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2011 Annual Report

Joseph A. Cook

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Museum of Southwestern Biology

Joseph A. Cook, Director

Museum of Southwestern Biology
Annual Report for 2011

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Executive Summary

The Department of Biology's Museum of Southwestern Biology (MSB) excels as one of the most vital and productive units in the College of Arts & Sciences and throughout the University of New Mexico system. Through its world-class natural history collections, associated databases, and staff expertise, MSB provides significant research infrastructure, meaningful undergraduate experiences, cutting-edge graduate training, and substantial public-service and outreach through an extensive network of collaborations across the local, national, and international scenes. During 2011, MSB experienced outstanding collections-based activity, including high research activity and heavy engagement of undergraduate and graduate students. Metrics reflect strong overall productivity and suggest that MSB is emerging as a pre-eminent university-based museum, with several programs gaining national and international recognition. In addition to well-established programs at MSB, especially notable in 2011 is the high research, teaching and curation activity of two recent faculty curator hires (Drs. Miller and Witt). These individuals have energized the Divisions of Arthropods and Birds, respectively, as recorded by substantial undergraduate and graduate student participation, as well as significant grant and publication activity. Support from UNM over the last decade has translated into highly visible and productive programs at MSB that align well with UNM's tripartite mission of teaching, research and public service.

2011 Overview

The Museum of Southwestern Biology (MSB) is a research and teaching facility in the Department of Biology of the University of New Mexico. MSB houses collections of vertebrates, arthropods, plants and genomic materials that span deep temporal (more than a century) and broad spatial scales (representing primarily western North America, Central and South America, but with significant holdings from Asia, Africa, Australia and Europe). MSB consists of 7 divisions (Amphibians and Reptiles, Arthropods, Birds, Fishes, Genomic Resources, Herbarium, Mammals, and Parasites), Natural Heritage New Mexico and the USGS Arid Lands Field Station and Collections. MSB provides a key part of the scientific infrastructure necessary for investigators interested in understanding environmental and health issues facing society such as emerging zoonotic pathogens, climate change, invasive species, habitat conversion, and decreasing biodiversity. Annually, the large number of peer-reviewed publications supported by our collections attests to their value and this level of activity places MSB among the most productive research units on campus. Our web-accessible archives and associated databases constitute an unparalleled informatics resource that contributes to understanding the complexity of planetary life and related ecosystem function on local, regional, and global scales. MSB curators have active research and graduate programs that exploit the wealth of specimens and data in the collections. Unlike other faculty, they also commit considerable effort to build a shared resource for the scientific community, Curators and collection managers then strive to make these incredibly valuable collections and data accessible to other UNM faculty and students and to the broader scientific community. Such facilities are a hallmark of top-notch research-intensive universities.

A primary strength of the Museum of Southwestern Biology is the focus on hands-on training and education of students at all levels from undergraduate students to post-doctoral associates. Each division immerses students in subdisciplines within biology that fall under the broad umbrella of natural history, including systematics, molecular biology, morphology, species identification, museum specimen preparation and curation, field studies, and web-based informatics. Over the past 6 decades, MSB has held a leading role in graduate education on campus by ensuring that museum-based doctoral students obtain competitive professional positions and eventually assume leadership roles in their respective fields. A large percentage of undergraduate projects or graduate theses and dissertations in Biology, Anthropology and elsewhere used MSB specimens as a basis for their studies. MSB also has become a leader in training international students, especially those from Latin America. Many of the undergraduate students associated with the museum matriculate to graduate or professional school or obtain jobs in conservation and management agencies in state and federal positions. Indeed, MSB has been the locus of large student-training efforts for many years and now sponsors two museum-centered programs (funded by the National Science Foundation) that focus on student success: Undergraduate Opportunities (UnO) and AIM – UP! MSB continues to be a vital contributor to the educational initiatives in UNM Biology.

MSB also is a leader at UNM in public service, especially activities related to thoughtful (science-based) management of dwindling natural resources. We are heavily involved with municipal (Rio Grande Open Spaces), state (NM State Lands Office, NM Game and Fish, Rare Plant Society, regional BioBlitz's, etc.) and federal (USDA Forest Service, US Fish and Wildlife Service, Bureau of Reclamation, National Park Service, etc.) agencies through funded projects, many related to developing effective management plans for their respective regions. International organizations also rely on our specimens, data and expertise to help them design and implement public health initiatives. MSB has built a strong tradition in the public health arena in efforts related to identifying zoonotic pathogens and understanding the ecology of zoonotic diseases and wildlife diseases in the western US, but also in a number of international settings.

Table 1. Metrics identifying the quality and productivity over the last five years in the Museum of Southwestern Biology. Numbers are compiled from Divisional reports (annual reports are available at http://msb.unm.edu).

Metric	2007	2008	2009	2010	2011	Avg for 5 Yrs
1. Collection growth (Specimens Cataloged)	392509	389144	136248	301268	64598	256753
2. Loans Out	122	125	128	167	185	145
3. Professional Visitors to the Collections	795	795	953	692	504	748
4. Collection Database Web Site Hits	NR	51287	319745	298360	160880	166054
5. RFIs Answered in Person	1167	1196	1355	1214	1354	1257
6. Outside Publications Citing MSB Specimens	53	60	68	61	134	75
7. Peer-Reviewed Publications by Staff	48	54	79	72	52	61
8. Technical Reports	37	30	24	29	29	30
9. UNM Courses using the Collection	23	22	25	23	58	29
10. UNM Courses taught	21	22	24	22	68	31
11. Graduate Students	36	35	51	39	42	41
12. Graduate Theses/Dissertations Completed	8	8	4	5	3*	6
13. Undergraduate Students	54	54	91	102	75	75
14. Grants/Contracts in Force	87	98	94	98	78	91
15. Grants In Force Total Costs	$9,825,425	$9,444,626	$11,239,035	$10,741,063	$10,132,206	$10,276,471
16. Estimated F&A return	$1,186,838	$1,449,793	$2,141,328	$2,601,398	$3,499,439	$2,175,759

* 1 UNM, 2 outside, NR – not reported

Metric Descriptions

(1) Collection growth is the number of newly cataloged specimens and is an important measure of activity. This metric also tracks the annual increase in value of the collections. In 2011, all collections at MSB exhibited growth, with some collections seeing outstanding increases in size. Cataloging of new specimens from regional and international expeditions was responsible for the majority of new specimens. Average growth of over 250,000 cataloged specimens per year places MSB among the fastest growing university-based natural history museums in the nation. Large accessions of external collections (USGS, NM Game and Fish, University of Illinois) were responsible for extraordinary growth in recent years.

(2) Number of specimen loans made to outside researchers and institutions. These are specimens, groups of specimens, or tissues loaned in support of ongoing research at other institutions. Loans help establish UNM's reputation as a significant contributor to research initiatives nationally and internationally. This metric, which is another measure of collection value, visibility and utility, continued to increase in 2011.

(3) Professional Visitors to the Collections. This metric reflects the number of visiting scientists and other professionals seeking to review specimens or study morphological and/or molecular variability of organisms. It does not include members of the UNM Biology Department.

(4) Collection web hits. This metric is under-reported because of wide electronic dissemination of MSB specimen and locality data. Major databases supported by the MSB are ARCTOS, the New Mexico Biodiversity Collections Consortium (NMBCC), and conservation databases of the New Mexico Natural Heritage Program. More broadly, MSB data are served by outside entities such as the Global Biodiversity Information Facility (GBIF) and VertNet. The wide dispersion of web hits suggests MSB specimens have high impact in informatics initiatives globally.

(5) Requests for information (RFIs) answered in person. Natural history collections staff also perform important advisory functions as indicated by the number of requests for information. Such requests come from academic and

government scientists, natural resource management agency personnel, and/or the general public. MSB is one of the primary clearinghouses for knowledge and expertise on natural history of western North America and in several cases globally (e.g., Peru, Mexico, Chile, Bolivia, Panama, Mongolia).

(6) Publications by scientists outside of the MSB. Curatorial management has direct impact on scholarly production through the provision of specimens and data to other researchers. In 2011, at least 134 publications or graduate theses were supported in part through materials provided by the MSB through loans and data sharing. This contribution to the global scientific infrastructure vastly increases the scholarly impact of MSB and by extension UNM's reputation as a major player in the environmental and biological sciences.

(7) Publications by museum staff. This metric includes all publications in bona fide outlets such as books, journals, compendia, and other publications. Gray literature and quasi-public reports (e.g., technical reports, agency reports – see below) are not included.

(8) Technical reports by museum staff include reports to agencies in fulfillment of contract deliverables. Many reports hold primary data that are the basis for critical management decisions, including endangered species status, listing decisions, and biological opinions.

(9) UNM courses using specimens, data, electronic archives and other resources provided by the MSB. This number is increasing due largely to new courses and independent studies offered by new faculty curators and their staff. With the new Museum Studies degree program coming online at UNM in 2012, this high level of engagement of students will be sustained.

(10) UNM courses provided by museum staff include lecture courses taught by faculty curators and associate curators of the MSB. It also includes laboratory teaching by graduate students affiliated with the MSB.

(11) Number of graduate students mentored by MSB staff per year includes graduate students who are formally trained in curatorial practices and standards of field data collection, specimen preservation, field protocols that are consistent with institutional animal care guidelines, directly by faculty and staff of the MSB. It does not include graduate enrollment in formal courses. Substantial involvement of graduate students reflects the drawing power of natural history and the MSB for graduate recruitment in Biology and A&S.

(12) Number of graduate theses/dissertations includes all the graduate students who graduated in 2011 that were mentored by MSB faculty as primary advisor or co-advisor.

(13) Number of undergraduate students trained in the MSB includes undergraduate students that are employed through Federal Work-Study program, externally funded research grants and contracts, or education programs like Undergraduate Opportunities (UNO). This number is high as a result of MSB-centered undergraduate educational programs, increased grant activity for curation (e.g., Fishes, Mammals, USGS), and new museum-based programs in Birds and Arthropods.

(14) Number of grants and contracts in force includes all active grants and contracts that are available to specimen-based research and are being conducted by MSB staff. This number varies little from year to year, but overall funding has steadily increased with inclusion of new curatorial staff (Miller and Witt) and a new unit (Division of Parasitology), along with sustained granting activity from other units.

(15) Total dollar amount of all grants and contracts in force is simply the sum of the total dollar amounts of all grants in force. Yearly expenditures are expected to be a fraction of the total grants in force.

(16) Total amount of Facilities and Administration (F&A) funds from grants/contracts in force is likewise the sum of estimated F&A. Yearly expenditures are expected to be far less than totals. Returned F&A is steadily increasing because of an increasing amount of grants that return F&A at the federal negotiated rate.

Activities in the MSB in 2011

MSB faculty, staff, and students were heavily involved in a number of academic pursuits in 2011 (Table 2). There has been considerable emphasis on student training in research and informatics that includes travel to national and international meetings to present their research findings, and on developing new ways for museum data and objects to be incorporated in the classroom. The MSB develops collection resources by winning extremely competitive Biological Collection Improvement Grants from the National Science Foundation and other federal agencies. MSB Graduate Students excel when applying for awards and recognition from the Department of Biology, and from disciplinary and inter-disciplinary professional societies.

Ongoing Museum Wide Initiatives that integrate across disciplines:

New program in host-parasite interactions. The new MSB Division of Parasitology is envisioned as an international resource for systematics, ecology, and epidemiology of helminths that is integrated across parasites and hosts. The Division represents new capacity at UNM to address emerging challenges to science and society. The Division of Parasitology hired a new Senior Collection Manager, Dr. Sara Brant, in January 2011. With new UNM infrastructure support, we competed successfully for an NSF Biological Research Collections Grant ($495,000) to obtain, curate, and electronically capture the Robert and Virginia Rausch Collection and Archives.

UnO (at http://msb.unm.edu/UnO/education.html) has led to high retention and graduation rates for underrepresented students, and successful placement of UNM undergraduate students in graduate school or professional scientific positions.

AIM-UP! (aim-up.org), is a Research Coordinating Network in Undergraduate Biology Education (RCN-UBE) that explores new ways to integrate museum specimens, archives, and databases into undergraduate courses and activities.

Museum Studies Program. The MSB, in collaboration with the Maxwell Museum of Anthropology, Meteoritics, and UNM Art Museums, continued to make progress on development of a graduate (MS) Museum Studies Program. In December 2011, the program (and curriculum) was ratified by the UNM Board of Regents. A website has been developed that provides an overview of the program and we anticipate the first Museum Studies students to begin in Fall 2012. MSB has been offering museum-related courses for several years now.

International Activities:

In addition to ongoing projects throughout the Southwestern United States, MSB expeditions throughout Latin America (e.g., Panama, Peru, Venezuela), Asia (e.g., Kazakhstan, Mongolia) Australia and Africa (e.g., South Africa) brought significant new collections of arthropods, birds, mammals and parasites to UNM and provided outstanding opportunities to train a new generation of field biologists in the international research arena.

Table 2. Notable MSB Activities in 2011.

Month	Award or Event	MSB Program
February	New Intrastate Stream Commission Award! $75,328 to R. Bixby, P.I., "Resource utilization by Rio Grande silvery minnow."	Herbarium
March	NSF Grant! $495,000 Awarded for Integration of the Robert and Virginia Rausch Collection	Parasites/Mammals
April	Donald Caughan Scholarship Award to Undergraduate Matt Jones (Advisor: Witt)	Birds
April	Grove Scholarship Award to MS Student Shane Dubay (Advisor: Witt)	Birds
April	Donald Caughan Scholarship Award to MS Student Brooks Kohli (Advisor: Cook)	Mammals
April	Cliff Crawford Scholarship Award to MS Student Corey Love (Advisor: Turner)	Fishes
April	NMOS Research Award to Undergraduate Bethany Abramson (Advisor: Witt)	Birds
April	Sigma-Xi Grant-in-Aid-of-Research, PhD Student Libby Beckman (Advisor: Witt)	Birds
May	Dean's Dissertation Prize to PhD Student Trevor Krabbenhoft (Advisor: Turner)	Fishes
May	Undergraduates from MSB Graduate! Kate Cauthen, Matt Peralta, Sophia Thompson	
June	American Parasitology Society Meritorious Paper Award to PhD Student Kayce Bell (Advisor: Cook)	Mammals
June	Joe Cook Elected to Board of Directors American Society of Mammalogists	Mammals
July	Lex Snyder Elected to American Society of Ichthyologists and Herpetologists Board of Governors	Fishes
July	Albuquerque and UNM/MSB selected to host Joint Meeting of Ichthyologists and Herpetologists	Fishes, Amphib & Reptiles
July	USDA ARS Beltsville to provide $25K annually for student support of Insect Systematics (PI Miller)	Arthropods
August	Undergraduates from MSB Graduate! Melvin Foster, Emily Hodson, Shelley MacNeil, Abigail Ramirez Ortiz, Amber Schwettmann, Nicole Telles	
October	Sandy Brantley was expert identifier for the Broad Canyon Audubon Area BioBlitz	Arthropods
November	Kelly Miller elected President of Entomological Society of America	Arthropods
December	NSF Grant! Montane biogeography revealed by quirks of the evolutionary process: Integrative respiratory phenotypes for Andean birds. (PI – Witt) $650,000	Birds
December	Undergraduates from MSB Graduate! Hiyatsi Bassett, Nicole Caimi, Krista Gibboney, Sarah Sasek	

Ongoing Challenges to Growth and Development of the MSB

MSB would benefit from a rigorous external review that would help. Challenges to the MSB relate to a lack of I/T staff, low operational budgets, no recognition of curatorial duties with the faculty curator workload, and no plan for sustainability of the Natural Heritage Program.

1. MSB lacks Critical Information Technology Support: Because MSB has huge digital databases and plays a leadership role nationally in environmental informatics (e.g., VertNet, Arctos, NSCA); we need state-funded information technology support. IT Technologist/Systems Administrator position or faculty associated line would help develop, utilize, sell, and maintain our growing cyber-infrastructure.

2. Fluid collection storage space, cryogenic space and increasingly dry storage space are all limited. New space is now being developed related to the Parasitology expansion, but more remains to be done. A liquid nitrogen facility has special requirements and safety concerns that necessitate relocation to a new building.

3. Operating budgets are low for collection care and have not kept pace with increased activity in several of the Divisions.

4. A more permanent solution needs to be found to insure faculty leadership and involvement in MSB. Currently, faculty curators are not compensated for curatorial work. UNM administrators have acknowledged this problem and have agreed to rectify. Furthermore, faculty lines are not permanently tied to collections, so that any loss of a faculty member (i.e., retirement, resignation) jeopardizes UNM's long-term investment in this significant resource.

5. Natural Heritage New Mexico (NMNH) does not have a sustainable infrastructure. This year "bridge funding" from the department and Dean's office kept the program afloat, but a long-term plan is needed. NMNH holds a leader in UNM's collaborations with state and federal agencies and private partners related to UNM's involvement in conservation science projects and plays a significant role in the institutions research and public service portfolios.

DIVISION OF AMPHIBIANS AND REPTILES

Curator: Howard Snell
Collection Manager: J. Tomas Giermakowski

1. DIVISION HIGHLIGHTS

During 2011, the collection has increased by 1,053 specimens to a total of 92,165 specimens. Many of the specimens were collected and processed by division staff and students. New Mexico Dept. of Game and Fish personnel and collaborators deposited approximately half of the specimens. The most notable additions from the 18 accessions catalogued during 2011 include a large collection of snakes from New Mexico donated by TL Brown and voucher specimens for at least three new county records of occurrence from New Mexico and Arizona.

The website of the division continues to see many hits on its pages and the collection receives a lot of queries via aggregator sites. In June, HerpNET, one of the largest data aggregators, has implemented a new reporting system for its participants. According to these records, between July 1 and December 31st, our collection has been queried 3973 times and served 2,795,964 individual specimen records. In addition to Internet queries, MSB specimens from the division and their associated data have been used in at least 16 new publications in 2011. Many scientists and members of the general public continue to request information on specimens or general aspects of herpetology from our division via telephone, email and directly in person. In addition to responding to these requests, we hosted 14 visitors and individually compiled data on 24 occasions.

Our outreach activities continue to consist of many tours and public presentations led by the division's collection manager as well as lending of specimens for teaching purposes to University of New Mexico classes and other educational entities, such as the Bosque Ecological Monitoring Program. In addition to several tours of the collection, in December we were invited to a local radio show (KUNM) to talk about amphibian declines. We continued to work with the New Mexico Department of Game and Fish through participation on boards dedicated to species recovery. We also continued our work with the USGS Colorado Plateau Research Station at Northern Arizona University on a project that forecasts changes to distribution of reptiles. Through this project and another project on lizards in New Mexico, in 2011 we provided field and training opportunities to five undergraduate students to work in biological research.

2. TABLE OF COLLECTION USE

Collection Growth	1,053
Loans (outgoing/incoming)	13 (8/5)
Research Visitors[1]	14
Outreach Visitors[1]	115
Information Requests Answered	105
Direct Website Access[2] ("Hits")	4,803
Indirect Specimen Data Access[3] ("Hits")	59,248[4]
Downloads of Division Documents	1,993
Publications Citing/Using MSB Herpetological Specimens	16

[1]Research Visitors are those visiting the collection as part of research activities, Outreach visitors are those visiting as part of tours.

[2]Direct Website access represents access to our Division's webpages.

[3]Indirect Collection Access represents access to data associated with our specimens via data aggregator websites including HerpNET, NM Biodiversity, and GBIF

[4]Herpnet began a local cache of records, thus significantly decreasing direct hits to our server (when compared to previous years)

3. COURSES USING THE COLLECTIONS

BIOL 204, Animal Form and Function, spring and fall semesters, 358 students
BIOL 386, General Vertebrate Zoology, spring and fall semesters, 68 students
BIOL 488, Herpetology, 10 students

4. COURSES TAUGHT BY MSB PERSONNEL

A. Faculty/Collection Managers

Snell, H.L.

Spring
BIOL 386 – General Vertebrate Zoology, 38 students
BIOL 400 – Senior Honors Thesis, 1 student
BIOL 402 – Topics in Conservation Biology, 10 students
BIOL 402 – Topics in Herpetology Collection Research, 5 students
BIOL 488 – Herpetology, 10 students
BIOL 502 – Topics in Conservation Biology, 4 students
BIOL 502 – Topics in Herpetology Collection Research, 4 students
BIOL 551 – Graduate Research Problems, 3 students

Fall
BIOL 379 – Conservation Biology, 47 students
BIOL 400 – Senior Honors Thesis, 1 student
BIOL 402 – Introduction to GPS for conservation, 12 students
BIOL 402 – Topics in Herpetology Collection Research, 5 students
BIOL 499 – Undergraduate Research Problems, 2 students
BIOL 502 – Topics in Herpetology Collection Research, 3 students
BIOL 551 – Graduate Research Problems, 3 students
BIOL 599 – Master's thesis, 1 student

Poe, S.

Spring
BIOL 386 – General Vertebrate Zoology, 38 students
BIOL 488 – Herpetology, 10 students
BIOL 551 – Graduate Research Problems, 5 students
BIOL 651 – Advanced Field Biology, 2 students
BIOL 699 – Dissertation, 1 student

Fall
BIOL 436 – Phylogenetics, 2 students
BIOL 536 – Phylogenetics, 13 students
BIOL 551 – Graduate Research Problems, 3 students
BIOL 699 – Dissertation, 2 students

Giermakowski, J.T.
Fall BIOL 402 – Introduction to GPS for conservation, 12 students
BIOL 402 – Topics in Herpetology Collection Research, 5 students
BIOL 502 – Topics in Herpetology Collection Research, 3 students

B. Graduate Students
Latella, I.M.
BIOL 488 – Herpetology, spring, 10 students
BIOL 436/536 – Phylogenetics, fall, 15 students

Ryan, M.J.
BIOL 461/561 – Tropical Biology, 15 students

McInnes, T.L.
BIOL 204 – Plant and Animal Form and Function, fall, 36 students

5. COLLECTION MANAGEMENT
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The website of the division continues to see many hits on its pages and the collection receives a lot of queries via aggregator sites. In June, HerpNET, one of the largest data aggregators, has implemented a new reporting system for its participants. According to these records, between July 1 and December 31st, our collection has been queried 3973 times and served 2,795,964 individual specimen records. In addition to Internet queries, MSB specimens from the division and their associated data have been used in at least 16 new publications in 2011. Many scientists and members of the general public continue to request information on specimens or general aspects of herpetology from our division via telephone, email and directly in person. In addition to responding to these requests, we hosted 14 visitors and individually compiled data on 24 occasions. We continued our efforts to have the most precise georeferencing available for all of the specimens in the collection. We are also continuing the addition of frozen tissues as an additional preparation type and now have tissue (usually liver or muscle) available for nearly 1000 specimens.

6. AWARDS, GRANTS, AND CONTRACTS
$8,000. Evaluating the potential for climate change-induced extinction of selected New Mexican lizards. **H.L. Snell** and **J.T. Giermakowski**. New Mexico Department of Game and Fish. Dec 2010 – Jun 2011.

$24,904. Forecasting climate impacts on wildlife of the arid southwest at regional and local scales. **H.L. Snell** and **J.T. Giermakowski**. Northern Arizona University/U.S. Geological Survey. Sep 2010 – Mar 2012.

7. PUBLICATIONS

A. Books, Book Chapters, Edited Volumes

Jiménez-Uzcátegui, G., Márquez, C., **Snell, H. L.** (2011). CDF Checklist of Galapagos Amphibians - FCD Lista de especies de Anfibios de Galápagos. In: Bungartz, F., Herrera, H., Jaramillo, P., Tirado, N., Jímenez-Uzcategui, G., Ruiz, D., Guézou, A. Ziemmeck, F. (eds.). Charles Darwin Foundation Galapagos Species Checklist - Lista de Especies de Galápagos de la Fundación Charles Darwin. Charles Darwin Foundation / Fundación Charles Darwin, Puerto Ayora, Galapagos: http://www.darwinfoundation.org/datazone/checklists/vertebrates/amphibia/ Last updated 07 Jul 2011.

Jiménez-Uzcátegui, G., Wiedenfeld, D. A., Vargas, F. H., **Snell, H. L.** (2011). CDF Checklist of Galapagos Birds - FCD Lista de especies de Aves de Galápagos. In: Bungartz, F., Herrera, H., Jaramillo, P., Tirado, N., Jímenez-Uzcategui, G., Ruiz, D., Guézou, A. Ziemmeck, F. (eds.). Charles Darwin Foundation Galapagos Species Checklist - Lista de Especies de Galápagos de la Fundación Charles Darwin. Charles Darwin Foundation / Fundación Charles Darwin, Puerto Ayora, Galapagos: http://www.darwinfoundation.org/datazone/checklists/vertebrates/aves/ Last updated 07 Jul 2011.

Jiménez-Uzcátegui, G., **Snell, H. L.** (2011). CDF Checklist of Galapagos Mammals - FCD Lista de especies de Mamíferos de Galápagos. In: Bungartz, F., Herrera, H., Jaramillo, P., Tirado, N., Jímenez-Uzcategui, G., Ruiz, D., Guézou, A. Ziemmeck, F. (eds.). Charles Darwin Foundation Galapagos Species Checklist - Lista de Especies de Galápagos de la Fundación Charles Darwin. Charles Darwin Foundation / Fundación Charles Darwin, Puerto Ayora, Galapagos:http://www.darwinfoundation.org/datazone/checklists/vertebrates/mammalia/ Last updated 07 Jul 2011

Jiménez-Uzcátegui, G., Zabala, J., Milstead, B., **Snell, H. L.** (2011). CDF Checklist of Galapagos Introduced Vertebrates - FCD Lista de especies de Vertebrados introducidos de Galápagos. In: Bungartz, F., Herrera, H., Jaramillo, P., Tirado, N., Jímenez-Uzcategui, G., Ruiz, D., Guézou, A. Ziemmeck, F. (eds.). Charles Darwin Foundation Galapagos Species Checklist - Lista de Especies de Galápagos de la Fundación Charles Darwin. Charles Darwin Foundation / Fundación Charles Darwin, Puerto Ayora, Galapagos: http://www.darwinfoundation.org/datazone/checklists/introduced-species/introduced-vertebrates/ Last updated 07 Jul 2011

Jiménez-Uzcátegui, G., Márquez, C., **Snell, H. L.** (2011). CDF Checklist of Galapagos Reptiles - FCD Lista de especies de Reptiles de Galápagos. In: Bungartz, F., Herrera, H., Jaramillo, P., Tirado, N., Jímenez-Uzcategui, G., Ruiz, D., Guézou, A. Ziemmeck, F. (eds.). Charles Darwin Foundation Galapagos Species Checklist - Lista de Especies de Galápagos de la Fundación Charles Darwin. Charles Darwin Foundation / Fundación Charles Darwin, Puerto Ayora, Galapagos:

http://www.darwinfoundation.org/datazone/checklists/vertebrates/reptilia/ Last updated 07 Jul 2011

B. Journal Articles

Fabiani, A. Trucchi, E., Rosa, S., Marquez, C., **Snell, H.L.**, Snell, H.M., Tapia, W., Gentile, G. 2011. Conservation of Galápagos land iguanas: genetic monitoring and predictions of a long-term program on the island of Santa Cruz. Animal Conservation, In Press.

Latella, I., S. **Poe**, and **J.T. Giermakowski**. 2011. Traits associated with naturalization in Anolis lizards: comparison of morphological, distributional, anthropogenic, and phylogenetic models. Biological Invasions 13:845-856.

Poe, S., **J.T. Giermakowski**, I. **Latella**, E. W. **Schaad**, E. P. Hulebak, and M. J. **Ryan**. 2011. Ancient colonization predicts recent naturalization in *Anolis* lizards. Evolution 65:1195-1202.

Ryan, M.J. and D. Barry. 2011. Interactions between two dart-poison frogs (Anura: Dendrobatidae) in phytotelmata-breeding pools from Costa Rica. Journal of Herpetology 45 (4):438-443.

C. Web-Based

Ryan, M.J., F. Bolaños, and G. Chaves. 2011. Museums help prioritize conservation goals. Science. (http://www.sciencemag.org/content/329/5997/1272/reply#sci_el_13658)

D. Technical Reports

None.

E. Theses/Dissertations Completed

None.

F. Work In Progress

Poe, S., F. Ayala, **E.W. Schaad**, **I.M. Latella**, T. Kennedy, and N. Blea. Rediscovery and Redescription of Anolis proboscis. Breviora (in revision)

G. Publications/Reports Based on MSB Specimens/Data by Outside Researchers

Algar, A. C., and J. B. Losos. 2011. Evolutionary assembly of island faunas reverses the classic island–mainland richness difference in Anolis lizards. Journal of Biogeography 38:1125-1137.

Angetter, L. E. A. S. U., S. Lötters, and D. Rödder. 2011. Climate niche shift in invasive species: the case of the brown anole. Biological Journal of the Linnean Society 104:943-954.

Barker, B. S., R. B. Waide, and J. A. Cook. 2011. Deep intra-island divergence of a montane forest endemic: phylogeography of the Puerto Rican frog *Eleutherodactylus portoricensis* (Anura: Eleutherodactylidae). Journal of Biogeography 38:2311-2325.

Bryson Jr, R. W., R. W. Murphy, M. R. Graham, A. Lathrop, and D. Lazcano. 2011. Ephemeral Pleistocene woodlands connect the dots for highland rattlesnakes of the *Crotalus intermedius* group. Journal of Biogeography 38:2299-2310.

Burbrink, F. T., S. Ruane, and R. A. Pyron. 2011. When are adaptive radiations replicated in areas? Ecological opportunity and unexceptional diversification in West Indian dipsadine snakes (Colubridae: Alsophiini). Journal of Biogeography Early Online.

Farr, W. L. 2011. Distribution of *Hemidactylus frenatus* in Mexico. The Southwestern Naturalist **56**:265-273.

Gerson, M. M. 2011. Population status and habitat affinities of the Blainville's horned lizard (Phrynosma blainvilli) at a site in the northern San Joaquin Valley, California, USA. Herpetological Conservation and Biology **6**:228-236.

Latella, I. M., S. Poe, and J.T. Giermakowski. 2011. Traits associated with naturalization in Anolis lizards: comparison of morphological, distributional, anthropogenic, and phylogenetic models. Biological Invasions:1-12.

Newman, C. E., and L. J. Rissler. 2011. Phylogeographic analyses of the southern leopard frog: the impact of geography and climate on the distribution of genetic lineages vs. subspecies. Molecular Ecology 24:5295-5312.

Nori, J., M. S. Akmentins, R. Ghirardi, N. Frutos, and G. C. Leynaud. 2011. American bullfrog invasion in Argentina: where should we take urgent measures? Biodiversity and Conservation 20:1125-1132.

Reid, B., M. Le, W. McCord, J. Iverson, A. Georges, T. Bergmann, G. Amato, R. Desalle, and E. Naro-Maciel. 2011. Comparing and combining distance-based and character-based approaches for barcoding turtles. Molecular Ecology Resources 11:956-967.

Trumbo, D., A. Burgett, and J. Knouft. 2011. Testing climate-based species distribution models with recent field surveys of pond-breeding amphibians in eastern Missouri. Canadian Journal of Zoology **89**:1074-1083.

Vasconcelos, T. S., M. Á. Rodríguez, and B. A. Hawkins. 2011. Species distribution modelling as a macroecological tool: a case study using New World amphibians. Ecography EarlyView.

Wooten, J., and H. Gibbs. 2011. Niche divergence and lineage diversification among closely related *Sistrurus* rattlesnakes. Journal of Evolutionary Biology 25.

8. ACTIVITIES IN LEARNED SOCIETIES

A. Invited/Plenary Talks and/or Seminars

JT Giermakowski

Herpetological resources and research at the Museum of Southwestern Biology. Herpetology Class. University of New Mexico, Department of Biology. March.

T.L. McInnes

McInnes, T. L., H. L. Snell, and E. C. Toolson. Seasonal Movements of Western Diamond-backed Rattlesnakes (*Crotalus atrox*) at Bosque del Apache National Wildlife Refuge, New Mexico. University of NewMexico, Biology Department, Research Day, Albuquerque, New Mexico. April.

McInnes, T. L., H. L. **Snell**, and E. C. Toolson. Habitat Use of Western Diamond-backed Rattlesnakes (*Crotalus arox*) at Bosque del Apache National Wildlife Refuge, New Mexico. Biology of the Rattlesnakes Conference, Tucson, Arizona. July.

McInnes, T. L., H. L. **Snell**, and E. C. Toolson. Western Diamond-backed Rattlesnakes (*Crotalus atrox*) at Bosque del Apache National Wildlife Refuge, New Mexico. Bosque del Apache National Wildlife Refuge, Festival of the Cranes, Socorro, New Mexico. November.

B. Contributed Talks/Posters (*presenter)
Giermakowski, J.T.*, E.W. Nowak, C. Schwalbe, H.L. **Snell**, J. R. Hatten, M. J. Johnson, D. J. Mattson, J. A. Holmes, K. Ironside, M. Peters, C. van Riper III. Changes of future landscape suitability of select reptiles in the Southwestern United States. Oral presentation. Biennial Conference on the Research on the Colorado Plateau, Flagstaff, Arizona. November.

Giermakowski, J.T.* and H.L. **Snell**. Will future climates promote range expansions or extirpations of New Mexico's lizards? Oral presentation. New Mexico Chapter of the Wildlife Society Meeting, Albuquerque, New Mexico. October.

