at Chi¬cago, Chicago, IL; and Kadambari Devarajan, Department of Computer Science, The University of Illinois at Chicago, Chicago, IL.*

Group living is a strategy that confers the advantage of better access to mates and protection from predation, but also the disadvantage of increased competition for resources and higher visibility. As an evolutionary response to these challenges, socially-living individuals may organize themselves into particular configurations to decrease the probability of events detrimental to their own fitness. Determining the key factor(s) that drive the selection for a specific aggregation poses a challenge because often the boundaries defining the group are unclear. However, in weaver bird colonies a unique opportunity to investigate the architecture of their living arrangement exists, as the colony is constrained to one tree. We aimed to determine which factors weigh most heavily in the determination of the nest arrangement (spatial distribution) of the weaver birds Pseudonigrita arnaudi, Pseudonigrita cabanisi, and Plocepasser mahali, of the African woodlands in Laikipia, Kenya. We specifically asked if the spatial distribution of their nests within a given tree is determined by the tree architecture or the weaver bird. Using data that we collected from 515 nests in 16 trees we computationally modeled the factors that determine the spatial relationships between the nests in a given tree and yielded canopy size, number of nests, and distance between nests as the determining factors. These results all relate to the available space within a given tree, however future work on the order of nest construction will address whether nest location is solely based on available space or also on interaction between neighboring birds.

SNOWY PLOVER NESTING SUCCESS AND NEST DENSITY AT GREAT SALT LAKE, UTAH.

Christian Edwards, Utah Division of Wildlife Resources, Hurricane, UT 84737, Greg Farley, Department of Biological Sciences, Fort Hays State University, Hays, KS 67601, John F. Cavitt, Avian Ecology Laboratory, Department of Zoology, Weber State University, Ogden, UT 84408*

Throughout much of its range, Snowy Plover (Charadrius alexandrinus nivosus) numbers have been declining over the past two decades. In fact, the Pacific Coast population has been designated as "Threatened" under the Endangered Species Act. Inland populations also have experienced declines and have been given "Priority Status" by many bird conservation organizations and state wildlife agencies. The expansive mudflats and playas of the Great Salt Lake shoreline provide ideal breeding habitat for the Snowy Plover. In 2008, we investigated the breeding biology of Snowy Plover at three study sites at Great Salt Lake. Apparent nesting success resulted in 60% (95% CI: 50 - 69%); Mayfield estimates resulted in 46% (95% CI: 37 - 58%) nesting success and 97% (95% CI: 96 - 98%) daily survival probability. Predation was the cause of failure for 86% of the unsuccessful nests; 9% of the nests failed due to flooding; and 5% were due to an unknown cause. When all sites are combined, green vegetation around nests was 7% higher at successful nests compared to depredated upon nests. Nest density differed significantly among the three study sites at Great Salt Lake. Data collected will assist in further understanding the breeding biology of inland populations of Snowy Plover.

EFFECTS OF PREDATION RISK ON INCUBATION BEHAVIOR OF SNOWY PLOVER AT GREAT SALT LAKE.

**Kristen Ellis and John F. Cavitt, Avian Ecology Laboratory, Department of Zoology, Weber State University, Ogden UT 84315.*

Snowy Plovers (Charadrius alexandrinus) are considered a bird of conservation concern throughout most of its range. At Great Salt Lake, Snowy Plover populations, as well as other shorebirds, face important threats to their conservation. Some of these threats include loss and degradation of breeding habitat, and increased risk of nest predation. In order to predict the potential impacts of threats to breeding birds, it is important to have a basic understanding of breeding biology. Therefore, we examined the incubation behavior of this species nesting at four sites at Great Salt Lake with different risks of predation. We conducted focal observations on incubating birds and recorded nest attentiveness, and number and causes of off-bouts. In addition, we examined if nest attentiveness varied with stage of incubation and ambient conditions. In general nest attentiveness was high (> 70%) but varied between sexes and stage of the incubation period. While most adults exhibited high attentiveness, variation was observed and tended to correlate with presence of nest predators.

LACK OF FATHER-SON CORRELATION AMONG ACOUSTIC ELEMENTS OF THE TERRITORIAL YODELS OF COMMON LOONS (GAVIA IMMER) SUPPORT IDEA THAT INDIVIDUALLY-RECOGNIZABLE PARAMETERS ARE DETERMINED BY ACOUSTIC ENVIRONMENT.

Chelsey Evans, Jay Mager, Department of Biological and Allied Health Sciences, Ohio Northern University, Ada, OH 45810, and Charles Walcott, Department of Neurobiology and Behavior, Cornell University, Ithaca, NY 14850.*

Male Common Loons (Gavia immer) produce territorial vocalizations called yodels that are in part believed to communicate their identity to conspecifics. We examined fifteen acoustic parameters of over 150 yodels recorded from 15 father-son pairs of banded common loons within north central Wisconsin between 2004 and 2007 to determine whether any parameter could be heritable. Using father-son correlation as a mechanism to assess potential of heritability of yodel parameters, we found no correlation between all measured frequency, latency, or timing elements of father and son yodels. Additionally, we did not detect any correlation among these parameters between loons that share the same father. Thus, unlike elements that facilitate species recognition, it is unlikely that elements of a male's yodel that communicate individual identity are passed from father to son. Like many birds in which parameters of territorial songs in songbirds are shaped by aspects of their acoustical environment, we provide support of the notion that many aspects of the territorial signal produced by this non-oscine waterbird are largely shaped by the aspects of their acoustic "neighborhood".

FACTORS AFFECTING PIPING PLOVER PRODUCTIVITY AT A LARGE PRAIRIE ALKALINE LAKE

Cheri Gratto-Trevor, Prairie and Northern Wildlife Research Centre, Environment Canada, 115 Perimeter Road, Saskatoon, SK S7N 0X4 Canada.

Piping Plovers (Charadrius melodus) have been listed as Endangered in Canada since 1985. The primary cause of population decline is thought to be heavy predation rates on eggs and chicks. This study examines factors affecting natural productivity of Piping Plovers at Big Quill Lake, Saskatchewan, from 2002-2006, compared to results from previous studies (Whyte 1985: 1981-1982; Harris et al. 2005: 1993-1995). At this huge alkaline wetland, natural water levels have varied considerably, with beach width varying from several km to less than 100 m. Combining results from the three studies, nest success was considerably lower when water levels were high, but nest loss was rarely due to flooding of nests. Virtually all nest loss was due to predation of eggs, perhaps because there was considerably less nesting habitat for predators to search when water levels were high. Fledging success was not related to water levels, nor to conditions measured at the closest weather station. However, rainstorms and hail observed at Big Quill Lake were not always recorded in the Wynyard Environment Canada database. For example, a hail storm at peak hatch in 2006 that apparently killed many chicks was not recorded at Wynyard. Productivity of Piping Plovers at Big Quill Lake varies dramatically from year to year, primarily due (directly

STATE OF SHARP-TAILED GROUSE IN NORTHERN UTAH.

Ron D. Greer, UDWR Ogden, Utah 84405, Darren Debloois, UDWR Ogden, Utah 84405. Dave Olsen UDWR, Salt Lake City 84114. Dr. Terry Messmer, USU Logan, Utah 84321, Jolene Rose, Antelope Island State Park, Syracuse, Utah, 84075

To collect more information about Columbian Sharp-tailed grouse (CSTG) in northern Utah, I trapped and radio marked grouse from 2 distinct populations of CSTG. I collected vegetation data, an unsupervised classification, Visual Obstruction Readings (VOR), nesting data, and mortality data on the radio marked grouse. Sagebrush/shrubs and forbs were significant. CSTG used sagebrush more than was available on the landscape. Mortality was averaged at 71% for both populations over the 2 years. VOR were significantly higher at the flush sites than at the paired points. Nest success was at 75%. To find leks, a helicopter survey technique has been developed and is very successful. High probability areas are flown to locate leks for CSTG. A transplant program has been developed and undertaken within the State of Utah to increase range and population. Our first translocation has been Antelope Island in 2009 and 2010. We moved 14 and 23 grouse respectively in these 2 years.

COMPARATIVE STUDY OF METHODS USED TO TRAP NESTING SNOWY PLOVERS (CHARADRIUS ALEXANDRINUS).

Lucas K. Hall and John F. Cavitt, Avian Ecology Laboratory, Department of Zoology, Weber State University, Ogden, UT 84408-2505*

The need for the conservation of "threatened" species is becoming progressively imperative. With continuing development and recreational use, some species habitats are receding, resulting in population declines. The Snowy Plover (Charadrius alexandrinus; SNPL) is a small shorebird found breeding at Great Salt Lake. Because of population declines, the SNPL is considered a bird of conservation concern by the U.S. Fish & Wildlife Service and the Utah Division of Wildlife Resources. Due to its conservation status, the SNPL is monitored throughout its range. Unfortunately, different methodologies are used for studying populations. For example, at least three different methods are used to trap SNPL at nests and these methods vary in design, cost, set-up time, and operation as well as trapping success. Thus, to manage for the conservation of this species and to provide information on trap effectiveness, data are needed which test each trap design. In this study, we compared the efficacy of three trapping methods used to capture SNPL at their nests. Our research questions were: what are the costs for constructing each trap? And which trap is most efficient / effective? Our results will provide information on trapping techniques for SNPL as well as other ground-nesting birds.

DISTRIBUTION OF COLONIAL WATERBIRDS IN SOUTHERN OREGON: SURVEY RESULTS FROM 2009 AND 2010.

Karen F. Hussey and Jaime L. Stephens, Klamath Bird Observatory, Ashland, OR 97520, Jennifer Hoskins, U.S. Fish and Wildlife Service, Portland, OR 97232, and Bob Altman, American Bird Conservancy, Corvallis OR 97330.*

According to the North American Waterbird Conservation Plan, one third of colonial waterbirds are at risk of population loss. It is unclear however, what this means for western colonial waterbirds because the population status of many species is not well understood. Population estimates are difficult to obtain because colony locations fluctuate temporally as existing locations become less habitable and more suitable locations emerge. Estimating population size of species with these temporal-spatial shifts requires a coordinated inventory effort. Contributing to the US Fish & Wildlife Service's Western Colonial Waterbird Survey, Klamath Bird Observatory in conjunction with American Bird Conservancy coordinated monitoring efforts for 13 colonial focal species throughout southern Oregon in 2009 and 2010. Specifically, Klamath Bird Observatory implemented surveys in southern Oregon at 47 sites in 2009 for tree nesting and ground nesting colonies and 171 sites in 2010 for marsh nesting colonies. Preliminary survey results on species occurrence and distribution will be presented. These data will be used to estimate populations in Oregon as well as contribute to west-wide population estimates.