Chour, J.*, J.T. **Giermakowski**, H.L. **Snell**. Prevalence of Ectoparasitic Arthropods on Spiny Lizards in New Mexico. Poster presentation. Research Day, Department of Biology, University of New Mexico. April.

C. Attendance at Professional Meetings
J.T. Giermakowski
Southwestern Partners in Amphibian and Reptile Conservation, Tucson, Arizona. August.

The New Mexico Chapter of The Wildlife Society Annual Meeting, Albuquerque, October. Biennial Conference of Research on the Colorado Plateau, Flagstaff, Arizona. November.

D. Service as Editor or on Editorial Board of a Journal
H.L. Snell, Chair the Publication Series of the Museum of Southwestern Biology

E. Service as Officer of Professional Society/Organization
HL Snell. Elected Board Member, Tierra Grande Improvement Association (organization that administers 15,000 acres of protected areas in southern Manzano Mountains, Valencia County).

9. OTHER PROFESSIONAL ACTIVITIES
A. Presentation to General Audience in a Scholarly Capacity
J.T. Giermakowski
Local amphibians and reptiles. Presentation to the Bosque Academy Summer Camp Program, Albuquerque, NM. July.

KUNM local radio show. Presentation on amphibians and their declines. December.

M.J. Ryan
Deformations in frogs at Los Lunas park. TV interview with KOAT.

KUNM local radio show. Presentation on amphibians and their declines. December.

B. Presentations in a Scholarly Capacity at Hearings, Workshops, Legislative Committees, etc.
H.L. Snell
Work with Environmental Health Division on Urban Biodiversity, Albuquerque, NM

Work with Whiitfield Wildlife Conservation Area, Belen, NM

C. Scholarly Service as a Member of a Local/State/Regional/National Committee, Panel, etc.
H.L. Snell.
New Mexico Department of Game & Fish Species Recovery Board.

J.T. Giermakowski.
Member of the Southwestern Partners in Amphibian and Reptile Conservation Steering Committee.

Member of Collections Committee for the American Society of Ichthyologists and Herpetologists.

Member of New Mexico Department of Game & Fish Species Recovery Board.

D. Journal Referee
M.J. Ryan. *Phyllomedusa; Herpetological Conservation and Biology; Revista Biología Tropical*

E. Hosting Professional Colloquia and Groups

None.

10. SERVICE
A. Symposia, Workshops, Conferences etc. Sponsored, Organized, Held, etc.

None.

B. Public Service
H.L. Snell
Elected Board Member, Tierra Grande Improvement Association (organization that administers 15,000 acres of protected areas in southern Manzano Mountains, Valencia County).

Work with Environmental Health Division on Urban Biodiversity, Albuquerque, NM

Work with Whitfield Wildlife Conservation Area, Belen, NM
Member NM Department of Game & Fish Species Recovery Board, Santa Fe & Albuquerque, NM

Work with the New Mexico Mountain Club to promote wilderness activities throughout New Mexico.

M.J. Ryan
Assisted development and running of BioBlog course in UNM Biology
Contributor to IUCN amphibian conservation group
Co-ordinated UNM Biology Departmental Brown Bag Seminar Spring
Organized Amphibian and Reptile Conservation Discussion Fall
Organized Macroecology/Phylogenetic Discussion Fall/Spring

11. ADVANCED STUDY, HONORS, AWARDS, FELLOWSHIPS, ETC.

M.J. Ryan
Graduate Student Fellowship for Summer Research at the Sevilleta LTER. $3,500.
Bin Zayed Conservation Fund. $10,000.
Grove Scholarship UNM Biology Department. $3,000.

T.L. McInnes
University of New Mexico, Biology Graduate Student Association-Travel Grant. $75.00.
University of New Mexico, Office of Career Services, Student Conference Award Program. $550.00.

12. DONATIONS AND GIFTS RECEIVED
Donation of 2011 issues of the Southwestern Naturalist and Texas Journal of Science.
Donation of Reptile Magazine and Bulletin of Chicago Herpetological Society (most years).

13. CURRENT STAFF
A. Faculty/Staff
Snell, H.L. Professor and Curator

Degenhardt, W.D., Curator and Professor Emeritus
Poe, S., Assistant Professor and Associate Curatorial

Giermakowski, J.T. Collection Manager

McInnes, T.L. Graduate Assistant (Spring)
Ryan, M.J. Graduate Assistant (Fall)

B. Graduate students
Davis, J., M.S./Poe
Gray, L.N., M.S. /Poe
Latella, I.M., Ph.D./Poe
McInnes, T.L., M.S./Snell
Pederson, N., M.S./Snell
Ryan, M.J.,Ph.D./Poe
Schaad, E., Ph.D./Poe

C. Undergraduate Student Workers and Volunteers
Chour, Jobette. Student employee (UnO).
Gibboney, Krista. Student employee.
Hostak, Emily. Student employee.
White, Amy. Student employee.
Wilson, Cassandra. Student employee.

14. MUSEUM ASSOCIATES
A. Curatorial Associates
Painter, C.W., New Mexico Dept. of Game & Fish
Stuart, J.N., New Mexico Dept. of Game & Fish

B. Research Associates
Fitzgerald, L., Texas A&M University
Fritts, T.H., retired

DIVISION OF ARTHROPODS

Curator: Kelly Miller
Collection Managers: Sandra Brantley and David Lightfoot

1. DIVISION HIGHLIGHTS

Highlights for the Division (in conjunction with the research laboratory of KB Miller) include initiation or continuation of multiple NSF grants, a US National Park Service grant and USDA grants totaling $2.4 million with one of these an NSF grant specifically for improvement to the Arthropod Division ($453,444). New insect cabinets as well as other new equipment were purchased with these funds. We also made a major shift to development of a Specify database for our collection holdings. Major field campaigns for insect collecting were conducted to Peru, Kazakhstan, Australia and Venezuela as well as locally in the southwest producing large numbers of new specimens for the collection.

2. TABLE OF COLLECTION USE

Specimens Accessioned	Loans (outgoing)	Loans (incoming)	Visitors	Information Requests	Publications Citing MSB Specimens
11000	6	25	25	100	2

3. COURSES USING THE COLLECTION

BIOL 485/585, Entomology, 20 students
BIOL 371L, Invertebrate Zoology, 25 students
BIOL 419, Field Entomology

4. COURSES TAUGHT BY MSB PERSONNEL

A. Faculty/Collection Managers
Miller, K.B.
BIOL 485/585, Discovering Arthropods, 16 students
BIOL 203, Ecology and Evolution
BIOL 419, Field Entomology

5. COLLECTION MANAGEMENT

With more undergraduate and graduate students working in the division, we increased our efforts to curate and re-label older specimens as well as process the large numbers of new specimens. We purchased drawers and cabinets to fill our compactor space using NSF funds. Our databasing efforts have been dramatically revised as we have moved into a new database, Specify, from our existing one. We anticipate that this change will make our data considerably more accessible going forward. Fourteen undergraduate students and 6 graduate students have contributed to Arthropod Division activities in various ways in the past year.

6. AWARDS, GRANTS, AND CONTRACTS

Joint Research on endemism at White Sands National Monument and the Cuatrociénegas Protected Area, K.B. Miller, David Lightfoot, National Park Service, $120,000, 2010-2011, 10%.

Identification Resource for the Ironclad and Cylindrical Bark Beetles and the Longhorned Wood Boring Beetle Tribe Onciderini, K.B. Miller, USDA-APHIS, $173,000 + $10,000 supplement, 2010-2011, 10%.

REVSYS: Multilevel Revision within the Praying Mantises (Insecta, Dictyoptera, Mantodea), G.J. Svenson, PI; K.B. Miller, NSF Systematic Biology and Biodiversity Inventories Grant #DEB-1050569, $603,742, 2010-2012, 51%.

Phylogenetic Revisions of South American Water Beetles (Coleoptera: Adephaga: Hydradephaga): A Model for Teaching Systematic Biology, K.B. Miller, NSF CAREER #DEB–0845984, $675,000, 2009-2014, 51%.

Improvements to the Division of Arthropods Collection, Museum of Southwestern Biology, K.B. Miller, Sandra Brantley and David Lightfoot, NSF Division of Biological Infrastructure Grant #DBI–0847847, $453,444, 2009-2012, 51%.

Survey of the Aquatic Insects of Northern Venezuela with an emphasis on Coleoptera, A.E.Z. Short, K.B. Miller, NSF Systematic Biology and Biodiversity Inventories Grant #DEB–0816904, $500,000 (~$60,000 to UNM), 2008-2012, 51%.

Annual monitoring of ground-dwelling arthropods at Bandelier National Monument, NM, Sandra Brantley, $5000.

7. PUBLICATIONS

A. Books, Book Chapters, Edited Volumes

B. Journal Articles

Nearns, E.H. and I.P. Swift. 2011. New taxa and combinations in Onciderini Thomson, 1860 (Coleoptera: Cerambycidae: Lamiinae). Insecta Mundi 0192:1-27.

Lightfoot, D.C., Weissman, D.B. and Ueshima, N. 2011. *Phymonotus jacintotopos*: A new genus and species of shield-backed katydid (Orthoptera: Tettigoniidae: Tettigoniinae: Nedubini) from the San Jacinto Mountains of California, USA. Zootaxa 2937: 49-65.

Lingafelter, S.W. and **E.H. Nearns**. 2011. New synonymy in Cuban *Tilloclytus* Bates (Coleoptera: Cerambycidae: Anaglyptini). Coleopterists Bulletin 65 (2): 153.

Parmenter, R.R., M. Kreutzian, D.I. Moore and **D.C. Lightfoot.** 2011. Short-term effects of a summer wildfire on a desert grassland arthropod community in New Mexico. Environmental Entomology

Richman, D.B., **S.L. Brantley**, D.H.-C. Hu, and M.E.A. Whitehouse. 2011. Spiders of the Chihuahuan Desert of southern New Mexico and western Texas. Southwestern Naturalist 56: 44-53.

Alaire, Y., Michat, M.C., & **K.B. Miller**. 2011. Notation of primary setae and pores on larvae of Dytiscinae (Coleoptera: Dytiscidae), with phylogenetic considerations. *Zootaxa*, 3087: 1-55.

Miller, K.B. & M. Garcia. 2011. *Spanglerodessus shorti* and *Incomptodessus camachoi*, new genera and species of Bidessini from Guyana and Venezuela (Coleoptera: Dytiscidae: Hydroporinae). *Zootaxa*, 2996: 49-56.

Smith, A.D., **Miller, K.B.**, & Q.D. Wheeler. 2011. A new species of *Stenomorpha* Solier (Coleoptera: Tenebrionidae: Pimeliinae: Asidini) from Cuatrociénegas, Mexico with a key to the *furcata* species group. *Zootaxa*, 2909: 27-37.

C. Web-Based

Lord, N.P., E.H. Nearns, and K.B. Miller. 2011. Ironclad ID: Tool for diagnosing ironclad and cylindrical bark beetles (Coleoptera: Zopheridae) of North America north of Mexico. The University of New Mexico, and Center for Plant Health Science and Technology, USDA, APHIS, PPQ. Available from: http://itp.lucidcentral.org/id/wbb/IroncladId/

Nearns, E.H., N.P. Lord, and K.B. Miller. 2011. Oncid ID: Tool for diagnosing adult twig girdlers (Cerambycidae: Lamiinae: Onciderini). The University of New Mexico, and Center for Plant Health Science and Technology, USDA, APHIS, PPQ. Available from: http://itp.lucidcentral.org/id/wbb/OncidID/

D. Technical Reports

Brantley, S.L. 2011. Long-term study of ground-dwelling arthropod biodiversity at Bandelier National Monument: report for 2010 data.

E. Theses/Dissertations Completed

F. Work in Progress (Only *in press* and already submitted)

Gómez, R.A., Lightfoot, D.C., and Miller, K.B. 2011. (submitted) A phylogenetic review of the North American band-winged grasshopper genus, Encoptolophus Scudder with description of Nebulositettix gen. n. (Orthoptera: Acrididae: Oedipodinae). Insect Systematics and Evolution.

Lightfoot, D.C, A. D. Davidson, D. G. Parker, L. Laundre, and J. W. Laundre. 2011. (submitted) Bottom-up regulation of desert grassland and shrubland rodent communities: Implications of species-specific reproductive potentials. Journal of Mammalogy.

G. Publications/Reports Based on MSB Specimens/Data by Outside Researchers

Sanborn, A.F., M.S. Heath, P.K. Phillips, and J.E. Heath. 2011. A new species of the genus *Beameria* (Hemiptera: Cicadidae) from North America. Journal of Natural History 45: 1589-1605.

Sanborn, A.F. and P.K. Phillips. 2011. Elevation of a subspecies of *Tibicen* (Hemiptera: Cicadoidea: Cicadidae) to a full species. Southwestern Naturalist 56: 363-368.

8. ACTIVITIES IN LEARNED SOCIETIES

A. Invited/Plenary Talks and/or Seminars

Lord, N.P., R.A.B. Leschen, and Buckley, T. From Broun to Bayesian: morphological and molecular investigations of the Zopheridae of New Zealand. SysEB Section Symposia: Taxonomy and Systematics of the Tenebrionoidea (Coleoptera). Annual Meeting of the Entomological Society of America, Reno, Nv. November 12-16, 2011.

B. Contributed Talks/Posters (*presenter)

Hopkins, H. *A Revision of the Genus* Arenivaga *Rehn (Blattodea, Polyphagidae, Polyphaginae).* Graduate student paper presentation, runner-up award for president's prize for best student paper. Entomological Society of America Meeting, Reno, NV. Nov. 2011.

Hopkins, H. *A Revision of the Genus* Arenivaga *Rehn (Blattodea, Polyphagidae, Polyphaginae).* Research Day poster presentation, Biology Department, UNM, Albuquerque, NM, April 2011.

***Brantley, S.L.** *Bandelier National Monument spiders: a test case for species response to climate change.* 11th Biennial Conference of Research on the Colorado Plateau, Northern Arizona University, Flagstaff, AZ, October 2011.

***Gomez, R.A.,** Edelman, W.C., **Lightfoot, D.C.**, and **Miller, K.B.** *A Taxonomic Review of the North American Band-winged Grasshopper Genus Encoptolophus Scudder (Orthoptera: Acrididae: Oedipodinae).* Research Day poster presentation, Biology Department, UNM, Albuquerque, NM April 2011. 3rd place award winner.

***Gomez, R.A.,** and Kavanaugh, D.H. *Litter Lords of Madagascar: Biodiversity and evolution among endemic, predaceous ground beetles.* Undergraduate speaker, 2nd Annual BA-SURE, San Jose State University, San Jose, CA August 2011.

***Gomez, R.A.,** Edelman, W.C., **Lightfoot, D.C.**, and **Miller, K.B.** *A Taxonomic Review of the North American Band-winged Grasshopper Genus Encoptolophus Scudder (Orthoptera: Acrididae: Oedipodinae).* Undergraduate student poster presentation, winner for president's prize for best student poster. Entomological Society of America Meeting, Reno, NV. Nov. 2011.

Homziak, N., and Miller, K.B. *A revision of the genus Heteranasa Smith, (Lepidoptera, Erebidae, Erebinae).* Undergraduate student poster presentation. Entomological Society of America Meeting, Reno, NV. Nov. 2011.

***Lightfoot, D.C.** *Planning and implementing landscape scale arthropod inventory and monitoring projects.* 11th Biennial Conference of Research on the Colorado Plateau, Northern Arizona University, Flagstaff, AZ, October 2011.

***Nearns, E.H., N.P. Lord, and K.B. Miller**. *Design and development of web-based identification tools for work boring beetles: a case study*. Invited talk, Web-Based Digital Insect Identification: Our Progress, Challenges and Opportunities. Entomological Society of America, Reno, NV, November 2011.

***Nearns, E.H. and K.B. Miller**. *Preliminary findings into the morphology and systemics of Onciderini (Cerambycidae: Lamiinae)*. Invited talk, Hardly Boring, Cerambycid Workers Symposium. Entomological Society of America, Reno, NV, November 2011.

***Wetherill, K.R**. Native bees of New Mexico. Invited guest lecturer. Native Plant Society of New Mexico, Albuquerque chapter meeting, June 2011.

***Wetherill, K.R**. Native bees of New Mexico. Invited guest lecturer. Native Plant Society of New Mexico, annual meeting, August 2011.

C. Attendance at Professional Meetings

Brantley, S.L. Walter E. Dean Environmental Information Management Institute, Albuquerque, NM, 6/2011.

Brantley, S.L. Entomological Collection Network National Meeting, Reno, NV, 11/2011

Hopkins, H. Entomological Society of America National Meeting, Reno, NV 11/2011.

Hopkins, H. Entomological Collection Network National Meeting, Reno, NV 11/2011.

Lord, N. Entomological Society of America National Meeting, Reno, NV, 11/2011.

Lord, N. Entomological Collection Network National Meeting, Reno, NV, 11/2011.

Miller, K.B. Entomological Society of America National Meeting, Reno, NV, 11/2011.
Miller, K.B. Entomological Collection Network National Meeting, Reno, NV, 11/2011.
Gustafson, G. Entomological Society of America National Meeting, Reno, NV, 11/2011.
Gustafson, G. Entomological Collection Network National Meeting, Reno, NV, 11/2011.
Nearns, E. Entomological Society of America National Meeting, Reno, NV, 11/2011.
Nearns, E. Entomological Collection Network National Meeting, Reno, NV, 11/2011.
Wetherill, K. Entomological Society of America National Meeting, Reno, NV, 11/2011.
Wetherill, K. Entomological Collection Network National Meeting, Reno, NV, 11/2011.

D. Service as Editor or on Editorial Board of a Journal
Lord, N.P. Subject Editor (Coleoptera: Cucujiformia, Tenebrionoidea) ZooTaxa.
Lightfoot, D.C. Associate editor (entomology and ecology) Western North American Naturalist

E. Service as Officer of Professional Society/Organization
Miller, K.B. President, Entomological Society of America.

9. OTHER PROFESSIONAL ACTIVITIES
A. Presentation to General Audience in a Scholarly Capacity
Lord, N.P. Tropical Arthropod Biodiversity. *Tropical Biology* (Biol 461/561), Department of Biology, University of New Mexico. February, 2012.

B. Presentations in a Scholarly Capacity at Hearings, Workshops, Legislative Committees, etc.

C. Scholarly Service as a Member of a Local/State/Regional/National Committee, Panel, etc.

D. Journal Referee
Lord, N.P. Reviews for Systematic Entomology, Zootaxa, Proc. of the Ent. Soc. of Washington, Japanese Journal of Systematic Entomology.

Lightfoot, D.C. Reviews for Zootaxa, Insect Conservation and Diversity, Journal of Arid Environments.

Miller, K.B. Reviews for Coleopterists Bulletin, Zootaxa, Molecular Phylogenetics and Evolution.

E. Hosting Professional Colleagues and Groups

10. SERVICE
A. Symposia, Workshops, Conferences etc. Sponsored, Organized, Held, etc.

B. Public Service
Brantley, S.L. Participated (as a bilingual member) in the BioBlitz at the Rio Grande Nature Center, June 2011.
Brantley, S .L. Participated in the Broad Canyon Audubon Area BioBlitz, October 2011.
Brantley, S.L. Invited speaker for Sandia Prep School workshop on ants, June 2011.
Hopkins, H. Served as science fair judge and made presentation on cockroaches at local elementary school. Serving as mentor to undergraduate Nick Homziak in the UnO program at UNM. Served on graduate student question panel for UnO program participants.

Lightfoot, D.C. Organized arthropod survey for Broad Canyon BioBlitz, June 2011, participated in Broad Canyon BioBlitz, October 2011.

11. ADVANCED STUDY, HONORS, AWARDS, FELLOWSHIPS

12. DONATIONS AND GIFTS RECEIVED
Miller, K.B. 3000 specimens
Brantley, S.L. 250 hours for specimen prep/databasing

13. CURRENT STAFF
A. Faculty/Staff
Kelly Miller, Assistant Professor, Curator
Manuel Molles, Professor Emeritus, Curator Emeritus
Sandra Brantley, Research Assoc. Professor, Senior Collection Manager
David Lightfoot, Research Assoc. Professor, Senior Collection Manager

B. Graduate Students
Nathan Lord, Ph.D. candidate
Eugenio Nearns, Ph.D. candidate
Michael Medrano, Ph.D. candidate
Heidi Hopkins, Ph.D. student
Karen Wetherill, Ph.D. student
Grey Gustafson, Ph.D. student
Rachael Mallis, Ph.D. student

C. Undergraduate Student Workers and Volunteers
Sharyn Davidson, volunteer
Martha Lara
Matthew Leister
Kayla Sayre
Emily Schmeltzer
Amber Schwettmann
Eoghan Doyle
R. Antonio Gomez, (UNM MARC program, honors)
Nicholas Homziak, (UNM UNO program, honors)

14. MUSEUM ASSOCIATES
A. Research Associates
Ana Davidson, postdoctoral fellow, UNM and UNAM
Eric Metzler, Ohio State University, retired
Ernest Valdez, USGS
Robert Parmenter, Valles Caldera Preserve.

DIVISION OF BIRDS

Curator: Chris Witt
Collection Manager: Andrew Johnson

1. DIVISION HIGHLIGHTS

- Overall growth by 3277 specimens, making us one of the World's fastest growing bird collections.
- Two-month internship by Peruvian student, Alessandra Quiñonez.
- Field expedition to South Africa that added 360 specimens to the MSB collection.
- Five field expeditions to Peru that collected over 1500 new specimens.
- Ten scientific papers published.
- Six presentations at the American Ornithologists' Union meetings in Jacksonville, Florida.
- Major specimen export from Peru in November, including 2493 data-rich bird specimens.
- Major NSF Grant Awarded for specimen-based research.
- 18 grants, contracts, or fellowships awarded or in force for Division of Birds research.

2. TABLE OF COLLECTION USE

Collection Growth (specimens cataloged): 3277
Loans (outgoing): 42 (6 from dry collections; 36 tissue loans)
Loans (incoming): 32 (2 for dry collections; 30 tissue loans received).
Visits: 30
Information Requests: 64
Publications Citing MSB Bird Specimens: 11

3. COURSES USING THE COLLECTIONS (24)

Term	Course	Title	Students
Spr.2011	BIOL 300	Evolution	39
Spr.2011	Bio 386	General Vertebrate Zoology	36
Spr.2011	BIOL 400	Senior Honors Thesis	1
Spr.2011	BIOL 402	T: Avian Sci Specimen Prep	6
Spr.2011	BIOL 402	T: Molecular Systematic Discus	4
Spr.2011	BIOL 499	Undergraduate Problems	3
Spr.2011	BIOL 502	T: Avian Sci Specimen Prep	3
Spr.2011	BIOL 502	T: Molecular Systematic Disc	3
Spr.2011	BIOL 517	Basic Graduate Evolution	18
Spr.2011	BIOL 551	Research Problems	1
Spr.2011	BIOL 599	Masters Thesis	1
Spr.2011	BIOL 300	Evolution	1
Fall 2011	Bio 386	General Vertebrate Zoology	36
Fall 2011	BIOL 400	Senior Honors Thesis	1
Fall 2011	BIOL 402	T: Molecular Systematics Disc	4
Fall 2011	BIOL 419	T: Ornithology Field Expeditn	2
Fall 2011	BIOL 486	Ornithology	26
Fall 2011	BIOL 486L	Ornithology Lab	25

Fall 2011	BIOL 499	Undergraduate Problems	1
Fall 2011	BIOL 502	T: Molecular Systematics Disc	4
Fall 2011	BIOL 519	T: Ornithology Field Expeditn	2
Fall 2011	BIOL 551	Research Problems	3
Fall 2011	BIOL 599	Masters Thesis	2
Fall 2011	BIOL 699	Dissertation	1

4. COURSES TAUGHT BY MSB PERSONNEL
A. Faculty/Collection Managers (26 by Witt and Johnson)

Witt, C. C. (including courses co-taught with A. B. Johnson, marked with asterisks)

Term	Course	Title	Students
Spr. 2011	BIOL 300	Evolution	39
Spr. 2011	BIOL 400	Senior Honors Thesis	1
Spr. 2011	BIOL 402	*T: Avian Sci Specimen Prep	6
Spr. 2011	BIOL 402	T: Molecular Systematic Discus	4
Spr. 2011	BIOL 499	Undergraduate Problems	3
Spr. 2011	BIOL 502	*T: Avian Sci Specimen Prep	3
Spr. 2011	BIOL 502	T: Molecular Systematic Disc	3
Spr. 2011	BIOL 517	Basic Graduate Evolution	18
Spr. 2011	BIOL 551	Research Problems	1
Spr. 2011	BIOL 599	Masters Thesis	1
Spr. 2011	BIOL 300	Evolution	1
Fall 2011	BIOL 400	Senior Honors Thesis	1
Fall 2011	BIOL 402	T: Ecology Seminar	6
Fall 2011	BIOL 402	T: Molecular Seminar	3
Fall 2011	BIOL 402	T: Molecular Systematics Disc	4
Fall 2011	BIOL 419	*T: Ornithology Field Expedition	2
Fall 2011	BIOL 486	Ornithology	26
Fall 2011	BIOL 486L	Ornithology Lab	25
Fall 2011	BIOL 499	Undergraduate Problems	1
Fall 2011	BIOL 502	T: Ecology Seminar	7
Fall 2011	BIOL 502	T: Molecular Seminar	2
Fall 2011	BIOL 502	T: Molecular Systematics Disc	4
Fall 2011	BIOL 519	*T: Ornithology Field Expedition	2
Fall 2011	BIOL 551	Research Problems	3
Fall 2011	BIOL 599	Masters Thesis	2
Fall 2011	BIOL 699	Dissertation	1
Spr 2011	BIOL 461/561	Guest Lecture: Tropical Biology	15
Fall 2011	BIOL 436/536	Guest Lecture: Phylogenetics	15
Fall 2011	BIOL 402	Guest Lecture: Undergraduate Nurturing Opportunities	12
Fall 2011	BIOL 110	Guest Lecture: Biology for Non-majors	180

Wolf, B.O.

Spr 2011	BIOL 461	Tropical Biology, Panama (with Joseph Cook)	15
Spr 2011	BIOL 561	Tropical Biology, Panama (with Joseph Cook)	15
Spr 2011	BIOL 204L	Plant & Animal Structure & Function	120
Fall 2011	BIOL 204L	Plant & Animal Structure & Function	120
Fall 2011	BIOL 486L	Ornithology, with C. Witt	26

5. COLLECTION MANAGEMENT

The Division of Birds added a record 3277 specimens to the collection in 2011. That rate of growth makes us one of the fastest growing bird collections in the world. The world's fastest growing collections, such as KU and LSU, typically add ~3000 specimens per year.

2011 was a banner year for international collecting by the Bird Division. First, we went to Free State Province, South Africa. Bob Dickerman, Andy Johnson, and Phred Benham spent a month in the field at four different sites, collecting 360 birds for ongoing research projects on avian malaria and genome size evolution. These specimens contribute significantly to the diversity of our skin, skeleton, and tissue collections. We established new partnerships with colleagues in the National Museum, Bloemfontein, South Africa.

Our international expeditions continued in late April when Andy Johnson and Bob Dickerman went to the United Kingdom to obtain salvaged birds from rehabilitators' freezers. We got some great birds from rehabilitators as well as from our colleagues at the British Museum of Natural History in Tring.

From May through August we made four major expeditions to Peru. All four graduate students plus three undergraduates and Andy Johnson participated in the trip. After an initial expedition to Ancash targeting tit-tyrants and other birds across an elevational transect, we split into two teams to work the foothills and lowlands of Amazonia. One team worked in southern Peru on the in Cusco and Madre de Dios Departments, while the second team went north and worked on an outlying ridge of the Andes in San Martín. Undergraduate Jonathan Schmitt stayed through August to study the genetics, distribution, and mating behavior of sooty morph Vermilion Flycatchers around Lima.

A major breakthrough came in November, 2011, when we achieved a specimen export that had been held up for over a year by internal politics in Peru. The 2493 specimens were exported in conjunction with the Neotropical Ornithological Congress in Cusco, which was attended by Chris Witt, Shane DuBay, and Sabrina McNew.

Field work at Boone's Draw, New Mexico, was carried out during both spring and fall migration periods. UNM graduate students Matt Baumann and Nick Pederson have spent a considerable effort studying and documenting migration in that small woodlot in eastern New Mexico. Important specimen records this year have included eastern subspecies of Hermit Thrush and White-breasted Nuthatch, a Black-billed Cuckoo, Field Sparrow, and many others.

Back at the prep room at UNM, we prepared over 400 specimens this year, which reflects the growing numbers of personnel in our division and their enthusiasm for museum work. We have kept up with specimen preparation and cataloging, though our successful acquisition of new specimen materials has caused a backlog of skeletons to be cleaned and boxed. Fortunately, through the Generousity of MSB Birds' Associate, Robert W. Dickerman, we were able to add Adrienne Raniszewski to our staff. Adrienne is a skilled curatorial woker who works half-time in the Division of Birds, concentrating on skeletons.

Museum Research Visits:
Libby Beckman:
LSU Museum of Natural Science (1 week)

Phred Benham:
Field Museum of Natural History, Chicago (1 week)
LSU Museum of Natural Science, Baton Rouge (1 week)

Shane DuBay:
Field Museum of Natural History, Chicago (1 week)
Academy of Natural Sciences, Philadelphia (1 week)
American Museum of Natural History, New York (1 week)
CORBIDI (Lima, Peru; 1 week)

Jonathan Schmitt:
CORBIDI (Lima, Peru; 1 week)
Museo de Historia Natural de la Universidad Mayor de San Marcos (Lima, Peru; 1 week)

Christopher C. Witt:
CORBIDI (Lima, Peru; 1 week)

Natalie Wright:
Florida Museum of Natural History (2 weeks)
Smithsonian National Natural History Museum (2 weeks)

6. AWARDS, GRANTS, AND CONTRACTS
Christopher. C. Witt:

- Montane biogeography revealed by quirks of the evolutionary process: Integrative respiratory phenotypes for Andean birds. PI – C. C. Witt, co-PI B. O. Wolf, co-PI J. Mudge. NSF-DEB-Evolutionary Processes. $774,000 over three years, submitted January 2011.Declined.
- Montane biogeography revealed by quirks of the evolutionary process: Integrative respiratory phenotypes for Andean birds. PI – C. C. Witt; co-PI B. O. Wolf, co-PI J. Mudge; NSF-DEB-Evolutionary Processes. $650,000 over three years, submitted July 2011. Funded, with anticipated funding period from 1 December 2011 – 28 February 2015.
- Diversity and Evolutionary Dynamics of Avian Malaria on a Tropical Elevational Gradient. PI – C. C. Witt. NSF-DEB-Evolutionary Processes. $499,000 over three years, submitted July 2011. Declined (Ranked "Outstanding", top 7%, but not funded due to lack of funds).
- Sandhill Crane surveys for the Sunzia transmission line project, Phase III. PI – C. C. Witt; co-PI – S. Maliakal-Witt. Environmental Planning Group, Tucson, AZ. $230,000 over one year, submitted May 2011. Declined.
- Genetic diversity in Painted Bunting populations in New Mexico. PI – C. C. Witt. New Mexico Department of Fish and Game. $11,000 over one year, submitted March 2011. Declined.

- Evolution of Avian Flight Muscles. PI – C. C. Witt; co-PI N. A. Wright; $20,000. Submitted November 2011 to NSF–DEB-Doctoral Dissertation Improvement Grant Program. Pending.
- Diversity of avian haemosporidian parasites on a tropical elevational gradient. PI – C. C. Witt; UNM-RAC Major Grants. $8000. Funded.
- Bird surveys on the Rio Grande for the Sunzia Transmission Line Project, Phase II; PI – C. C. Witt; Environmental Planning Group, Phoenix, AZ; $147,000. June 2010-April 2011.
- CETI Seed Grant: Diversity and host-parasite dynamics of avian malaria along a tropical altitudinal gradient. ~1 December 2010 – 1 December 2012. PI- C. C. Witt; (Subaward of NIH-CETI grant to P.I.'s E. S. Loker and R. Miller; $80,000).
- The Phylogenetic and Biogeographic History of High Altitude Adaptation in Hummingbirds: Selection on Hemoglobin Proteins as a Function of Oxygen Supply and Demand; (2) J. A. McGuire, (written and carried out by Christopher C. Witt); (3) National Science Foundation DEB-0543556; (4) No-cost extension through April 2011 (last $60,000 spent in 2011). [Award to University of California-Berkeley].

Blair O. Wolf

- The direct effects of global warming on desert bird communities: the physiology ecology of die-offs during heat waves, Julie Hutt Co-PI, NSF IOS-Organism-Environment Interactions (2011-2014), $654,985
- Montane biogeography revealed by quirks of the evolutionary process: Integrative respiratory phenotypes for Andean birds. Chris Witt PI, B. O. Wolf Co-PI, NSF IOS-Organism-Environment Interactions (2012-2015), $650,000
- Desert tortoises as walking tree rings: evaluating the effects of climate and resource variability on tortoise growth and survival using stable isotopes, Ian Murray, Ph.D. Candidate, Co-PI, Arizona Game and Fish Department, (2009-2012), $59,543

Bethany Abrahamson

- Ryan Beaulieau Memorial Research Scholarship ($1,000)

Elizabeth Beckman:

- Chapman Memorial Fund Fall 2011 - pending
- GRAC, Fall 2011 - declined
- UNM Biology Scholarships Spring 2011 - declined
- Systematic Biology Spring 2011 - declined
- Sigma Xi Spring 2011 - ($1,000)
- AOU research grant Spring 2011 - ($2,420)

Fred Benham:

- Frank M. Chapman Memorial Fund Grant ($3000)
- Graduate Resource Allocation Committee Grant ($400)
- AOU Travel Award (~$475)
- Sigma-xi grant in aid of research - Declined
- Society for Systematic Biologists grant - Declined
- AOU Research Grant - Declined

Shane DuBay:

- American Ornithologists' Union Student Travel Award ($400)
- Graduate Research Allocations Committee Award (Univ. of New Mexico) ($500)
- Alvin R. and Caroline G. Groves Summer Scholarship ($3000)

Spencer Galen:

- NSF Graduate Research Fellowship (pending)

Sabrina McNew:

- NSF Graduate Research Fellowship (pending)

C. Jonathan Schmitt:

- 2011 UNM Biology Department DONALD M. CAUGHRAN MEMORIAL ENDOWED SCHOLARSHIP IN BIOLOGY; $1500.
- 2011 New Mexico Ornithological Society Research Grant; $1000.

Natalie Wright:

- UNM PiBBs Fellowship, ~$30,000.
- NSF DDIG ($20,000, pending)

7. PUBLICATIONS By Division Personnel
A. Books, Book Chapters, Edited Volumes
None

B. Journal Articles
Baumann, M. J., N. D. Pederson, J. Oldenettel, **M. S. Graus, S. M. McNew, & C. C. Witt.** 2011. Molecular and morphological evidence confirm the first record of Eastern Whip-poor-will (*Caprimulgus vociferus*) for New Mexico. *NMOS Bulletin*, 39:1-10.

Benham, P. M., E. J. Beckman, S. G. DuBay, M. Flores, **A. B. Johnson, M. J. Lelevier, C. J. Schmitt, N. A. Wright**, and **C. C. Witt**. 2011. Satellite imagery reveals new critical habitat for endangered bird species in the high Andes of Peru. *Endangered Species Research* 13(2):145-157.

Braun, E. L., R. T. Kimball, K.-L. Han, N. R. Iuhasz, A. J. Bonilla, J. L. Chojnowski, J. V. Smith, R. C. K. Bowie, M. J. Braun, S. J. Hackett, J. Harshman, C. J. Huddleston, B. D. Marks, K. J. Miglia, W. S. Moore, S. Reddy, F. H. Sheldon, **C. C. Witt**, & T. Yuri. 2011. Homoplastic Microinversions and the Avian Tree of Life. *BMC Evolutionary Biology,* 11:141-. doi:10.1186/1471-2148-11-141.

Engel, J. I., M. H. Hennan, **C. C. Witt**, and J. D. Weckstein. 2011. Genetic affinities of three vagrant Cave Swallows (*Petrochelidon fulva*) from eastern North America. *Wilson Journal of Ornithology*, 123(4):840-845.

Han, K-L., E. L. Braun, R. T. Kimball, S. Reddy, R. C. K. Bowie, M. J. Braun, J. L. Chojnowski, S. J. Hackett, J. Harshman, C. J. Huddleston, B. D. Marks, K. J. Miglia, W. S. Moore, F. H. Sheldon, D. W. Steadman, **C. C. Witt** & T. Yuri. 2011. Are transposable element insertions homoplasy free? An examination using the avian tree of life. *Systematic Biology* 60(3)375-386.

Johnson, A. B., S. M. McNew, M. S. Graus, and **C. C. Witt.** 2011. Mitochondrial DNA and meteorological data suggest a Caribbean origin for New Mexico's first Sooty Tern (*Onychoprion fuscatus*). *Western Birds*, 42:233-242.

McCluney K. E., J. Belnap, S. L. Collins, B. Cutts, A. L. González, E. M. Hagen, J. N. Holland, B. P. Kotler, F. T. Maestre, S. D. Smith, and B. O. **Wolf** (2011) Shifting consumer-resource interactions in response to altered water availability in dryland systems, **Biological Reviews** DOI: 10.1111/j.1469-185X.2011.00209.x

Smith C. L., M. Toomey, B. R. Walker, E. J. Braun, B. O. **Wolf**, K. McGraw, and K. L. Sweazea (2011) Resistance to oxidative stress in the vasculature of Mourning Doves (*Zenaida macroura*), **Journal of Zoology** 114 171-176.

Witt, C. C. and E. Bautista-Obispo. 2011. Triorchidism in a hummingbird. *The Wilson Journal of Ornithology* 123(3):632–635.

Wolf B. O. and K. A. Hatch (2011) Invited commentary: Aloe nectar, birds and stable Isotopes-opportunities for quantifying trophic interactions, **Ibis** 153 1-3.

C. Web-Based
None

D. Technical Reports
Witt, C. C. and T. Valqui. 2011. Preliminary report on work conducted under INRENA Permit No. 377-2010-AG-DGFFS-DGEFFS. Technical Report to DGFFS/INRENA (Peru). Submitted May 17, 2011 (in Spanish). 19pp.

Maliakal-Witt, S. and C. C. Witt. 2011. Assessment of the Potential Impacts of the SUNZIA Southwest Transmission Project on Birds during Autumn Migration: a Comparison of Four Alternative Routes across the Rio Grande. Technical Report on the Sunzia Southwest Transmission Line Project. April 15, 2011. 67pp.

Maliakal-Witt, S. and C. C. Witt. 2011. Synthesis of fall and winter data for the assessment of the Potential Impacts of the SUNZIA Southwest Transmission Project on Birds: a Comparison of Four Alternative Routes across the Rio Grande. Technical Report on the Sunzia Southwest Transmission Line Project. July 15, 2011. 87pp.

E. Theses/Dissertations Completed

F. Work In Progress

G. Publications/Reports Based on MSB Bird Division Specimens/Data
Baumann, M. J., N. D. Pederson, J. Oldenettel, **M. S. Graus, S. M. McNew, & C. C. Witt.** 2011. Molecular and morphological evidence confirm the first record of Eastern Whip-poor-will (*Caprimulgus vociferus*) for New Mexico. *NMOS Bulletin*, 39:1-10.

Benham, P. M., E. J. Beckman, S. G. DuBay, M. Flores, **A. B. Johnson, M. J. Lelevier, C. J. Schmitt, N. A. Wright**, and **C. C. Witt**. 2011. Satellite imagery reveals new critical habitat for endangered bird species in the high Andes of Peru. *Endangered Species Research* 13(2):145-157.

Braun, E. L., R. T. Kimball, K.-L. Han, N. R. Iuhasz, A. J. Bonilla, J. L. Chojnowski, J. V. Smith, R. C. K. Bowie, M. J. Braun, S. J. Hackett, J. Harshman, C. J. Huddleston, B. D. Marks, K. J. Miglia, W. S. Moore, S. Reddy, F. H. Sheldon, **C. C. Witt**, & T. Yuri. 2011. Homoplastic Microinversions and the Avian Tree of Life. *BMC Evolutionary Biology,* 11:141-. doi:10.1186/1471-2148-11-141.

Engel, J. I., M. H. Hennan, **C. C. Witt**, and J. D. Weckstein. 2011. Genetic affinities of three vagrant Cave Swallows (*Petrochelidon fulva*) from eastern North America. *Wilson Journal of Ornithology*, 123(4):840-845.

Han, K-L., E. L. Braun, R. T. Kimball, S. Reddy, R. C. K. Bowie, M. J. Braun, J. L. Chojnowski, S. J. Hackett, J. Harshman, C. J. Huddleston, B. D. Marks, K. J. Miglia, W. S. Moore, F. H. Sheldon, D. W. Steadman, **C. C. Witt** & T. Yuri. 2011. Are transposable element insertions homoplasy free? An examination using the avian tree of life. *Systematic Biology* 60(3)375-386.

Johnson, A. B., S. M. McNew, M. S. Graus, and **C. C. Witt.** 2011. Mitochondrial DNA and meteorological data suggest a Caribbean origin for New Mexico's first Sooty Tern (*Onychoprion fuscatus*). *Western Birds*, 42:233-242.

KERR, K. C. R. (2011), Searching for evidence of selection in avian DNA barcodes. Molecular Ecology Resources, 11: 1045–1055. doi: 10.1111/j.1755-0998.2011.03049.x

Klicka J., G.M. Spellman, K. Winker, V. Chua, and B.T. Smith. A Phylogeographic and Population Genetic Analysis of a Widespread, Sedentary North American Bird: The Hairy Woodpecker (*Picoides villosus*). Auk 128. 346-362.

Smith, B.T., P. Escalante, B.E. Hernándes Baños, A.B.Navarro-Sigüenza, S. Rohwer, and J. Klicka. The role of historical and contemporary processes on phylogeographic structure and genetic diversity in the Northern Cardinal, *Cardinalis cardinalis.* BMC Evolutionary Biology 11: 136; 12 pp.

Witt, C. C. and E. Bautista-Obispo. 2011. Triorchidism in a hummingbird. *The Wilson Journal of Ornithology* 123(3):632–635.

WOLFE, D. H., L. C. LARSSON, J. R. OLDENETTEL, H. A. WALKER, AND M. A. PATTEN. 2011. Status of populations of the White-tailed Ptarmigan at the southern edge of its range. In R. T. Watson, T. J. Cade, M. Fuller, G. Hunt, and E. Potapov (Eds.). Gyrfalcons and Ptarmigan in a Changing World. The Peregrine Fund, Boise, Idaho, USA. http://dx.doi.org/10.4080/gpcw.2011.0122

ACTIVITIES IN LEARNED SOCIETIES

A. Invited/Plenary Talks and/or Seminars

Williams, S.O. Adventures in Mexico with the Mexican Duck 49th Annual Meeting of New Mexico Ornithological Society, Las Cruces, NM, April 2011.

Wright, N.A. Taking wing: Avian flight muscle evolution. October 2011. University of New Mexico Brown Bag Seminar.

Witt, C. C. 2011. Parasites, respiratory physiology, and the elevational limits of Andean birds. University of Nebraska-Lincoln, invited seminar.

Wolf, B. O. Climate change increases the likelihood of catastrophic avian mortality events during extreme heat waves. Australian Ornithological Conference, Cairns, Australia

B. Contributed Talks/Posters

Benham, P.M., and C.C. Witt. 2011. Climate explains the discordance between morphological and genetic variation in hummingbird *Metallura tyrianthiana*. 129th Meeting of American Ornithologists' Union, Jacksonville, FL.

Beckman, E.J. & Witt, C.C. 2011. Genetic and Morphometric Variability in Generalist and Specialist Species of South American siskins. 129th Meeting of American Ornithologists' Union, Jacksonville, FL.

DuBay, S.G., and C.C. Witt. 2011 Diversification by local adaptation across an elevational gradient in Tit-tyrant flycatchers. 129th Meeting of American Ornithologists' Union, Jacksonville, FL.

DuBay, S.G., and C.C. Witt. 2011. Diversification by local adaptation across an elevational gradient in Tit-tyrant flycatchers, Neotropical Ornithological Congress Cusco, Peru.

Schmitt, C.J, W. Vargas Compos and C. C. Witt. Industrial melanism in the Vermilion Flycatcher (Pyrocephalus rubinus): the first case in a vertebrate? 2011 Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) National Conference

Smiley, A., G. Williams, N.A. Wright, and C.C. Witt. Cardiac Morphology as an Indicator of Hypoxic Stress in High-Andean Birds. 129th Meeting of American Ornithologists' Union, Jacksonville, FL.

Williams, S.O. III. New Mexico List Update: 538 and Counting. 36th Annual Conference of Western Field Ornithologists, Sierra Vista, AZ August 2011.

Wolf, B. O. Climate change increases the likelihood of catastrophic avian mortality events during extreme heat waves. Australian Ornithological Conference, Cairns, Australia
Wright, N.A. 2011. An island rule for avian flight muscles. 129th Meeting of the American Ornithologists' Union. Jacksonville, FL.

Witt, C. C. 2011. Elevational diversity gradients in avian malaria in the tropical Andes. International Meeting on Haemosporidian Parasites of Wildlife, Sheperdstown, West Virginia.

Witt, C. C. 2011. Discordant diversity gradients between avian malaria and their hosts in the tropical Andes. 129th Meeting of American Ornithologists' Union, Jacksonville, FL.

Witt, C. C. 2011. Comparative physiology and elevational distribution limits in Andean birds. Symposium on High Altitude Adaptation, Neotropical Ornithological Congress, Cusco, Peru.

Witt, C. C. 2011. Synthesis of symposium on high altitude adaptation in Andean birds. Symposium on High Altitude Adaptation. Neotropical Ornithological Congress, Cusco, Peru.

C. Attendance at Professional Meetings

Beckman, E.J.
129th Meeting of the American Ornithologists' Union, Jacksonville, Florida, USA.

Schmitt, C. J.
Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) National Conference

Benham, P.M.
129th Meeting of the American Ornithologists' Union, Jacksonville, Florida, USA.

DuBay, S.G.
129th Meeting of the American Ornithologists' Union, Jacksonville, Florida, USA.
Neotropical Ornithological Congress, Cusco, Peru,

Smiley, A.
129th Meeting of the American Ornithologists' Union, Jacksonville, Florida, USA.

Williams, S. O. III
49th Annual Meeting of New Mexico Ornithological Society, Las Cruces, NM, April 2011
36th Annual Conference of Western Field Ornithologists, Sierra Vista, AZ August 2011

Witt, C. C.
129th Meeting of the American Ornithologists' Union, Jacksonville, Florida, USA.
Neotropical Ornithological Congress, Cusco, Peru,
International Meeting on Haemosporidian Parasites of Wildlife, Sheperdstown, WV, USA.

Wright, N.A.
129th Meeting of the American Ornithologists' Union, Jacksonville, Florida, USA.

D. Service as Editor or on Editorial Board of a Journal

Williams, S. O. III
New Mexico Editor, North American Birds
Editor, New Mexico Ornithological Society Field Notes

E. Service as Officer of Professional Society/Organization
Wright, N.A.
AOU Collections Committee

Witt, C. C.
AOU Student Awards Committee

9. OTHER PROFESSIONAL ACTIVITIES

A. Colloquium Presentations

None.

B. Presentation to General Audience in a Scholarly Capacity
Benham, P. M. 2011. Bird Migration. Presentation to Santa Fe Audubon Society. April.

Witt, C. C. 2011. "Exciting new research on birds at the Museum of Southwestern Biology." Presentation to the Central New Mexico Audubon Society. October 17.

C. Presentations in a Scholarly Capacity at Hearings, Workshops, Legislative Committees, etc.
Witt served as volunteer expert for USFWS for bird identification in Migratory Bird Treaty Act violation case in New Mexico, 2011.

D. Scholarly Service as a Member of a Local/State/Regional/National Committee, Panel, etc.
Williams, S.O.
Secretary, New Mexico Bird Records Committee.

E. Journal Referee
Wright, N.A.:
Evolution (2)

Williams. S.O. III:
NMOS Bulletin (1)

Witt, C. C.:
Cotinga (2)
Evolution (2)
Proceedings of the National Academy of Sciences (1)
The Auk (1)
Journal of Field Ornithology (1)
Journal of Biogeography (2)
Zootaxa (1)
Wilson Journal of Ornithology (1)
Neotropical Fauna and Environment (1)

Roberts Publishing (1 book chapter)
Freeman-Herron Press (2 book chapters)
W. W. Norton Publishers, *Evolution* by Dugatkin and Bergstrom (1 textbook)

Wolf, B. O.
Western Birds (1)
Ecosphere (1)
Functional ecology (1)
Oecologia (1)

10. SERVICE
A. Symposia, Workshops, Conferences etc. Sponsored, Organized, Held, etc.
Witt, C. C., and Z. A. Cheviron, co-organizers. Symposium on high-altitude adaptation in Andean birds. Neotropical Ornithological Congress, Cusco, Peru, November 2011.

B. Public Service
Williams, S.O. III
Secretary of the New Mexico Bird Records Committee
New Mexico Coordinator of the North American Breeding Bird Survey (BBS)

Wolf, B.O.
Institutional Animal Care and Use Committee
Department of Biology Grad Policy Committee Chair
Faculty sponsor, BUGS- Biology Undergraduate Society
Coordinator for SORA

Benham, P.M.
Bird Migration talk to Santa Fe Audubon Society April 2011

Witt, C. C.
- Popular science talk for Central New Mexico Audubon Society
- Popular science article about Sandhill Cranes for *Bosque Tracks*.
- High School Intern: Shawn Lujan, Del Norte High School, Spring 2011.
- Hosted "Day at the Museum: A behind the scenes tour of the Museum of Southwestern Biology," for The Montessori Elementary School Public Charter school, Albuquerque, NM (52 students); October 31, 2011.
- Other Tours and visits to MSB Bird Division (as per above).

11. ADVANCED STUDY, HONORS, AWARDS, FELLOWSHIPS, ETC.
None

12. DONATIONS AND GIFTS RECEIVED
R. W. Dickerman: ~$10,000 for Africa expedition.
R. W. Dickerman: $20,000 for curatorial labor.

13. CURRENT STAFF

A. Faculty/Staff

Christopher C. Witt, Curator of Birds
Andrew B. Johnson, Collection Manager
Blair O. Wolf, Associate Curator
Adrienne Raniszewski, Curatorial Staff
Sabrina McNew, Lab Technician

B. Graduate students

Natalie Wright, Ph.D Student
Elizabeth Beckman, Ph.D Student
Phred Benham, Masters' Student
Shane DuBay, Masters' Student
Spencer Galen, Masters' Student
Nick Pederson, Masters' Student
Matthew Baumann, Masters' Student

C. Undergraduate Student Workers and Volunteers

Student Workers, REU students, and paid undergraduates:
Abrahamson, Bethany
Boslough, Kobie
Clark, Jennifer
Flores M., Monica (Peru)
Graus, Matthew S.
Hilchey, Michael
Jones, Matthew R.
O'Donnell, Matthew
Olivas, Iris
Pena, Margie
Quiñonez Z., Alessandra (Peru)
Reyes-Azul, Diego
Schmitt, C. Gregory
Schmitt, C. Jonathan
Schmitt, Donna C.
Sheldon, Sarah
Smiley, Ashley
Steinberg, Rosemary
Swiderek, Sara
Talbot, William
VanBuskirk, Raymond
Yazzi, Sierra
Wolf, Cole

14. MUSEUM ASSOCIATES

A. Curatorial Associates

Robert W. Dickerman

John P. Hubbard

B. Research Associates
Sartor O. Williams, III
Hira A. Walker
C. Gregory Schmitt
Donna C. Schmitt
Mary Alice Root
J. David Ligon

DIVISION OF FISHES

Curator: Thomas Turner
Collection Manager: Alexandra Snyder

1. DIVISION HIGHLIGHTS

Currently, the MSB Division of Fishes has **86,689** catalogued lots of fishes (3,878,375 specimens). During the year, 868 lots of fishes (2,792 specimens) were cataloged and integrated into the main collections. To date, there are 43,949 digital files of field notes, habitat photographs, and data sheets available along with 38,587 specimen locality records.

$435,339 annual funding through grants and contracts was available for ichthyological research, aquatic studies, and museum curation of fish collections, undertaken by MSB Division of Fishes staff, students, and research associates during 2011.

Outreach Summary: Tours: Summer of Science, Belen Public Schools June 2011(3 hours); UNM Biology Graduate Student Orientation, August 2011(1 hour); UNM Institutional Animal Care and Use Committee, November 2011 (3.5 hours); Pecos Nat'l Historical Park, NPS, November 2011(.50 hours); Montessori Elementary School, October 2011 (1 hour); California Works Program, July 2011 (1 hour); UNM Main Campus Institutional Animal Care and Use Committee, December 2011 (4 hours).

2. TABLE OF COLLECTION USE

Collection Growth	Loans-out[1]	Loans-in[2]	Visitors- number & days[3]	Information Requests[4]	Publications Citing MSB Specimens[5]
868 lots 2,792 spec	14 936 spec	2	46 visitors 67 days	90 requests	18 illustrations 4 publications

[1]Specimen loans, return of loans, gifts, exchanges, and tissue (consumptive) transfers
[2]Loans, gifts or tissue transfers from other institutions
[3]research, accessing specimens, or info exchange (not tour groups)/number of visitor days
[4]emails, letters, telephone calls (not tour groups or website "hits") averaging 1 hour to respond
[5]publications in peer review journals

3. COURSES USING THE COLLECTIONS

BIOL. 487L Ichthyology, Spring 2011, 20 students
BIOL. 386L General Vertebrate Zoology Lab, Spring 2011, 37 students
BIOL. 204L Plant and Animal Form and Function, Spring 2011, 30 students
BIOL. 386L General Vertebrate Zoology Lab, Fall 2011, 29 students
BIOL. 204L Plant and Animal Form and Function, Fall 2011, 30 students
BIOL. 499 Undergraduate Problems, Fall 2011, 1 student

4. COURSES TAUGHT BY MSB PERSONNEL

A. Faculty/Collection Managers/Research Associates

Osborne, M.J.
BIOL-517-001 Graduate Evolution Core, 20 students

Turner, T. F.

BIOL. 402 Ecology and Evolution of Fishes, Spring 2011, 4 students
BIOL. 502 Ecology and Evolution of Fishes, Spring 2011, 6 students
BIOL. 487L Ichthyology, Spring 2011, 19 students
BIOL. 387L General Vertebrate Zoology, Fall 2011, 29 students
BIOL. 499 Undergraduate Problems, Fall 2011, 1 student

B. Graduate Students

Krabbenhoft, C.A.

BIOL. 487L Ichthyology, Spring 2011, 20 students
BIOL. 202L Genetics, Fall 2011, 70 students

Krabbenhoft, T.J.

BIOL. 495L Limnology, Spring 2011, 10 students

Pilger, T.J.

BIOL. 386L General Vertebrate Zoology Lab, Fall 2011, 29 students

5. COLLECTION MANAGEMENT

The full integration of New Mexico Dept. Game and Fish State Reference Collections approximately 10,000 jars) is almost complete but currently on hold while staff process and catalog other collections that have been waiting while we devoted all curatorial efforts to NMDGF collections. Graduate student assistants, T.J. Pilger and T.J. Krabbenhoft, were responsible for all georeferencing, data editing, and validation of MSB fish locality data. Currently, 36,551 out of 38,587 specimen locality records are georeferenced and cleaned.

Seven undergraduate Curatorial Assistants processed specimens received from several ongoing projects: Wyoming Dept. Game and Fish, USFWS NM/TX Fish and Wildlife Conservation Office, US Bureau of Reclamation, US Bureau of Land Management, Aquatic Conservation Facility of Albuquerque BioPark, American Southwest Ichthyological Researchers, New Mexico Dept. Game and Fish, five UNM Biology graduate students, and one UNM Biology postdoctoral researcher.

The purchase of a Labconco Freeze Dryer (November 2011) was funded by New Mexico Department of Game and Fish, State Wildlife Grant so that fin clips and tissues extracted for genetic analysis can be archived in dry condition, maintaining genetic material for longer than 5 years. Tracy Diver, Museum Graduate Student (GA), will be developing a protocol for preparing, archiving, and using freeze dried tissues in the next year.

6. AWARDS, GRANTS, AND CONTRACTS

Evolutionary and conservation genetics of endemic and native fishes of the Cuatro Ciénegas basin, Mexico. T.F. Turner PI and E.W. Carson Co-PI. World Wildlife Fund, Mexico. Total $120,000 1 Jan 2011-1 Jan 2013. **Annual Budget $40,000**.

Curation of NM Fish and Wildlife Conservation Office Collections No. 201819G905. A.M. Snyder PI and T.F. Turner Co-PI. U.S. Fish and Wildlife Service. Total award: $130,000 1 Oct 2008 to 1 Oct 2011. **Annual budget $26,000.**

Grant Agreement for Curatorial Services Between Bureau of Reclamation upper Colorado Region and the Museum of Southwestern Biology at the University of New Mexico R11AP40025. A.M. Snyder PI and T.F. Turner Co-PI. U.S. Bureau of Reclamation. Total award: $146,425. 1 April 2011 to 31 March 2015. **Annual budget $29,285.**

Accession and Integration of NMDGF Fish Collections in Museum of Southwestern Biology, Division of Fishes No. T-39-1 A.M. Snyder PI and T.F. Turner Co-PI. New Mexico Department of Game and Fish. Total award: $140,000. 1 Jul 2008 to 30 Jun 2015. **Annual budget $20,000.**

Baseline genetic studies of fishes native to the Gila River T.F. Turner, PI and T.J. Pilger CoPI. New Mexico Department of Game and Fish. Total award: $11,000 1 Jul 2010 to 30 Jun 2011. **Annual budget $11,000.**

Community responses to river drying in an arid-land ecosystem: a field and experimental study: REU supplement. PI Thomas F. Turner. National Science Foundation. Total award: $7,500 10 May 2010 to 31 Jul 2011. **Annual budget $7,500.**

Genetic and demographic studies to guide conservation management of bonytail chub and razorback sucker in off-channel habitats. T. Dowling PI Arizona State University and T.F. Turner Co-PI subaward. US Bureau of Reclamation. Total award: $44,760. 1 Oct 2010 to 30 Sep 2015 **Annual budget $8,000.**

Assessment and monitoring of Rio Grande silvery minnow genetics.
US Bureau of Reclamation, Middle Rio Grande ESA Collaborative Program T.F. Turner PI and M.J. Osborne Co-PI. Total Award: $772,000 (based on annual renewals) 1 Oct 2007 to 30 Sep 2012. **Annual budget $172,794**

Metacommunity dynamics of Gila River fishes. K. Gido PI, T. F. Turner Co-PI, D. L. Propst Co-PI and J. Falke Co-PI. US Bureau of Reclamation, Desert LCC. 1 Oct 2011 to 30 Sep 2014. Total award (UNM) $78,000. **Annual budget $37,500.**

*Comparative transcriptomics of immune-related genes in cyprinid fishes.*T. F. Turner PI. Center for Evolutionary and Theoretical Immunology (CETI) Seed Grant. 1 Oct 2011 to 1 May 2013. Total award $79,500. **Annual budget $39,000.**

Razorback Sucker Genetic Diversity Assessment. T. Dowling PI Arizona State University and T F Turner CoPI. US Bureau of Reclamation Total Award: $32,891. 1 Oct 2011 to 30 Sep 2015. **Annual budget $7,500.**

7. PUBLICATIONS
A. Books, Book Chapters, Edited Volumes

NONE

B. Journal Articles

Carson, E. W. 2011. Low but stable frequency of xanthic phenotypes in a population of the twoline pupfish *Cyprinodon bifasciatus*. American Midland Naturalist 166:462-466.

Carson, E. W., E. Saillant, M. A. Renshaw, N. J. Cummings, J. R. Gold. 2011. Population structure and long-term connectivity and effective size of mutton snapper (*Lutjanus analis*) in the Caribbean Sea and Florida Keys. Fishery Bulletin 109:416-428.

Israel, J. A., K. M. Fisch, T. F. Turner, and R. S. Waples. 2011. Conservation of native Bay-Delta fishes: past experience and future considerations for artificial propagation of Chinook salmon, delta smelt and green sturgeon. San Francisco Estuary & Watershed Science. April: 1-20.

Kennedy, T. L., and T. F. Turner. 2011. River channelization reduces nutrient flow and macro-invertebrate diversity at the aquatic-terrestrial transition zone. Ecosphere. Vol 2(3) Article 35: 1-13.

Osborne, M.J. and T.F. Turner. 2011. Isolation and characterization of major histocompatibility class II beta genes in an endangered North American cyprinid fish, the Rio Grande silvery minnow (*Hybognathus amarus*). Fish and Shellfish Immunology Vol.30 (6):1275-1282.

Stefferud, J.A., K.B. Gido, and D.L. Propst. 2011. Spatially variable response of native fish assemblages to discharge, predators and habitat characteristics in an arid-land river. Freshwater Biology 56:1403-1416.

Stevens, M.M., A.S. Burdett, E.M. Mudford, S. Helliwell, and G. Doran. 2011. The acute toxicity of fipronil to two non-target invertebrates associated with mosquito breeding sites in Australia. Acta Tropica 117: 125-130

C. Web-Based NONE

D. Technical Reports

Brandenburg, W. H., 2010 – 2011. Eighteen ink and watercolor scientific illustrations of New Mexico's native fishes: *Gila Pandora, Ictalurus furcatus, Ictalurus punctatus, Notropis simus pecosensis, Notropis stramineus, Notropis girardi, Hybognathus placitus, Catostomus commersonii, Gambusia affinis, Gambusia nobilis, Dorosoma cepedianum, Lucania parva, Dionda episcopa, Cyprinella lutrensis, Ictiobus bubalus, Pylodictis olivaris, Lepomis macrochirus,* and *Pimephales promelas.* Contracted by New Mexico Department of Game and Fish, Santa Fe, NM.

Brandenburg, W. H. and M.A. Farrington. 2011. Colorado pikeminnow and razorback sucker larval fish survey in the San Juan River during 2010. Report to the San Juan River Recovery Implementation Program USBR Salt Lake UT and the US Fish and Wildlife Service, Albuquerque NM. 56 pp.

Bixby, R.J. and A.S. Burdett. 2011. Effects of nutrient availability on periphyton growth and diversity in the Middle Rio Grande: top-down and bottom-up factors. Report to the Middle Rio Grande Endangered Species Act Collaborative Program, USBR Albuquerque NM. 79 pp.

Carson, E. W. October 2011. Status of the Rio Churince system, Cuatro Cienegas, Mexico. Contracted by Universidad Nacional Autónoma de México (UNAM) and World Wildlife Fund, México.

Carson, E. W. August 2011. Status of the Rio Churince system, Cuatro Cienegas, Mexico. Contracted by Universidad Nacional Autónoma de México (UNAM) and World Wildlife Fund, México.

Carson, E. W. June 2011. Vital signs report for pupfishes (genus *Cyprinodon*) of the Rio Conchos basin, Chihuahua, Mexico, including preliminary environment, habitat, and population data, and initial sampling of specimens for conservation genetic analyses. Contracted by World Wildlife Fund, México.

Carson, E. W. February 2011. Status of the Rio Churince system, Cuatro Cienegas, Mexico. Contracted by Universidad Nacional Autónoma de México (UNAM) and World Wildlife Fund, México.

Dudley, R.K. and S.P. Platania. 2011. Rio Grande silvery minnow (*Hybognathus amarus*) population monitoring monthly trip reports and analyses. Nine reports to the Middle Rio Grande Endangered Species Act Collaborative Program and the US Bureau of Reclamation, Albuquerque, NM. 270 pp.

Dudley, R.K. and S.P. Platania. 2011 Spatial spawning periodicity of Rio Grande silvery minnow during 2009. Report to the Middle Rio Grande Endangered Species Act Collaborative Program and the US Bureau of Reclamation, Albuquerque, NM. 42 pp.

Dudley, R.K. and S.P. Platania. 2011. Rio Grande silvery minnow population monitoring program results from September 2009 to October 2010. Report to the Middle Rio Grande Endangered Species Collaborative Program and the US Bureau of Reclamation, Albuquerque, NM. 179 pp.

Dudley, R.K., G.C. White, S.P. Platania, and D.A. Helfrich. 2011. Rio Grande silvery minnow (Hybognathus amarus) population estimation program results from October 2010. Report to the Middle Rio Grande Endangered Species Collaborative Program and the US Bureau of Reclamation, Albuquerque, NM. 85 pp.

Horwitz, R.J, D.H. Keller, P.F. Overbeck, S.P. Platania, and R.K. Dudley. 2011. Age and growth of Rio Grande silvery minnow. Report to the Middle Rio Grande Endangered Species Collaborative Program and the US Bureau of Reclamation, Albuquerque, NM. 74 pp.

Pilger, T.J. and T.F. Turner. 2011. Baseline genetic studies of fishes native to the Gila River Basin. New Mexico Department of Game and Fish, Share with Wildlife Program Report. 20 pp.

Snyder, A.M. and T.F. Turner. 2011. Accession and curation of fish collections received from the USFWS New Mexico Fish and Wildlife Conservation Office by the University of New Mexico, Museum of Southwestern Biology. Contract 201819G905. Annual Report to USFWS, Albuquerque NM. 140 pp.

Snyder, A.M. and T.F. Turner. 2011. Curation of the 2010 San Juan River collections of fishes, University of New Mexico, Museum of Southwestern Biology. Contract 05-FG-40-2411. Annual Report to San Juan River Basin Recovery Implementation Program, US Bureau of Reclamation, UT.
26 pp.

Snyder, A.M. 2011. Accession and integration of New Mexico Dept. Game and Fish State Reference Collections of fishes by the University of New Mexico, Museum of Southwestern Biology. Contract T-39-1. Annual Report to Conservation Services, NMDGF, Santa Fe. 4 pp.+ 421 appendix pages

E. Theses/Dissertations Completed

F. Work In Progress
Burdett, A.S., and T.F. Turner. Effects of river drying and flooding on biotic assemblage structure in an aridland river (Rio Grande, New Mexico). Freshwater Biology. **In review.**

Burdett, A. S., J. S. Fencl, and T. F. Turner. Comparison of aquatic invertebrate sampling methods in a shallow and braided aridland river (Rio Grande, New Mexico). The Southwestern Naturalist. **In review.**

Carson, E. W., M. Tobler, W. L. Minckley, R. J. Ainsworth, and T. E. Dowling. Relationships between spatio-temporal environmental and genetic variation reveal an important influence of exogenous selection in a pupfish hybrid zone. Molecular Ecology **Early view DOI: 10.1111/j.1365-294X.2011.05433.x.**

Hanna, A. H., K. W. Conway, E. W. Carson, G. P. Garrett, and J. R. Gold. Conservation genetics of an undescribed species of *Dionda* (Teleostei: Cyprinidae) in the Rio Grande drainage in West Texas. Southwestern Naturalist. **In press.**

Osborne, Megan J., Evan W. Carson, Thomas F. Turner. Genetic monitoring and complex population dynamics: insights from a 12-year study of the Rio Grande silvery minnow. Evolutionary Applications. **In press.**

Pilger, T.J. and K.B. Gido. Overlapping Unionid assemblages between streams and a reservoir with the Kansas River Basin. *American Midland Naturalist.* **In press.**

Ross, S. T. and W. J. Matthews. Evolution and ecology of North American freshwater fish assemblages, Volume 1. *In*: North American Freshwater Fishes: Ecology, Evolution, and Behavior. B. M. Burr and M. L. Warren (eds.). Johns Hopkins University Press. **In press.**

Ross, S.T. Native fishes. *In*: Mississippi Encyclopedia. C.R. Wilson (ed). University Press of Mississippi. **In press.**

Ross, S.T. Ecology of North American Freshwater Fishes. Textbook. University of California Press. **In preparation**.