DO HOUSE WRENS RECOGNIZE AND AVOID THE ODOR OF MUSTLELID NEST PREDATORS?

L. Scott Johnson, Shannon Murphy, and Gordon Parrish, Dept. Biol. Sci., Towson University, Towson MD 21252*

Recent studies suggest that many birds have a better sense of smell than generally believed. Current research is focused on how birds use their sense of smell. One possible use of smell, common in other taxa, is predator recognition and avoidance. We tested whether House Wrens (Troglodytes aedon) show avoidance behavior at nest boxes that contain the odor of mink (Mustela vison), a species whose odor closely matches the odor of other mustelids that are common nest predators (e.g., weasels). At two points during the nestling stage, we implanted in boxes filter paper that we had infused with either mink anal gland extract, distilled water, or human cologne or garlic extract. We then videotaped nests for 2 h to document the responses of parent birds. We assessed several measures of avoidance including the number of times that an individual failed to enter the nest box upon first arrival at the box entrance, time spent in the box upon first entry, and delay to return and re-enter the box after first entry. We found no evidence that wrens avoided nests with a predator odor or any other odor. We discuss how our results contrast sharply with a similar, but potentially flawed, study on Blue Tits (Cyanistes caeruleus).

THE WESTERN COLONIAL WATERBIRD SURVEY DESIGN AND PROCESS.

Stephanie L. Jones, U.S. Fish and Wildlife Service, Nongame Migratory Birds, Denver, CO 80225; Jenny D. Hoskins and Tara S. Zimmerman (1), U.S. Fish and Wildlife Service, Migratory Birds and Habitat Programs, Portland, OR 97232; William H. Howe, U.S. Fish and Wildlife Service, Migratory Bird Office, Albuquerque, NM 87103; and Nanette Seto, U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, VA 22203. (1) Current address: Kinglet Consulting, Washougal WA 98671.*

The Western Colonial Waterbird Survey (WCWS) was initiated due to substantial information gaps for colonial waterbird populations in the western U.S. The U.S. Fish and Wildlife Service (USFWS) and states in the western U.S. identified information on colonial waterbird distribution and abundance as a priority need for determining their status, identifying conservation issues, and refining conservation actions. Survey planning was accomplished by USFWS in cooperation with multiple state and non-governmental partners in 2008. The WCWS is being coordinated by USFWS and implemented in 11 western states for 17 species during 2009, 2010, and 2011. This survey is being implemented at the state level, with each state coordinating the survey in that state. The objective of the WCWS is to locate all colonies and quantify the number of nests or adults. The WCWS is an inventory and census, and protocols (http://www.fws.gov/mountain-prairie/species/birds/westerncolonial/index.html) varied with the details of the species and colonies. The 17 species targeted were divided into island and tree nesters, although among these species, some of the grebes don't fall into either category. The product will be an atlas of nesting waterbird colonies in 11 western states. This atlas will provide a regional context for assessing the status of species and colonies from a large landscape scale perspective and for local and regional population and habitat conservation purposes. The atlas could be the basis of a sampling frame if a population or periodic trend survey later becomes desirable.

[S,G] SECRETIVE MARSH BIRD RESPONSE TO PRESCRIBED FIRE IN MID-ATLANTIC TIDAL MARSHES

Rebecca A. Kern, W. Gregory Shriver and Jacob L. Bowman, Department of Entomology and Wildlife Ecology, University of Delaware, Newark, DE 19717; Laura R. Mitchell, U.S. Fish and Wildlife Service, Smyrna, DE 19977; and Dixie L. Birch, U.S. Fish and Wildlife Service, Tulsa, OK 74129 .*

Prescribed burning has been used to manage tidal marshes for at least 80 years, but its effects on secretive marsh birds are not well understood. We compared the effects of four fire treatments (0 years since burn (YSB), 1 – 2 YSB, 3 – 4 YSB and 5+ YSB) on the breeding marsh bird community at Blackwater National Wildlife Refuge and Fishing Bay Wildlife Management Area, Maryland. We established 20 plots (68.5 ha) within five management units in which the four fire treatments had been replicated. From May to August 2007 – 2009, we monitored nests, estimated territory density and productivity, and sampled vegetation. We detected the nests of 7 marsh bird species, with Seaside Sparrows (Ammodramus maritimus maritimus) the most abundant (353 nests located). Seaside Sparrow nest and territory densities were about two times greater on the 0 YSB treatment than on the 5+ YSB treatment ($F_{3,48} = 2.83$, $P < 0.05$). We used the logistic-exposure method to model the effects of time since fire, management unit, vegetation characteristics, and year on Seaside Sparrow nest survival. The best model included time since fire, management unit, time since fire x management unit interaction and year. Daily nest survival rates were lower on the 5+ YSB treatment (0.902) compared to marsh that was more recently burned (0 years – 0.937; 1-2 years – 0.923; 3-4 years – 0.946). Daily nest survival rates ranged from 0.913 – 0.943 across the five management units. Nest survival declined across study years, with period nest survival declining by 92% from 2007 to 2009.

ACOUSTIC MONITORING OF FLIGHT CALLS DESCRIBES PHENOLOGY OF NOCTURNAL MIGRATION OVER ITHACA

Anne E. Klingensmith, Michael E. Powers, and Andrew Farnsworth, Cornell Lab of Ornithology, Ithaca, NY 14830; and Benjamin van Doren, White Plains High School, White Plains, NY 10603.

Flight calls of migrating birds are salient features of nocturnal migrations, highlighting the temporal and spatial extent of these movements. However, the nuances of these movements have not been well characterized, particularly at multiple locations in a region. We hypothesized that phenology of nocturnal migration would vary even across a small geographic area as a function of local geography, topography, and time. We recorded flight calls in the greater Ithaca, NY area by deploying five autonomous recording units to gather flight call data during the fall 2009. We detected a total of 13,322 calls and identified over 45 species (to date). These include Caspian Tern, Gray-cheeked Thrush, Canada Warbler, and Nelson's Sparrow. The temporal patterns exhibited suggest that the peak of calling was largely similar across the region, occurring three to four hours after civil twilight, and again 10-11 hours after civil twilight. Our results suggest that, although call counts and calling behavior varies substantially, even over a small area, several patterns hold true across locations; other studies have also reported similar patterns. Additionally, our data suggest that calling clumps unevenly in time and space, suggesting that it might be possible to correlate departure stopover habitat with passing call counts. The temporal and spatial distribution of nocturnal movements is presumably governed by local and regional meteorological conditions, distribution of stopover habitat, and species-specific behaviors.

S,G GENETIC VARIATION AMONG AND BETWEEN FRANKLIN GULL (LARUS PIPIXCAN) POPULATIONS

AnnMarie Krmpotich, Katherine Mehl and Rebecca Simmons, Department of Biology, University of North Dakota, Grand Forks, ND 58202*

Segregated avian breeding populations may lead to panmictic populations if segregated birds share common wintering areas and pair formation occurs on these areas. This study uses the Franklin's Gull as a model species to assess genetic diversity of segregated populations. Feathers will be collected from multiple nests within each sub-population (n = 7 states, 50 feathers/nest/state). Mitochondrial DNA(mtDNA) will be extracted from the calamus of the collected sample feathers to determine the genetic variation and degree of mixing among sub-populations. Approximately 350 base pairs of the mtDNA D-loop will be amplified and sequenced using standard molecular methods. Sequences will be compared between and within populations for shared haplotypes using phylogeographic methods. Broader impacts of this research include delineating populations and allowing development of conservation plans in the breeding range.

NESTING AND BREEDING ECOLOGY OF RED-WATTLED LAPWING: VANELLUS INDICUS IN AGRICULTURAL AREAS IN PUNJAB, INDIA

Manoj Kumar, Assistant Ornithologist and K S Khera, Professor, Department of Zoology, PAU Ludhiana, Punjab-141004, India*

Nesting and breeding ecology of red-wattled lapwing: Vanellus indicus was studied in Punjab, India. Five active nests were located in April-May 2010 in and around the city of Ludhiana. Breeding lapwing occupy open terrestrial habitats, especially where sparsely vegetated ground with a short grass is found close to damp substrates rich in soil invertebrates- the species' favored diet. The nest is a small cleaned patch of land slightly depressed than surrounding land surface and the depressed area is lined by small pebbles of the same color as that of surrounding as well as that of eggs. The nest often conceals through the instinctive choice of nesting site as well as nesting material. Usually the nesting material comprising the exposed part of nest was gathered from the near vicinity, and thus the nest quite naturally matches the surroundings in coloration effectively providing camouflage. Occasionally nests are partly constructed at several sites before the final selection is made, although the final selection of a nesting site is preceded by a period of active search during which the birds move from one potential site to another, usually with in the confines of their established territory. Clutch size ranges from 2-4, usually four in most of the cases that are laid over a period of four to five days. The eggs are dusty gray or stone colored, blotched with blackish patches on their surfaces, peg-top shaped, laid on bare ground in open agricultural field, abandoned fields or waste land. The eggs are usually laid in a very shallow depression lined with small stones and earthen pebbles in case nest is in agricultural land, which conceal them within the surrounding and make the eggs and nest camouflaged to perfection. Dimensions of the nests as well as eggs were recorded. Nest predation by the Peafowls and crows were also observed during the study.

S,G THE POPULATION STRUCTURE AND POSTGLACIAL EXPANSION OF THE BOREAL CHICKADEE (POECILE HUDSONICUS)

Linda Lait and Theresa Burg, Department of Biology, University of Lethbridge, Lethbridge, Alberta T1K 3M4*

During the last glacial period much of North America was covered by large ice sheets. Throughout this time, both fauna and flora survived in ice-free regions known as refugia. Two large refugia existed in North America – one south of the ice sheets, and Beringia in western Alaska. A number of smaller, disputed refugia may have been present on both the east and west coasts of Canada. Many studies have looked at how physical barriers such as mountain ranges and large bodies of water can act as barriers to gene flow in a number of species. Obstacles such as these may have impacted the recolonization following the melting of the ice sheets. The boreal chickadee (Poecile hudsonicus) is a small passerine, which resides in the boreal forests of Canada and the northern United States. In order to study their postglacial expansion, and how physical barriers affected their population makeup, we evaluated mitochondrial sequences and microsatellites from field and museum samples (N=176), covering all of the chickadees' range. A strong pattern of isolation by distance was present, with evidence of a starburst pattern of genetic variation.

INTRASPECIFIC BROOD PARASITISM AS A COST TO COLONIALITY IN AMERICAN AVOCETS: THE OCCURRENCE AND FREQUENCY OF ABOVE-MODAL CLUTCHES ON ISLANDS AT GREAT SALT LAKE.