Turner, T. F., and M. S. Edwards. Aquatic food web structure of the Rio Grande assessed with stable carbon and nitrogen isotopes. Journal of the North American Benthological Society. **In press.**

Wilson, W. D., and T. F. Turner. Evolution of the MHC class II DAB locus in the family Salmonidae. Immunogenetics. **In revision.**

G. Publications/Reports Based on MSB Specimens/Data by Outside Researchers
McGarvey, D.J. 2011. Quantifying ichthyofaunal zonation and species richness along a 2800-km reach of the Rio Chama and Rio Grande (USA). Ecology of Freshwater Fish 2011: 1-12.

Stefferud, J.A., K.B. Gido, and D.L. Propst. 2011. Spatially variable response of native fish assemblages to discharge, predators and habitat characteristics in an arid-land river. Freshwater Biology 56:1403-1416.

8. ACTIVITIES IN LEARNED SOCIETIES
A. Invited/Plenary Talks and/or Seminars
Quattro, J.M., T.J. Krabbenhoft, F.C. Rohde, J.M. Grady. Genetic and morphological divergence in Lake Waccamaw endemic fishes. Joint Meeting of Ichthyologists and Herpetologists, Minneapolis, MN. July 2011.

B. Contributed Talks/Posters (Presenters' name in bold)
Bixby, R.J., A.S. Burdett, and N. Lopez-Brody. Role of desiccation periodicity in shaping algal community heterogeneity in an aridland river. North American Benthological Society 59th Annual Meeting, Providence, RI. 22-26 May 2011.

Burdett, A.S., and T.F. Turner. Of droughts and flooding rains: aquatic invertebrate community ecology in a dryland river (Rio Grande, New Mexico). North American Benthological Society 59th Annual Meeting, Providence, RI May 2011.
Carson, E.W. 2011. Dead spring flowing: witnessing loss of the Churince system. 43rd Annual Meeting of the Desert Fishes Council, Hermosillo, Mexico. November 2011.

Esquibel, J.M., A.S. Burdett, and R.J. Bixby. Effects of nitrogen as a limiting resource on aquatic abundance and richness. UNM Department of Biology 20th Annual Research Day Albuquerque, NM April 2011.

Kawatachi, J., T.J. Krabbenhoft, T.F. Turner. Reproductive timing and allele length variation in the PolyQ domain of the Clock gene in cyprinid fishes of the middle Rio Grande, New Mexico. SACNAS Conference, San Jose, CA. 27-30 October 2011. **Winner of best poster award in Animal Science.**

Krabbenhoft, C.A., A.S. Burdett, and T.F. Turner. The feeding habits of larval fishes: abiotic influences and food web impact. UNM Department of Biology 20th Annual Research Day Albuquerque, NM April 2011.

Krabbenhoft, C.A., Burdett, A.S., Turner, T.F. The feeding habits of larval fishes: abiotic influences and food web impact. Joint Meeting of Ichthyologists and Herpetologists, Minneapolis, MN July 2011.

Krabbenhoft T.J., S.P. Platania, T.F. Turner. Reproductive phenology of fishes of the middle Rio Grande, New Mexico. Joint Meeting of Ichthyologists and Herpetologists, Minneapolis, MN. 6-11 July 2011. American Fisheries Society Annual Conference, Seattle, WA. 4-8 September 2011.

Krabbenhoft, T.J., T.F. Turner. Comparative genomics of North American minnows: Next-generation transcriptome sequencing of Rio Grande silvery minnow, *Hybognathus amarus* (Cypriniformes:Cyprinidae). Joint Meeting of Ichthyologists and Herpetologists, Minneapolis, MN. 6-11 July 2011.

Krabbenhoft, T.J., T.F. Turner. Comparative genomics of North American minnows: Next-generation transcriptome sequencing of Rio Grande silvery minnow, *Hybognathus amarus* (Cypriniformes:Cyprinidae). American Fisheries Society Annual Conference, Seattle, WA. 4-8 September 2011.

Peralta, M.F., A.S. Burdett, C.A. Love, and T.F. Turner. Influences of habitat and predatory fish on mosquito abundance in a mesocosm experiment. UNM Department of Biology 20th Annual Research Day Albuquerque, NM April 2011.

Pilger, T.J., and T.F. Turner. Comparative population genetics of two Gila River cyprinids. UNM Department of Biology 20th Annual Research Day Albuquerque, NM April 2011.

Sayre, K.R., A.S. Burdett, R.J. Bixby and T.F. Turner. Dynamics of bottom-up and top-down effects on biotic assemblages during drydown in the Rio Grande: A mesocosm experiment. UNM Department of Biology 20th Annual Research Day Albuquerque, NM April 2011.

Snyder, D. E., W. H. Brandenburg, J. P. Sherrod, L. C. Bjork, S. C. Seal, S. P. Platania, and K. R. Bestgen. Comparison of larvae and early juveniles of *Hybognathus* species (Cyprinidae) in Colorado and New Mexico. AFS-ELHS 35th Annual Larval Fish Conference, Wilmington, North Carolina, 22-26 May 2011.

Turner, T.F., T.J. Krabbenhoft, C.A. Krabbenhoft. New insights from old specimens: effects of intensive river regulation in the Rio Grande revealed from stable isotopes of preserved material. Joint Meeting of Ichthyologists and Herpetologists, Minneapolis, MN. 6-11 July 2011.

C. Attendance at Professional Meetings

A.S. Burdett

- North American Benthological Society 59th Annual Meeting, Providence, RI. 22-26 May 2011.

E. W. Carson

- Desert Fishes Council 43rd Annual Meeting, Hermosillo Sonora MEXICO 8-12 November 2012.

C.A. Krabbenhoft

- Joint Meetings of Ichthyologists and Herpetologists (JMIH): 91st Annual Meeting for American Society of Ichthyologists and Herpetologists (AES 27th; 54th SSAR; 69th HL) Minneapolis MN. 6-11 July 2011.

T.J. Krabbenhoft

- Joint Meetings of Ichthyologists and Herpetologists (JMIH): 91st Annual Meeting for American Society of Ichthyologists and Herpetologists (AES 27th; 54th SSAR; 69th HL) Minneapolis MN. 6-11 July 2011.
- American Fisheries Society Annual Meeting, Seattle, WA. 4-8 September 2011.
- RAD Sequencing and Genomics Symposium, Portland, OR. 19 April 2011.

S.T. Ross

- Joint Meetings of Ichthyologists and Herpetologists (JMIH): 91st Annual Meeting for American Society of Ichthyologists and Herpetologists (AES 27th; 54th SSAR; 69th HL) Minneapolis MN. 6-11 July 2011.

A.M. Snyder

- Desert Fishes Council 43rd Annual Meeting, Hermosillo Sonora MEXICO 8-12 November 2011.
- IACUC 101 and Wildlife Research, 26-28 October 2011, Albuquerque NM.
- Joint Meetings of Ichthyologists and Herpetologists (JMIH): 91st Annual Meeting for American Society of Ichthyologists and Herpetologists (AES 27th; 54th SSAR; 69th HL) Minneapolis MN. 6-11 July 2011

T.F. Turner

- Joint Meetings of Ichthyologists and Herpetologists (JMIH): 91st Annual Meeting for American Society of Ichthyologists and Herpetologists (AES 27th; 54th SSAR; 69th HL) Minneapolis MN. 6-11 July 2011.

D. Service as Editor or on Editorial Board of a Journal

T. F. Turner

- Contributing Editor – Aquatic Biology since 2009.

E. Service as Officer of Professional Society/Organization

S.P. Platania

- Member, Endowment and Finance Committee, American Society of Ichthyologists and Herpetologists, 2008-2012.

S.T. Ross
- Member, Long Range Planning and Policy Committee, American Society of Ichthyologists and Herpetologists, 2007-2012.
- Local Committee for the Joint Meeting of Ichthyologists and Herpetologists, Albuquerque NM 2013.

A.M. Snyder
- Board of Governors, American Society of Ichthyologists and Herpetologists, 2011-2016.
- Local Committee for the Joint Meeting of Ichthyologists and Herpetologists, Albuquerque NM 2013.

T.F. Turner
- Local Committee Chairman for the Joint Meeting of Ichthyologists and Herpetologists, Albuquerque NM 2013.
- Member, Education and Human Resources Committee, American Society of Ichthyologists and Herpetologists, 2009-2012.

9. OTHER PROFESSIONAL ACTIVITIES

Presentation to General Audience in a Scholarly Capacity

M.A. Brandenburg *Use of larval razorback sucker otoliths to determine age, spawning dates, spawning duration, patterns of drift, and potential spawning sites in the San Juan River.* Biology Committee*,* San Juan River Basin Recovery Implementation Program USBR. Civic Center, Farmington, NM. February 2011.

A.S. Burdett *Stable Isotopes and Food Web Ecology*. BIOL 495 Limnology, C. Dahm, University of New Mexico, Albuquerque. 18 April 2011.

R.K. Dudley and S.P. Platania *Rio Grande silvery minnow population monitoring program 1993-2010.* Middle Rio Grande Endangered Species Collaborative Program, New Mexico Ecological Services Field Office, Albuquerque. 19 January 2011.

R.K. Dudley *Native fishes of New Mexico*. BIOL 487 Ichthyology, T.F. Turner, University of New Mexico, Albuquerque. March 22, 2011.

M.A. Farrington. Results of 2010 larval Colorado pikeminnow (*Ptychocheilus lucius*) larval razorback sucker (*Xyrauchen texanus*) surveys. Presented to San Juan River Basin Recovery Implementation Program, Biology Committee, Civic Center, Farmington, NM. February 2011.

M.A. Farrington. Results of 2010 larval Colorado pikeminnow (*Ptychocheilus lucius*) larval razorback sucker (*Xyrauchen texanus*) surveys. Presented to San Juan River Basin Recovery Implementation Program, Coordination Committee, Fort Lewis College, Durango, CO. May 2011.

C.A. Krabbenhoft *The contribution of larval fishes to aquatic food web dynamics.* Brown Bag Seminar, Department of Biology, University of New Mexico, Albuquerque. 9 November 2011.

T.J. Krabbenhoft *Reproductive phenology of fishes of the middle Rio Grande.* BIOL 487 Ichthyology, T.F. Turner, University of New Mexico, Albuquerque. 4 April 2011.

T.J. Krabbenhoft *The role of fishes in inland systems.* BIOL 495 Limnology, University of New Mexico, C. Dahm and B. Bixby, University of New Mexico, Albuquerque. 28 April 2011.

M.J. Osborne *Genetic monitoring and complex population dynamics: insights from a 12-year study of the Rio Grande silvery minnow.* Middle Rio Grande Endangered Species Act Collaborative Program Open House-Technical Session, Albuquerque NM. 21 October 2011.

T.J. Pilger *Trophic Ecology of Fishes.* BIOL 487 Ichthyology, T.F. Turner, University of New Mexico, Albuquerque. 19 April 2011.

S.T. Ross *Origin and derivation of the North American freshwater fish fauna*, BIOL 487 Ichthyology University of New Mexico, Albuquerque. 24 March 2011.

Presentations in a Scholarly Capacity at Hearings, Workshops, Legislative Committees
NONE

C. Scholarly Service as a Member of a Local/State/Regional/Nat'l Committee, Panel
A.S. Burdett

- Database Management System Ad Hoc Work Group, Middle Rio Grande Endangered Species Collaborative Program. April 2008 – present.

E. W. Carson

- Technical advisor, Conocimiento y conservación de la biodiversidad del Churince, Cuatro Ciénegas, Coahuila, Universidad Nacional Autónoma de México (UNAM) and World Wildlife Fund, México.
- Technical Advisor, Vital signs of the pupfishes of the Rio Conchos basin, Mexico, World Wildlife Fund, México.

R.K. Dudley

- Technical Advisor, Recovery Team for Rio Grande silvery minnow (*Hybognathus amarus*), US Fish and Wildlife Service.
- Technical Advisor, Middle Rio Grande Endangered Species Act Collaborative Program, PVA Biology Group.

C.A. Krabbenhoft

- Graduate Student Reviewer, Graduate Resource Allocations Committee, Department of Biology, University of New Mexico.
- Poster Judge, 20th Annual Research Day, Department of Biology, University of New Mexico.

T.J. Krabbenhoft

- Member, Publication Reimbursement Committee, Department of Biology, University of New Mexico.
- Graduate Student Representative, Graduate Application Review Committee, Department of Biology, University of New Mexico.
- Secretary, Biology Graduate Student Association, Department of Biology, University of New Mexico.

M.J. Osborne

- Member, Rio Grande silvery minnow (*Hybognathus amarus)* Propagation and Genetics Workgroup. US Fish and Wildlife Service, Albuquerque NM.
- Member, Population viability analysis of Rio Grande silvery minnow (*Hybognathus amarus)* US Fish and Wildlife Service, Albuquerque NM.

S.P. Platania

- Member, Committee on Endangered and Threatened Fish Species, American Fisheries Society.

S.T. Ross

- Member, Peer Review Panel, San Juan River Basin Recovery Implementation Program.

A.M. Snyder

- Voting member, UNM Institutional Animal Care and Use Committee 2010-2013.

T.F. Turner

- Museum of Southwestern Biology Executive Committee (Chair).
- UNM Biology Department Space Committee.
- UNM Biology Department Tenure and Promotion Committee.
- UNM Biology Comparative Evolutionary Immunologist Search Committee.
- UNM Biology Department Administrator Search Committee.
- UNM Arts &Sciences Council of Chairs and Directors.
- UNM Museum Collections Committee.
- UNM Museum Studies Committee.
- UNM Representative Colorado Plateau Cooperative Ecosystems Study Unit.
- Invited external proposal reviewer: CALFED Delta Science Program.
- Judge, Stoye Award Genetics Development and Morphology, Joint Meeting of Ichthyologists. and Herpetologists, Minneapolis, MN July

D. Journal Referee

E. W. Carson
Environmental Biology of Fishes (1), PlosOne (1).

T.J. Krabbenhoft
Biological Journal of the Linnean Society (1), Environmental Biology of Fishes (1), Journal of Fish Biology (1), Marine Ecology Progress Series (1), Zootaxa (2).

M.J. Osborne
Biological Conservation (1), Molecular Phylogenetics and Evolution (1), Heredity (1), Aquatic Biology (1).

T.J. Pilger
Hydrobiologia (1), Journal of Fish Biology (1), Marine Ecology Progress Series (1), Western North American Naturalist (1).

T.F. Turner
Proceedings of the Royal Society London B (Biological Sciences) (1), Ecology and Evolution (1), Journal of Mammalogy (2), Freshwater Biology (2), Hydrobiologia (1), Genetics (1).

E. Hosting Professional Colloquia and Groups
T.F. Turner

- Hosted Professors Edie Marsh-Matthews and William Matthews, UNM Biology Seminar and MSB Special Seminar, 27-28 October 2011.

10. SERVICE
A. Symposia, Workshops, Conferences etc. Sponsored, Organized, Held, etc. NONE

B. Public Service
A.S. Burdett

- Regional judge for Central NM Science and Engineering Research Challenge.
- Judge, Research Day, University of New Mexico, Biology Albuquerque, April 2011.
- Judge at North American Benthological Society Annual Meeting.

R.K. Dudley

- Technical and scientific advisory role for the conservation and management of threatened and endangered native fishes for the New Mexico Department of Game and Fish, US Army Corps of Engineers, US. Bureau of Reclamation, and the US Fish and Wildlife Service. 1999 - present.

A.M. Snyder

- Student Mentor, Accessibility Resource Center (ARC), University of New Mexico, January-May 2011.

T.F. Turner

- Member, Gila Trout and Chihuahua Chub Recovery Team.
- Member, Rio Grande silvery minnow Propagation & Genetics Workgroup.
- Science Fair Advisory Group, Amy Biehl High School, Albuquerque New Mexico.
- Judge, Science Fair, Jefferson Middle School, Albuquerque New Mexico.

11. ADVANCED STUDY, HONORS, AWARDS, FELLOWSHIPS, ETC.

- **Krabbenhoft C.A.** Clifford Crawford Scholarship, Department of Biology, University of New Mexico. $900.

- **Krabbenhoft C.A.** Student Conference Award Program, Career Services, University of New Mexico. $600.
- **Krabbenhoft T.J.** Graduate Dean's Dissertation Scholarship, University of New Mexico. $1000.
- **Krabbenhoft T.J**. Student Conference Award Recipient, University of New Mexico. $600.

12. DONATIONS AND GIFTS RECEIVED (non specimen)
September 2011. 70 original color and B/W illustrations of New Mexico native fishes by W.H. Brandenburg, scientific illustrator for the New Mexico Department of Game and Fish postcard series.

December 2011. 525 color slides of New Mexico rivers, lakes, habitat, and wildlife photographs 1978-2010 taken by D.L. Propst, Ph.D. while conducting research as a graduate student at Colorado State University and biologist for New Mexico Dept. Game and Fish. Most of these photographs coincide with field notes (data) taken for cataloged collections of fishes.

13. CURRENT STAFF
A. Faculty/Staff

Ayesha S. Burdett, Adjunct Research Assistant Professor
Evan W. Carson, Research Assistant Professor
Stephani L. Clark, Staff Curatorial Assistant II/Research Assistant
Megan J. Osborne, Research Assistant Professor
Steven P. Platania, Associate Curator of Fishes
Stephen T. Ross, Curator Emeritus and UNM Adjunct Professor of Biology
Alexandra M. Snyder, Collections Manager
Thomas F. Turner, Curator of Fishes and MSB Director

B. Graduate students

Museum Research Assistants
Trevor J. Krabbenhoft, UNM Biology Ph.D. candidate
Tyler J. Pilger, UNM Biology Ph.D. student

MSB Fishes Graduate Students, UNM Biology
Mary A. Brandenburg, M.Sci. student
Tracy Diver, M.Sci. student
Michael A. Farrington, M.Sci. student
Corey A. Krabbenhoft, M.Sci. student
Trevor J. Krabbenhoft, Ph.D. candidate
Tyler J. Pilger, Ph.D. student

C**.** Undergraduate Students

Curatorial Assistants
Kendra Brunet Lecomte, A&S Biology
Kaitlin M. Hulsbos, A&S Earth and Planetary Sciences
Kylie R. Naegele, A&S Biology

Sarah J. Sasek, A&S Biology
Devin Sims, UNM School of Engineering
Maribel Solis, A&S Biology
Jonathan Yu, UNM ARC Program, Biology

Research Students
Rebecca J. Bixby and Ayesha S. Burdett Student Mentorship
Summer D. Woods-Tunney, research assistant and Honors research project

Thomas F. Turner and Ayesha S. Burdett Student Mentorship
Jennifer S. Kraus, research assistant
Matthew F. Peralta, UNO student
Kayla R. Sayre, REU student and research assistant

Thomas F. Turner and Megan J. Osborne Student Mentorship
Tracy Diver, Turner Lab Research Assistant
Thein Le, Turner Lab Research Assistant
Ian Cunning, Turner Lab Research Assistant
Samantha Sanchez, Turner Lab Research Assistant
Michelle Sandoval, Turner Lab Research Assistant

Thomas F. Turner and Tyler J. Pilger Student mentorship
Jesse D. Trujillo, UNO student

Thomas F. Turner and Stephen T. Ross Student Mentorship
Leon Krabbe, Undergraduate Honors Thesis

14. MUSEUM ASSOCIATES

A. Curatorial Associates

David L. Propst, Ph.D. Retired New Mexico Dept. of Game and Fish, Santa Fe

B. Research Associates

W. Howard Brandenburg, American SW Ichthyological Research, Albuquerque
Sara Blocker, MS US Fish and Wildlife Service, Albuquerque
James E. Brooks, US Fish and Wildlife Service, Albuquerque
Eliza I. Gilbert, MS New Mexico Dept. Game and Fish, Santa Fe
Astrid Kodric-Brown, Ph.D. University of New Mexico, Albuquerque
Brooks M. Burr, Ph.D. Southern Illinois University, Carbondale
Michael Collyer, Ph.D. Stephen F. Austin State University, Nacogdoches
Thomas E. Dowling, Ph.D. Arizona State University, Tempe
Robert K. Dudley, Ph. D. American SW Ichthyological Researchers, Albuquerque
Michael A. Farrington, American SW Ichthyological Researchers, Albuquerque
Keith B. Gido, Ph.D. Kansas State University, Manhattan KS
Richard L. Mayden, Ph.D. St Louis University, St Louis
Norman Mercado Silva, Ph.D. University of Arizona, Tucson

DIVISION OF GENOMIC RESOURCES

Curator: Joseph Cook
Collection Manager: Cheryl Parmenter

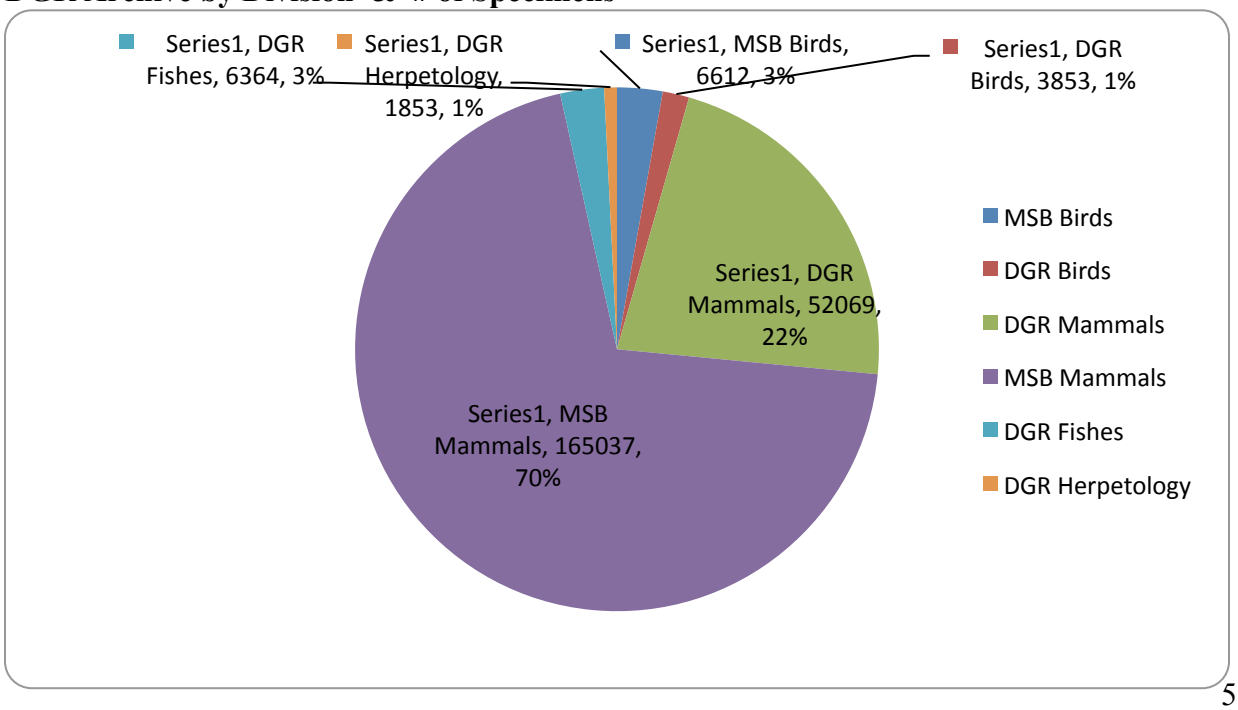
1. DIVISION HIGHLIGHTS

The Division of Genomic Resources (DGR) of the Museum of Southwestern Biology (MSB) is a centralized repository for cryogenic material from all MSB divisions at the University of New Mexico and other individuals and institutions worldwide for which archival agreements are extant. The DGR frozen tissue collection is taxonomically broad and contains multiple tissue samples from over 235,000 specimens, including Mammals, Birds, Reptiles and Fishes. The collection is ranked as one of the largest collections of its kind worldwide. In total, 10,500 new NK numbers were issued to the MSB mammal division and used in DGR for projects in Panama, Mongolia, Alaska, and the Pacific Northwest. In 2011 the collection manager processed 37 outgoing loans for the mammal division containing 1, 828 specimens, and 5 loans for the bird division, containing 42 bird specimens to 14 states, and 4 foreign countries, including 22 tissue loans for UNM students.

2. TABLE OF COLLECTION USE

Collection Growth (Specimens catalogued)	Outgoing Loans (loans/ specimen)	Incoming Loans (loans/ specimen)	Visitors	Responses to Information Requests	Publications 2011 Citing MSB Specimens from DGR Loans
12,672/38,016	42/1870	0/0	200	100 + Web	40

DGR Archive by Division & # of Specimens



3. COURSES USING THE COLLECTIONS.

UNM BIOL 386L General Vertebrate Zoology
UNM BIOL 489 Mammalogy
UNM Natural Sciences 262L
BIOL 400 (Fall) Senior Honors Thesis
BIOL 599 Masters Thesis
BIOL 699 Dissertation

1. COURSES TAUGHT BY MSB PERSONNEL

A.Faculty/Collection Managers

Joeseph A. Cook:

Reported in Mammal Division.

2. COLLECTION MANAGEMENT

This year, DGR Collection Manager Parmenter focused on loan processing, specimen archiving, maintaining the publication database, database record cleaning, issuing NK numbers, pages, labels, and equipment and alarm maintenance. Publications resulting from all DGR tissue loans to date have been entered into the ARCTOS database, and the associated links to GenBank are complete and available to the public. Extra time was spent on the completion of old projects. But, unfortunately, a significant amount of time was spent correcting alarm and electrical problems due to poor infrastructure.

Special Problems: Disruption of daily activities-

Floor Tile: All floor tiles were replaced in the division this year. This required a lot of alarm and freezer disconnecting and reconnecting, and the moving of freezers, cabinets and other equipment.

Alarms: The collection manager had to respond to many freezer alarms due to many and repeated fluctuations in the electrical supply in the division. There were also many room alarms and temperature alarms to reconcile.

AC melt down: One of the AC units that supplies DGR exclusively, malfunctioned. The wiring melted down and caused a short circuit which took out the electricity to the whole CERIA building. All the AC units of the same brand were found to be faulty and repaired.

Short Circuits: Repeatedly the 13 Ultra-cold freezers in DGR turned off at the same time (this has zero probability in a normal environment). After assessment of the electrical panels that supply the DGR freezers, short circuits and loose wiring were discovered. This lead to the discovery that the electrical supply to the freezers is insufficient. A new electrical panel with the correct voltage is scheduled to be installed in early 2012.

Freezer Space: This year we lost another freezer over the Christmas break (the ninth in 8 years in the CERIA Building). We still are freezer-space challenged and had no back-up freezer as of late 2011. Due to the poor electrical supply in DGR (an inspection revealed code violations due to faulty wiring), we repeatedly fry freezers and can never get all the space we need for new incoming specimens. As of December 2011, we have room for 2,000 samples. This is quite insufficient considering we expect to accession 40,000 new cryovials per year.

Current projects generating specimens for DGR
Beringian Coevolution Project - NSF
Mexican wolf reintroduction – USFWS
Mongolian Vertebrate Parasite Project – NSF
Chilean Hantavirus Project – ICIDR NIH
Panama Hantavirus – ICIDR NIH
Panama Climate Change Project - STRI/Gorgas
Bighorn Sheep Reintroduction Program – NMGF
ISLES---USDA Forest Service
Jackson Whitman carnivore collection
Black bear /elk predation project – NMDGF
Robert Rausch parasite host collection
Western U.S.
Mammalogy Class
    Valles Caldera National Preserve
    Cook-graduate students
    Witt- Peru Birds plus other projects
    Mammal & Bird Prep Room

Projects Cleaned Up by DGR
Parmenter, Cheryl :
Bears and Mountain Lions Project
Sorex Project
Wolverines Project
Hanta-North Campus Project
Elk Annual Project
Russian Project
MSB mammal specimens archived 2011= 11,702 specimens, 281 species in multiple tubes.

Count	Scientific_Name Specimen
3	Abrocoma bennetti
2	Abrocoma bennettii
1	Abrothrix
2	Abrothrix hershkovitzi
115	Abrothrix longipilis
1	Abrothrix longipilis longipilis
261	Abrothrix olivaceus
2	Abrothrix sanborni
1	Accipiter gentilis
33	Allactaga balikunica
59	Allactaga bullata
4	Allocricetulus curtatus
1	Alopex lagopus
26	Alticola
3	Alticola macrotis
13	Alticola semicanus
6	Alticola strelzowi
38	Ammospermophilus leucurus
1	Amphispiza belli
64	Apodemus agrarius
3	Apodemus flavicollis
50	Apodemus uralensis
1	Arthropoda
2	Artibeus
3	Artibeus jamaicensis
10	Baiomys taylori
9	Bassariscus astutus
104	Blarina brevicauda
1	Bufo boreas
22	Canis latrans
134	Canis lupus baileyi
4	Canis lupus familiaris
1	Capra hircus
13	Cardiocranius paradoxus
2	Carollia brevicauda

4	Carollia castanea
4	Carollia perspicillata
15	Castor canadensis
2	Catharus guttatus
3	Cavia porcellus
174	Cervus elaphus
2	Chaetodipus eremicus
88	Chaetodipus formosus
2	Chaetodipus hispidus
8	Chaetodipus intermedius
2	Chaetodipus penicillatus
1	Chelemys macronix
2	Chelemys macronyx
3	Clethrionomys gapperi
21	Clethrionomys rufocanus
2	Condylura cristata
1	Conepatus mesoleucus
1	Corynorhinus townsendii
4	Cricetulus longicaudatus
14	Cricetulus migratorius
2	Cricetus cricetus
1	Crocidura sibirica
1	Crocidura suaveolens
17	Cynomys gunnisoni
19	Didelphis marsupialis
170	Dipodomys merriami
14	Dipodomys microps
1	Dipodomys ordi
2	Dipodomys ordii
9	Dipodomys spectabilis
28	Dipus sagitta
3	Dromiciops gliroides
2	Dryomys nitedula
4	Ellobius tancrei
3	Eptesicus fuscus
49	Eptesicus gobiensis
2	Eptesicus serotinus
1	Equus caballus
2	Equus hemionus
6	Erethizon dorsatum
3	Euchoreutes naso
7	Euneomys chinchilloides
1	Eutamias minimus
1	Gazella subguttorosa
4	Gazella subgutturosa
42	Glaucomys sabrinus
213	Gulo gulo
7	Hemiechinus auritus
5	Irenomys tarsalis
1	Junco
5	Lasionycteris noctivagans
37	Lasiopodomys brandti
44	Lemmiscus curtatus
2	Lemmus trimucronatus
14	Lepus americanus
10	Lepus californicus
14	Lepus tolai
26	Liomys adspersus
32	Lontra canadensis
17	Loxodontomys micropus micropus
1	Lynx lynx
4	Lynx rufus
1	Marmota
1	Marmota caligata
3	Marmota flaviventris
3	Marmota monax
2	Marmota sibirica
40	Martes
1286	Martes americana
3	Martes caurina
1	Melospiza melodia
2	Mephitis mephitis
34	Meriones meridianus
19	Meriones unguiculatus
42	Microtus
21	Microtus chrotorrhinus
4	Microtus gregalis
317	Microtus longicaudus
21	Microtus miurus
123	Microtus montanus
2	Microtus ochrogaster
237	Microtus oeconomus
200	Microtus pennsylvanicus
6	Microtus richardsoni
1	Microtus xanthognathus
54	Mus musculus
40	Mustela erminea
8	Mustela frenata
1	Mustela frenata neomexicana
1	Mustela nivalis
1	Myodes
347	Myodes gapperi

7	Myodes glareolus
378	Myodes rutilus
1	Myotis
1	Myotis lucifugus
8	Myotis mystacinus
3	Myotis nigricans
2	Myotis occultus
1	Myotis thysanodes
1	Myotis volans
66	Napaeozapus insignis
1	Napeozapus insignis
61	Neotoma albigula
10	Neotoma cinerea
14	Neotoma lepida
3	Neotoma leucodon
64	Neotoma mexicana
1	Neotoma micropus
115	Neovison vison
3	Notiosorex crawfordi
2	Ochotona cansus
9	Ochotona collaris
6	Ochotona pallasi
397	Ochotona princeps
12	Octodon degu
14	Octodon degus
4	Odocoileus hemionus
3	Odocoileus hemionus sitkensis
1	Odocoileus virginianus couesi
42	Oligoryzomys fulvescens
201	Oligoryzomys longicaudatus
4	Oligoryzomys magelanicus
8	Oligoryzomys magellanicus
3	Ondatra zibethicus
4	Onychomys arenicola
9	Onychomys leucogaster
11	Onychomys torridus
2	Oryzomys
1	Oryzomys couesi
1	Otospermophilus beecheyi
1	Otospermophilus variegatus
1	Ovis canadensis
9	Ovis canadensis mexicana
2	Parascalops breweri
4	Perognathus flavus
16	Perognathus parvus
4	Peromyscus
50	Peromyscus boylii
45	Peromyscus eremicus
493	Peromyscus keeni
414	Peromyscus leucopus
2140	Peromyscus maniculatus
5	Peromyscus nasutus
32	Peromyscus truei
4	Phenacomys intermedius
1	Phenacomys sp.
2	Phodopus campbelli
30	Phodopus roborovskii
25	Phyllotis darwini
1	Phyllotis xanthopygus
1	Poecile
1	Potamochoerus larvatus
16	Procyon lotor
9	Proechimys semispinosus
1	Pteronotus parnellii
12	Puma concolor
7	Rattus norvegicus
1	Rattus novergicus
14	Rattus rattus
60	Reithrodontomys megalotis
4	Reithrodontomys montanus
2	Rodentia
3	Salpingotus kozlovi
9	Sciurus aberti
3	Sciurus carolinensis
1	Sigmodon fulviventer
36	Sigmodon hirsutus
4	Sigmodon hispidus
4	Sigmodon ochrognathus
29	Sorex
2	Sorex (Otisorex) cinereus
4	Sorex araneus
1	Sorex arizonae
453	Sorex cinereus
40	Sorex fumeus
50	Sorex hoyi
2	Sorex merriami
280	Sorex monticolus
1	Sorex nanus
35	Sorex palustris
16	Sorex preblei
4	Sorex tundrensis
5	Sorex ugyunak

31	Sorex vagrans
3	Spermophilus
9	Spermophilus beecheyi
1	Spermophilus beldingi
8	Spermophilus erythrogenys
11	Spermophilus lateralis
1	Spermophilus pallidicauda
10	Spermophilus parryii
1	Spermophilus richardsonii
1	Spermophilus spilosoma
25	Spermophilus undulatus
9	Spermophilus variegatus
30	Stylodipus andrewsi
3	Sylvilagus
21	Sylvilagus audubonii
2	Sylvilagus floridanus
1	Sylvilagus gabbi
2	Sylvilagus nuttallii
8	Synaptomys borealis
2	Synaptomys cooperi
2	Tadarida brasiliensis
1	Tamias
33	Tamias amoenus
1	Tamias cinereicollis
3	Tamias dorsalis
49	Tamias minimus
6	Tamias minimus grisescens
22	Tamias quadrivittatus
6	Tamias ruficaudus
9	Tamias senex
17	Tamias siskiyou
1	Tamias speciosus
11	Tamias striatus
15	Tamias townsendii
29	Tamiasciurus hudsonicus
5	Taxidea taxus
4	Thamnophis elegans
39	Thomomys bottae
1	Thomomys idahoensis
8	Thomomys talpoides
1	Thomomys umbrinus
47	Thylamys elegans
1	Tonatia saurophila
1	Transandinomys talamancae
1	Troglodytidae
10	Unkown
7	Urocyon cinereoargenteus
1	Uroderma bilobatum
5	Ursus americanus
16	Vespertilio murinus
1	Vormela peregusna
1	Vulpes macrotis neomexicana
2	Vulpes velox
1	Vulpes velox macrotis
5	Vulpes vulpes
1	Zapus
60	Zapus hudsonius
145	Zapus princeps
1	Zapus princeps princeps
1	Zapus trinotatus
88	Zygodontomys brevicauda
5	unidentifiable

MSB bird specimens archived 2011=970 specimens, 347 species in single tubes.

Count	Scientific_Name Bird Specimen Summary for 2011
4	Accipiter cooperii
5	Accipiter striatus
1	Accipiter striatus perobscurus
2	Acrocephalus baeticatus
4	Aegolius acadicus
1	Agelaius phoecnicus
1	Agelaius phoeniceus
1	Aimophila cassinii
1	Aix sponsa
5	Alcedo cristata
1	Amphispiza belli
6	Anas clypeata
1	Anas erythrorhyncha
1	Anas platyrhynchos
1	Anas undulata
4	Anthus cinnamomeus
2	Anthus crenatus
2	Aphelocoma californica
1	Aphelocoma ultramarina
1	Apus affinis
4	Apus caffer
1	Ara macao
3	Archilochus alexandri
1	Archilochus colubris

1	Asio otus
3	Athene cunicularia
2	Auriparus flaviceps
1	Aythya affinis
1	Aythya americana
2	Aythya collaris
1	Aythya valisineria
1	Baeolophus inornatus
1	Baeolophus ridgwayi
1	Baeolophus wollweberi
3	Batis pririt
2	Bombycilla cedrorum
1	Bostrychia hagedash
5	Bradornis mariquensis
3	Branta canadensis
16	Bubo virginianus
1	Bubo virginianus pinorum
1	Bucephala albeola
4	Bucephala clangula
3	Buteo jamaicensis
1	Buteo swainsoni
2	Butorides virescens
1	Calamonastes fasciolatus
1	Calcarius ornatus
2	Calidris alpina
2	Campethera abingoni
1	Caprimulgus rufigena
3	Cardellina rubifrons
2	Cardinalis cardinalis
1	Cardinalis sinuatus
5	Carduelis pinus
2	Carduelis psaltria
8	Carpodacus cassinii
1	Carpodacus cassinii cassinii
1	Carpodacus cassinii vinifer
9	Carpodacus mexicanus
5	Catharus fuscescens
14	Catharus guttatus
2	Catharus ustulatus
1	Cecropis cucullata
2	Cecropis semirufa
2	Cercomela familiaris
3	Cercotrichas coryphaeus
3	Cercotrichas paena
2	Certhia americana
1	Ceryle alcyon
1	Chen caerulescens
1	Chen rossii
1	Chersomanes albofasciata
1	Chlorochrysa calliparaea
4	Chondestes grammacus
3	Chordeiles minor
1	Chordeiles minor minor
4	Chrysococcyx caprius
1	Chrysolophus amherstiae
1	Cisticola aridulus
4	Cisticola chiniana
5	Cisticola fulvicapilla
2	Cisticola juncidis
2	Cisticola subruficapilla
2	Cisticola textrix
2	Cistothorus palustris
3	Clamator jacobinus
4	Coccothraustes vespertinus
7	Colaptes auratus
2	Colaptes auratus auratus
3	Colius colius
1	Colius striatus
1	Columba guinea
2	Coracias garrulus
1	Corvus brachyrhynchos
1	Corvus brachyrhynchos hargravei
1	Corvus corax
5	Cossypha caffra
1	Cuculus gularis
6	Cyanocitta stelleri
1	Cygnus buccinator
2	Dendragapus obscurus
1	Dendrocygna viduata
1	Dendroica caerulescens
1	Dendroica coronata
1	Dendroica coronata audoboni
2	Dendroica coronata coronata
2	Dendroica graciae
2	Dendroica nigrescens
1	Dendroica palmarum
1	Dendroica pensylvanica
2	Dendroica townsendi
1	Dendropicos fuscescens
2	Dicrurus adsimilis
1	Dryocopus pileatus
2	Dumetella carolinensis

2	Egretta tricolor
2	Emberiza capensis
1	Emberiza flaviventris
3	Emberiza tahapisi
5	Empidonax flaviventris
4	Empidonax minimus
1	Empidonax occidentalis
2	Empidonax traillii
1	Eremomela icteropygialis
2	Estrilda astrild
1	Eudromia elegans
1	Euphagus cyanocephalus
4	Euplectes afer
6	Euplectes albonotatus
2	Euplectes ardens
1	Euplectes capensis
5	Euplectes orix
2	Euplectes progne
2	Falco columbarius
2	Falco mexicanus
1	Falco peregrinus
1	Falco peregrinus nesiotes
1	Falco sparverius
1	Francolinus natalensis
2	Francolinus swainsonii
2	Geococcyx californianus
3	Geothlypis trichas
1	Glareola nordmanni
60	Grus canadensis
5	Grus canadensis canadensis
1	Grus canadensis rowani
3	Grus canadensis tabida
1	Halcyon albiventris
1	Himantopus mexicanus
3	Hippolais icterina
3	Hirundo dimidiata
3	Hirundo rustica
3	Hylocichla mustelina
2	Icteria virens
4	Icterus bullockii
2	Ictinia mississippiensis
5	Indicator minor
12	Junco hyemalis
2	Junco hyemalis caniceps
3	Junco hyemalis mearnsi
1	Jynx ruficollis
1	Lagonosticta rhodopareia
2	Lagonosticta senegala
3	Lamprotornis nitens
2	Laniarius atrococcineus
2	Lanius collaris
2	Lanius collurio
1	Lanius ludovicianus
1	Lanius minor
5	Larus occidentalis
1	Leptopogon superciliaris
9	Leucosticte atrata
10	Leucosticte australis
10	Leucosticte tephrocotis
1	Lophodytes cucullatus
2	Lophura edwardsi
4	Lophura leucomelanos
1	Lophura leucomelanos hamiltonii
1	Lophura leucomelanos williamsi
14	Loxia curvirostra
3	Macronyx capensis
1	Malcorus pectoralis
2	Megascops asio
1	Megascops kennicottii
1	Melanerpes erythrocephalus
2	Melanerpes formicivorus
1	Melanitta perspicillata
1	Melospiza georgiana
1	Melospiza lincolnii
1	Mergus merganser
3	Merops apiaster
3	Merops bullockoides
1	Mimus polyglottos
2	Mionectes striaticollis
1	Mirafra africana
1	Mirafra apiata fasciolata
2	Mirafra sabota
2	Mniotilta varia
3	Molothrus ater
1	Monticola brevipes
2	Motacilla capensis
3	Muscicapa striata
1	Myadestes townsendi
5	Myiarchus cinerascens
2	Myrmecocichla formicivora
1	Myrmotherula longicauda
1	Netta erythrophthalma

4	Nilaus afer
2	Numida meleagris
1	Oena capensis
1	Oenanthe monticola
1	Onychoprion fuscatus
4	Oporornis tolmiei
2	Oreoscoptes montanus
1	Ortygospiza atricollis
1	Otus kennicotti
1	Parisoma layardi
9	Parisoma subcaeruleum
8	Parus cinerascens
6	Passer diffusus
2	Passer melanurus
1	Passerina cyanea
4	Perisoreus canadensis
1	Peucedramus taeniatus
1	Phainopepla nitens
5	Phalaenoptilus nuttalli
3	Pheucticus melanocephalus
3	Philetairus socius
1	Phoeniculus purpureus
2	Phylloscopus trochilus
1	Pica hudsonia
2	Picoides arizonae
1	Picoides dorsalis
1	Picoides pubescens
1	Picoides scalaris
2	Picoides tridactylus
4	Picoides villosus
4	Pinicola enucleator
3	Pipilo fuscus
3	Pipilo maculatus
5	Piranga ludoviciana
3	Piranga rubra cooperi
2	Plocepasser mahali
1	Ploceus capensis
12	Ploceus velatus
1	Poecile carolinensis
1	Poecile gambeli
3	Poocetes gramineus
1	Porzana carolina
2	Premnoplex brunnescens
3	Prinia flavicans
2	Prinia maculosa
1	Protonotaria citrea
10	Pycnonotus nigricans
1	Pyrocephalus rubinus
8	Pytilia melba
3	Quelea quelea
3	Rallus limicola
1	Ramphocelus carbo
2	Regulus calendula
1	Regulus satrapa
3	Rhinopomastus cyanomelas
1	Rhinoptilus africanus
2	Salpinctes obsoletus
1	Saxicola torquatus
2	Sayornis phoebe
2	Sayornis saya
1	Schistes geoffroyi
5	Scolopax minor
2	Scopus umbretta
1	Seiurus aurocapillus
3	Seiurus noveboracensis
3	Selasphorus rufus
1	Serinus alario
5	Serinus atrogularis
7	Serinus flaviventris
3	Setophaga ruticilla
4	Sialia currucoides
2	Sialia mexicana
5	Sigelus silens
5	Sitta canadensis
1	Sitta carolinensis
2	Sitta pygmaea
4	Sphyrapicus nuchalis
2	Sphyrapicus thyroideus
1	Spinus pinus
3	Spizella arborea
2	Spizella pallida
7	Spizella passerina
1	Spizocorys conirostris
3	Sporopipes squamifrons
1	Stelgidopteryx serripennis
1	Stellula calliope
2	Stenostira scita
1	Streptopelia capicola
2	Streptopelia decaocto
5	Streptopelia senegalensis
1	Strix varia
1	Sturnella neglecta

1	Sylvia communis	2	Urocolius indicus
6	Sylvietta rufescens	3	Urolestes melanoleucus
1	Tachybaptus ruficollis	2	Vanellus coronatus
1	Tachycineta bicolor	1	Vermivora celata
1	Tachycineta thalassina	1	Vermivora ruficapilla
1	Tangara punctata	4	Vidua chalybeata
4	Tchagra australis	1	Vidua macroura
1	Telophorus zeylonus	2	Vidua paradisaea
2	Thryomanes bewickii	1	Vidua regia
4	Toxostoma curvirostre	1	Vireo cassinii
5	Trachyphonus vaillantii	5	Vireo huttoni
3	Tragopan temminckii	3	Vireo olivaceus
12	Tricholaema leucomelas	2	Vireo plumbeus
1	Tringa nebularia	2	Vireo solitarius
3	Troglodytes aedon	1	Wilsonia canadensis
9	Turdus migratorius	14	Wilsonia pusilla
3	Turdus olivaceus smithi	1	Xanthocephalus xanthocephalus
1	Turnix sylvaticus	3	Zenaida macroura
1	Tympanuchus pallidicinctus	2	Zonotrichia albicollis
1	Tyrannus vociferous	2	Zonotrichia leucophrys
3	Tyto alba	2	Zonotrichia leucophrys gambelii
2	Upupa epops africana	5	Zonotrichia leucophrys oriantha
4	Uraeginthus angolensis	13	Zosterops pallidus
2	Uraeginthus granatinus		

6. AWARDS, GRANTS, AND CONTRACTS
Cook, Joseph A.
Grants and Contracts, Extramural and Intramural.

Reported in Mammal Division.

7. PUBLICATIONS
A. Books, Book Chapters, Edited Volumes

B. Journal Articles
Reported in Mammal Division.

C. Web-Based
All MSB publications are available via the web.
All DGR archival specimens are available via the web.

D. Technical Reports
1. University of New Mexico, Museum of Southwestern Biology, Division of Genomic Resources:

2011 MSB Annual Report. **Joseph A. Cook** and **Cheryl A. Parmenter.**

E. Theses/Dissertations Completed

Reported in Mammal Division.

F. Work In Progress

Reported in Mammal Division.

G. Publications/Reports Based on MSB Specimens/Data by Outside Researchers. For mammal and bird specimens.

All of the following publications used MSB specimens.

NOTE: These publications will also be listed in Bird and Mammal division reports.

1. Adrian Tejedor. 2011. Systematics of Funnel-Eared Bats (Chiroptera: Natalidae). Bulletin of the American Museum of Natural History. 353:1-140.
   - 62 Cited Specimens

2. Alexandre R. Percequillo, Marcelo Weksler, Leonora P. Costa. 2011. A new genus and species of rodent from the Brazilian Atlantic Forest (Rodentia: Cricetidae: Sigmodontinae: Oryzomyini), with comments on oryzomyine biogeography. Zoological Journal of the Linnean Society 161(2):357-390.
   - 1 Cited Specimens

3. Andrew G. Hope, Eric Waltari, Vadim B. Fedorov, Anna V. Goropashnaya, Sandra L. Talbot, Joseph A. Cook. 2011. Persistence and diversification of the Holarctic shrew, *Sorex tundrensis* (Family Soricidae), in response to climate change. Molecular Ecology 20(20):4346-4370.
   - 78 Cited Specimens
   - http://dx.doi.org/10.1111/j.1365-294X.2011.05226.x
4. Andrés Parada, Guillermo D'Elia, Claudio J. Bidau, Enrique P. Lessa. 2011. Species groups and the evolutionary diversification of tuco-tucos, genus Ctenomys (Rodentia: Ctenomyidae). Journal of Mammalogy 92(3):671-682.
   - No Citations –Not specifically cited by specimen number.

5. Arseny Makarikov, Scott Gardner, and Eric Hoberg. 2011. New species of Arostrilepis (Eucestoda: Hymenolepidiae) in members of Cricetidae and Geomyidae (Rodentia) from the western nearctic. Journal of Parasitology. In Press.
   - No Citations –Not specifically cited by specimen number.
   - http://dx.doi.org/10.1645/GE-2943.1

6. Brian Tilston Smith, Patricia Escalante, Blanca E. Hernandez-Banos, Adolfo G. Navarro-Siguenza, Sievert Rohwer and John Klicka. 2011. *The role of historical and contemporary processes on phylogeographic structure and genetic diversity in the Northern Cardinal, Cardinalis cardinalis.* BioMed Central Evolutionary Biology 11:136
   - 6 Cited Specimens

7. Byron V. Weckworth, Natalie G. Dawson, Sandra L. Talbot, Melanie J. Flamme, Joseph A. Cook. 2011. Going Coastal: Shared Evolutionary History between Coastal British Columbia and Southeast Alaska Wolves (*Canis lupus*). PLoS One 6(5):1-8.
- 225 Cited Specimens
- http://dx.doi.org/10.1371/JOURNAL.PONE.0019582
- text (application/pdf)
  Media Details
  Weckworth_etal_2011_Shared_Evolutionary_History_between_Coastal_British_Columbia_and_Southeast_Alaska_Wolves.pdf

8. Christopher C. Witt and Emil Bautista. 2011. *Triorchidism in a Hummingbird*. The Wilson Journal of Ornithology, 123(3):632-635.
- No Citations – Not specifically cited by specimen number.
- http://dx.doi.org/10.1676/10-180.1

9. David S. Tinnin, Sumiya Ganzorig, and Scott L. Gardner. 2011. *Helminths of Squirrels (Sciuridae) from Mongolia.* Museum of Texas Tech Occasional Papers. Number 303.
- No Citations- (334 specimens cited in his 2002 paper)

10. Dolly L. Crawford, Jerry W. Dragoo, Felisa A. Smith and Andrea N. Chavez. *Diversification within the Mexican Vole (Microtus mexicanus) and the Role of Post-Pleistocene Climate Change.* 2011. Western North American Naturalist, 71(2):176-194.
- 38 Cited Specimens
- http://dx.doi.org/10.3398/064.071.0205

11. F. Bozinovic, J.M. Rojas, P.A. Gallardo, R.E. Palma, E. Gianoli. 2011. *Body mass and water economy in the South American olivaceous field mouse along a latitudinal gradient: Implications for climate change*. Journal of Arid Environments 75(5):411-415.

- No Citations – Not specifically cited by specimen number.
- http://dx.doi.org/10.1016/j.jaridenv.2010.11.011

12. Fabiana P. Caramaschi, Fabricia F. Nascimento, Rui Cerqueira and Cibele R. Bonvicino. 2011. Genetic diversity of wild populations of the grey short-tailed opossum, *Monodelphis domestica* (Didelphimorphia: Didelphidae), in Brazilian landscapes. Biological Journal of the Linnean society, 104, 251-263.
- 8 Cited Specimens

13. Fernando Torres-Perez, R. Eduardo Palma, Brian Hjelle, Edward C. Holmes, Joseph A. Cook. 2011. *Spatial but not temporal co-divergence of a virus and its mammalian host*. Molecular Ecology 20(19):4109-4122.
- 23 Cited Specimens
- http://dx.doi.org/10.1111/j.1365-294X.2011.05241.x

14. Gemma Beatty and Jim Provan. 2011. Phylogeographic analysis of North American populations of the parasitic herbaceous plant Monotropa hypopitys L. reveals a complex history of range expansion from multiple late glacial refugia. Journal of Biogeography:-.
- No Citations- Not specifically cited by specimen number.

15. Hae Ji Kang, Shannon N. Bennett, Andrew G. Hope, Joseph A. Cook, and Richard Yanagihara. *Shared Ancestry between a Newfound Mole-Borne Hantavirus and Hantaviruses Harbored by Cricetid Rodents.* 2011. Journal of Virology Aug. p. 7496-7503.
- 57 Cited Specimens

16. Issac K. Erickson, Michael A. Cantrell, Luann Scott and Holly A. Wichman. 2011. *Retrofitting the Genome: L1 Extinction Follows Endogenous Retroviral Expansion in a Group of Muroid Rodents.* Journal of Virology 85(23): 12315.
- 4 Cited Specimens
- http://dx.doi.org/10.1128/JVI.05180-11

17. Janeth Lessmann, Jazzmin Arrivillaga and Marisol Aguilera. 2011. Caracterizacion molecular de poblaciones venezolanas de *Sigmodon hirsutus* (Rodentia: Cricetidae). Rev. Biol. Trop. Vol.59(2): 795-807.
- 3 Cited Specimens

18. Jason L. Malaney, Jennifer K. Frey, and Joseph A. Cook. 2011. *The biogeographic legacy of an imperilled taxon provides a foundation for assessing lineage diversification, demography and conservation genetics.*Diversity and Distributions (2011) 1-5.
- 79 Cited Specimens
- http://dx.doi.org/10.1111/j.1472-4642.2011.00866.x

19. John C. Hafner and Nathan S. Upham. 2011. Phylogeography of the dark kangaroo mouse, *Microdipodops megacephalus*: cryptic lineages and dispersal routes in North America's Great Basin. Journal of Biogeography 38(6):1077-1097.
- 9 Cited Specimens
- http://dx.doi.org/10.1111/j.1365-2699.2010.02472.x

20. Jonathan Gabriel Escobar-Flores, Gorgonio Ruiz-Campos, Aldo Antonio Guevara-Carrizales, Roberto Martínez-Gallardo. 2011. *Extension of Southern Range and New Specimens of the Western Gray Squirrel,(Mammalia: Sciuridae), in Baja California, México*. Western North American Naturalist 71(1):119-120.
- 11 Cited Specimens
- http://dx.doi.org/10.3398/064.071.0117

21. Josuha I. Engel, Mary H. Hennen, Christopher C. Witt, Jason D. Weckstein. 2011. *Affinities of Three Vagrant Cave Swallows from Eastern North America*. The Wilson Journal of Orinthology. 123(4)840-845.
- 2 Cited Specimens
- http://dx.doi.org/10.1676/11-021.1

22. Justin Tevie, Kristine M. Grimsrud, Robert P. Berrens. 2011. *Testing the Environmental Kuznets Curve Hypothesis for Biodiversity Risk in the US: A Spatial Econometric Approach*. Sustainability 3(11):2182-2199.
- No Citations
- http://dx.doi.org/10.3390/su3112182

23. K. C. Bell & M. D. Matocq. *Regional genetic subdivision in the Mohave ground squirrel: evidence of historic isolation and ongoing connectivity in a Mojave Desert endemic.*2011. Animal Conservation 14(2011) 371-381.
- 35 Cited Specimens
- http://dx.doi.org/10.1111/j.1469-1795.2011.00435.x

24. Kurt E. Galbreath, Joseph A. Cook, Aren A. Eddingsaas, Eric G. DeChaine. 2011. Diversity and demography in Beringia: multilocus tests of paleodistribution models reveal the complex history of arctic ground squirrels. Evolution 65(7):1879-1896.
- 172 Cited Specimens
- text (application/pdf)
  Media Details
  Galbreath_etal_2011_Diversity_and_demography_in_Beringia_multilocus_test_reveal_complex_history_of_arctic_ground_squirrels.pdf

25. Lisa W. Drew. 2011. Are We Losing the Science of Taxonomy?. BioScience 61(12):942-946.
- No Citations -Not specifically cited by specimen number.
- http://dx.doi.org/10.1525/bio.2011.61.12.4

26. Noah Reid, John R. Demboski, Jack M. Sullivan. 2011. Phylogeny Estimation of the Radiation of Western North American Chipmunks (Tamias) in the Face of Introgression Using Reproductive Protein Genes. Systematic Biology doi: 10.1093/sysbio/syr094:1-67.
- 43 Cited Specimens
- http://dx.doi.org/10.1093/sysbio/syr094
- PubMed

27. Noe U. de la Sancha, Guillermo D'Elia, and Pablo Teta. Systematics of the subgenus of mouse opossums Marmosa (Micoureus) (Didelphimorphia, Didelphidae) with noteworthy records from Paraguay. 2011. Mammalian Biology In Press.
- 2 Cited Specimens
- http://dx.doi.org/10.1016/j.mambio.2011.10.003

28. Oriet Alarcon, Guillermo D'Elia, Enrique P. Lessa, and Ulyses F. J. Pardinas. 2011.Phylogeographic Structure of the Fossorial Long-Clawed Mouse *Chelemys macronyx* (Cricetidae: Sigmodontinae). Zoological Studies 50(5): 682-688.
- 2 Cited Specimens

29. Pablo Teta, Guillermo D'Elía, Ulyses F. J. Pardiñas, J. Pablo Jayat, Pablo E. Ortíz. 2011. Phylogenetic position and morphology of *Abrothrix illutea* Thomas, 1925, with

comments on the incongruence between gene trees of Abrothrix (Rodentia, Cricetidae) and their implications for the delimitation of the genus. Zoosystematics and Evolution 87(2):227-241.
- No Citations -Not specifically cited by specimen number.
- http://dx.doi.org/10.1002/zoos.201100005

30. Paul M. Velazco & Richard Cadenillas. 2011. On the identity of *Lophostoma silvicolum occidentalis* (Davis & Carter, 1978) (Chiroptera: Phyllostomidae). Zootaxa 2962: 1-20.
- 1 Cited Specimens

31. Peter A. Larsen, Lizette Siles, Scott C. Pedersen, Gary G. Kwiecinski. 2011. A new species of *Micronycteris* (Chiroptera: Phyllostomidae) from Saint Vincent, Lesser Antilles. Mammalian Biology - Zeitschrift für Säugetierkunde 76(6):687-700.
- 1 Cited Specimens
- http://dx.doi.org/10.1016/j.mambio.2011.01.006

32. Robert L. Rausch and Francis H. Fay. 2011. *Toxascaris leonina* in rodents, and relationship to eosinophilia in a human population. Comparative Parasitology 78(2):236-244.
- No Citations -Not specifically cited by specimen number.
- http://dx.doi.org/10.1654/4504.1

33. Robert S. Voss. 2011. *Revisionary Notes on Neotropical Porcupines (Rodentia: Erethizontidae)3. An Annotated Checklist of the Species of Lacépède, 1799.* American Museum Novitates 3720(3720):1-36.
- 1 Cited Specimens
- http://dx.doi.org/10.1206/3720.2

34. Sean A. Neiswenter and Brett R. Riddle. 2011. Landscape and climatic effects on the evolutionary diversification of the Perognathus fasciatus species group. Journal of Mammalogy 92(5):982-993.
- 15 Cited Specimens
- http://dx.doi.org/10.1644/11-MAMM-A-037.1

35. Tania Escalante, Elizabeth A. Martinez-Salazar, Jorge Falcon-Ordaz, Miguel Linaje & Ricardo Guerrero. 2011. Analisis Panbiogeografico de *Vexillata* (Nematoda: Orntihostrongylidae) Y Sus Huespedes (Mammalia: Rodentia).
- No Citations - Not specifically cited by specimen number.

36. Thomas J. O'Shea, Paul M. Cryan, E. Apple Snider, Ernest W. Valdez, Laura E. Ellison, Daniel J. Neubaum. 2011. *Bats of Mesa Verde National Park, Colorado: Composition, Reproduction, and Roosting Habits*. Monographs of the Western North American Naturalist 5(1):1-19.
- No Citations - Not specifically cited by specimen number.
- http://dx.doi.org/10.3398/042.005.0101

37. Thomas S. Jung and Todd Powell. 2011. *Spatial distribution of meadow jumping mice (Zapus hudsonius) in logged boreal forest of northwestern Canada*. Mammalian Biology - Zeitschrift für Säugetierkunde 76(6):678-682.
- No Citations - Not specifically cited by specimen number.
- http://dx.doi.org/10.1016/j.mambio.2011.08.002

38. Ulyses F. J. Pardinas, Pablo Teta, Guillermo D'elia, and Gabriela B. Diaz. 2011. Taxonomic status of *Akodon oenos* (Rodentia, Sigmodontinae), an obscure species from West Central Argentia. Zootaza 2749: 46-61.
- No Citations - Not specifically cited by specimen number.

39. William David Webster, Nancy D. Moncrief, Jerry R. Choate and Hugh H. Genoways. 2011. Systematic Revision of the Northern Short-tailed Shrew, *Blarina brevicauda* (Say). Virginia Museum of Natural History, Scientific Publications Series, Memoir 10:1-77.
- No Citations - Not specifically cited by specimen number.

40. Zachary P. Roehrs, Justin B. Lack and Ronald A. Van Den Bussche. *A Molecular phylogenetic Reevaluation of the Tribe Nycticeiii (Chiroptera: Vespertilionidae)*.2011. Acta Chiropterologica, 13(1):17-31.
- 1 Cited Specimens
- http://dx.doi.org/10.3161/150811011X578598

8. ACTIVITIES IN LEARNED SOCIETIES.

A.Invited or plenary talks

Joseph A. Cook

Reported in Mammal Division.

B. Contributed Talks/Posters

C. Attendance at professional meetings.

Reported in Mammal Division.

D. Service as editor or on editorial board of a journal.

Reported in Mammal Division.

E. **Service as officer of professional society or organization**.

Reported in Mammal Division.

9. OTHER PROFESSIONAL ACTIVITIES.

A. **Colloquium Presentations.**

B Presentation to General Audience in a Scholarly Capacity.

Reported in Mammal Division.

Parmenter, Cheryl – Museum, DGR tours.

C. **Presentations in a Scholarly Capacity at Hearings, Workshops, Legislative Committees, etc.**
None

D. **Service in a Scholarly Capacity as a Member of a Local, State, Regional or National Committee, Panel etc.**

E. Journal Referee.

F. Hosting Professional Colleagues and Groups

Parmenter, C.A.
Hosted Dr. Greg Glass, Johns Hopkins University and helped his students.

10. SERVICE.
Cheryl Parmenter:

Division tours *– provided educational tours and assistance for visitors. Responds to all division emails, telephone calls and inquires.*

Visitors:

UNM - New Graduate Students tour.
Valles Caldera-Dr. Robert Parmenter
Johns Hopkins University-Dr Gregory Glass and students.
Texas Tech. University-Dr. Robert Baker
UNM president- Dr. David Schmidly.
UNM students-many
UNM Art Majors tour-25
IACUC-tour.

11. ADVANCED STUDY, HONORS, AWARDS, FELLOWSHIPS, ETC.

12. DONATIONS AND GIFTS RECEIVED.
None.

13.CURRENT STAFF.
Faculty:
Joseph A. Cook**: Interim Curator** of Genomic Resources, Curator of Mammals Museum of Southwestern Biology and Professor the Department of Biology UNM.

Staff:

Cheryl Parmenter: **Collection manager** 1.0FTE.

Students:

Jessica Weber .05FTE. Graduate Assistant and Winter semester and Bryan McLean: Graduate Assistant .05FTE. Fall semester.

13. MUSEUM ASSOCIATES.

A. Curatorial Associates

None

B. **Research Associates**

Robert J. Baker	The Museum, Texas Tech University, Lubbock, TX
Troy L. Best	Department of Biology, Auburn University
James Derr	Texas A&M University
Jerry Dragoo	UNM Department of Biology
Jennifer Frey	New Mexico State University,
Scott L. Gardner	Dept. Nematology, Curator, University Nebraska.
Bruce J. Hayward	Department of Biology, Western New Mexico University
Edward J. Heske	Illinois Biological Survey
Dwight W. Moore	Emporia State University
Robert Parmenter	Valles Caldera Preserve- Chief Scientist
James L. Patton	Museum of Vertebrate Zoology, University of California
Luis Ruedas	Portland State University, Portland, Oregon
Jorge-Salazar Bravo	Texas Tech University, Lubbock, TX

HERBARIUM

Curator: Tim Lowrey
Collection Manager: Phil Tonne

1. DIVISION HIGHLIGHTS

The UNM herbarium contained more than 126,862 accessioned specimens of vascular and non-vascular plants at the end of 2011.

Interpretive activities or Collections-related Outreach includes tours for K-12 and UNM students. The Herbarium works closely with Native Plant Society of New Mexico and the New Mexico Rare Plant Technical Council.

The Herbarium continues to provide the leadership for the statewide collection database, New Mexico Biodiversity Consortium (NMBCC), that serves natural history specimen data via the World Wide Web**,** and contributes to regional web-served data on SEINET.

2. TABLE OF COLLECTION USE

Collection Growth (specimens catalogued & entered in collection)	Loans/# specimens (outgoing)	Loans (incoming)	Visitors (not including tour groups)	Information Requests Personally Responded to	Publications Citing MSB Specimens
3340	35/848	3/20	162	150	10

3. COURSES USING THE COLLECTIONS

4. COURSES TAUGHT BY MSB PERSONNEL

A. Faculty/Collection Manager
Hanson, D.
ALGAL BIOFUELS: A Multidisciplinary Approach, Spring Semester 2011
Sections: Bio 419/519.009, CS 591, Stat 479/579, Math 439/579, Phyc 300, ECE 495/595, Anth 450/560.