Monica Linford and John F. Cavitt, Avian Ecology Laboratory, Department of Zoology, Weber State University, Ogden, UT 84408.*

The American Avocet (Recurvirostra americana) is considered a semi-colonial shorebird, nesting either in isolation or in large aggregations. Most data on this species reports little variation in clutch size, prompting some to consider clutch sizes above four eggs (modal clutch size) as indicating brood parasitism. We studied the breeding ecology and behavior of this species nesting on a series of 38 small islands at the Bear River Migratory Bird Refuge, north of Great Salt Lake, from 2004 – 2009. Because these islands have different nest densities, ranging from only a few nests to 50 or more, it provides a unique opportunity to examine the costs and benefits associated with coloniality. One potential cost to colonial nesting is intraspecific brood parasitism. Here we report clutch size data on 1237 avocet nests. The modal clutch size of avocets nesting on these islands was four eggs (mean = 4.07 ± 0.02) but ranged from 1 – 9. Clutches with five eggs or more accounted for 14% of all nests monitored. Nest densities varied across years, with the largest nesting populations in 2009. Above-modal clutches occurred more frequently on islands with the highest nest densities. In addition, above-modal clutches also tended to have lower daily survival rates than either modal or below modal clutches. These results suggest a potential cost associated with colonial nesting in this species.

FACTORS THAT AFFECT EGG MASS IN TREE SWALLOWS

Michael P. Lombardo, Marci Baiz, Lisa Bol, Kyle Burgher, Angel Hayden, Liberty Hightower, Maegen Kish, Bradley J. Houdek, Matthew Romeyn, and Patrick A. Thorpe, Department of Biology, Grand Valley State University, Allendale, MI 49401-9403.*

Previous research has shown that environmental factors and breeding phenology influence the mass of eggs laid by female Tree Swallows that have bred at least once. Egg mass is positively correlated with nestling weight at hatching and subsequent survival so is an important component of parental investment by females. From 2008-2010, we noted the laying sequence and measured the mass of eggs laid by swallows in their first breeding season. Weather data were recorded at a nearby weather station. Egg mass was associated with mean and high air temperatures and the amount of rainfall before laying. Air temperature and rainfall affect the availability of aerial insects the main food source of Tree Swallows. Laying order had a significant effect on egg mass; eggs 1-3 were significantly lighter than eggs 4-6. When all eggs were considered, there was no significant relationship between egg mass and laying date. However, egg mass significantly increased with laying date at both early and late nests. These results suggest that first-time breeders, like more experienced Tree Swallows, vary their investment in egg production by responding to environmental factors, laying order, and laying date.

CONSERVATION STATUS OF SNOWY PLOVERS IN NORTH AMERICA: RESULTS OF A RANGE-WIDE SURVEY

James E. Lyons, U.S. Fish and Wildlife Service, Patuxent Wildlife Research Center, 11510 American Holly Dr, Laurel, MA 20708, USA; Brad A. Andres, U.S. Fish and Wildlife Service, PO Box 25486, DFC-Parfet, Denver, CO 80225, USA; John F. Cavitt, Avian Ecology Laboratory, Department of Zoology, Weber State University, 2505 University Cir, Ogden, UT 84408, USA; Elise Elliott-Smith, U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, 3200 SW Jefferson Way, Corvallis, OR 97331, USA; Suzanne D. Fellows, U.S. Fish and Wildlife Service, PO Box 25486 DFC, Denver, CO 80225, USA; Bill Howe, U.S. Fish and Wildlife Service, PO Box 1306, Albuquerque, NM 87103, USA; Stefani Melvin, U.S. Fish and Wildlife Service, 1875 Century Blvd Ste 240, Atlanta, GA 30345, USA; Eduardo Palacios, Pronatura Noroeste, Av. Congreso #48 Esq. Calle Uno, Fracc. Colinas Residencial, Hermosillo, Sonora, México 83145; J. Andrew Royle, U.S. Geological Survey, Patuxent Wildlife Research Center, 12100 Beech Forest Rd, Laurel, MD 20708, USA; and Sue Thomas, U.S. Fish and Wildlife Service, 911 NE 11th Ave, Portland, OR 97232, USA*

We conducted a range-wide survey of Snowy Plovers (Charadrius alexandrinus nivosus) during the breeding seasons of 2007 and 2008 for all subpopulations except the Pacific Coast population. Our goal was to produce a comprehensive assessment of the distribution and conservation status of Snowy Plover populations in the interior U.S. and Gulf of Mexico Coast. We surveyed breeding habitat throughout the W. Great Basin, Colorado Plateau, Playa Lakes region, Gulf Coasts of Texas and Florida, and other areas. The spatial extent and variety of habitats in our survey precluded a single counting methodology for all breeding sites. At large wetland complexes, we used stratified random sampling and assumed that we detected all birds in small spatial sampling units. At smaller breeding sites, we used repeated counts over time to produce estimates of local population size that were corrected for imperfect detection. In some parts of the range, repeated counts were not feasible and we used area search methods that were not corrected for imperfect detection. The combined population estimate for the range-wide survey was 22,767 (15,201 – 30,539 [95% CI]). Great Salt Lake, Salt Plains NWR (OK) and other wetlands in the Playa Lakes region, and the south Texas coast each contained at least 10% of the range-wide total and represent important core areas. We review implications of our survey for conservation status of the species and provide recommendations for future monitoring efforts.

USING EGG FLOTATION AND EGGSHELL EVIDENCE TO DETERMINE AGE AND FATE OF SHOREBIRD NESTS

Todd J. Mabee, Senior Scientist & Research Coordinator, ABR Inc. Environmental Research & Services, Forest Grove, OR 97116

We floated eggs to estimate incubation age at nests of 11 species of shorebirds on the Arctic Coastal Plain of Alaska during 2002–2004. We present egg flotation schedules for 9 species to facilitate the estimation of nest age. We tested the predictive ability of the egg flotation schedule for Semipalmated Sandpiper and were able to estimate incubation age within ~ 1–3 d of the actual hatch date. We also collected eggshell evidence at 3 species of shorebirds in Colorado during 1994–1995 and at 11 species of shorebirds in Alaska during 2002–2004 to determine nest fate. Patterns of eggshell evidence were similar across species from the different regions, with eggshell fragments (~1–5 mm) present at most successful nests and eggshell tops or bottoms present only at successful nests. We determined nest fate independently of eggshell evidence and then used discriminant function analysis to predict the probability of correctly classifying a nest's fate given different types of eggshell evidence. The use of eggshell fragment evidence resulted in the correct classification of the fate of the different species of shorebirds from both Colorado and Alaska in at least 90% of the cases. Both the egg flotation technique and eggshell evidence can be used in future studies to calculate accurate measures of reproductive success that are needed for ecological investigations of shorebirds, an important group of declining birds.

DISCORDANCE BETWEEN NESTLING AND MATERNAL SUCCESS IN COMMON GRACKLES

J. Dylan Maddox, Department of Ecology and Evolution, University of Chicago, 1101 East 57th Street, Chicago, IL 60637

We examined whether multiple maternal effects were relevant to the success of individual nestlings and to maternal success in common grackles (Quiscalus quiscula). Although considerable variation occurred both within and among clutches for all of the maternal effects we assessed (i.e., hatching asynchrony, individual egg size, mean egg size, sex, clutch initiation date), maternal effects that benefited mothers versus those that benefited their offspring were not congruent. The maternal effect that had by far the greatest influence on the fate of individual nestlings within nests was hatching asynchrony. In general, the earlier that a nestling hatched relative to its siblings, the heavier it was and the more likely it was to fledge. Among nests, however, clutch size had the greatest influence—females laying larger clutches fledged more young than females laying smaller clutches. Thus, most of the maternal effects that we assessed were irrelevant because both nestling and maternal success were largely determined by a single, albeit different, maternal effect. Female condition may dictate which strategies individuals adopt to adjust brood size to coincide with their ability to raise young. In this species, determining whether females adaptively allocate maternal effects over their lifespan will ultimately require following individual females of known condition over multiple years.

MALE COMMON LOONS (GAVIA IMMER) YODEL MORE FREQUENTLY EARLY IN THE BREEDING SEASON BUT ENCODE GREATER AGGRESSIVE MOTIVATION WITHIN YODELS WHEN COSTS OF LOSING OFFSPRING ARE HIGH.

Jay Mager, Katie Klotz, and Kimberly Trinkle, Department of Biological and Allied Health Sciences, Ohio Northern University, Ada, OH 45810.*

Male Common Loons (Gavia immer) produce territorial vocalizations called yodels to communicate their identity, condition-dependent fighting ability, and aggressive motivational state. We examined whether the rate at which males yodeled to conspecifics, as well as whether the number of two-syllable repeat phrases they produced within each yodel (which is believed to be directly related to their aggressive motivational state), were related to specific stages (pre-nesting, nesting, post-hatching, and nest failure) of the breeding season. Through time-activity budgets of 20 individually-banded territorial males over four breeding seasons within north-central Wisconsin, we found that males yodeled more frequently during pre-nesting period (Friedman's ANOVA X23, 19 = 24.358; P<0.0001). From a subset of males we observed yodeling during all of these four periods, we also found that males gave significantly more repeat phrases per yodel (reflecting greater aggressive motivation) during the post-hatching period relative to the nesting period and during periods after which nests had failed (repeated-measures ANOVA F4, 3 = 4.034; P = 0.033). We believe these results indicate that: 1, like many songbirds, male loons yodel most frequently early in the breeding season when reestablishing territories and pair bonds, and 2, male loons communicate a heightened aggressive motivational state through these yodels during a stage in the breeding season when the cost associated with losing current offspring (i.e., the unlikelihood of successfully raising replacement offspring during the season) is greatest.

S,U NEST SITE SELECTION OF THE SNOWY PLOVER (CHARADRIUS ALEXANDRINUS) IN THE MARISMAS NACIONALES, NAYARIT, MEXICO AND GREAT SALT LAKE, UTAH.

Paulina Martinez, Programa de Biología, Universidad Autónoma de Nayarit; Carlos Villar, SEMARNAT, Nayarit, Mexico, Juan Pablo Ramirez, Programa de Biología, Universidad Autónoma de Nayarit, and John F. Cavitt, Avian Ecology Laboratory, Department of Zoology, Weber State University, Ogden, UT.

Wetlands at Great Salt Lake, Utah and Marismas Nacionales, Nayarit provide important habitat for both wintering and breeding shorebirds, especially Snowy Plover (Charadrius alexandrinus). we examined habitat use and nest site selection of Snowy Plover nesting at two sites within the Marismas Nacionales: Lagunas "Las Grazas" and "Chumbeño", as well as five sites located at the Great Salt Lake: "Saltair", "Farmington Bay", "Shorelands", "Antelope Island Causeway" and the "Bear River Migratory Bird Refuge". Snowy Plover nests were located at each site. Once nesting had finished, we estimated the composition of the vegetation at each nest site, at 1 meter and 5 meter in each cardinal direction (N-S-W-E). Distance to nearest water, nest substrate used was also determined. We also compared the nest site characteristics between nests that were successful with those nests that failed in order to determine if nesting fate can be predicted based on characteristics of the nest location.

S,G INTERPRETING BREEDING BIRD SURVEY DATA IN THE FACE OF CLIMATE CHANGE

Christopher J.W. McClure, Department of Biological Sciences, Auburn University; Nathan D. Burkett-Cadena, Department of Entomology and Plant Pathology, Auburn University; Russell A. Ligon and Geoffrey E. Hill, Department of Biological Sciences, Auburn University*

Global warming is causing birds to breed and migrate earlier. Because bird detectability is often correlated with breeding stage, earlier breeding dates could shift the timing of peak detectability for some species, thereby changing the number of birds perceived during surveys conducted at the same time each year. Such changes could be erroneously interpreted as changes in bird abundance. Declines in the numbers of some Neotropical migrant bird species detected per count period have occurred concurrent with changes in breeding phenology linked to climate change. These declines in bird number have been attributed to changes in abundance without due consideration of changes in detectability. We modeled the detectabilities of 31 bird species in southern Alabama throughout the breeding season, and we documented strong temporal variation in the detectability of many species. We then used our detectability estimates to calculate expected change in the number of detections during censuses conducted within fixed dates, assuming a one-week shift in breeding activity, as a means to test whether changes in detectability could underlie observed trends in Breeding Bird Survey (BBS) data within the state of Alabama. Although change in detection was significantly correlated with migrant status (migrant versus resident), changes in detectability did not account for trends in BBS data. Moreover, migrant birds did not show a disproportionate decline within the state of Alabama. Our results suggest that while migrant detectability may be declining during BBS dates, observed declines in BBS data cannot be dismissed as due to shifts in phenology.

MOLT TIMING IN RELATION TO REPRODUCTIVE STATUS AND ENVIRONMENTAL CUES IN KENTUCKY WARBLERS (OPORORNIS FORMOSUS)

M. Victoria McDonald, Smithsonian Conservation Biology Institute, Front Royal, VA 22630, USA.

The timing and extent of molt in adult Kentucky Warblers (Oporornis formosus) at the end of the breeding season has been observed since 1989 at a mid-Atlantic study site, the Smithsonian Conservation Biology Institute (formerly Conservation and Research Center) near Front Royal, Virginia. In general, these warblers' molt patterns are typical of mid-latitude North American Parulidae. I investigated whether differences in the timing of molt onset, molt patterns (e.g., body areas), and molt extent (i.e., rapidity of loss and replacement of feathers) was related to reproductive status and environmental cues in this well-studied population. The following were not significantly correlated with onset, patterns, or extent of molt: age of adults, time of arrival on breeding grounds, year-to-year breeding site tenacity, previous years' breeding success, number of young attempted or hatched, within the season prior to molt onset, number of nesting attempts prior to molt onset, rainfall, heat accumulation days, and date of last nest initiation. Only one factor investigated, sex, correlated significantly with different dates of molt onset. The results of this investigation indicate that pre-basic molt in adult Kentucky Warblers at this study site is strongly, if not solely, influenced by photoperiod cues. Advantages and disadvantages of a molt strictly controlled by photoperiod are discussed.

S,G NATAL PHILOPATRY IN A NEOTROPICAL MIGRATORY SONGBIRD

Matt Mckim-Louder, Natural Resources and Environmental Sciences, University of Illinois, Champaign, Illinois, USA; Jeffrey P. Hoover, Institute of Natural Resource Sustainability, Illinois Natural History Survey, Champaign, Illinois, USA*

Although we currently understand remarkably little about the natal dispersal patterns of birds, it is assumed that most long-distance migratory passerines breed far from natal locations. Limited observations of natal dispersal movements in migratory species may reflect inherent issues associated with studying migratory birds (e.g. limited study areas, few marked individuals, vast available habitat) rather than an actual lack of philopatry. Natal philopatry, breeding near one's natal location, has been reported in populations with restricted dispersal opportunities (e.g. on islands or isolated), but these habitat limitations fail to reflect most Neotropical migrants. From 1995-2008, we banded nestling Prothonotary Warblers (Protonotaria citrea) (n = 7909), a long-distant migrant, in a large nest box study (~1500 nest boxes) located in southern Illinois. Calculating the natal dispersal distance of only second-year recruits (n = 391) revealed relatively low mean (2.2 km) and median (1.4 km) natal dispersal distances. To determine whether these results represent a philopatric population rather than a biased estimation limited by study area, we used song playback to search for banded recruits in a majority (81%) of total available habitat within a 30-km buffer surrounding all nest boxes. The proportion of banded recruits observed within the core study area (5 km buffer surrounding nest boxes) was significantly greater (15%) than outside the core (<1%). Based on systematic surveys outside the core study area and the observed natal dispersal distribution, we conclude that most juvenile Prothonotary Warblers return to breed near their natal origins.

S,G POTENTIAL FOR BIRD CONSERVATION OF TREE VEGETATION TYPES AT THE HUASTECA REGION OF SAN LUIS POTOSÍ, MEXICO

Victor Hugo Mendoza-Rodriguez and Leonardo Chapa Vargas, Division of Environmental Sciences, Institute for Scientific and Technological Research of San Luis Potosi (IPICYT), Camino a la Presa San José 2055. Col. Lomas 4ta Sección C.P. 78216, San Luis Potosí, SLP, Mexico.*

The Huasteca Region of San Luis Potosí, located at the northeastern portion of the Gulf coast slope of Mexico contains a large portion of the northernmost distribution of the Mexican Neotropics. It harbors extremely high diversity in a relatively good conservation status. However, anthropogenic pressures due to ongoing changes in land use are a major threat to this biodiversity. The objective of our study was to identify important sites for conservation of Neotropical resident and migratory birds, and we hypothesized that primary forests would be the most important habitats. This is part of an ongoing international project that aims at protecting lands for both resident and migratory birds. Mist netting was carried out in the most dominant vegetation types of the region including short tropical moist forest (STF), medium tropical moist forest (MTF) and second growth (SG) during both the wet and dry seasons. We found that the habitat with the highest diversity was STF (Shannon = 2.758). When we included all bird species in the analysis, the highest value for bird conservation was STF (32.1), followed by SG (30.166) and MTF (19.696). After removing species with low-sensitivity values from the analysis the trend held (STF= 18.53, SG =13.51, and MTF = 12.94). The complementarily index of Colwell & Codington showed the highest similarity between STF and MTF (64.86%), and the greatest complementarity between MTF and SG (72.34%). Although MTF had the smallest values of species richness, diversity and importance of conservation, the greatest number of species of intermediate sensitivity was recorded in this habitat. Contrary to our original prediction, SG is as important to bird conservation as MTF and STF, especially because it is used by Neotropical migrants as well as some residents of medium and high-sensitivity. SG habitats may be important because they may naturally form part of the disturbance-generated mosaic. Therefore, a comprehensive management plan should include all habitats.

MONITORING IDAHO'S COLONIAL WATERBIRDS: ROLE OF THE IDAHO BIRD INVENTORY AND SURVEY

Colleen E. Moulton, Idaho Department of Fish and Game, Boise, ID 83707

The Idaho Bird Inventory and Survey (IBIS) is a plan to monitor all birds (waterbirds, shorebirds, waterfowl, and landbirds) throughout the state in a coordinated, standardized manner. Phase I of the IBIS Program has emphasized monitoring of aquatic species and habitats, as this avian group had previously received little attention in Idaho. As a result of this emphasis, Idaho was uniquely equipped to participate in the current Western Colonial Waterbird Inventory coordinated by U.S. Fish and Wildlife Service. Using nesting guilds (e.g., island nesters) to organize our inventory effort, we focused on island and tree nesting species in 2009 and marsh nesting species in 2010. In 2009, we surveyed all 9 known island and 103 tree colonies in the state. Ten colonial waterbird species were detected and over 25,000 nests were counted. Six of these species (black-crowned night-heron, snowy egret, great egret, California gull, American white pelican, and Caspian Tern) are Species of Greatest Conservation Need (SGCN) in Idaho. In 2010, we completed the tree colony survey and surveyed all known marsh colonies of 6 additional SGCN (western and Clark's grebes, white-faced ibis, black and Forster's terns, and Franklin's gull). At the completion of this two-year survey effort, we have a comprehensive picture of nesting colonial waterbirds in Idaho. Combined with data from other western states that are participating in the Western Colonial Waterbird Inventory, this effort illustrates how IBIS can be used to provide an immediate and effective tool for implementing bird monitoring at both local and regional scales.

RAPID REPERTOIRE TURNOVER IN RED-EYED VIREOS

D. James Mountjoy, Jacob D. Scholl and E. Laine Badger, Department of Biology, Knox College, Galesburg, IL 61401.*

The paradigm for song learning in oscine birds has been a sensitive period in early life, followed by a stable song type or song repertoire later in life. This view has been modified by the realization that many species have some capability of modifying their song or adding to their song repertoire later in life. Red-eyed Vireos (Vireo olivaceus) appear to take this pattern to a new extreme. For individually banded vireos recorded in the field in multiple years, 72-100% of the song repertoire was new (not recorded in the previous year). However, no consistent trends for increases in repertoire size have been noted. It also appears that individual vireos may replace most of their song repertoire within less than a month. The functional significance of such rapid change in the song repertoire will be discussed.

CONSERVATION PLAN FOR THE SNOWY PLOVER IN NORTH AMERICA (CHARADRIUS ALEXANDRINUS NIVOSUS AND C. A. TENUIROSTRIS), EXCLUDING THE PACIFIC COAST POPULATION

Robert K. Murphy and William H. Howe, Division of Migratory Birds, U.S. Fish and Wildlife Service, Albuquerque, NM 87103.*

In the U.S. Shorebird Conservation Plan, Snowy Plover is classified as Highly Imperiled due mainly to 1) low overall population size, 2) declining population trend, and 3) multiple threats during breeding and nonbreeding seasons. These concerns prompted development of a Conservation Plan for the Snowy Plover as part of a series being developed through the Western Hemisphere Shorebird Reserve Network to help guide management and restoration of populations of imperiled species of shorebirds. Goals of the plan are to summarize current knowledge of the Snowy Plover's biology and population limiting factors and specify actions to resolve threats to the species and maintain or increase its abundance in North America. This presentation is a synopsis of the final draft of the plan, focusing on conservation strategies and actions for non-listed populations in the U.S. A goal of the presentation is to solicit comments and prompt discussion that improve the final product.