B. Graduate Students/Associates
Bixby, R.J.
BIOL 400-Senior Honors Thesis (1 student)
BIOL 495 – Limnology lecture (20 students) and lab (9 students)
BIOL 499- Research Problems (2 students)

Guest lectures: Ecosystem Studies BIOL 514, “Aquatic and terrestrial primary productivity”, “Sulfur and metal cycles”, and “Human impacts on ecosystems,” graduate, University of New Mexico, 2011

Summer Field Problems (Water Resources), "Aquatic bioindicators", graduate, University of New Mexico, 2011

5. COLLECTION MANAGEMENT

We processed and added 3340 new acquisitions to the collection. The UNM Herbarium received gifts of 2313 specimens (mounting some of the 2010 specimens that had not yet been processed, we added 3340 specimens to the collection). The majority of specimens were collected in New Mexico.

The herbarium logged more than 162 visits from the botanical community as well as group visits by schools and organizations. We average 2-3 information requests per week by e-mail and/or phone, and the Biodiversity and Seinet websites receive many hits per month to access specimen data for herbaria in the state.

Processed Accessions, 2011:
2011.1 Gift of 481 unmounted specimens from Robert Sivinski
2011.2 Gift of 1271 unmounted specimens from Rocky Mountain Herbarium – Ben Legler collections from the Vermejo Park Area
2011.3 Gift of 561 unmounted specimens from Rocky Mountain Herbarium.
Brian Elliott

6. AWARDS, GRANTS, AND CONTRACTS

Awarded:

$75,328 (2011-2012), R. Bixby, P.I., "Resource utilization by Rio Grande silvery minnow at the Los Lunas Silvery Minnow Refugium." Interstate Stream Commission, 2011-2012: **R. Bixby**

$382,503 ($132,610 for 2010-2011). Effects of nutrient availability of periphyton biomass and diversity in the Middle Rio Grande: top-down and bottom-up factors "(P.I.), Middle Rio Grande Endangered Species Act Collaborative Program, Bureau of Reclamation, 2007-2011: **R. Bixby**

7. PUBLICATIONS

A. Books, Book Chapters, Edited Volumes

Pringle, C.M., E.P. Anderson, M. Ardón, R.J. Bixby, S. Connelly, J.H. Duff, A.P. Jackman, P. Paaby, A. Ramírez, G.E. Small, M.N. Snyder, and F.J. Triska. In press. Rivers of Costa Rica. In: M. Kappelle (ed.) Costa Rican Ecosystems. The University of Chicago Press, Chicago, Illinois

C. Journal Articles

Fuelling, L.J., J.A. Adams, K. Badik, R.J. Bixby, C.L. Caprette, H.E. Caprette, W.B. Chiasson, C.L. Davies, M.M. Hall, W.L. Perry, E.R. Schultz, D.A. Taylor, M.L. Vis, and R.G. Verb. In press. Occurrence of freshwater red algal chantransia on rusty crayfish. *Nova Hedwigia*.

Lucas, P. W., J. T. Gaskins, T. K. Lowrey, M. E. Harrison, H. Morrogh-Bernard, S. M. Cheyne, and M. R. Begley. 2011. Evolutionary optimization of material properties of a tropical seed. Journal Royal Society Interface. doi: 10.1098/rsif.2011.0188

Small, G.E., R.J. Bixby, C. Kazanci, and C.M. Pringle. 2011. Partitioning isotopic and stoichometric components of epilithic biofilm using algebraic mixing models. *Limnology and Oceanography: Methods* 9: 185-193.

Sivinski, R.C. and M.O. Howard. 2011. A new species of *Linum* from the northern Chihuahuan Desert. Phytoneuron 2011-33:1–7.

The botanical community published nine new plant taxa in New Mexico in 2011, and one from adjacent Colorado. This is a remarkable number of new plants in a single year, with more coming out in early 2012. The specimens at the UNM Herbarium were the first clues to some of these newly named species. Our type collection has expanded with these new taxa:

Alliciella cliffordii J.M. Porter
Phytotaxa 15: 15-25 (2011).

Cymopterus spellenbergii R.L. Hartm. & J.E. Larson:
Journal of the Botanical Research Institute of Texas
5(1): 33-40.

Geranium dodecatheoides P.J. Alexander & Aedo:
Rhodora, volume 113, issue 955, pages 252-259.

Ipomopsis congesta ssp. *matthewii* J.M. Porter
Phytotaxa 15: 15-25 (2011).

Colorado: *Ipomopsis ramosa* Al Schneid. & Bregar:
Phytoneuron 45: 1-2. 2011

Linum allredii Sivinski & M.O. Howard
Phytoneuron 2011-33: 1-7, f. 1-3. 2011.
Mentzelia sivinskii J.J. Schenk & L. Hufford
Mentzelia filifolia J.J. Schenk & L. Hufford
Mentzelia longiloba var. *chihuahuaensis* J.J. Schenk & L. Hufford
Madroño 57(4): 256–257, f. 3F [map], 4B, 5A. 2010[2011].

Phlox vermejoensis B.S. Legler
Journal of the Botanical Research Institute of Texas
Volume 5, number 2.

C. Web-Based / Curriculum Development

D. Technical Reports

Bixby, R.J. and A.S. Burdett. 2011. Effects of nutrient availability on periphyton growth and diversity in the middle Rio Grande: top-down and bottom-up factors, Final Report. Bureau of Reclamation (Middle Rio Grande Endangered species Act Collaborative Program), 79 pp.

Sivinski, R, and P. Tonne. 2011. Survey and Assessment of Aridland Spring Ciénegas in the Southwestern Region. Submitted to EMNRD-Forestry Division and USDI-Fish & Wildlife Service, Region 2 Office.

Sivinski, R. 2011. *Agalinis calycina* (Leoncita false-foxglove): A Conservation Status Assessment. Submitted to EMNRD-Forestry Division and USDI-Fish & Wildlife Service, Region 2 Office.

E. Theses/Dissertations Completed

F. Work In Progress

Ph.D. Advisement:
University of New Mexico
Jack Triepke, 2011. Tim Lowrey, Co-supervised with Dr. Esteban Muldavin. In Progress.

G. Publications/Reports Based on MSB Specimens (including outside researchers)

8. ACTIVITIES IN LEARNED SOCIETIES
A. Invited/Plenary Talks and/or Seminars

B. Contributed Talks/Posters

Bixby, R.J. and A.S. Burdett. 2011. Bathtub ring-a-ding-ding: turbidity makes algal communities sing (in an aridland river). North American Diatom Symposium, Flathead Lake, Polson, Montana.

Bixby, R.J., S.A. Spaulding, D. Jewson, and H. Nelson. 2011. Can digital imaging flow cytometry replace microscope measurements of diatom cell dimensions? North American Diatom Symposium, Flathead Lake, Polson, Montana.

Bixby, R.J., A.S. Burdett, and N. Lopez-Brody. 2011. Role of turbidity in shaping algal communities in an aridland river. North American Benthological Society, Providence, Rhode Island.

Sayre, K. and R.J. Bixby. 2011. A new species of the genus *Amphipleura* found in the Neotropics ? North American Diatom Symposium, Flathead Lake, Polson, Montana.

Vijayaraghavan, S., M. Garcia, T. Lowrey, and A. Porras-Alfaro. 2011. Plant-associated fungi: diversity and function in gypsophilic soils. Botany 2011. St. Louis MO. July 2011.

C. Attendance at Professional Meetings

Hanson, D. T. American Society of Plant Biologists; Montreal, Canada; July 2010

Lowrey, T.
May 2011- Society for the Preservation of Natural History Collections-San Francisco, Ca.
July 2011- Botany 2011- St. Louis, MO.
New Mexico Native Plant Society Annual Meeting- August 2011, Santa Fe, NM
Southwestern Rare Plant Conference- Dec. 2011- Desert Botanical Garden-Phoeniz, AZ
California Botanical Society-February 2011- Monterey, Ca.

D. Service as Editor or on Editorial Board of a Journal
Lowrey, T.K.
Co- Editor, Madrono, Journal of the California Botanical Society, Nov. 2008 to 2011

Corresponding Editor, Madrono, Journal of the California Botanical Society, Nov. 2008 to 2011.

E. Service as Officer of Professional Society/Organization
Hanson, D.T.
Vice-Chair/Chair, Gordon Research Conference on CO_2 Assimilation in Plants, August 30, 2008–August 30, 2014 (elected). Secretary, UNM Chapter of Sigma Xi, August 1, 2008–August 1, 2011 (appointed).

Lowrey, T.K.
Member, Board of Directors, Flora North America, Elected.

Research Associate, Missouri Botanical Garden, St. Louis, MO. 1985-present.

9. OTHER PROFESSIONAL ACTIVITIES
A. Presentation to General Audience in a Scholarly Capacity (*presenter)
Lowrey, T. New Mexico Native Plant Society Annual Meeting- August 2011, Santa Fe, NM

Sivinski, R. New Mexico Native Plant Society Annual Meeting- August 2011, Santa Fe, NM

Tonne, P. 2011. Rare Plant Recovery Efforts in New Mexico. Native Plant Society of New Mexico. Albuquerque, NM.

B. Presentations in a Scholarly Capacity at Hearings, Workshops, Legislative Committees, etc.

C. Scholarly Service as a Member of a Local/State/Regional/National Committee, Panel, etc.
Bixby,R.J.
Member, Public Information and Publicity Committee, Society for Freshwater Science
Member, Literature Review Committee, Society for Freshwater Science
Editor/Writer, Benthos News on society website, Society for Freshwater Science
Page contributor, Diatoms of North America, http://westerndiatoms.colorado.edu/

Hanson, D.T.
Grant Reviewer, National Science Foundation 2010

Panel Member, National Science Foundation 2010
Grant Reviewer, SWISS National Science Foundation 2010

Lowrey, T.K.
Member, New Mexico Rare Plant Technical Council
Member, Native Plant Society of New Mexico
California Botanical Society, 2008-present.
American Society of Plant Taxonomists, 1975-present.

Sivinski, R.
Member, New Mexico Rare Plant Technical Council
Member, Native Plant Society of New Mexico

Tonne, P.C.
Member, New Mexico Rare Plant Technical Council.
Member, Native Plant Society of New Mexico

D. Journal Referee
Bixby, R.J.
Diatom Research (1), *Freshwater Biology* (1), *Journal of the North American Benthological Society* (1), *Phytotaxa* (1)

Hanson, D.T.
Acta Oecologia 2
BMC Plant Biology 1
Canadian Journal of Forest Research 2
ISMEJ 1
New Phytologist 2
Plant, Cell and Environment 2
Physiologia Plantarum 2

Lowrey, T.K.
International Journal of Plant Science (1)
Madrono (3)
Systematic Botany (1)

E. Hosting Professional Colloquia and Groups

F. Field Research
Lowrey, T., R. Sivinski, and P. Tonne:
1. Gray Ranch-Hidalgo County
2. Grant County New Mexico-May 2011.

10. SERVICE
A. Symposia, Workshops, Conferences etc. Sponsored, Organized, Held, etc.

B. Public Service

Lowrey, T.K., Phil Tonne, and Bob Sivinski:
Plant Identification for the general public in the UNM Herbarium.

Tonne, P., Joy Avritt, and Bob Sivinski. Rare plant conservation and restoration efforts on the Santa Fe National Forest. Organized and implemented forest thinning in Holy Ghost Canyon. Germinated seeds and grew plants at the UNM greenhouse leading to the planting of 1111 individuals of the Holy Ghost Ipomopsis, a federally endangered species within its native, restored habitat.

C. University and Departmental Committees
Hanson, D. T.
Biology Department Seminars Committee
Greenhouse Committee
Seminars Committee

Lowrey, T.K.
Policy Committee, UNM Faculty Senate
Committee on Governance
Biology Dept. Space Committee
Associate Chair-Dept. of Biology 2009-2011.

11. ADVANCED STUDY, HONORS, AWARDS, FELLOWSHIPS, ETC.

12. DONATIONS AND GIFTS RECEIVED
$500 annually. Native Plant Society donation for New Mexico Herbaria.

13. CURRENT STAFF (List Faculty/Staff, Students and Volunteers)
A. Faculty/Staff
Lowrey, T.K., Curator
Tonne, P., Collection Manager

B. Graduate students
Petrie, Matt (Spring and Fall 2011)

C. Undergraduate Student Workers and Volunteers
Gautreaux, Matt. Volunteer
Kartchner, Andrea. Work-study Employee. Senior.
Robinson, Kyle. Work-study Employee. Freshman.

14. MUSEUM ASSOCIATES
A. Curatorial Associates
Hanson, D.T., UNM Faculty (Curator of Bryophytes)
Sivinski, R., New Mexico State Botanist

B. Research Associates
Bixby, R.J. UNM Research Assistant Professor, Diatoms

Bleakly, D., Botanical Consultant
Carter, J.L., Emeritus Professor, Colorado College and Botanist
Dunmire, W., Retired U.S. National Park Service and Author
Keller, C., Retired, Los Alamos National Laboratory
Knight, P., Botanical Consultant

DIVISION OF MAMMALS

Curator: Joseph Cook
Collection Manager: Jon Dunnum

1. DIVISION HIGHLIGHTS.

A. **Collection Growth.** The DOM added 11,700 specimens to its catalogue during 2011 and now contains over 236,000 specimens. DGR records are currently being converted to DOM records as they are catalogued into the DOM. When mammal specimens from the DGR and DOM are combined, the MSB holds over 250,000 mammal specimens (3rd largest collection in the Western Hemisphere).

The collection remains among the fastest growing for mammals in the world and is the result of a number of important facets of our operation:

- **a. Specimen growth through fieldwork**
  - **i.** Directed specimen-based studies within Joe Cook's research program.
  - **ii.** Highly successful fieldwork in a wide variety of projects spanning the Western Hemisphere, eastern Asia, and collaborations with state and federal resource agencies in the western US and Canada. Work primarily sponsored by the National Science Foundation, National Institutes of Health, USDA Forest Service and US Fish and Wildlife Service.
  - **iii.** New initiatives focused on building the collection in certain geographic regions.
- **b. Specimen growth through donation**
  - **i.** A well-developed network of researchers and agencies worldwide which are now heavily invested in the strength of the DOM and continue to deposit their material here.
  - **ii.** Donations of personal collections from individual researchers.

Growth as a repository for research material points to the strength and good standing of the collection in the greater scientific community.

B. **Training in specimen based research and curation**. Training remains one of the integral goals of the DOM. Students are involved in all activities of the division. During 2011, 32 students worked in the division at some point (4 graduate students, 16 paid undergraduates, 2 high school interns, and 10 volunteers). Of these, 24 were females, 8 males, and of these 8 were from under-represented groups. Students gain experience in bioinformatics, natural history collection preparation and curation, and field and laboratory based research.

C. **Publications citing MSB DOM specimens.** The DOM collection continues to be utilized heavily in wide range of integrated disciplines. During 2011 our specimens were cited in 38 studies published in 29 journals including: Acta Chiropterologica, Acta Zoológica Mexicana, American Museum Novitates, Animal Conservation, Biological Journal of the Linnean Society, BioScience, Bulletin of the American Museum of Natural History, Comparative Parasitology, Diversity and Distributions, Evolution, Journal of

Arid Environments, Journal of Biogeography, Journal of Mammalogy, Journal of Parasitology, Journal of Virology, Mammalian Biology, Molecular Ecology, Occasional Papers Museum of Texas Tech University, PLoS One, Revista Biologia Tropical, Sustainability, Systematic Biology, Special Publications Museum of Texas Tech University, Virginia Museum of Natural History Scientific Publications Series, Western North American Naturalist, Zoological Journal of the Linnean Society, Zoological Studies, Zoosystematics and Evolution, and Zootaxa.

D. **Arctos database and collection accessibility.** The Arctos database is a cutting-edge relational database that continues to provide an invaluable resource for researchers worldwide. Arctos is web-accessible and greatly enhances the visibility of the MSB. Web visits to the database tracked via Google analytics = 119,363 visits (from 197 countries (5.2% (6,168) visitors referred to our site were from GenBank).

E. **Educational Modules.** The DOM has begun a collaboration with the UNM Art and Ecology program to develop web-based modules using museum specimens to illustrate various evolutionary concepts that can be viewed online and used by K-12 and UNM classes.

2. COLLECTION USE

Collection Growth (specimens catalogued)	Loans (outgoing)	Loans (incoming)	Visitors	Information Requests Personally Responded to	Publications Citing MSB DOM Specimens
11,700*	30(753) / 37(1828)**	3	297***	>500****	41

* Currently the fastest growing mammal collection worldwide.
** Loans originating in DOM / loans of mammal tissue originating in DGR Combined total of 67 loans of 2581 specimens of traditional voucher specimens, mammalian parasites, and tissue samples.
*** 26 visiting researchers from 11 institutions, 16 school group tours (141 people), 8 UNM classes (89 students, 7 instructors), 34 other visitors.
**** Estimate of email or phone requests to Jon Dunnum and Joe Cook.

3. COURSES USING THE COLLECTIONS

Classes receiving loans of material for educational purposes

UNM BIOL 204L - Plant and Animal Form and Function. Spring (180 students)
BIOL 204L - Plant and Animal Form and Function. Fall (180 students)
UNM BIOL 386L General Vertebrate Zoology, Spring
UNM NTSC 262L, Fall
UNM ART history, Spring
ANTH dental anthropology, Fall

BIOL 599 Masters Thesis	(1 student, 4 loans)
BIOL 699 Dissertation	(2 students, 5 loans)

UNM Courses using collection through visits or staff presentations (89 students, 7 instructors from 8 classes).

ART Studio 141 (intro art/ecol) Spring	(15 students, 1 instructor)
ART Studio 141 (intro art/ecol) Fall	(15 students, 1 instructor)
ART history	(1 student)
BIOL 461/561Tropical Biology	(16 students, 1 instructor)
ANTH 373/573 Zooarcheology	(15 students, 1 instructor)
ANTH Paleoecology	(10 students, 1 instructor)
MUS studies	(12 students, 1 instructor)
ART 240	(5 students, 1 instructor)

K-12 schools and educational groups: 120 students, 21 teachers from 16 schools.

Sandia High school	(1 students, 1 teacher)
Jefferson Middle school	(1 student)
Monte Vista Elementary school	(25 students, 2 teachers)
Montesorri of the Rio Grande	(9 students, 2 teachers)
St. Pius High School	(20 students, 1 teacher)
Highland High school	(1 teacher)
North Valley Academy	(1 teacher)
Jimmy Carter Middle School	(2 teachers)
West Mesa High School	(1 teacher)
Bosque Prep School	(2 teachers)
Manzano Day School	(1 teacher)
Dexter YCC Environmental education	(7 students, 1 teacher)
Summer of Science	(27 students, 4 teachers)
Estancia High school	(20 students, 1 teacher)
Johns Hopkins University School of Public Health	(6 students, 1 instructor)
Univ Nebraska-Kearney (Biol of the Southwest)	(4 students, 1 instructor)

Visiting researchers: 26 from 11 institutions or departments

Eastern New Mexico University	(3)
Indiana University	(1)
Sunset Mesa	(2)
Southwest Archeology Consultants	(1)
Southwest Wildlife Rehabilitators	(2)
Texas Tech University	(2)
Univ Nebraska-Kearney	(1)
UNM Anthropology	(7)
UNM Biology	(4)
UNM Art	(2)
University Texas Austin	(1)
Other visitors: 34	
California State University Fresno	(1)

Centers for Disease Control and Prevention	(2)
National Park Service	(2)
New Mexico Dept Game and Fish	(1)
UNM IACUC Committee	(6)
US Fish and Wildlife Service	(2)
US Geological Survey	(3)
Other	(17)

4. COURSES TAUGHT BY MSB PERSONNEL

A. Faculty/Collection Managers

Cook, J. A.

Biol. 461/561, Introduction to Tropical Biology, Spring: 14 undergrad, 2 grad students
UnO-502, Spring: 8 students, Fall: 9 students

Student Mentoring

Undergraduates

1. Kelly Speer, Regents' Scholar, NSF-UNO,
2. Hiyatsi Bassett, NSF-UNO,
3. Randle McCain, NSF-UNO
4. Sophia Thompson, NSF-UNO
5. Andrea Jackson, NSF-UNO
6. Diego Matek, NSF UNO
7. Jamie Raines, NSF-BRC
8. Kyle Crossey, NSF BRC
9. Sonia Peterson, volunteer
10. Joanna Johnson, NSF UnO
11. Kate Cauthen, NSF UNO
12. Sienna Wright, workstudy & NSF BRC
13. Abbie Reade, museum tech
14. Angie Swanson, museum tech
15. Nicole Caimi
16. Abigail Ramirez
17. Andrea Kartchner, museum tech
18. Adeline Murthy, NSF UNO
19. Amber McArdle, volunteer
20. Colton Dalton, volunteer
21. Rosemary Steinberg, volunteer
22. Elliot Shriver, volunteer
23. Victoria Brooke Rodrigues, volunteer
24. Neesha Karanth, volunteer
25. Lila Badash, volunteer
26. Kathryn Cook, volunteer
27. Alanna Jornigan, volunteer
28. Rachel Lentz, volunteer

High school interns

1. Lauren Mills
2. Richard Romero

B. Graduate Students (labs, etc.)

BIOL 386L - General Vertebrate Zoology Lab

5. COLLECTION MANAGEMENT

The DOM received 81 new accessions of material and added approximately 12,000 specimens to its catalogue during 2011. DGR records are currently being converted to DOM records as they are catalogued into the DOM.

Current projects generating specimens for DOM

Beringian Coevolution Project - NSF
Mexican wolf reintroduction – USFWS
Mongolian Vertebrate Parasite Project – NSF
Chilean Hantavirus Project – ICIDR NIH
Panama Hantavirus – ICIDR NIH
Panama Climate Change Project - STRI/Gorgas
Bighorn Sheep Reintroduction Program – NMGF
ISLES---USDA Forest Service
Jackson Whitman carnivore collection
Black bear /elk predation project – NMDGF
Robert Rausch parasite host collection

The majority of staff time was spent:

1. Development of the Arctos database.
2. Reorganizing and relabeling of dry collections.
3. Training student technicians and UnO students in museum work.
4. Preparation, cataloging and installation of museum specimens.
5. Data entry for the incoming accessions.
6. Filling information requests.
7. Processing loan material.
8. Assisting with BIOL 489 – Mammalogy and other courses.

6. AWARDS, GRANTS, AND CONTRACTS

Bell, K.C.

1. Society of Systematic Biologists, Graduate Student Research Award (2011).
2. American Society of Parasitologists, Willis A. Reid Jr. Fund (2011).
3. Research Project and Travel Grant, Office of Graduate Studies, UNM (2011).
4. Graduate Research and Development, Graduate and Professional Student Association, UNM (2011).
5. Melinda Bealmer Scholarship, UNM Dept. of Biology (2011).
6. Joseph Alvin Gaudin Jr. Scholarship, UNM Dept. of Biology (2011)

Barker, B.

1. 2011 Grove Summer Scholarship; $3,000; Department of Biology, UNM

Cook, J.A.

1. Integration and Curation of the Robert and Virginia Rausch Helminthological Collection-A Resource for Science and Society in the MSB Division of Parasitology. NSF-DEB 1057383 $489,490 1/1/11-12/32/14 ($163K annually).
2. Comparative paleogenomics of the Arctic tundra ecosystem: The genetic response of plants and animals to climate change. Australian Research Council $182,000 (none to UNM) 2/2011-2/2013.
3. A Test of Landscape Connectivity across the Sky Islands Region using Large Carnivores as Model Organisms---II (co-PI; PI is Gary Roemer, NMSU). Wilburforce Foundation $25,000 (3/2011-6/2012).
4. RCN-UBE: Advancing Integration of Museums into Undergraduate Programs (AIM-UP!) (w/ co-PIs E. Lacey (UC Berkeley), S. Edwards (Harvard), S. Ickert-Bond (U Alaska)). NSF-DEB 0956129 $485,648 5/01/2010-4/30/2015 ($98K annually).
5. ISLES—Amendment 1 USDA Forest Service $180,000 (9/09-12/12) ($60K annually).
6. ISLES—Island Survey to Locate Endemics USDA Forest Service $100,000 (9/08-12/12) ($25K annually).
7. URM: Undergraduate Nurturing Opportunities (UNO) NSF-DEB 0731350 $1,014,659 08/01/07-08/01/12 ($200k annually).
8. Mongolia Vertebrate Parasite Project ((Co-PI) to University of Nebraska) NSF-DEB 0717214 $629,999 09/11/07 -9/01/11 (no $$ to UNM, but excellent collection of mammals)

Dunnum, J. L.

1. Improved housing of Mexican wolf (*Canis lupus baileyi*) specimens and its conservation in New Mexico. U. S. Fish and Wildlife Service. Total $18,500 (No F&A).

Hope, A.

1. Alaska Science Center, US Geological Survey/US Fish and Wildlife Service Science Support Partnership Program - High-Arctic preserves: modeling future prospects for the tundra ecosystem. $139,000. Co-PI.
2. Alaska Science Center, US Geological Survey Changing Arctic Ecosystems Initiative – Demographic and environmental change: genetic and GIS-based analyses of resident Arctic mammals. $65,000. Co-PI.

Kohli, B.

1. University of New Mexico (UNM) Biology Department, Caughran Endowed Scholarship (2011) ($5000)
2. UNM Graduate and Professional Students Association, Student Research and Activities Committee ($800), $400 in Spring and Fall cycles (2011)
3. University of New Mexico Biology Graduate Student Association, Graduate Research Allocation Committee ($900), $400 in Spring and $500 in Fall cycle (2011)

McLean, B.

SRAC, UNM Graduate and Professional Student Assoc. - $400

Weber, J.

UNM PiBBs Fellowship, ~$30,000.

7. PUBLICATIONS

A. Books, Book Chapters, Edited Volumes

B. Journal Articles

Bell, K.C.

1. Bell, K. C.and M. D. Matocq. 2011. Regional genetic subdivision in the Mohave ground squirrel: evidence of historic isolation and ongoing connectivity in a Mojave Desert endemic. Animal Conservation Volume 14(4):371–381.

Barker, B.S.

1. Barker, B.S., R.B. Waide, and J.A. Cook. 2011. Deep intra-island divergence of a montane forest endemic in the Caribbean: phylogeography of the Puerto Rican frog *Eleutherodactylus portoricensis* (Anura: Eleutherodactylidae). *Journal of Biogeography*, 38(12):2311-2325.

2. Barker, B.S. and Y.E. Sawyer. 2011. *Aspidoscelis tessalatus* (Common Checkered Whiptail) and *Salvadora hexalepis deserticola* (Big Bend Patch-nosed Snake). Ecology; Predation. *Herpetological Review*, 42(2):304.

Cook, J. A.

1. Torres-Perez, F., B. Hjelle, E. C. Holmes, and J.A. Cook. 2011. Spatial but not Temporal Co-divergence of a Virus and its Mammalian Host. Molecular Ecology 20:4109-4122.
2. Torres-Pérez, F., M. Acuna-Retamar, J. A. Cook , A. Bacigalupo, A. García, P. E. Cattan. 2011. Statistical phylogeography and population dynamics of Chagas disease vector *Triatoma infestans*: testing biogeographic hypotheses of dispersal. Infection, Genetics, and Evolution. 11:167-174.
3. Weckworth, B.V., N. G. Dawson, S. L. Talbot, M. J. Flamme, J. A. Cook. 2011. Going coastal: Shared evolutionary history between coastal British Columbia and Southeast Alaska wolves (*Canis lupus*). PLoS One 6: e19582.
4. Galbreath, K. E., J. A. Cook, A. A. Eddingsaas, E. G. DeChaine. 2011. Multi-locus tests of paleodistributional models reveal different facets of the complex demographic history of arctic ground squirrels in Beringia. Evolution 65:1879-1896.
5. Kang, H. J., S. N. Bennett, A. G. Hope, J. A. Cook, R. Yanagihara. 2011. Shared Ancestry Between a Newfound Mole-Borne Hantavirus and Hantaviruses Harbored by Cricetid Rodents. Journal of Virology 85:7496-7503.

Hope, A.G

1. Hope AG, Waltari E, Fedorov VB, Goropashnaya AV, Talbot SL, Cook JA (2011). Persistence and diversification of the Holarctic shrew, *Sorex tundrensis* (Family Soricidae), in response to climate change. *Molecular Ecology,* 20, 4346-4370.

C. Web-Based

All publications in the MSB series are available via free-download from our website.

D. Technical Reports

1. MacDonald, S.O., Cook, J.A. ISLES-Mammal and Parasite Inventory of the Tongass National Forest, 2011.
2. Leitner, P., M.D. Matocq, and K.C. Bell. 2011. Genetic analysis of Mohave ground squirrels from the Desert Tortoise Research Natural Area. DTRNA Report.
3. Hope, A. National Park Service, Arctic Network Newsletter, May-September (2011). "Small creatures in a large landscape".

E. Theses/Dissertations Completed

1. Hope, Andrew G. 2011. Mammalian diversification across the holarctic: spatiotemporal evolution in response to environmental change. Department of Biology, University of New Mexico. PhD Dissertation.
2. Tinnin, David. 2011. Vertebrate parasites of Mongolia. University of Nebraska-Linclon. PhD dissertation.
3. Zgurski, Jessie. 2011. The mating system, dispersal behavior and genetic structure of a collared pika (*Ochotona collaris*: Ochotonidae) population in the southwest Yukon, and a phylogeny of the genus *Ochotona*. Department of Biological Sciences, University of Alberta. PhD Dissertation.

F. Work In Progress (Only *in press* and already submitted)

Barker, B.S.

1. Barker, B.S., J.A. Rodríguez-Robles, R.B. Waide, and J.A. Cook. The role of sea-level fluctuations and topography in generating island diversity: phylogeography of the Puerto Rican Red-eyed Coquí, *Eleutherodactylus antillensis*. *Molecular Ecology*, submitted September 2011. *In revision.*

Cook, J.A.

1. Cook, J. A., M. Kholodova, C. Brochmann, V. Fedorov, S. L. Talbot, E. B. Taylor, R. Väinölä, E.P. Hoberg, K. P. Magnusson. 2012. Genetic Perspectives on Arctic Biodiversity. *In* Arctic Biodiversity Assessment. Conservation of Arctic Fauna and Flora Committee, Copenhagen.

2. Eric P. Hoberg, E. P., S. J. Kutz, J. A. Cook. K. Galaktionov, V. Haukisalmi, H. Henttonen, and S. Laaksonen. 2012. Parasites in Terrestrial, Freshwater, and Marine Environments. *In* Arctic Biodiversity Assessment. Conservation of Arctic Fauna and Flora Committee, Copenhagen.

3. Cook, J. A. and S. O. MacDonald. 2012. Island life: Coming to grips with the insular nature of North Pacific Coastal Forests. *In* Conservation of North Pacific Coastal Forests, G. Orians, J. Schoen, and J. Franklin, eds. Univ. Washington Press.

4. Dawson, N. G. and J. A. Cook. 2012. Behind the genes: Diversification of North American marten (*Martes americana* and *Martes caurina*). *In* Biology of Marten, S. Buskirk and K. Aubry, eds

5. Hoberg, E., A.V.A. Koehler, and J. A. Cook. 2012. Complex host-parasite systems in Martes: Implications for conservation biology of endemic faunas. Accepted. *In* Biology of Marten, S. Buskirk and K. Aubry, eds.

6. Sumibcay, L., Kadjo, B., Gu, S. H., Kang, H. J., Song, J-W, Cook, J. A., Lim, B. K., and Yanagihara, R. 2012. Divergent hantavirus lineage in the banana pipistrelle (*Neoromicia nanus*) in Côte d'Ivoire. J. Virology 9:34

7. Malaney, J.L., J. K. Frey, J. A. Cook. 2012. Lineage diversification, historical demography, and conservation genetics of an imperiled mammal, *Zapus hudsonius luteus*, in the American Southwest. Diversity and Distributions.

8. Dawson, N. G., M. P. Small, K. D. Stone, and J. A. Cook. In Revision. Conservation genetics and management considerations for high latitude island faunas: Marten (*Martes americana* and *Martes caurina*) along the North Pacific Coast. Biological Conservation.

9. Malaney, J. L., C. J. Conroy, L. A. Moffitt, H. D. Spoonhunter, J. L. Patton, and J. A. Cook. Submitted. Phylogeography of the western jumping mouse (*Zapus princeps*) detects deep structure in the southwestern United States. Journal of Mammalogy

10. Haas, G. E., J. Kucera, S. O. MacDonald and J. A. Cook. Submitted. First flea (Siphonaptera) records for Kanuti National Wildlife Refuge and review of historical records from nearby villages, Central Alaska. Journal of the Entomological Society of British Columbia.

11. Hoberg, E. P., K. E. Galbreath, J. A. Cook, S. Kutz, and L. Polley. Northern host-parasite assemblages: History and biogeography on the borderlands of episodic climate and environmental transition. Advances in Parasitology.

Hope, A

1. Hope AG, Speer KA, Demboski JR, Talbot SL, Cook JA (In Revision). A climate for speciation: Rapid Pleistocene diversification within the Sorex cinereus group of shrews. Molecular Phylogenetics and Evolution
2. Hope AG, Takebayashi N, Galbreath KE, Talbot SL, Cook JA (In Revision). Temporal dynamics of speciation among the amphi-Beringian small mammal community. Journal of Biogeography.
3. Hope AG (In Review). High shrew diversity in the Arctic: community assembly and environmental change. Northwestern Naturalist.

McLean, B.S.