RECENT AND HISTORIC COLONIAL WATERBIRD USE AT GREAT SALT LAKE, UTAH

John Neill Great Salt Lake Ecosystem Program, Utah Division of Wildlife Resources, 4790 S 7500 W, Hooper, UT 84315*

Great Salt Lake, on average, covers over 1,600 square miles (4,100 km2) making it one of the largest terminal lakes in the world. Although the lake is saline (13-15 % salt), it is surrounded by 400,000 acres of wetlands comprising almost 75% of Utah's total. Three large drainage basins enter the lake along its eastern edge through an expansive network of diversions and impoundments managed by private duck clubs and preserves, state Waterfowl Management Areas, and the Bear River Migratory Bird refuge. Additionally, natural and artificial islands together with fringe and sheet flow wetlands along the mudflat shores of Great Salt Lake provide numerous areas for colonial waterbirds to nest. Each of the five major bays of Great Salt Lake is a Globally Important Bird Area and colonial nesting species alone qualify each bay for this status. American White Pelicans on Gunnison Island have numbered as high as 20,000 breeding adults. A lake-wide census in 1991 estimated 154,000 breeding California Gulls. A 2000 census counted 21,000 breeding White-faced Ibis and 14,000 Franklin's Gulls. The Great Salt Lake is part of the recent and ongoing Western Colonial Waterbird Survey (WCWS) coordinated by the U.S. Fish and Wildlife Service to catalog nesting colonial waterbirds in all 11 western states. Great Salt Lake data from the WCWS along with decades of historic records will be presented and compared.

[S,G] ROLE OF TOPOGRAPHY, CANOPY STRUCTURE, AND FLORISTICS IN NEST-SITE SELECTION AND NESTING SUCCESS OF CANOPY SONGBIRDS

Felicity L. Newell and Amanda D. Rodewald, School of Environment and Natural Resources, Ohio State University, Columbus, OH 43210.*

During presettlement times, many Eastern deciduous forests in North America are thought to have been open park-like woodlands rather than the closed-canopy, even-aged forests encountered today. Partial-harvesting is one management technique used to simulate historic disturbance regimes and, thereby, restore a more open forest structure. However, effective forest restoration requires a better understanding of specific habitat requirements for plant and animal species. The knowledge gap is especially large for canopy songbirds, which have been the focus of few studies. From 2007-2009 we examined nest-site selection and nesting success of a guild of five sensitive canopy songbirds in upland mixed-oak forests in southern Ohio, USA. Over 700 nests were monitored at 12 sites in three state forests with half in open canopy stands created through partial-harvesting (shelterwoods with 50% stocking) and half in closed-canopy mature forest. Habitat attributes, including topography, canopy structure, and floristics, were measured at nest sites and random plots ≤ 100 m from nests representing habitat available within the territory. The best-ranked models indicate that canopy structure was important in nest-site selection, as canopy openness or tree size was among the top models for all species. Cerulean warblers (Dendroica cerulea) especially favored northeast facing slopes. Selection for red and white oaks (Quercus spp) varied among species, but overall four species selected white oak (Quercus alba) as the nest substrate twice as much as available at random, while daily survival rates of nests were negatively associated with red oaks for several species and across all canopy species. Our data suggest that, as a whole, canopy songbirds are sensitive to forest structure and seem to favor open canopies with fewer medium trees and white oaks.

RESTORATION IMPACTS ON SHRUBSTEPPE BIRDS AND A CALL FOR PLANNING AT WATERSHED SCALES.

Russell Norvell, Utah Partners in Flight Program Coordinator, Utah Division of Wildlife Resources, Salt Lake City, UT 84114-6301

Disturbance and stability play fundamental roles in the creation, maintenance, and restoration of shrub-steppe bird habitats. Active restoration of shrub-steppe areas, primarily for the benefit of declining avian species such as the Greater Sage Grouse, is increasingly seen as a viable alternative to the widespread and accelerating drift into monocultural state-basins of annual exotics –a change considered undesirable by humans and a variety of endemic bird species alike. But the goals of restoration and the scale of disturbance involved in active restoration are not yet well matched. As a result, goals underlying active restoration projects can vary considerably even within planning units. Ecological assumptions, specifically that restorations benefitting Greater Sage Grouse inevitably benefit other shrub-steppe associated birds are not well explicated or tested. Using a combined BACI and case-control experimental design, I studied the short-term impacts of replicated, large-scale vegetation treatments (mechanical shrub-cover reductions) designed to improve long-term habitat quality for shrub-steppe associated birds at landscape scales. The density, territorial density, habitat selection, and nesting success of four focal species were intensively studied: Brewer's Sparrow, Sage Sparrow, Sage Thrasher, and Vesper Sparrow. Impacts varied in magnitude, onset, duration, and scale by species. Taken together, the diverse habitat requirements of the focal species indicate restoration prescriptions should be regionally coordinated to compensate for necessary local compromises.

RANGE EXPANSION AND LEAD EXPOSURE OF ARIZONA-RELEASED CALIFORNIA CONDORS

Chris N. Parish, The Peregrine Fund, 5668 W. Flying Hawk Lane, Boise, ID 83709; Keith Day, Utah Division of Natural Resources, 1470 North Airport Road, Suite #1, Cedar City, UT; Kathy Sullivan, Arizona Game and Fish Department, Region II, 500 South Lake Mary Road, Flagstaff, Arizona 86004; Eddie Feltes and Grainger Hunt, The Peregrine Fund, 5668 W. Flying Hawk Lane, Boise, ID 83709*

In 1996, as part of the California Condor Recovery Program, The Peregrine Fund, in cooperation with state and federal agencies, began releasing California condors (Gymnogyps californianus) to northern Arizona. Each year since, 8 to 15 captive bred condors, (and a total of eleven wild-hatched young) have been added to the population. Fifty-one birds have died or gone missing, and 10 have been returned to captivity. By the early 2000s, lead poisoning had become, and remains today, the leading cause of death. Our studies have shown that bullet fragments in the discarded remains of rifle-harvested game are the principle source of exposure. In 2005, The Arizona Game and Fish Department instituted a lead awareness campaign and distributed premium non-lead (copper) ammunition to deer hunters in northern Arizona. In each of the past three years, over 80% of hunters have voluntarily helped to reduce lead available to scavengers on the Kaibab Plateau through the use of non-lead ammunition and gut pile removal. Although lead levels have decreased slightly, lead exposure and lead-caused deaths continue. Radio-tracking data suggest that the continued exposure is in part associated with the population's recent tendency to forage in southern Utah during the summer and fall, including the hunting seasons. As a result of these findings, the Utah Division of Wildlife has implemented a lead awareness program similar to the Arizona effort.

DISTRIBUTION AND OCCURRENCE OF COLONIAL WATERBIRDS IN UTAH

Ed Parker, Valerie Frokjer, Monica Linford and John F. Cavitt, Avian Ecology Laboratory, Department of Zoology, Weber State University, Ogden, UT 84408*

Information on the distribution and breeding status of colonial waterbirds is important for defining conservation actions in Utah. The U.S. Fish and Wildlife Service is currently coordinating a three-year survey of colonial waterbirds in 11 western states. In accordance with this effort, we surveyed the entire state of Utah, excluding the Great Salt Lake, in May and June of 2009 and 2010. The state was divided into a northern and southern region by following the southern boundaries of Uintah, Carbon, Sanpete, and Juab counties. The first year of the project surveyed the northern region and the second year the southern region. The goal of the survey was to identify and characterize colonial waterbird nesting locations within each region of the state. Information collected included geographic location, species composition, number of adults, number of nests, and number of juveniles at each site. During the survey we located and recorded the distributions of 17 colonial water bird species. Great Blue Herons (Ardea herodias) were the most widespread breeding species, followed by Western Grebes (Aechmophorus occidentalis) and California Gulls (Larus californicus). California Gulls had the largest breeding colonies recorded, with several consisting of over 5,000 nests. The distribution of breeding species, colony size as well as habitat associated with the colonies will be reported.

BODY MASS OF EASTERN BLUEBIRDS DURING WINTER IN TENNESSEE

David Pitts, Department of Biological Sciences, University of Tennessee at Martin, Martin, TN 38238

Eastern Bluebirds (Sialia sialis) that nest in the mid-latitudes of the United States do not migrate and, consequently, they may be subjected to harsh winter weather. One of their adaptations to cold weather and temporary food shortages is an increase in body mass in early winter. They maintain this increase in mass, if possible, through January and February, the two months when challenging weather (in the form of ice, snow, and low temperatures) is most likely to occur. The objectives of this study included determining the effects of age, sex, location, and year on winter body mass of bluebirds in Weakley County, Tennessee. During January-March of 2009 and November-March of 2009/2010 my field assistant and I determined the body mass of bluebirds that we trapped at feeders stocked with mealworms. We made a total of 225 captures, involving 22 females, 22 males, and 1 bird whose sex was not determined. Bluebirds captured in January and February typically exceeded the mean breeding season body mass, which is approximately 30 g, by 2-10 g. Most older birds of both sexes had a greater body mass than young individuals. Mean body mass was not significantly different between the sexes or between four trapping sites. Bluebird body mass during the winters of 2009 and 2010 did not differ significantly from the body mass of bluebirds captured in the same area during the winters of 1986-1989.

SWAINSON'S THRUSH MIGRATION: TRACKING OFFSHORE MIGRATION BY FLIGHT CALL

Michael Powers, Anne Klingensmith, and Andrew Farnsworth, Cornell Lab of Ornithology, Ithaca, NY 14830, and Nick Lethaby, Goleta, CA 93117

The Swainson's Thrush (Catharus ustulatus) is a widespread breeding bird across the boreal forest and western North America, the western population wintering in tropical Mexico and Central America. Western birds are known to migrate along the Pacific Coast in spring and fall, though in fall migration there appears to be a paucity of migrants onshore while offshore observers frequently hear their flight calls during the pre-dawn hours. In fall 2009 we deployed autonomous recording units (ARUs) on Santa Barbara Island (Santa Barbara Co., CA) to document and quantify Swainson's Thrush migration over the California Bight. The ARUs recorded each night, starting six hours before sunrise and recording until thirty minutes after sunrise. We used Raven 1.4 sound analysis software to detect Swainson's Thrush flight calls, giving a record of their movement over the island. We identified 657 calls between 3 September and 15 October 2010. During that range we found 13 nights held no calls while dozens of calls were recorded on seven different nights. On two nights we recorded over 100 calls. The majority of calls were recorded in the two hours before sunrise, with the highest number in the hour before sunrise. Additionally, we found that high instances of nightly calling corresponded to periods of substantial fallouts of Swainson's Thrush on the island, particularly the high call counts in October. Based on our successful pilot season we will deploy units to Santa Barbara Island again, as well as additional islands off coastal California and on the mainland, to further quantify the extent of their migration along this oversea route. In addition, we anticipate applying this approach to identify other species that may follow a similar migration strategy.

DOES CLUTCH SIZE INCREASE OR DECREASE WITH INCREASING ELEVATION?

Kathryn L. Purcell, USDA Forest Service, Pacific Southwest Research Station, 2081 E. Sierra Avenue, Fresno, CA 93710

A fundamental paradigm of avian reproductive ecology is that clutch size increases with latitude but the relationship between clutch size and altitude is less clear. I examined clutch sizes of seven species nesting across an elevational gradient in the Sierra Nevada, California. Clutch size decreased with increasing elevation for three open-nesting species (Cassin's Vireo, Dark-eyed Junco, and Dusky Flycatcher). Two other open-nesting species (American Robin and Hammond's Flycatcher) showed no significant response but followed the same pattern. In contrast, clutch size did not vary with elevation in two cavity-nesting species (White-headed Woodpecker and Mountain Chickadee). These results suggest that the response of cavity nesters to environmental conditions that vary with elevation differs from that of open nesters. Cavity nesters breed earlier and tend to be single brooded and are therefore less constrained by the shorter period over which conditions are considered suitable for breeding at higher elevations. Reduced thermoregulatory costs relative to open-cup nesting species due to the insulation of cavities and larger brood sizes may allow cavity nesters to lay similar-sized clutches at different elevations. Clearly, a single life history trait such as clutch size cannot explain the complex factors related to life history strategies, but comparison across species that differ in response to elevation may be helpful in elucidating trade-offs in life history strategies. In any case, the patterns and processes applicable to life history strategies of latitudinal and elevational gradients appear to differ. These results suggest that cavity-nesting species are less affected by elevation than open-nesting species.

MOLT PATTERNS AND AGE AND SEX DETERMINATION OF LANDBIRDS ON SAIPAN, NORTHERN MARIANA ISLANDS

Paul Radley, Commonwealth of the Northern Mariana Islands Division of Fish and Wildlife, Department of Lands and Natural Resources, Saipan, MP; Andrea Crary, James Bradley, Christina Carter, and Peter Pyle, The Institute for Bird Populations, Point Reyes Station, CA*

Although well documented for temperate birds, molt timing and sequence, and plumage development in age and sex classes are poorly understood for resident tropical species. We used data from six banding stations originally established on Saipan in 2008 and examination of 277 museum specimens to determine patterns of molt and to establish criteria for ageing and sexing 10 resident landbird species on the island. With one exception, molt sequences in Saipan's resident landbirds are typical of passerines. Preformative molt (occurring in nine species) and definitive prebasic molt (occurring in all species) are incomplete to complete. Prealternate molt appears to be absent. We developed sexing criteria for sexually dimorphic species using plumage cues, presence of brood patch or cloacal protuberance, and morphological measurements. Although distinct periods or seasons of molt are not well defined and can vary between years, age determination based on molt limits, feather shape and condition, and degree of skull pneumatization is possible for most landbird species on Saipan.

[S,G] RADIO TRANSMITTERS DO NOT AFFECT THE BODY CONDITION OF SAVANNAH SPARROWS DURING THE FALL PRE-MIGRATORY PERIOD

Lauren F. Rae, Greg W. Mitchell, and D. Ryan Norris, Department of Integrative Biology, University of Guelph, Guelph, ON N1G 2W1; Christopher G. Guglielmo, Department of Biology, University of Western Ontario, London, ON N6A 5B7; and Robert A. Mauck, Department of Biology, Kenyon College, Gambier, OH 43022*

Radio telemetry can be an extremely valuable tool for studying the behavior, physiology and demography of a wide range of animals. We tested the major assumption that there are no adverse effects of radio transmitters on body condition in an island population of Savannah Sparrows (Passerculus sandwichensis) between the breeding and migratory periods. To assess change in condition, 20 radio-tagged and 25 non-tagged individuals were captured and recaptured throughout the post-fledging period (total recaptures N = 61). We used four measures of condition: mass, an index of fat free dry mass (measured via heavy water dilution), pectoral muscle depth (measured via ultrasound imaging), and an index of fat mass (measured via heavy water dilution). Using both a generalized linear modeling framework and paired design, we found no significant difference in body condition between radio-tagged and non-tagged adults and juveniles. Our results provide evidence that radio-tags have no effect on the condition of Savannah sparrows during the pre-migratory period.

PROVISIONING BEHAVIOR OF MALE AND FEMALE GRASSHOPPER SPARROWS

Gary Ritchison and Jen Adler, Department of Biological Sciences, Eastern Kentucky University, Richmond, KY 40475.*

The relative contributions of males and females in caring for young vary among species, with male behavior most variable. Additional study is needed to better understand the factors that influence provisioning strategies. We examined the provisioning behavior of male and female Grasshopper Sparrows (Ammodramus savannarum), a songbird that nests in grassland habitats with high rates of nest predation. In 2002 and 2003, we videotaped the nests of 15 pairs and found no difference in the provisioning rates of males and females ($P = 0.13$), with mean provisioning rates of 2.2 ± 0.2 (SE) visits per hour for females and 1.9 ± 0.1 visits per hour for males. Provisioning rates varied with nestling age ($P = 0.01$), with rates lower for 1-4-day-old nestlings, increasing through day 6 post-hatching, then declining for 7-10-day-old nestlings. Provisioning rates also varied with brood size ($P = 0.026$), with rates higher for broods of five than broods of three or four. High rates of nest predation may favor relatively high provisioning rates by male Grasshopper Sparrows, with male provisioning insuring rapid growth of nestlings and earlier fledging. For pairs with large broods, male contributions may also help insure that nestlings are fed at comparable rates regardless of brood size. Such compensation may enhance reproductive success because mass at fledging is an important predictor of survival for young birds. Male and female Grasshopper Sparrows reduced provisioning rates during the days prior to fledging, possibly to induce young to fledge, and such behavior may also be a response to high rates of nest predation.

[S,G] THE EFFECT OF WATERFOWL IMPOUNDMENTS ON SORA AND VIRGINIA RAIL POPULATIONS

Ellen Robertson and Brian Olsen, Department of Biology and Ecology, University of Maine, Orono, ME 04401.*

Freshwater wetlands have experienced steep declines in North America. Wetland habitat loss threatens species that breed in these wetlands including sora (Porzana carolina) and Virginia rail (Rallus limicola). A common management technique for creating new wetland habitat is the impoundment of aquatic areas. The effects of impounded wetlands have been studied for waterfowl and shorebirds but remain untested for rails. The more stable water levels of impoundments could be beneficial for rails by increasing foraging success and decreasing nest predation, but impoundments could also have a negative impact by increasing nest flooding and mercury levels, and by decreasing the diversity of prey and vegetation. Studying the impacts of impoundments is difficult with traditional broadcast surveys due to the confounded influences of reproductive stage and vocalization probability. This talk will address the results of the first two years of a three year study on whether 1) the hydrologic profile of impounded wetlands affects rail nesting success 2) rail blood mercury levels are affected by wetland impoundment 3) rails respond differently to broadcast surveys at different reproductive stages.

RAPTOR NESTING ECOLOGY IN THE WEST DESERT OF UTAH

Steven J. Slater and Jeff P. Smith, HawkWatch International, Inc., 2240 South 900 East, Salt Lake City, UT 84106*

We summarize the findings from 10 years of raptor nest survey work conducted in shrubsteppe and adjacent habitats of northwestern Utah between 1998–2007. Our results stress the importance of a territory focus for the monitoring and protection of nesting raptors, as individual nests typically are not independent entities. Further, extended intervals of inactivity between individual nest use suggests that extending 5-years of protection to inactive nests may be reasonable. Egg laying dates for focal study species did not differ consistently from values reported 15–30 years earlier in the immediate vicinity. A period of severe drought during the study did not appear to greatly affect nesting activity of most focal species, with the Ferruginous Hawk (Buteo regalis) being one notable exception. Range fires were most common during the onset of dry periods immediately following wetter than average conditions (i.e., when fuel loads were high). Although few nests were lost directly to fire, invasive cheatgrass (Bromus tectorum) is a major threat within the Great Basin and West Desert of Utah and may represent an “ecological trap” for the Burrowing Owl (Athene cunicularia) and Ferruginous Hawk. We found that these two species were attracted to nesting in cheatgrass-dominated habitats, but used such areas less consistently over the long-term or experienced lower reproductive output there. We recently entered into a collaborative research endeavor funded through the Department of Defense Legacy Program to further investigate the potential implications of cheatgrass to select raptor species, their prey, and West Desert land managers.

MORTALITY FACTORS AND PREDATORS OF SPOTTED TOWHEE NESTS IN THE SACRAMENTO VALLEY, CALIFORNIA

Stacy L. Small PRBO Conservation Science, 4990 Shoreline Highway, Stinson Beach, California 94970 USA

Nest predation was the main nest mortality factor for Spotted Towhees (Pipilo maculatus) along the Sacramento River, California, during 1993–2003, followed by cowbird parasitism. From 2001 to 2003, I monitored 161 Spotted Towhee nests and filmed 24 nests using miniature infrared video cameras to identify predators. Daily survival rate was 0.928 for this period. I detected no difference in nest survival between the incubation and nestling stages. Nests with cameras had marginally higher survival rates than those without. I filmed nine nest predation events in 2002 and 2003. Eight of these were upon nestlings, while one was upon eggs. Predators were birds, mammals, and a snake, including the Red-shouldered Hawk (Buteo lineatus), Brown-headed Cowbird (Molothrus ater), Western Scrub-Jay (Aphelocoma californica), a raccoon (Procyon lotor), black or Norway rats (Rattus sp.), two unidentified rodents, and a racer (Coluber constrictor). Many of these predators are associated with agriculture and/or human habitation. I documented two multi-predator events. In both instances, a diurnal partial predation by a bird was followed by a nocturnal rodent predator. Two predation events occurred at the very end of the nestling period. I advise investigators engaged in nest success studies to consider the possibility of partial predation that may reduce a female's overall reproductive output and note that a nest should only be considered successful when direct evidence of fledglings is observed near the nest. I recommend more detailed studies of nest predator composition and the compound effects of Brown-headed Cowbird nest parasitism and ''infanticide.'' Follow up analyses investigated factors at multiple scales that influence nest predation risk for Spotted Towhees on these sites, in the context of riparian floodplain restoration in a predominately agricultural landscape.