1. McLean, B.S. and Emslie, S.D. (2012). Stable isotopes reflect the ecological persistence of two high-elevation mammals from the Late Quaternary of Colorado. Accepted in *Quaternary Research.*

2. Emslie, S.D., Meltzer, D.J. and McLean, B.S. (2012). High-elevation small mammal community resilience and climate change in the Pleistocene and Holocene of Colorado. Submitted to *PNAS.*

G. Publications/Reports Based on MSB Specimens/Data by Outside Researchers

1. Alarcón, Oriet, Guillermo D'Elía, Enrique P. Lessa, and Ulyses F.J. Pardiñas. 2011. Phylogeographic Structure of the Fossorial Long-Clawed Mouse *Chelemys macronyx* (Cricetidae: Sigmodontinae). Zoological Studies 50(5): 682-688.
2. Bell, K. C.and M. D. Matocq. 2011. Regional genetic subdivision in the Mohave ground squirrel: evidence of historic isolation and ongoing connectivity in a Mojave Desert endemic. Animal Conservation Volume 14(4):371–381.
3. Bozinovic, F., J. M. Rojas, P.A. Gallardo, R.E. Palma, and E. Gianoli. 2011. Body mass and water economy in the South American olivaceous field mouse along a latitudinal gradient: Implications for climate change. Journal of Arid Environments 75:411-415.
4. Caramaschi, Fabiana P., Fabrícia F. Nascimento, Rui Cerqueira1, Cibele R. Bonvicino. 2011. Genetic diversity of wild populations of the grey short-tailed opossum, *Monodelphis domestica* (Didelphimorphia: Didelphidae), in Brazilian landscapes. Biological Journal of the Linnean Society 104(2): 251–263.
5. Crawford, Dolly L., Jerry W. Dragoo, Felisa A. Smith, and Andrea N. Chavez. 2011. Diversification within the Mexican vole (*Microtus mexicanus*) and the role of post-Pleistocene climate change. Western North American Naturalist 71(2):176-194.
6. De La Sancha, Noé U., Guillermo D'Elía, Pablo Teta. 2011. Systematics of the subgenus of mouse opossums *Marmosa* (*Micoureus*) (Didelphimorphia, Didelphidae) with noteworthy records from Paraguay. Mammalian Biology doi:10.1016/j.mambio.2011.10.003.
7. Drew, Lisa W. 2011. Are We Losing the Science of Taxonomy? BioScience 61:942-946.
8. Erickson, Issac K., Michael A. Cantrell, LuAnn Scott and Holly A. Wichman. 2011. Retrofitting the Genome: L1 Extinction Follows Endogenous Retroviral Expansion in a Group of Muroid Rodents. Journal of Virology 85(23):12315-12323.
9. Escalante, Tania, Elizabeth A. Martínez-Salazar, Jorge Falcón-Ordaz, Miguel Linaje and Ricardo Guerrero. 2011. Análisis Panbiogeográfico De *Vexillata* (Nematoda: Ornithostrongylidae) Y Sus Huéspedes (Mammalia: Rodentia). Acta Zoológica Mexicana 27(1): 25-46.
10. Escobar-Flores, Jonathan Gabriel, Gorgonio Ruiz-Campos, Aldo Antonio Guevara-Carrizales, and Roberto Martínez-Gallardo. 2011. Extension of Southern Range and New Specimens of the Western Gray Squirrel, Sciurus Griseus Anthonyi (Mammalia: Sciuridae), in Baja California, México. Western North American Naturalist 71(1):119-120.
11. Hafner, John C. and Nathan S. Upham. 2011. Phylogeography of the dark kangaroo mouse, *Microdipodops megacephalus*: cryptic lineages and dispersal routes in North America's Great Basin. Journal of Biogeography 38:1077–1097.
12. Hornsby, Angela D., and Marjorie D. Matocq. 2011. Differential regional response of the bushy-tailed woodrat (*Neotoma cinerea*) to late Quaternary climate change. Journal of Biogeography DOI: 10.1111/j.1365-2699.2011.02616.x
13. Galbreath, K. E., J. A. Cook, A. A. Eddingsaas, E. G. DeChaine. 2011. Multi-locus tests of paleodistributional models reveal different facets of the complex demographic history of arctic ground squirrels in Beringia. Evolution 65:1879-1896.
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21. Neiswenter, Sean A. and Brett R. Riddle. 2011. Landscape and climatic effects on the evolutionary diversification of the *Perognathus fasciatus* species group. Journal of Mammalogy, 92(5):982-993.
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33. Tinnin, David S.; Ganzorig, Sumiya; and Gardner, Scott Lyell,. 2011. Helminths of Small Mammals (Erinaceomorpha, Soricomorpha,Chiroptera, Rodentia, and Lagomorpha) of Mongolia. Special Publications, Museum of Texas Tech University 59:1-50.
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35. Velazco, Paúl M. and Richard Cadenillas. 2011. On the identity of *Lophostoma silvicolum occidentalis* (Davis & Carter, 1978) (Chiroptera: Phyllostomidae). Zootaxa 2962: 1–20.
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37. Webster, Wm. David, Nancy D. Moncrief, Jerry R. Choate, and Hugh H. Genoways. 2011. Systematic Revision of the Northern Short-tailed Shrew, *Blarina brevicauda* (Say).Virginia Museum of Natural History, Scientific Publications Series, Memoir 10:1-77.
38. Weckworth, B.V., N. G. Dawson, S. L. Talbot, M. J. Flamme, J. A. Cook. 2011. Going coastal: Shared evolutionary history between coastal British Columbia and Southeast Alaska wolves (*Canis lupus*). PLoS One 6(5): e19582. doi:10.1371/journal.pone.0019582

8. ACTIVITIES IN LEARNED SOCIETIES

A. Invited/ Plenary talks

Cook, J.A.

1. Cook, J., E. Hoberg, A. Hope, K. Galbreath. 2 June 2011. The Beringian Coevolution Project. Invited Symposium Honoring Robert Rausch. American Society of Parasitologists Annual Meeting, Anchorage, AK

Dunnum, J.L.

1. Dunnum, J.L., and J.A. Cook. Gerrit Smith Miller- Contributions to European mammalogy and the value of natural history collections. 6th European Mammal Congress, Paris, France July 2011.

Hope, A.

1. Mammalian diversification across the Holarctic: spatiotemporal evolution in response to environmental change. Alaska Science Center, US Geological Survey, Anchorage, June 2011.

B. Contributed Talks/Posters

Bell, K.C.

1. Bell, K., E. Hoberg, J. Demboski, J. Cook. June 2011. Complexity in a Wormy World. Evolution, Norman, OK.
2. Bell, K., E. Hoberg, J. Demboski, J. Cook. 02 June 2011. Comparative phylogeography of two species of pinworms that infect chipmunks. American Society of Parasitologists Annual Meeting, Anchorage, AK

Chavez, A.

1. Chavez, April M and Yadéeh E. Sawyer. 2011. Taming of the Dusky Shrew: An Attempt to Structure a Cryptic Species. UNM Biomedical Symposium Undergraduate Research Presentation, Albuquerque, New Mexico.
2. Chavez, April M. 2011. Being a Lobo Scientist. College Day at Santa Fe Indian School of New Mexico.
3. Chavez, April M. 2011. Being a Lobo Scientist. UNM Biology Department presentation to Albuquerque 21st Century Middle School.
4. Chavez, April M. 2011. Being a Lobo Scientist. UNM Biology Department presentation to Albuquerque Highland High School.

Cook, J.A.

1. Cook, J. A., E. Lacey, S. Edwards, S. Ickert-Bond. AIM-UP! American Society of Mammalogists, Portland. June 2011.
2. Chavez, April and Yadéeh E. Sawyer. 2011. Taming of the dusky shrew: An attempt to identify a cryptic species. Biomedical Research Symposium, Albuquerque, New Mexico.
3. Sawyer, Yadéeh E., Natalie Dawson, and Joseph A. Cook. 2011. Historic climate change and island connectivity: implications for island ecosystem management. Annual meeting of the Alaska chapter of the Wildlife Society, Juneau, Alaska.
4. Bell, K., E. Hoberg, J. Demboski, J. Cook. June 2011. Complexity in a Wormy World. Evolution, Norman, OK.
5. Sawyer, Yadéeh E., Natalie Dawson, and Joseph A. Cook. 2011. Improving island ecosystem management by understanding historic climate change and island connectivity. University of New Mexico Department of Biology 2011 Annual Research Day, Albuquerque, New Mexico.
6. Malaney, Jason, A Hope, YE Sawyer, SO MacDonald and JA Cook. 2011. Phylogeography and historical demography highlight biogeographic processes for boreal mammals in western North America. American Society of Naturalists, Society of the Study of Evolution, and Society of Systematic Biologists Annual Conference, Norman, Oklahoma.
7. Sawyer, Yadéeh E. 2011 Living on the edge in the Alexander Archipelago of Alaska. American Society of Naturalists, Society of the Study of Evolution, and Society of Systematic Biologists Annual Conference, Norman, Oklahoma.
8. MacDonald, S.O., YE Sawyer, N Dawson, J Dunnum, B Truett, and JA. Cook. 2011. Island Surveys to Learn about Endemic Species (ISLES). Annual meeting of the Alaska chapter of the Wildlife Society, Juneau, Alaska.

9. Thompson, Sophia and Yadéeh E. Sawyer. 2011. *Microtus longicaudus* and the theory of island biogeography. University of New Mexico Department of Biology 2011 Annual Research Day, Albuquerque, New Mexico.
10. McClean, M. L., C. M. Himes, and J. A. Cook. MtDNA pseudogenes in the nuclear genome of *Thylamys venustus* (Didelphidae). ASERT Undergraduate Research Symposium, August 2011, Albuquerque.
11. Kang, H. J., S. N. Bennett, J. A. Cook, and R. Yanagihara. Ancestral sooricomorphs as early reservoir hosts of primordial hantaviruses. European Meeting on Viral Zoonoses. St. Raphaël, France. August 2011.
12. Dunnum, J.L., and J.A. Cook. Gerrit Smith Miller- Contributions to European mammalogy and the value of natural history collections. European Mammal Society, Paris, France July 2011.
13. Bell, K., J.R. Demboski, E. Hoberg, and J.A. Cook. Chipmunk and Louse evolution. American Society of Parasitologists Annual Meeting, Anchorage, AK, June 2011.
14. Hope A. G., K. A. Speer, J. R. Demboski, S. L. Talbot, J. A. Cook. A climate for speciation. American Society of Mammalogists, Portland. June 2011.
15. Barker, B.S., J.A. Rodríquez-Robles, R.A. Waide and J.A. Cook. 2011. The role of sea-level fluctuations, topography, and human introductions in generating island diversity: multi-locus phylogeography of a widespread *Eleutherodactylus* frog in the Puerto Rican Bank. Annual meeting for the Society for the Study of Evolution, Norman, OK.
16. Cicero, C., Cook, J. A., E. Lacey, S. Edwards, S. Ickert-Bond. AIM-UP! A Research Coordinating Network to Increase the Use of Museum Collections in Undergraduate Education. Society for the Preservation of Natural History Collections, Annual meeting, San Francisco, April 2011.
17. MacDonald, S.O., Y. E. Sawyer, N.G. Dawson, J. L. Dunnum, B. Truett, and J A. Cook. Island Surveys to Learn about Endemic Species. The Wildlife Society, Regional Meeting, Juneau Alaska February 2011.
18. Sawyer, Y.E., and J.A. Cook. Comparative phylogeography and management of the Tongass fauna. The Wildlife Society, Regional Meeting, Juneau Alaska February 2011.

Dunnum, J.L.

1. MacDonald, S.O., YE Sawyer, N Dawson, J Dunnum, B Truett, and JA. Cook. 2011. Island Surveys to Learn about Endemic Species (ISLES). Annual meeting of the Alaska chapter of the Wildlife Society, Juneau, Alaska.

Hope, A.

1. A climate for speciation: rapid spatial diversification among the *Sorex cinereus* complex of shrews. American Society of Mammalogists Annual Meeting, Portland, Oregon, June 2011.

Mclean, B.

1. Mclean, B. A unique isotopic record of mammal ecology from the Southern Rockies during and after the last glacial period. American Society of Mammalogists 91st Annual Meeting, poster presentation (July 2011).

Weber, J.

1. Mammalian cells in culture actively export specific microRNAs. New Mexico Bioinformatics Symposium, Santa Fe, NM.

Himes, C.

1. Himes, Christopher M. Enrique Lessa, & Joe Cook (2011) Population Genomic Divergence in the Tropical Andes Forest using RAD-tag Markers. American Genetic Association Annual Symposium. Guanajuato, Mexico
2. Himes, Christopher M. Enrique Lessa, & Joe Cook (2011) Adaptations to hypoxic environments in the Andes Tropical Forest. Institutional Research and Academic Career Development Award (IRCADA) Annual Conference, Houston Texas
3. Himes, Christopher M. Enrique Lessa, & Joe Cook (2011) Population Genomics and Patterns of Diversity of South American Marsupials in the Tropical Andes Yungas Forest. New Mexico Bioinformatics and Science Symposium 2011: Population-Level Genomic Diversity.

C. Attendance at Professional Meetings

Barker, B.

Annual meeting for the Society for the Study of Evolution, Norman, OK.

Bell, K.C.

American Society of Mammalogists, June 19-23 Portland, Oregon.

Cook, JA.

Genetic Monitoring of the Poles Workshop, British Antarctic Survey, Cambridge, UK, 3-6 April 2011
SNOWBANK Workshop, Museum of Natural History London, UK, 6-8 April 2011
New Approaches to Digitization of Natural History Collections, OU, Norman OK 3-5 March 2011
American Society of Mammalogists, June 19-23 Portland, Oregon.

Dunnum, J.L.

6th European Mammal Congress, Paris, France, 19-24 July, 2011.

Hope, A. G.

American Society of Mammalogists, June 19-23 Portland, Oregon.

Mclean, B.

American Society of Mammalogists, June 19-23 Portland, Oregon.

Malaney, J.

American Society of Mammalogists, June 19-23 Portland, Oregon.
Annual meeting for the Society for the Study of Evolution, Norman, OK.

D. Service as Editor or on Editorial Board of a Journal

Cook, J.A.

International Advisory Board Member, Editorial Board, *Zoologia,* Brazilian Journal of Zoology

Gannon, W.L.

Editor, Book reviews, American Society of Mammalogists

E. Service as Officer or Professional Society/Organization

Cook, J.A.

Board of Directors, American Society of Mammalogists, Member, 2011-2014

9. OTHER PROFESSIONAL ACTIVITIES

A. Presentations to General Audience in a Scholarly Capacity

Mexican Gray Wolf Reintroduction, at NM Game and Fish Commission meeting, Las Cruces, May 2011

B. Presentations in a Scholarly Capacity at Hearings, Workshops, Legislative Committees, etc.

None

C. Scholarly Service as a Member of a Local/State/Regional/National Committee, Panel, etc.

Cook, J.A.

National Science Foundation, Ad Hoc Proposal Review, Earth Sciences Division, April 2011

National Science Foundation, Evolutionary Processes Panel, 17-21 Oct 2011

2011-2013 Member Steering Committee, VertNet

2011-2012 Member Steering Committee, CollectionsWeb Research Coordinating Network

2010-2014 Chair, Steering Committee, AIM-UP! Research Coordinating Network in Undergraduate Biology Education

2008-2012 Convener and Lead, Genetic Resources, Arctic Biodiversity Assessment, Conservation of Arctic Fauna and Flora (CAFF)

Member, MSB Executive Committee

Editorial Board, MSB Publications Series

Member, Resolutions Committee, American Society of Mammalogists

Chair, Latin American Scholarship Committee, American Society of Mammalogists

Dunnum, J.L.

Systematic Collections Committee, American Society of Mammalogists

Chavez, A.

Biological Undergraduate Society of UNM (BUGS) Secretary Officer, 2011-2012

Gannon, W.L.

Animal Care and Use Committee, American Society of Mammalogists
Systematic Collections Committee, American Society of Mammalogists

Weber, J.

Graduate Policy Representative for the UNM BGSA

D. Journal Referee

Cook, J.A.

North American Fauna, 1 manuscript Dec 2011
Northwestern Naturalist, 1 manuscript Feb 2011

Dunnum, J.L.

Journal of Experimental Zoology Part A: Comparative Experimental Biology (1 manuscript)
Occasional Papers, Museum of Southwestern Biology (1 manuscript)
Mammalia (1 manuscript)
Southwestern Naturalist (1 manuscript)

E. Hosting Professional Colleagues and Groups

26 visiting academics and professionals from 11 outside institutions or departments visited the collections for research purposes.

Cook personally hosted the following individuals:

Dr. John Demboski, Denver Museum of Nature and Science, April 2011
Dr. David Hafner, retired NM Museum of Natural History, now in Michigan April 2011
Dr. Sandra Talbot, USGS Molecular Ecology Lab, Anchorage,

10. SERVICE

A. Symposia, Workshops, Conferences, etc. Sponsored, Organized, Held, etc.

B. Public Service

General

A significant portion of DOM staff time is spent providing information or assistance to the public either during visits to the collection, through phone calls, emails or through outreach endeavors. This is an important and ongoing activity of all DOM personnel.

Barker, B.S.

1. 2011 Panel volunteer, UNM Undergraduate Opportunities (UnO) seminar series.
2. Nature Hike Tour Guide - Truman Middle School and the Sandia National Forest Doc Long Recreation Area, New Mexico Lead a nature hike for a group of 10 seventh grade students, teaching them about the ecology of the region and how to identify various flora and faunal species.

Cook, J. A.

1. External Reviewer, Wildlife Department 10 year review, Texas A&M University, Feb 2011
2. External Faculty Review: Colorado State University, Wildlife Department, Dr. Kevin Crooks for promotion to Full Professor.
3. Santa Fe Indian School, First Annual College Fair, 14 Oct 2011, 2 UnO students and I traveled to Santa Fe to present on research and the college experience.
4. Highland High School, 15 Dec 2011 UnO Road Show, 3 students and I presented on science and the university experience to 6 biology classes under Dana Allen.

Sawyer, Y.

1. "Science is Cool!" - César Chavez elementary, Santa Fe, New Mexico. presentation of our research and life as a scientist to several second grade classes (~80 students). We took a total of 13 live animals ranging from insects to mammals, as well as museum specimens from the Museum of Southwestern Biology, representing the diversity of New Mexico's Arthropods and Mammals. The presentation included a slide show of our research and all the "cool things" that biologists get to do, followed by a show-and-tell of the animals and a Q&A session. A more detailed and hands-on presentation was provided for the bilingual class, which included direct interactions with some of the specimens.
2. Nature Hike Tour Guide - Truman Middle School and the Sandia National Forest Doc Long Recreation Area, New Mexico Lead a nature hike for a group of 10 seventh grade students, teaching them about the ecology of the region and how to identify various flora and faunal species.
3. Biorama Graduate Student Panel - University of New Mexico, Albuquerque Answered questions from undergraduates regarding graduate school and spoke about my personal experiences.

Dunnum, J. L.

1. Division tours – provided educational tours and information for 238 visitors and school groups.
2. Presentation on evolution and adaptations – Truman Middle School.
3. Nature Hike Tour Guide - Truman Middle School and the Sandia National Forest Doc Long Recreation Area, New Mexico Lead a nature hike for a group of 10 seventh grade students, teaching them about the ecology of the region and how to identify various flora and faunal species.
4. Volunteer coach for Duke City Soccer Organization. U13 girls.

12. DONATIONS AND GIFTS RECEIVED

13. CURRENT STAFF

A. Faculty/Staff

J.A. Cook, Curator
J.L. Dunnum, Collection Manager
C.A. Ramotnik, USGS Collection Manager
M.A. Bogan, Emeritus Curator

J.S. Findley, Emeritus Curator
Stephen O. MacDonald, Curator II
Gordon Jarrell, Cyber Coordinator
Sylvia Brunner, UnO Coordinator
Adrienne Raniszewski, Curatorial Assistant

B. Graduate students

Barker, Brittany. 6th year Ph.D. student. Landscape genetics of two frogs from Puerto Rico: *Eleutherodactylus antillensis* and *E. portoricensis.*

Bell, Kayce. 1st year Ph.D. student.

Escobedo, Yadeeh. 5 th year Ph.D. Linkage corridors along the North Pacific Coast.

Hope, Andrew. Received Ph.D. Mammalian Diversification Across The Holarctic: Spatiotemporal Evolution In Response To Environmental Change

Malaney, Jason. 6th year Ph.D. student. *Zapus* and *Lepus* historical biogeography.

Rearick, Jolene. 5th year Ph.D. Phylogeography and molecular evolution of freeze tolerance in *Lithobates sylvaticus*.

Brooks Kohi. 2st year Master's student. Phylogeography of high latitude *Myodes*.

Jessica Weber. 1st year Ph.D student.

C. Undergraduate Student Workers and Volunteers

16 undergraduate students

Randle McCain
Hiyatsi Bassett
Diego Joshua Matek
Andrea Jackson
Abbie Reade
Angie Swanson
Nicole Caimi
Abigail Ramirez
Sophia Thompson
Andrea Kartchner
Kyle Crossey
Sienna Wright
Jamie Raines
Adeline Murthy
Joanna Johnson
Kelly Speer

10 Volunteers

Amber McArdle
Colton Dalton
Rosemary Steinberg
Elliot Shriver
Victoria Brooke Rodrigues
Neesha Karanth
Lila Badash
Kathryn Cook
Alanna Jornigan
Rachel Lentz

2 high school interns

Lauren Mills
Richard Romero

14. MUSEUM ASSOCIATES

A. Curatorial Associates

James H. Brown, UNM Department of Biology
Jerry W. Dragoo, UNM Department of Biology
William Gannon, UNM Research Ethics

B. Research Associates

J. Scott Altenbach, UNM Department of Biology
Sydney Anderson, American Museum of Natural History, New York
Robert J. Baker, The Museum, Texas Tech University,Lubbock, TX
Troy L. Best, Department of Biology, Auburn University
M. Scott Burt, Kirksville, Missouri
Fernando Cervantes, UNAM, Mexico City, Mexcio
Paul J. Cryan, Ft. Collins, Colorado
John Demboski, Denver Museum of Science and Nature, Denver, Colorado
Eugene Fleharty, Oklahoma
Melissa Fleming, Poulsbo, Washington
Jennifer K. Frey, Las Cruces, New Mexico
Scott L. Gardner, Dept. Nematology, Curator, University Nebraska
Keith Geluso, Albuquerque, New Mexico
Ken Geluso, Lincoln, Nebraska
Sarah B. George, Director, Utah State Museum
Gary L. Graham, Texas Parks and Recreation Division
David J. Hafner, UNM
Art Harris, University of Texas, El Paso, Texas
Bruce Hayward, Silver City, New Mexico
Heikki Henttonen, Finland
Edward J. Heske, Illinois Biological Survey
Eric Hoberg, Beltsville, Maryland
R. Dewitt Ivey, Retired. Active in Botany, mammals

Clyde Jones, The Museum Texas Tech University
Sue Kutz, Saskatoon, Saskatchewan
Enrique Lessa, Montevideo, Uruguay
Stephen MacDonald, Silver City, New Mexico
Michael Mares, Norman, Oklahoma
Pablo Marquet, Valdivia, Chile
Rodrigo Medillín, UNAM, Mexico City, Mexico
Tony R. Mollhagen, Lubbock, Texas
Gary Morgan, New Mexico Museum Natural History, New Mexico
Dwight W. Moore, Emporia State University
Michael J. O'Farrell, Jr., Las Vegas, Nevada
Thomas J. O'Shea , Ft. Collins, Colorado
Eduardo Palma, Valdavia, Chile
Robert Parmenter, Valles Caldera, Jemez, New Mexcio
James L. Patton, Museum of Vertebrate Zoology, Berkeley, California
Paul J. Polechla, Albuquerque, New Mexico
Robert Rausch, University of Washington, Seattle
Brett R. Riddle, University of Nevada, Las Vegas, NV
Jorge Salazar Bravo, Texas Tech University, Texas
David J. Schmidly, UNM
C. Greg Schmitt, Farmington, New Mexico
Richard E. Sherwin, Christopher Newport University, Virginia
Fred Szalay, Los Ranchos de la Rio Grande, New Mexico
Sandy Talbot, Molecular Ecology Lab- USGS Anchorage, Alaska
Ernie Valdez, Tijeras, New Mexico
Alasdair Veitch, Department of Renewable Resources, Norman Wells, NWT, Canada
Jack Whitman, Alaska Department of Fish and Game – Fairbanks, Alaska
Don E. Wilson, Smithsonian, Washington, DC
Nyamsuren Batsaikhan, National University of Mongolia, Ulaan Baatar

Natural Heritage New Mexico Division

Director: Esteban Muldavin

1. DIVISION HIGHLIGHTS

In 2011, the Natural Heritage New Mexico Division continued to work with agencies and private partners to conduct a suite of conservation science projects and build its conservation information data systems. Within the division, there are four working groups: Conservation Data Center, Conservation Ecology, Zoology, and Botany.

As part of our service role in the museum to provide conservation information to the broader public as well as for research, the Conservation Data Center Group (Rayo McCollough, Lead; Teri Neville, GIS manager) worked on projects to make conservation data more readily available via the web. We implemented a project with the U.S. Fish and Wildlife Service and NM Department of Game and Fish (NMDGF) to database the biological information content found in annual Threatened and Endangered Species science permits required under the Endangered Species Act. In cooperation with NMDGF, NM Energy, Minerals and Natural Resources Department, U.S. Forest Service, and the Bureau of Land Management, we also continued to gather additional data and provide quality control on target sensitive species to build tools for dissemination of that information via the web.

The Conservation Ecology Group (Esteban Muldavin, Lead; Elizabeth Milford, Riparian Ecologist; and Paul Arbetan, Assoc. Ecologist). In collaboration with New Mexico Environment Department (NMED), we completed the final version of the "New Mexico Rapid Assessment Method" (NMRAM) for New Mexico's wetlands and riparian areas. The goal of the NMRAM was to develop a tool of easily applied landscape, biotic, and abiotic metrics to evaluate and rank the ecological condition and function of wetlands for conservation, restoration, and management. The outcome was a manual and field guide to be used by a broad spectrum of agencies and NGOs that are now available on the NMED and NHNM websites. As part of the Collaborative Forest Restoration Program (USFS) grant at a post-fire riparian restoration site in the Middle Rio Grande near Belen restoration, we completed the draft final database of monitoring data as part of a multi-group monitoring for the project that includes Middle Rio Grande Conservancy District, Inter-state Stream Commission, Hawks Aloft, Inc., and the Bosque Ecosystem Monitoring Program (BEMP). In cooperation with the U.S. Army Corps of Engineers, we completed the data acquisition and entry of a legacy dataset of the middle Rio Grande Hink and Ohmart ecological studies from the early 1980s, and completed the re-establishment and rereading of a set of their transects as the foundation for an analysis of ecosystem change over the last 40 years in the middle Rio Grande. With respect to our upland projects, we completed vegetation classifications and maps for Petroglyph National Monument and Salinas Pueblo Missions National Monument. We continued work on similar maps for El Malpais National Monument, Guadalupe Mountains National Park, Pecos National Monument, and Fort Davis National Monument. The data collected on national parks will provide a valuable reference dataset for comparing the potential conservation value of other sites around the state. We continued providing biological monitoring and assessment for New Mexico Army National Guard lands. We participated in a multi-state Integrated Landscape Analysis Project (ILAP) sponsored by the U.S. Forest Service that included the acquisition and databasing of vegetation

data from USFS and BLM lands across New Mexico and Arizona and the development of vegetation dynamics models for target ecosystems to support wall-to wall spatial models of ecosystem change across the two states. We completed our research and monitoring projects in pinyon-juniper ecosystems and the effects of planned and unplanned fires and potential woodland thinning projects at USFWS San Andres National Wildlife Refuge in south-central New Mexico, and on BLM lands in the Wild Rivers Recreation along the Rio Grande in north-central New Mexico.

The Zoology Group conducts field research and modeling of the habitats of animal species of conservation concern in New Mexico. In 2010, began year three of a three-year, multi-scale habitat modeling study of pinyon-juniper birds on three DOD installations. We conducted a third year of monitoring grassland birds and raptors at Holloman Air Force Base. We surveyed migrating and breeding wetland birds and completed a revised operational plan for constructed wetland management at the Lake Holloman Wetland Complex Area. Finally, we created a web map interface of Gunnison's prairie dog occurrence data for the NM Department of Game and Fish.

For the Botany Group (Phil Tonne, Lead and Esteban Muldavin), our focus was on two key sensitive species in the state: the Chihuahua scurf pea and Kuenzler's hedgehog cactus. For Chihuahua Scurf pea, we completed the project documenting the sole New Mexico population (one of two recorded globally in recent history) and informing public agencies of its conservation needs. For Kuenzler's hedgehog cactus, we partnered with the Bureau of Land Management to re-measure a set of long-term monitoring plots at Fort Stanton in south-central New Mexico where we documented a significant decline in the species over the past 20 years.

2. TABLE OF COLLECTION USE

Collection Growth (specimens catalogued)	Loans (outgoing)	Loans (incoming)	Visitors	Information Requests Personally Responded to	Publications Citing MSB Specimens
19,407 new records, 8,621 updated records	NA	NA	36,714 visitors to web site	184 personally, 59865 publications downloaded	UNKNOWN

3. COURSES USING THE COLLECTIONS

4. COURSES TAUGHT BY MSB PERSONNEL

A. Faculty/Collection Managers
B. Staff
None.

5. COLLECTION MANAGEMENT

As part of our service role in the museum to provide conservation data to the broader public as well as for research, in 2011 the Conservation Data Management Group worked on several initiatives to add to our conservation information. We made big improvements in data gathering, increasing the number of new records by 245%. In collaboration with the MSB Fish Division we mapped and entered data for almost 5,000 fish specimens from their collection.
We implemented a one-of-a-kind program to database section 10 reports from the U.S. Fish and Wildlife Service, which have valuable current data on federally listed species. We began working with NM Dept. of Game & Fish to host their BISON-M database and collaborate with them on data exchange and creating decision support systems. We also worked on several initiatives to build our conservation database (see Section 1). As an outcome of our database activities, we completed 184 formal information requests, and 59,865 publications and data downloads were obtained from our website.

6. AWARDS, GRANTS, AND CONTRACTS

NHNM AWARDS:

$81,238. NM Military Affairs Dept. Banner #04805F. Integrated Natural Resources Management Plan Revision. **Paul Arbetan,** PI. 10/10-3/12. $0 (F&A $0).

$81,238. NM Military Affairs Dept. Banner #04807S. NMARNG species monitoring. **Paul Arbetan,** PI. 09/11-09/12. $0 (F&A $0).

$48,020. Animas Biological Studies. Banner #04804Z. Management of pinyon juniper woodlands at Kirtland AFB. **Kristine Johnson,** PI. 07/10-12/11. $4,4694 (F&A $9,223).

$40,000. Dept. of Defense. Banner #04800C. Raptor surveys at Holloman AFB. **Kristine Johnson**, PI. 01/09-09/11. $8,446 (F&A $1,658).

$85,000. Dept. of Defense. Banner #04800D. Grassland bird surveys at Holloman AFB. **Kristine Johnson**, PI. 01/09-09/11. $34,538 (F&A $7,970).

$110,000. Dept. of Defense. Banner #04801C. Management, wetlands/floodplain. **Kristine Johnson**, PI. 04/09-04/12. $53,595 (F&A $12,330).

$85,000. Dept. of Defense. Banner #04803X. Grassland bird surveys at Holloman AFB. **Kristine Johnson,** PI. 05/10-03/12. $17,866 (F&A $4,016).

$40,000. Dept. of Defense. Banner #04803Y. Raptor surveys at Holloman AFB. **Kristine Johnson,** PI. 05/10-12/11. $8,485 (F&A $3,904).

$110,000. Dept. of Defense. Banner #04803Z. Management wetlands/floodplains. **Kristine Johnson,** PI. 05/10-03/12. $10,639 (F&A $2,392).

$199,292. Dept. of Defense. Banner #04804I. Habitat use at multiple scales by pinyon-juniper birds. **Kristine Johnson,** PI. 08/10-12/11. $136,582 (F&A $41,082).

$43,852. Ecosphere Environmental Services. Banner #04808B. Pinyon Jay surveys at Kirtland AFB. **Kristine Johnson**, PI. 12/11-03/13. $0 (F&A $0).

$49,950. NM Dept. of Game and Fish. Banner #04803W. Gunnison's prairie dog surveys. **Kristine Johnson**, PI. 05/10-02/11. $15,394 (F&A $2,566).

$26,909. NM Dept. of Game & Fish. Banner #04807A. Black-tailed prairie dog web map. **Kristine Johnson,** PI. 07/10-06/12. $1,878 (F&A $313).

$15,000. BLM. Banner #04804D. Biological resources data collection and storage 2010. **Rayo McCollough**, PI. 10/09-09/12. $6,312 (F&A $940).

$50,000. BLM. Banner #04807L. Biological resources data collection and storage 2011. **Rayo McCollough**, PI. 10/09-09/12. $6,312 (F&A $940).

$31,000. NM Dept. of Game and Fish. Banner #04805D. Organizing federally listed species information. **Rayo McCollough**, PI. 11/10-10/11. $29,354 (F&A $4,892).

$79,840. NM Dept. of Game and Fish. Banner #04806K. Endangered Herp Data Project. **Rayo McCollough**, PI. 4/11-6/12. $32,773 (F&A $5,462).