Nests containing cowbird young were more likely to avoid predation than unparasitized nests, implicating cowbirds as nest predators on one of the few remaining open-cup nesting species on our study sites. These analytical results corroborated our earlier video evidence that cowbirds were acting as nest predators in this region, but possibly in a more significant role than video data had suggested. Hoover and Robinson (2007) concurrently conducted an independent, experimental study of Prothonotary Warblers in a different riparian landscape that demonstrated both "mafia" and "farming" behavior in cowbirds that depredate nests to create new parasitism opportunities or retaliate against ejection of cowbird contents by hosts.

ADULT SEX RATIO, SURVIVAL, AND MATING OPPORTUNITY IN THE SNOWY PLOVER

Lynne E. Stenzel, Gary W. Page, Jane C. Warriner, John S. Warriner, Kristina K. Neuman, Douglas E. George, Carleton R. Eyster, and Frances C. Bidstrup, PRBO Conservation Science, 3820 Cypress Drive Suite 11, Petaluma, California, 94954*

Sexual differences in adult mortality may be responsible for male-skewed adult sex ratios in birds. A surplus of breeding males is common in serially polyandrous populations of Charadrius alexandrinus. We examined a Snowy Plover population of conservation concern in coastal California for a biased sex ratio and sexual differences in opportunities for early season nesting and adult survival. Among years with most birds banded, the median population of nesters was 99 males and 84 females (median male-female difference = 8), resulting in 1 extra male per 6-8 pairs. The number of potential breeders without mates by the date on which the first nest hatched each year was higher for males than females by 1-14 (median = 8) individuals. True adult male survival (0.74, SE = 0.02) exceeded that of females (0.69, SE = 0.02) in top ranked models using Barker's (1999) joint model for combined sources of information. Fidelity to the study area was higher for males than for females, and higher for plovers banded as chicks at Monterey Bay than for those first banded otherwise, but lower the year of marking than in subsequent years. The probability of return to the study area for breeding birds absent the previous year was also higher for males than for females and for HY than AHY sample birds. Overall, our results support the hypothesis that a male-biased sex ratio in C. alexandrinus results from a sexual difference in adult mortality.

[S,U] EFFECTS OF SUMMER GONDOLA OPERATION ON BIRD POPULATIONS IN A HIGH ELEVATION WETLAND SYSTEM

Matthew R Stoddard, and Major Professor, Christy Ann Carello, Department of Biology, Metropolitan State College of Denver, Campus Box 53, P.O. Box 173362, Denver, CO 80217-3362; and Heide Andersen, Open Space and Trails Planner III, Department of Open Space and Trails, Town of Breckenridge, 150 Ski Hill Rd., P.O. Box 168, Breckenridge CO 80424*

Cucumber Gulch is a high elevation wetland system in Colorado that contains rare fens and numerous beaver ponds. A high level of biodiversity is associated with Cucumber Gulch, and thus the EPA has designated it an Aquatic Resource of National Importance (ARNI). Extensive development has occurred on the perimeter of this wetland system and a gondola that crosses over the wetland system and fragments the mixed conifer buffer habitat was recently completed. Avian populations have been monitored by circular point counts monthly during the summer and bi-monthly during the winter since 2003. We have found that avian abundance and species richness have consistently peaked during the months of June and July. The gondola will run daily starting July 1, 2010. Our objective is to identify the immediate affects gondola operation will have on avian populations. We will conduct avian point counts under the gondola and along a control transect for seven mornings prior to and seven mornings following the onset of gondola operation. We predict that gondola operation will have a minimal impact on the avian community found along the gondola path because these species are already accustomed to previous habitat disturbance and because the operational noise and the movement of the gondola cars will be consistent and predictable. The results of this study will be presented to local land managers and ski resorts so that informed decisions regarding the summer operation of the gondola can be made in the future.

INNATE IMMUNITY IN NESTLING AND ADULT TREE SWALLOWS (TACHYCINETA BICOLOR)

Patrick A. Thorpe, Tammy Stambaugh, Brad J. Houdek and Michael P. Lombardo, Department of Biology, Grand Valley State University, Allendale, MI 49401.*

The innate immune system is the immediate and first-line of defense against pathogens in animals. Innate immunity is especially important in developing juveniles but few studies have investigated the pattern of development. While the ability to respond to pathogens confers fitness benefits in terms of health, survival and therefore future reproductive success, this may be in competition with such functions such as rapid growth since energy is a limiting resource. Rapid growth is a characteristic of early development so that innate immunity may be limited initially and should increase as individuals mature. We examined the patterns of innate immunity in nestling tree swallows over two seasons using a microbiocidal assay. The patterns of development and their relationship to growth patterns and other measures of fitness show a pattern of increasing development but also show that nestlings just prior to fledging have not fully developed adult levels of innate immunity. Additionally, nestlings just prior to fledging show higher variability in innate immunity levels as compared to adults.

PHYSIOLOGICAL AND ENVIRONMENTAL FACTORS INFLUENCING THE DISEASE COSTS OF INBREEDING IN COOPERATIVE CROWS

Andrea Townsend, Cornell Lab of Ornithology, Ithaca NY 14850; Anne Clark, Department of Biological Sciences, Binghamton University, Binghamton, NY 13902; Kevin McGowan, Cornell Lab of Ornithology; and Irby Lovette, Cornell Lab of Ornithology*

The disease costs of inbreeding are difficult to quantify in wild populations of birds, and the physiological and environmental factors modulating inbreeding depression in wild birds are largely unknown. We have documented close inbreeding, associated with severe disease and survival costs, in a population of free-living, cooperatively breeding American crows (Corvus brachyrhynchos) in suburban Ithaca, NY. Here, we show that inbred birds mounted a suppressed innate immune response relative to outbred birds. Furthermore, inbred birds were in relatively poor condition as nestlings, and nestling body condition (in addition to inbreeding coefficient) predicted disease mortality within the first three years of life. Although the frequency of inbreeding was similar across a land-use gradient, the costs of inbreeding appeared to be higher in the suburbs than in rural environments: degree of inbreeding did not appear to affect nestling body condition in rural areas. High crow density and poor diet might contribute to elevated disease costs of inbreeding in suburban environments.

[S,G] CATHARUS THRUSHES AS BIOINDICATORS OF MERCURY HOTPOTS: FROM THE CATSKILLS TO THE CARIBBEAN

Jason M. Townsend, SUNY-College of Environmental Science and Forestry, 1 Forestry Drive, Syracuse, NY 13244; Charles T. Driscoll, Syracuse University, Center for Environmental Systems Engineering, Syracuse, NY 13244; Christopher C. Rimmer and Kent P. McFarland, Vermont Center for Ecostudies, P.O. Box 420, Norwich, VT 05055*

Mercury is a potent neurotoxin that accumulates in the environment as a result of global atmospheric pollution. Little is known about mercury bioaccumulation in strictly terrestrial ecosystems. Here we show that mercury accumulation in the soil and leaf litter increased with elevation in a densely forested watershed of the Catskill Mountains, NY. Catharus thrushes arrayed along this elevational gradient also showed increased blood mercury content with increasing elevation. This may have important health and conservation implications for Bicknell's Thrush (C. bicknelli), which is restricted exclusively to forests above 1000 m in the northeastern United States. Bicknell's Thrushes and high elevation Swainson's Thrushes (C. ustulatus) showed significantly greater blood mercury levels than lower elevation congeners, Hermit Thrush (C. guttatus) and Veery (C. fuscescens). Additionally, blood mercury levels declined with season, indicating that early season thrushes either carry mercury from the winter grounds or consume a diet higher in mercury during the early part of the breeding season (May –June 15). We will be using stable isotope composition of blood samples to further understand any dietary shifts which might lead to this seasonal decline in mercury levels. Analysis of mercury in Bicknell's Thrushes wintering on Hispaniola showed the highest blood mercury levels of any birds in this study and also wide, site-specific variance, potentially reflecting local pollution patterns. We will be modeling Hispaniolan weather patterns and sources of local mercury outputs to determine site-specific mercury deposition patterns for the island. This will be the first such mercury-monitoring data for a Caribbean island.

A BIRD CONSERVATION STRATEGY FOR THE "YURIRIA" LAGOON NATURAL AREA OF MICHOACÁN, MEXICO

Leonardo Chapa-Vargas, Institute for Scientific and Technological Research of San Luis Potosi, Division of Environmental Sciences, Camino a La Presa San Jose No 2055, Lomas 4a Seccion, San Luis Potosi 78394, Mexico; Arturo Javier Salgado-Ortiz, Ornithology Lab, Universidad Michoacana de San Nicolás de Hidalgo, Morelia, México; and Karina Monzalvo-Santos, Institute for Scientific and Technological Research of San Luis Potosi, Division of Environmental Sciences, Camino a La Presa San Jose No 2055, Lomas 4a Seccion, San Luis Potosi 78394, Mexico.*

Many Inland floodplain systems of Central Mexico contribute to the long-term viability of local, regional, and global bird populations. Our study took place at the "Yururia" Lagoon of Guanajuato, Mexico, a Ramsar site and a 15,000 ha reserve protected at the federal level. Our goals were to inventory the bird community, to calculate bird conservation values, and based on this information, to identifying zones within the reserve for a bird conservation strategy that could be implemented by state authorities. Bird populations were monitored through mist netting and fixed-radius point-counts in the floodplain system covered by "Tule" (Typha latifolia), and in all associated terrestrial habitats (subtropical scrubland, natural grassland, secondary vegetation, and agriculture), and through systematic, direct observations from a boat in the lagoon. A geographic information system was used in combination with the ornithological information to identify conservation zones. Over 120 bird species were recorded including overwintering and breeding species, Mexican endemics, and species at risk. To minimize risks associated to deforestation, soil erosion, pollution, and water extraction, the following zones should be managed: 1) the conservation zone including the lagoon, it's associated floodplain, and the subtropical scrubland habitat as these had the highest bird diversity and conservation values, 2) a buffer zone including secondary habitats in which effects of overgrazing, and pollution should be minimized, 3) a restoration zone where reforestation actions could be implemented to possibly improve bird metapopulation dynamics, and 4) a harvest zone in which agricultural and grazing conditions should be controlled to minimize impacts.