$13,744. NM Dept. of Game and Fish. Banner #04806O. Organizing federally listed species information (BISON-M). **Rayo McCollough**, PI. 11/10-10/11. $13,744 (F&A $2,291).

$25,000. NM Environment Dept. Banner #04807B. NM Rapid Assessment Methodology Phase 3. **Rayo McCollough**, PI. 07/11-11/12. $820 (F&A $137).

$25,000. BLM. Banner #04802Q. Santa Fe River vegetation map. **Esteban Muldavin**, PI. 10/09-09/12. $16,034 (F&A $2,388).

$30,000. BLM. Banner #04802P. Pinyon-juniper woodlands and bird diversity in Wild Rivers Recreation Area. **Esteban Muldavin**, PI. 10/09-10/11. $9,589 (F&A $1,185).

$20,000. BLM. Banner #04806N. Pediomelum pentaphyllum surveys **Esteban Muldavin**, PI. 10/09-09/12. $15,452 (F&A $2,301).

$91,453. Middle Rio Grande Conservancy District. Banner #048980. Post-fire bosque restoration in the middle Rio Grande: a landscape-scale approach towards revitalization of an ecosystem. **Esteban Muldavin**, PI. 10/08-03/12. $17,136 (F&A $1,558).

$152,363. NPS. Banner #048721. Vegetation map for Petroglyphs Nat'l Monument. **Esteban Muldavin**, PI. 06/06-06/11. $49,154 (F&A $6,411).

$31,920. NPS. Banner #048963. Evaluating vegetation response to prescribed fire at San Andres Nat'l. Wildlife Refuge. **Esteban Muldavin**, PI. 09/08-09/12. $7,879 (F&A $1028).

$14,900. NPS. Banner #04801H. Plant species inventory and herbarium specimen verification, Petroglyph Nat'l. Monument. **Esteban Muldavin**, PI. 05/09-01/12. $0 (F&A $0).

$61,425. NPS. Banner #04802H. Pinyon-juniper restoration monitoring. **Esteban Muldavin**, PI. 10/09-09/12. $3,140 (F&A $468).

$31,164. NPS. Banner #04802J. Development of vegetation classification and map for Ft. Davis Nat'l. Historic Site. **Esteban Muldavin**, PI. 09/09-01/12. $5,519 (F&A $822).

$30,000. NPS. Banner #04802P. Pinyon-Juniper woodlands and bird diversity in Wild Rivers Recreation Area. **Esteban Muldavin**, PI. 10/09-10/11. $9,589 (F&A $1,428).

$199,957. NM Environment Dept. Banner #048929. Rapid assessment of riverine wetlands in the upper Rio Grande watershed. **Esteban Muldavin**, PI. 05/08-09/11. $17,606 (F&A $0).

$99,258. NM Environment Dept. Banner #04805P. Wetland vegetation index for riverine wetland on the upper Rio Grande. **Esteban Muldavin**, PI. 12/10-12/11. $24,044 (F&A $0).

$61,400. NM Environment Dept. Banner #04806B. National wetland conditional assessment sampling in New Mexico. **Esteban Muldavin**, PI. 3/11-12/11. $61,355 (F&A $0).

$167,065. Pueblo of Santa Ana. Banner #04803Q. Rio Jemez corridor vegetation monitoring for Santa Ana Pueblo. **Esteban Muldavin**, PI. 5/10-6/11. $94,549 (F&A $19,510).

$44,874. U.S. Army Corps of Engineers. Banner #04803G. Hink and Ohmart vegetation analysis. **Esteban Muldavin**, PI. 02/10-05/11. $18,984 (F&A $4,268).

$29,847. U.S. Army Corps of Engineers. Banner #04807R. NMRAM Training Workshop 2011 for USACE. **Esteban Muldavin**, PI. 10/11-12/11. $29,814 (F&A $6,702).

$32,970. U.S. Fish & Wildlife Service. Banner #048893. Middle Rio Grande bosque initiative web page database and GIS. **Esteban Muldavin**, PI. 09/07-09/11. $7,054 (F&A $1,456).

$119,933. U.S. Forest Service. Banner #04803U. Nonforest ecological modeling for Arizona and New Mexico. **Esteban Muldavin**, PI. 04/10-12/13. $46,538 (F&A $6,931).

$25,800. U.S. Forest Service. Banner #048972. Development of native plant materials program. **Esteban Muldavin**, PI. 09/08-09/13. $0 (F&A $0).

$25,000. U.S. Geological Service. Banner #04804Y. Protected Areas Database for New Mexico. **Esteban Muldavin**, PI. 09/10-07/11. $21,810 (F&A $4,500).

PUBLICATIONS

A. Books, Book Chapters, Edited Volumes

B. Journal Articles

C. Web-Based

D. Technical Reports

Johnson, K., M. Freehling, and T. Neville. 2011. 2011 revised operational plan for the Lake Holloman Wetlands Complex Area. Natural Heritage New Mexico Publ. No. 11-GTR-361. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM. 59 p

Muldavin, E., Y. Chauvin, T. Neville, P. Arbetan, A. Fettes A. Kennedy, and L. Arnold. 2011. A vegetation classification and map: Capulin Volcano National Monument. Natural Resource Technical Report NPS/SOPN/NRTR—2011/461. National Park Service, Fort Collins, CO.

Muldavin, E., A. Kennedy, C. Jackson, T. Neville, P. Neville, K. Schultz, and M. Reid. 2011. A Vegetation Classification and Map Report: Bandelier National Monument. Natural Resource Technical Report NPS/SPCN/NRTR–2011/438, National Park Service, Fort Collins, CO.

E. Theses/Dissertations Completed

F. Work In Progress

Muldavin, E.H., D. Moore, and S. Collins. In prep. Extreme environmental conditions and post-fire vegetation response in a Chihuahuan Desert grassland.

Muldavin, E., A. Kennedy, C. Jackson, T. Neville, P. Neville, K. Schultz, and M. Reid. 201x. A Vegetation Classification and Map Report: Pecos National Historic Park. Natural Resource Technical Report NPS/SPCN/NRTR–201x/00X, National Park Service, Fort Collins, CO.

Muldavin, E., Y. Chauvin, A. Kennedy, T. Neville, P. Neville, K. Schultz, and M. Reid. 201x. A Vegetation Classification and Map: Salinas Pueblo Missions National Monument. Natural Resource Technical Report NPS/SCPN/NRTR–201X/00X, National Park Service, Fort Collins, CO.

Muldavin, E., Y. Chauvin, T. Neville, P. Arbetan, A. Kennedy, and P. Neville. 201X. A Vegetation Classification and Map, Fort Davis National Monument. Natural Resource Technical Report NPS/CHDN/NRTR–200X/00X, National Park Service, Fort Collins, CO.

G. Publications/Reports Based on MSB Specimens/Data by Outside Researchers

8. ACTIVITIES IN LEARNED SOCIETIES

A. Invited/Plenary Talks and/or Seminars

B. Contributed Talks/Posters

C. Attendance at Professional Meetings (List division personnel alphabetically then list meetings attended under each)

E. Muldavin: Ecological Society of America annual meeting. Austin, TX.

D. Service as Editor or on Editorial Board of a Journal

E. Service as Officer of Professional Society/Organization

None

9. OTHER PROFESSIONAL ACTIVITIES
A. Presentation to General Audience in a Scholarly Capacity

E. Milford. Progress report on New Mexico Rapid Assessment Methodology for the New Mexico Wetlands Roundtable.

B. Presentations in a Scholarly Capacity at Hearings, Workshops, Legislative Committees, etc.

C. Scholarly Service as a Member of a Local/State/Regional/National Committee, Panel, etc.
E. Muldavin: Ecological Society of America Vegetation Panel, New Mexico Rare Plant Council
K. Johnson: NM Prairie Dog Working Group
P. Tonne: Rare Plant Technical Council
E. Milford: New Mexico Wetlands Roundtable
R. McCollough: Jemez mountains salamander recovery team; Dune Sagebrush Lizard GIS Group

D. Journal Referee
K. Johnson: Auk
E. Muldavin: Oikos

E. Hosting Professional Colloquia and Groups

10. SERVICE
A. Symposia, Workshops, Conferences etc. Sponsored, Organized, Held, etc.
New Mexico Rapid Assessment Training Workshop, Santa Fe New Mexico October 1, 2011

B. Public Service

11. ADVANCED STUDY, HONORS, AWARDS, FELLOWSHIPS, ETC.

12. DONATIONS AND GIFTS RECEIVED

13. CURRENT STAFF
A. Faculty/Staff
Paul Arbetan, Research Assistant Professor
Lisa Arnold, GIS Analyst

Yvonne Chauvin, Sr. Research Tech/Life Sciences
Anthony Fettes, Research Tech/Life Sciences
Kristine Johnson, Research Associate Professor
Rebecca Keeshen, Unit Administrator I
Rayo McCollough, Database Administrator
Elizabeth Milford, Research Scientist III
Esteban Muldavin, Research Associate Professor
Teri Neville, GIS Analyst
Nathan Petersen, Field Research Tech/Life Sciences
Jacqueline Smith, Sr. Research Tech/Life Sciences
Phil Tonne, Sr. Research Scientist I
Hannah Varani, Sr. Field Research Tech

B. **Graduate students**

Keith Woodell, M.A.

C. Undergraduate Student Workers and Volunteers

Katherine Carillo
Jeff Hess
Hugh Hulse
Jason Kitting
Eric Smith
Natalie Sommer
Adam Summers
Matthew Wilder
Cole Wolf

14. MUSEUM ASSOCIATES

None

DIVISION OF PARASITES

Curator: E. Sam Loker
Collection Manager: Sara Brant

1. DIVISION HIGHLIGHTS

-Granted money from UNM to develop a renovation plan for space for the new division

2. TABLE OF COLLECTION USE

Specimens Accessioned	Loans (outgoing)	Loans (incoming)	Visitors	Information Requests	Publications Citing MSB Specimens
810	0	0	1	1	1

3. COURSES USING THE COLLECTION

None

4. COURSES TAUGHT BY MSB PERSONNEL

A. Faculty/Collection Managers

Loker, E.S. Vector Biology; Host-Parasite Interactions Seminar

5. COLLECTION MANAGEMENT

-Developed a data entry form for Arctos database specific for parasites
-Continued working with the Rausch collection NSF Improvement grant
-linked host and parasite records for some of the Rausch collection

6. AWARDS, GRANTS, AND CONTRACTS

Awarded: S. Brant NSF REU Supplemental for NSF DEB-1021427 Phylogenetic and Revisionary Systematics of a Diverse Clade of Avian Schistosomes (Platyhelminthes: Schistosomatidae) $7,500

Submitted: G.Mkoji, S. Brant, E. Loker NSF PEER: Project Title: *Exploiting digenetic trematode diversity for human schistosomiasis control in western Kenya* $150,000

Submitted: S. Brant NSF REU Supplemental for NSF DEB-1021427 Phylogenetic and Revisionary Systematics of a Diverse Clade of Avian Schistosomes (Platyhelminthes: Schistosomatidae) $15,000

7. PUBLICATIONS

A. Books, Book Chapters, Edited Volumes

B. Journal Articles

Brant SV, Bochte CA, **Loker ES**. 2011. New intermediate host records for the avian schistosomes *Dendritobilharzia pulverulenta*, *Gigantobilharzia huronensis* and *Trichobilharzia querquedulae* from North America. Journal of Parasitology 97: 946-949.

VanHorn, D.J., Hall, J.R., **Loker, E.S**., Mitchell, K.R., Mkoji, G.M., Adema, C.M. and Takacs-Vesbach, C.D., 2012. Complex intestinal bacterial communities in three species of planorbid snails. *Journal of Molluscan Studies* 78: 74-80.

Cupit PM, Steinauer ML, Tonnessen BW, Agola LE, Kinuthia JM, Mwangi IN, Mutuku MW, Mkoji GM, **Loker ES**, Cunningham C. 2011. Polymorphism associated with the *Schistosoma mansoni* tetraspanin-2 gene. International Journal for Parasitology 41: 1249-1252.

Lotfy WM, Hanelt B, Mkoji GM, **Loker ES**. 2011. Genotyping Natural Infections of *Schistosoma mansoni* in *Biomphalaria alexandrine* From Damietta, Egypt, with Comparisons to Natural Snail Infections From Kenya. Journal of Parasitology 97: 156-159.

C. Web-Based

None.

D. Technical Reports

None**.**

E. Theses/Dissertations Completed

None.

F. Work in Progress (Only *in press* and already submitted**)**

G. Publications/Reports Based on MSB Specimens/Data by Outside Researchers

None.

8. ACTIVITIES IN LEARNED SOCIETIES

A. Invited/Plenary Talks and/or Seminars

B. Contributed Talks/Posters (*presenter)

Brant SV*, Davis N. (2011). Itchy Kiwis: Swimmer's itch and schistosome diversity in New Zealand. American Society of Parasitologists 1-4 June Anchorage, Alaska.

Bochte C*, **S Brant**, J Leonard, **ES Loker**. Observations on the morphology, behavior and phylogenetic position of three large-tailed strigeid cercariae from small planorbid snails (Tribe Planorbini). American Society of Parasitologists 1-4 June Anchorage, Alaska.

C. Attendance at Professional Meetings
Loker, E. S.
June 2011 American Society of Parasitologists, Anchorage, Alaska
June 2011 Annual Midwestern Conference of Parasitologists, Notre Dame, Indiana

Brant, S.V.
June 2011 American Society of Parasitologists, Anchorage, Alaska

D. Service as Editor or on Editorial Board of a Journal

None**.**

E. Service as Officer of Professional Society/Organization

None.

9. OTHER PROFESSIONAL ACTIVITIES
A. Presentation to General Audience in a Scholarly Capacity

None.

B. Presentations in a Scholarly Capacity at Hearings, Workshops, Legislative Committees, etc.

None.

C. Scholarly Service as a Member of a Local/State/Regional/National Committee, Panel, etc.

D. Journal Referee
Loker, E. S. Journal of Helminthology, Acta Tropica, Journal of Parasitology

Brant, S. V. Parasite International, Acta Tropica, Journal of Helminthology, Molecular Phylogenetics and Evolution, Journal of Parasitology, Tropical Biomedicine and PLoS Neglected Diseases

E. Hosting Professional Colleagues and Groups

None.

10. SERVICE
A. Symposia, Workshops, Conferences etc. Sponsored, Organized, Held, etc.

None.

B. Public Service

None.

11. ADVANCED STUDY, HONORS, AWARDS, FELLOWSHIPS

None.

12. DONATIONS AND GIFTS RECEIVED

13. CURRENT STAFF
A. Faculty/Staff
Eric S. Loker, Regent's Professor, Curator
Sara Brant, Research Assoc. Professor, Collection Manager

B. Graduate Students
Ramesh Devkota
Erika Gendron
Sarah Buddenburg

C. Undergraduate Student Workers and Volunteers
D'Eldra Malone - undergraduate

14. MUSEUM ASSOCIATES
A. Research Associates

U.S. GEOLOGICAL SURVEY (USGS)

1. DIVISION HIGHLIGHTS

Integration of the USGS collection of "dry" mammals (skins and skeletons) into the MSB Division of Mammals was completed in April 2011 thanks to efforts led by Adrienne Raniszewski. Nearly 23,000 mammal specimens of skins and skeletons were reorganized; specimen records were updated in the database; and case and drawer labels were updated and reprinted. With the hire of a full-time intern in November, we were able to begin integrating the ~3,000 fluid-preserved mammals and completed about 50%. USGS specimens are increasingly included in MSB specimen and tissue loans, and the increase in publications citing USGS specimens reflects the accessibility of specimen data through online databases. We were also able to have 10 salted hides of mammals professionally tanned, including one that had been in the collection since 1974.

As a Federal agency that manages museum property and has expertise with natural history collections, USGS is responsive to other Department of Interior (DOI) agencies. USGS museum specialist Cindy Ramotnik provides technical assistance to DOI on collection issues such as integrated pest management, specimen deposition, and museum supplies, and routinely responds to National Park Service requests on annual inventories and loan agreement renewals. Ramotnik is an active member on the DOI museum property committee and serves on a DOI subcommittee that is revising the departmental policies on managing Federal museum property. Ramotnik is also an active member of the New Mexico Endemic Salamander Team and participates in office and field activities throughout the year.

Ernie Valdez, a USGS wildlife biologist and Research Associate of MSB, conducted an assessment of bats at El Malpais National Monument for the presence of White-nose Syndrome. The study is one of the few early attempts to detect this disease in New Mexico on a national park; meanwhile, the spread of WNS continues westward from its origin of New York. Findings from this study are currently being written as an open file report. Valdez was also asked by the National Park Service to provide a scientific review of methods used by another researcher to conduct assessments of bat gate use by the endangered nectar feeding bat (*Leptonycteris yerbabuenae*) at a mine on the Coronado National Historic Site in southeastern Arizona. This review involved examination of raw data (i.e. video) that was used to provide counts of individuals exiting the mine. Recommendations and comments were written as an administrative report. In 2011, Valdez was asked to replace Dr. Scott Altenbach as a committee member on Angela England's graduate panel, and was invited by the Wilderness Society to present on bat-related topics pertaining to habitat conservation in New Mexico. He conducted a bat assessment for Dr. Jennifer Frey from New Mexico State University as part of a BioBlitz at Broad Canyon Ranch near Radium Springs, New Mexico. Valdez published three manuscripts in Pacific Science, Acta Chiropterologica, and Western North American Naturalist. Valdez continues his studies on bats related to white-nose syndrome, fatalities at wind turbine facilities, and food habits.

Janet Ruth, a USGS Research Ecologist/Ornithologist received a promotion after going through the every-four-year Research Grade Evaluation Panel process. She presented a talk about her

project using NEXRAD weather radar data to document bird migration patterns and stopover habitat in the Southwest at a joint meeting of the Association of Field Ornithologists, Cooper Ornithological Society, and Wilson Ornithological Society in Kearney, NE in March 2011, and reprised the presentation at the annual meeting of the New Mexico Ornithological Society in Las Cruces, NM in April 2011. Ruth conducted the third year of fieldwork on the breeding ecology of the Arizona Grasshopper Sparrow (*Ammodramus savannarum ammolegus*) in the Sonoita Valley of southeastern Arizona. She continued work on her USGS Quick Response Program to synthesize information about birds in semidesert grasslands and pine-oak woodlands. The project is conducted in collaboration with the Sonoran Joint Venture, the Rio Grande Joint Venture, the Playa Lakes Joint Venture, and the Intermountain West Joint Venture. She presented information about the project – "Synthesis of avian research, monitoring, and conservation projects in southwestern semidesert grasslands" - at a Sonoran Joint Venture workshop in February 2011, and at a Rio Grande Joint Venture management board meeting in June 2011. She also presented a talk about "Ten years of research on grassland birds in Arizona" at the Sonoran Joint Venture grasslands workshop in Sierra Vista, AZ in February 2011. Ruth serves as the Partners in Flight (PIF) Coordinator for USGS. She attended national meetings of the PIF Implementation Committee, the PIF International Science Committee, and the PIF Federal Agency Committee.

Mike Bogan, Curator Emeritus of the USGS collection, and Tony Mollhagen, MSB Research Associate, continued their work on mammals of the Henry Mountains of south-central Utah during 2011. Specimens from this study are deposited in the MSB collection. They also continued to verify identifications of vespertilionid bats in the MSB collection and Bogan assisted the integration effort by verifying identifications of additional mammals in the collection. Bogan and Mollhagen were two of the authors of the Mammals of the Chinati Mountains State Natural Area, Texas, which was published in the Museum of Texas Tech University, Occasional Papers in 2011. This work resulted from field work conducted in the Chinati Mts. from 2003 to 2008. Bogan continued to serve on the MSB Executive Board during 2011.

2. TABLE OF COLLECTION USE

Specimens catalogued	Loans (outgoing)	Loans (incoming)	Visitors	Information Requests	Publications Citing MSB-USGS Specimens
471	8	1	See MSB	60	9

3. COURSES USING THE COLLECTIONS
See MSB Divisions.

4. COURSES TAUGHT BY MSB/USGS PERSONNEL
A. Faculty/Collection Managers
None.

B. Graduate Students
None.

5. COLLECTION MANAGEMENT
The USGS staff accessioned 12 collections (113 specimens) and cataloged 471 specimens of fishes, amphibians and reptiles, birds, and mammals in 2011. Staff reviewed 33 mammal tissue requests and 11 specimen requests for loans of mammals, amphibians and reptiles, and fishes. Staff responded to over 60 requests for specimen data and technical information on pest control, specimen identification, and museum supplies. Staff assisted 15 researchers with use of the collections and personally provided 8 tours, ranging from 1-7 individuals that included students (high school, undergraduate and graduate) and Department of Interior employees (NPS and USGS Director). Federal specimens were included in 8 outgoing loans: 5 mammal tissue loans and 3 loans of voucher specimens (fishes, mammals, and reptiles).

The integration of Federal "dry" mammals into the MSB Division of Mammals was completed in April 2011 under the direction of Adrienne Raniszewski, who worked with MSB staff to simultaneously integrate the Federal collection and a collection of 32,700 specimens of mammals formerly at the University of Illinois Museum of Natural History. Between January and April 2011 22, 654 specimens of skins and skeletons were reorganized; mammal drawer and case labels were updated, and vial and box labels for USGS specimens were printed and installed. Approximately 50% of the ~3,000 fluid-preserved mammals have been integrated, thanks to the full-time hire of Sadie Yurista, a UNM graduate. She provided additional collection support by cleaning and numbering skeletons, managing dermestid beetle operations, mixing preservatives, and installing jar and vial labels.

USGS donated 23 oversized glass jars to several natural history collections, and loaned and/or donated specimen collecting equipment to colleagues. Ramotnik wrote 6 letters of recommendation for former employees and notified them of job opportunities within DOI or the museum community.

Both Ramotnik and Bogan interact regularly with their MSB counterparts to share information on museum issues that may include integration, databases, website development, and museum policy. Bogan serves on the MSB Executive Board.

6. AWARDS, GRANTS, AND CONTRACTS
Faculty and Staff:
$7,200. Department of Interior- National Council for Preservation Education Program, Washington, DC. Museum internship. **C.A. Ramotnik**, P.I. 11/11-4/12 ($2,880).

$25,000. USGS Quick Response Program, Reston, VA. Avian research, monitoring and conservation work in southwestern semidesert grasslands and pine-oak woodlands – a synthesis. **J.M. Ruth,** P.I. 10/09 – 9/11. $25,000.

$25,000. Bureau of Land Management, National Landscape Conservation System program, Washington, D.C. Breeding ecology of the Arizona Grasshopper Sparrow (Year 3), **J.M. Ruth**, P.I. 7/10 – 6/11. ($25,000 each year for three years).

$23,000.00 USGS Reston headquarters. Support for USGS Partners in Flight Coordinator. 10/10 – 9/11. **J.M. Ruth**. $23,000.00

$111,000.00 Population Assessment of the Mariana Fruit Bat (*Pteropus mariannus mariannus*) on Anatahan, Sarigan, Guguan, Alamagan, Pagan, Agrihan, Asuncion, Maug, and Uracus. 5/10-5/11. $3,000.00 **E. W. Valdez**, P.I.

$40,000.00 Review of "State of Texas Mine: A Comparison of 2010 Modified Cupola and Cable-net Video Surveys" and Supporting Data. 10/10-5/11. $38,000.00 **E.W. Valdez**, P.I.

$2,500.00 Consultation on bat-related problems at Casa Grande Ruins National Monument. 4/11-12/11. $2,500. **E. W. Valdez, P.I.**

$28,400.00 Assessment of bats for white-nose syndrome at El Malpais National Monument. 2/11-12/11. $28,400. **E.W. Valdez**, P.I.

7. PUBLICATIONS

A. Books, Book Chapters, Edited Volumes
None.

B. Journal Articles

Jones, C., M.W. Lockwood, T.R. Mollhagen, F.D. Yancey, II, and **M.A. Bogan**. 2011. Mammals of the Chinati Mountains State Natural Area, Texas. Museum of Texas Tech University, Occasional Papers No. 300, 29 pp.

O'Shea, T. J., P. M. Cryan, E. A. Snider, **E. W. Valdez**, L. E. Ellison, and D. J. Neubaum. 2011. Bats of Mesa Verde National Park, Colorado: Faunal composition, reproduction, and roosting habits. Monographs of the Western North American Naturalist, 5: 1-19.

Valdez, E.W., G. J. Wiles, and T. J. O'Shea. 2011. Diets of the sympatric Pacific sheath-tailed bat (*Emballonura semicaudata rotensis*) and Mariana swiftlet (*Aerodramus bartschi*) on Aguiguan, Mariana Islands. Pacific Science, 65:301-310.

Wiles, G.J., T.J. O'Shea, D.J. Worthington, J.A. Esselstyn and **E.W. Valdez**. 2011. Status and natural history of *Emballonura semicaudata rotensis* on Aguiguan, Mariana Islands. Acta Chiropterologica, 13: 299-309.

C. Web-Based

Ruth, J.M. Ongoing. Serves as the content webmaster for the following websites:
Partners in Flight – U.S. website (national) http://www.partnersinflight.org
New Mexico Ornithological Society http://www.nmbirds.org

D. Technical Reports

Valdez, E. W., and L. E. Ellison. 2011. Review of "State of Texas Mine: A comparison of 2010 modified cupola and cable-net video surveys" and supporting data, prepared by WestLand Resources, Inc. and Arizona Game and Fish Department, 2010: Fort Collins, Colorado, U.S. Geological Survey, Administrative report to National Park Service.

E. Theses/Dissertations Completed

None.

F. Work In Progress

England, A.E. Landscape use of adult and juvenile *Leptonycteris nivalis* in Big Bend National Park, Texas. Journal of Mammalogy.

Hope, A.G., J.R. Demboski, K.S. Speer, **C.A. Ramotnik**, J.S. Findley, and J.A. Cook. Systematic assessment of a novel shrew (*Sorex*) from the Southwest United States.

Ruth, J.M., T.R. Stanley, and C.E. Gordon. Wintering bird-habitat associations in Arizona semidesert and plains grasslands. Southwestern Naturalist.

Ruth, J.M., R.H. Diehl, and R.K. Felix, Jr. Bird migration and stopover habitat use in the southwestern United States. The Condor.

Valdez, E.W., and P.M. Cryan. Feeding habits and mortality of the hoary bat at wind turbine facilities.

G. Publications/Reports/Dissertations/Theses that used MSB-USGS Specimens/Data by Outside Researchers

Hope, A.G. 2011. Mammalian diversification across the holarctic: spatiotemporal evolution in response to environmental change. Department of Biology, University of New Mexico. PhD Dissertation.

Neiswenter, S.A. and B.R. Riddle. 2011. Landscape and climatic effects on the evolutionary diversification of the *Perognathus fasciatus* species group. Journal of Mammalogy 92(5):982-993.

O'Shea, T. J., P. M. Cryan, E. A. Snider, **E. W. Valdez**, L. E. Ellison, and D. J. Neubaum. 2011. Bats of Mesa Verde National Park, Colorado: Faunal composition, reproduction, and roosting habits. Monographs of the Western North American Naturalist, 5: 1-19.

Roehrs, Z.P., J.B. Lack, and R.A. Van den Bussche. 2011. A molecular phylogenetic reevaluation of the tribe Nycticeiini (Chiroptera: Vespertilionidae). Acta Chiropterologica 13(1):17-31.

8. ACTIVITIES IN LEARNED SOCIETIES

A. Invited/Plenary Talks and/or Seminars

Ruth, J.M. 2011. Synthesis of avian research, monitoring, and conservation projects in southwestern semidesert grasslands. Rio Grande Joint Venture Management Board meeting, McAllen, TX. June 2011.

Ruth, J.M. 2011. Synthesis of avian research, monitoring, and conservation projects in southwestern semidesert grasslands. Rio Grande Joint Venture Management Board meeting, McAllen, TX. June 2011.

Ruth, J.M. 2011. Synthesis of avian research, monitoring, and conservation projects in southwestern semidesert grasslands. Sonoran Joint Venture Grasslands and Grassland Bird Workshop, Sierra Vista, AZ. February 2011.

Ruth, J.M. 2011. Ten years of research on grassland birds in Arizona. Sonoran Joint Venture Grasslands and Grassland Bird Workshop, Sierra Vista, AZ. February 2011.

B. Contributed Talks/Posters (*presenter)

Ruth, J.M. *, R.H. Diehl, and R.K. Felix, Jr. 2011. Bird migration and stopover habitat use in the Southwest. New Mexico Ornithological Society Annual Meeting, Las Cruces, NM. April 2011.

Ruth, J.M. *, R.H. Diehl, and R.K. Felix, Jr. 2011. Bird migration and stopover habitat use in the Southwest. Joint meeting of Association of Field Ornithologists, Cooper Ornithological Society, and Wilson Ornithological Society, Kearney, NE. March 2011.

C. Attendance at Professional Meeting

Ramotnik, C.A. Status of the Wildlife of New Mexico, New Mexico Chapter of The Wildlife Society, Albuquerque, NM, 18 October.

Ruth, J.M. Joint meeting of the Association of Field Ornithologists, Cooper Ornithological Society, and Wilson Ornithological Society, Kearney, NE. March 2011; annual meeting of the New Mexico Ornithological Society, Las Cruces, NM, April 2011; annual meeting of Western Field Ornithologists, Sierra Vista, AZ, August 2011.

Valdez, E.W. Status of the Wildlife of New Mexico, New Mexico Chapter of The Wildlife Society, Albuquerque, NM, 18 October.

D. Service as Editor or on Editorial Board of a Journal

Ramotnik, C.A. Associate Editor, Collection Forum (Society for the Preservation of Natural History Collections).

E. Service as Officer of Professional Society/Organization

Ramotnik, C.A. Society for the Preservation of Natural History Collections (SPNHC): Conservation Committee (Chair, Resources Subcommittee); member of the following standing committees: Documentation, Membership, and Publication.

Ruth, J.M. New Mexico Ornithological Society, Board Member.

9. OTHER PROFESSIONAL ACTIVITIES (List division personnel alphabetically and in **bold** with list of other professional activities under each)

A. Colloquium Presentations
None.

B. Presentation to General Audience in a Scholarly Capacity
Ramotnik, C.A. Presentation on Arid Lands Field Station to USGS Director Marcia McNutt at USGS Water Science Center, Albuquerque. April

C. Presentations in a Scholarly Capacity at Hearings, Workshops, Legislative Committees, etc.
None.

D. Scholarly Service as a Member of a Local/State/Regional/National Committee, Panel, etc.
Bogan, M.A. Member, MSB Executive Committee.

Ramotnik, C.A. Member, Department of Interior Museum Property Committee and 411 DM Subcommittee; Member, USGS Museum Property Committee; Member, New Mexico Endemic Salamander Team; and USGS Arid Lands Field Station representative for Combined Federal Campaign.

Ruth, J.M. USGS Partners in Flight (PIF) Coordinator; Chair of PIF National Research Working Group; Member of PIF Science Committee and PIF Implementation Committee.

E. Journal Referee
Bogan, M.A. The Southwestern Naturalist (1), Western North American Naturalist (2), and Journal of Mammalogy (1).

Ramotnik, C.A. The Southwestern Naturalist (1).

Ruth, J.M. Bulletin of the American Meteorological Society (1).

Valdez, E.W. Pacific Science (1) and The Southwestern Naturalist (1).

F. Hosting Professional Colleagues and Groups
N/A

10. SERVICE
A. Symposia, Workshops, Conferences etc. Sponsored, Organized, Held, etc.
None.

B. Public Service
Bogan, M.A. Member, Corrales Bosque Advisory Commission, Corrales, NM.

Ramotnik, C.A. Participated in the Albuquerque Christmas bird count.

Ruth, J.M. Participated in the Albuquerque Christmas bird count. Annually conducts/ participates in two Breeding Bird Survey routes – Counselors, NM and Fence Lake, NM.

Ruth, J.M. Member, Technical Advisory Group and Member, Corrales Bosque Advisory Commission, Corrales, NM.

Valdez, E.W. Presentation at Vista Grande Community Center. March.

11. ADVANCED STUDY, HONORS, AWARDS, FELLOWSHIPS, ETC.
Bogan, M.A. Served as Faculty Co-Advisor for one doctoral candidate in the Department of Biology, UNM.

Valdez, E.W. Served as Faculty Co-Advisor for one doctoral candidate in the Department of Biology, UNM.

12. DONATIONS AND GIFTS RECEIVED
None.

13. CURRENT STAFF
A. Faculty/Staff
Michael A. Bogan – Curator Emeritus
Cindy A. Ramotnik – Museum Specialist (Zoology)
Adrienne Raniszewski – Museum Technician
Janet M. Ruth – Research Ecologist (Ornithology), Adjunct Assistant Professor (UNM)
Ernest W. Valdez – Wildlife Biologist, Adjunct Assistant Professor (UNM)
Sadie Yurista – Museum Technician

B. Graduate students
Angela E. England—Wildlife Biologist, Ph.D. candidate

C. Undergraduate Student Workers and Volunteers
None.

14. MUSEUM ASSOCIATES
A. Curatorial Associates
None.

B. Research Associates
Paul Cryan, Ph.D., USGS wildlife research biologist, Ft. Collins, CO.
Keith Geluso, Assistant Professor, University of Nebraska-Kearney, NE.
Tony R. Mollhagen, Ph.D., emeritus professor, Texas Tech Univ., Lubbock, TX.

Tom O'Shea, Ph.D., USGS wildlife research biologist, Ft. Collins, CO.
Ernest Valdez, Ph.D., USGS wildlife research biologist, Albuquerque, NM.