[S,U] FOREST STRUCTURE AND TERRITORY SIZE RELATIONSHIP IN THE NEOTROPICAL UNDERSTORY INSECTIVORE WHITE-BREASTED WOOD-WREN HENICORHINA LEUCOSTICTA

Luis Esteban Vargas, Escuela de Biología, Universidad de Costa Rica, 2060 San Pedro, San José, Costa Rica; Natalie Viviana Sánchez, Instituto Internacional en Conservación y Manejo de Vida Silvestre, Universidad Nacional, 1350-3000 Heredia, Costa Rica; and Gerardo Ávalos, Escuela de Biología, Universidad de Costa Rica, 2060 San Pedro, San José, Costa Rica and The School for Field Studies, Center for Sustainable Development Studies, 10 Federal St., Salem, MA 01970, USA*

The Neotropical terrestrial insectivore Henicorhina leucosticta (Troglodytidae) maintains long-term territories through vocalizations and forages among leaf litter trapped in the understory vegetation and ground litter. The relationship between forest structure and H. leucosticta territory size was studied in La Selva Biological Station in Costa Rica, during the non-breeding season in 2009. Forest structure was measured by assessing canopy openness and leaf area index (LAI) using hemispherical photographs. Territory size was estimated with the playback technique using local conspecific vocalizations. Henicorhina leucosticta territory area was 3.8 ± 2.8 ha (mean ± SD, n=10). Territory radius length was similar in old growth forest and abandoned agro-forestry plantations. Canopy openness and LAI were negatively associated and high heterogeneity in habitat structure was predominant across territories. Territory size was not related to median canopy openness but a positive trend was observed. In turn, territory size decreased as median LAI increased. Within the context of the structural cues hypothesis, we suggest that greater leaf area in tropical rainforests can be used to infer higher arthropod abundance and more potential prey microhabitats for H. leucosticta, and other insectivorous birds with similar foraging behavior, due to greater leaf litter accumulation on the understory. These results could help to determine the viability of forest fragments to hold populations of terrestrial insectivorous birds, according to the effect of forest structure on territory size and habitat quality for these species in fragmented tropical landscapes.

[S,U] COMPARISON OF REPRODUCTIVE SUCCESS OF SNOWY PLOVER (CHARADRIUS ALEXANDRINUS) AT RESERVA DE LA BIOSFERA, MARISMAS NACIONALES, NAYARIT, MÉXICO, AND THE GREAT SALT LAKE UTAH.

Jonathan N. Vargas, Programa de Biología, Universidad Autónoma de Nayarit; Carlos Villar, SEMARNAT, Nayarit, Mexico, Juan Pablo Ramirez, Programa de Biología, Universidad Autónoma de Nayarit, and John F. Cavitt, Avian Ecology Laboratory, Department of Zoology, Weber State University, Ogden, UT.

The Marismas Nacionales (MN) is located along the Pacific coast of northwestern Mexico and covers an area of more than 200,000 ha. It is an important wetland site for both wintering and breeding birds and has recently received conservation status from the Mexican Federal Government. The Great Salt Lake (GSL) is a large terminal lake located in northern Utah and is an important location for migratory, wintering and breeding birds. Both sites are included within the Western Hemisphere Shorebird Reserve Network and thus host large, diverse populations of shorebirds. The Snowy Plover (Charadrius alexandrinus) is considered a bird of conservation concern throughout most of its range and can be found breeding at both sites. During the 2010 breeding season we initiated a project to compare the ecology and behavior of Snowy Plover nesting at both MN and GSL. We identified for the first time two important breeding sites for the Snowy plover in MN. A total of 51 nests were located in MN and 50 at GSL. The most important cause of nest failure for both sites was predation. Predation was higher at GSL relative to the MN but not significantly. These results confirm previous studies indicating that nest predation is intense at GSL. In addition, these results suggest that the MN is an important breeding site for Snowy Plover and is the second largest breeding site known for Mexico. This enhances the value of conservation for this area and also suggests that it is necessary to continue monitoring reproductive success of this species.

[S,U] SHOREBIRD SURVEY IN MARISMAS NACIONALES, NAYARIT, MÉXICO

Jonathan N. Vargas, Alianza Regional para la Conservación de las Aves y su Hábitat en Marismas Nacionales, A.C. and Programa de Biología Unidad Académica de Agricultura, Universidad Autónoma de Nayarit; David Molina and Emmanuel Miramontes, Alianza Regional para la Conservación de las Aves y su Hábitat en Marismas Nacionales, A.C.; Paulina Martínez Sarabia and Lidiana Ortega Solís, Alianza Regional para la Conservación de las Aves y su Hábitat en Marismas Nacionales, A.C. and Programa de Biología Unidad Académica de Agricultura, Universidad Autónoma de Nayarit; Carlos Villar Rodríguez, Alianza Regional para la Conservación de las Aves y su Hábitat en Marismas Nacionales, A.C. and Secretaria de Medio Ambiente y Recursos Naturales; Víctor Hugo Vázquez Moran and Javier Gómez, Reserva de la Biosfera Marismas Nacionales; Juan Pablo Ramírez-Silva, Alianza Regional para la Conservación de las Aves y su Hábitat en Marismas Nacionales, A.C. and Programa de Biología Unidad Académica de Agricultura, Universidad Autónoma de Nayarit; and John F. Cavitt, Avian Ecology Laboratory, Department of Zoology, Weber State University

Marismas Nacionales (MN) is an important wintering site for migratory birds in Northwest México. It is a complex of temporal and permanent wetlands with the principal habitats of mangroves, sandy beaches, shallow waters, coastal lagoons, and deciduous forests. The MN is a Ramsar Site, an International Site for shorebirds, and recently (May 2010) was decreed as Biosphere Reserve. For this study, we compiled data on the abundance, and occurrence of shorebirds within the MN. Data were collected from December 2009 to May 2010, in 25 study plots within five zones: Santiago, San Blas, Rosamorada, Tuxpan and Tecuala. A total of 35 shorebirds species were recorded, representing 196,745 individuals. The most abundant species were the Western Sandpiper (61,691), American Avocet (42,770) and both Dowitchers species (31,997). The most frequent species were Willet, Spotted Sandpiper and Black-necked Stilt which were present in 57 samples. In Santiago (32 spp) and Tuxpan (23spp), Dowitchers were the most abundant species; in San Blas (23 spp) the most abundant species was the Semipalmated Plover; Rosamorada (28 spp) American Avocet (29,471); and Tecuala (28 spp) Western Sandpiper (33,211). This dataset also provides new records for Dunlin (216 ind.) a species never recorded for this area. In addition, an important wintering group of Red Knots (3,712 records) was also discovered.

PATTERNS OF MOVEMENT AND POPULATION DYNAMICS OF THE SNOWY PLOVER WITHIN THE MARISMAS NATIONALES, MEXICO.

Carlos Villar, Director of the Dept. of Wildlife, SEMARNAT-Nayarit, México; Paulina Martínez; Jonathan Vargas; Lidiana Ortega; Juan Pablo Ramírez, Universidad Autónoma de Nayarit; David Molina and Emmanuel Miramontes, the Regional Alliance for the Conservation of Birds and Their Habitat in the Marismas Nacionales, A.C., Nayarit; John Cavitt, PhD, Director of the Office of Undergraduate Research, Professor of Zoology, Weber State University, Ogden, Utah.*

The Snowy Plover is a shorebird that has experienced significant population declines and is considered "threatened" by the Shorebird Conservation Plan of the USFWS. The loss of suitable habitat for breeding and rearing, particularly throughout the United States, along the Pacific and the Gulf Coast has resulted in the reduction in size of the breeding population. Current information suggests a breeding population of about 21,000 Snowy Plovers in the United States. In Mexico, the number of birds using our country during the winter, as well as the numbers of each of the three subspecies that breed here are unknown. Palacios reported 200 birds on the coast of Baja California; Kuepper reported Ceuta, Sinaloa as the most important site for breeding with 250 birds using it. This lack of information The results of this monitoring study in 2009-2010 in the Marismas Nacionales (MN) region, Nayarit, reported a population of 570 migratory and resident Snowy Plovers between December and April, representing 3.4% of the global population of Charadrius alexandrinus nivosus. We found in the lagoons of Las Garzas and Chahuin in Tecuala and El Chumbeño in Rosamorada, the largest wintering and breeding populations in the region of MN, banding in this first study of 2010, 73 birds (12.8% of those seen), of which 11 were nesting. Thirty-two nests in both sites have been found, of which 6 were depredated by mainly raccoons and two were abandoned. Nesting sites used were artificial mounds with remains of shells representing 80%, rocky mounds were 25% and 5% were sandy soils.

The material used for the building nests are 95% shell remains, 3% rocks, only 1.5% sand and less than 1% vegetation. The potential for reproduction of this species in these sites of MN is excellent because of the distance away from human activity, but there exists the danger of losing these sites to the establishment of aquaculture activities and tourist developments. From this aspect, the importance of these studies to provide elements for decision-making by environmental officials for the future of these sites is especially important now that the MN has been decreed as a Protected Natural Area of the Biosphere Reserve category. makes it impossible to identify the limiting factors of these birds and designing conservation plans.

SPATIAL AND TEMPORAL ASSOCIATIONS OF MALE REEVES'S PHEASANTS TO DIFFERENT FOREST EDGES IN THE DABIE MOUNTAINS OF CENTRAL CHINA

Ji-Liang Xu, College of Nature Conservation, Beijing Forestry University, Beijing 100083, China; Xiao-Hui Zhang, Zheng-Wang Zhang, and Guang-Mei Zheng, Ministry of Education Key Laboratory for Biodiversity Sciences and Ecological Engineering, College of Life Sciences, Beijing Normal University, Beijing 100875, China; and Yong Wang, Center of Forestry, Ecology, and Wildlife, Alabama A&M University, Alabama, 35762, USA.*

We studied how Reeves's Pheasants (Syrmaticus reevesii) responded to different forest edges in a fragmented forest landscape in central China using radio-telemetry. Fieldwork was carried out from April 2000 to August 2003 in Dongzhai National Nature Reserve in the Dabie Mountains. We identified four major types of forest edge: shrub, farmland, road, and residential. The associations of male pheasants with different forest edges were non-random: shrub edges were preferred over other three types of edges. Reeves's Pheasant hardly moved > 150 m away from shrub edge; they were associated with habitats far from farmland edges and within 100 m from the nearest road edges. Edge associations by male Reeves's Pheasants also varied by seasons, with a significant difference between winter and the other three seasons. Shrub edges were preferred by the birds during all seasons, whereas the birds were also more often associated with road edges in winter. Our data showed the habitat association patterns in relation to edge effects on this species. The results indicated that landscape configuration should be incorporated into management and conservation practices. The simple assessment or management framework for assessing habitat fragmentation and restoration for this pheasant could overlook key points for improving conservation strategies.

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