The University of New Mexico’s Museum of Southwestern Biology

The Museum of Southwestern Biology (MSB) is a research and teaching facility in the Department of Biology, University of New Mexico. MSB houses collections of vertebrates, arthropods, plants and genomic materials from the American West, Latin America, and from throughout the world. MSB consists of 8 divisions, and one special program (Natural Heritage Program New Mexico). MSB also manages the second largest US Geological Survey (federal) collection of biological specimens (second to only the Smithsonian Institution). MSB’s collections are among the finest biological resources currently available to scientists and educators who are interested in learning about significant environmental and health issues facing society such as emerging zoonotic pathogens, climate change, invasive species, habitat conversion, and decreasing biodiversity in the Southwest and now worldwide. Our web-accessible archives and associated databases constitute an informatics resource that contributes to understanding the complexity of planetary life and related ecosystem function on local, regional, and global scales.

MSB is a research leader at UNM. At >$5.3 million, MSB had the third highest research activity in the College of Arts and Science as measured by extramural dollars spent in 2014, ranking just below all other activity in the Biology Department and in the Physics and Astronomy Department. High research activity demonstrates the increasing use of collections (both samples and data) in environmental and biomedical research in addition to the very productive faculty, staff and students associated with the museum. Annually, our collections now support a tremendous number (>145 in 2014) of peer-reviewed publications and attract significant grant dollars. Web-accessible archives and databases constitute an unparalleled informatics resource contributing to applied efforts in conservation as well as theoretical advancements ranging from unraveling the complexity of planetary life with nucleic acids to using isotopes or community assemblies probe ecosystem function on local, regional, and global scales. MSB curators with active research and graduate programs build the collections and then exploit the wealth of specimens and data, as they also commit considerable time and effort to build a shared resource for the greater scientific community.

A primary strength of the Museum of Southwestern Biology is the focus on hands-on training and education of students at all levels (as I write this I am sitting in Panama City having just returned from a fieldtrip with undergraduate and graduate students) that took us to the unexplored and remote Darien, near the Columbian border). Training remains one of the primary goals of the MSB. Numerous UNM and local high school students gain experience in bioinformatics, natural history specimen preparation and curation, and field and laboratory based research. Students were involved in all activities in the MSB during 2014 from fieldwork to curation of specimens to database development. MSB has been the focus of large student-training efforts for many years, in fieldwork, museum curatorial procedures, and molecular and morphological research. Because MSB provides an extensive sample archive (specimens) and web-associated data, A large percentage of undergraduate projects or graduate dissertations in Biology, Anthropology, Chemistry, and elsewhere used MSB specimens as a basis for their studies. MSB has become central to educational initiatives at UNM in informatics. MSB faculty and staff are heavily involved in instructional efforts and curriculum development through the Department of Biology, the new Museum Studies Program and through collaborative efforts with other departments and colleges on campus. MSB staff members (8 collection managers and 7 curators) teach courses, provide specimens and offer many opportunities for high quality experiential or inquiry-based educational experiences. In Spring 2014, we co-taught a class with the University of California Berkeley (8 students) on Climate Change and Museums. That course included a number of speakers covering topics related to how museum resources address the biology of climate change. We also developed web-based educational modules using museum specimens to illustrate various climate change concepts that can be viewed online and used by K-12 or undergraduate instructors. A publication outlining those approaches was published in Bioscience this year and co-authored by Curators at other leading natural history
museums in the US. As one of the largest and most active university-based natural history museums worldwide, UNM students are afforded world-class opportunities in biodiversity informatics, comparative biology, cutting-edge genomics (and more!) that extend their university experiences far beyond those available at other Research Intensive universities in the Southwest (from Austin to San Diego). Our infrastructure delivers outstanding opportunities for students to engage in authentic, hands-on discovery.

<table>
<thead>
<tr>
<th>1. Collection growth (Specimens Cataloged)</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>5-YEAR AVERAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>301268</td>
<td>64598</td>
<td>25446</td>
<td>34772</td>
<td>103947</td>
<td>106006</td>
</tr>
<tr>
<td>2. Loans Out</td>
<td>167</td>
<td>185</td>
<td>99</td>
<td>145</td>
<td>241</td>
<td>167</td>
</tr>
<tr>
<td>3. Professional Visitors to the Collections</td>
<td>692</td>
<td>504</td>
<td>307</td>
<td>344</td>
<td>248</td>
<td>419</td>
</tr>
<tr>
<td>4. Collection Database Web Site Hits</td>
<td>298360</td>
<td>160880</td>
<td>396362</td>
<td>**</td>
<td>233079</td>
<td>272170</td>
</tr>
<tr>
<td>5. RFIs Answered in Person</td>
<td>1214</td>
<td>1354</td>
<td>522</td>
<td>1626</td>
<td>1635</td>
<td>1270</td>
</tr>
<tr>
<td>6. Outside Publications Citing MSB Specimens</td>
<td>61</td>
<td>134</td>
<td>76</td>
<td>167</td>
<td>147</td>
<td>117</td>
</tr>
<tr>
<td>7. Peer-Reviewed Publications by Staff</td>
<td>72</td>
<td>52</td>
<td>77</td>
<td>54</td>
<td>104</td>
<td>72</td>
</tr>
<tr>
<td>8. Technical Reports</td>
<td>29</td>
<td>29</td>
<td>23</td>
<td>35</td>
<td>35</td>
<td>30</td>
</tr>
<tr>
<td>9. UNM Courses using the Collection</td>
<td>23</td>
<td>58</td>
<td>79</td>
<td>50</td>
<td>47</td>
<td>51</td>
</tr>
<tr>
<td>10. UNM Courses taught</td>
<td>22</td>
<td>68</td>
<td>109</td>
<td>69</td>
<td>66</td>
<td>67</td>
</tr>
<tr>
<td>11. Graduate Students</td>
<td>39</td>
<td>42</td>
<td>42</td>
<td>42</td>
<td>41</td>
<td>41</td>
</tr>
<tr>
<td>12. Graduate Theses/Dissertations Completed</td>
<td>5</td>
<td>3*</td>
<td>9</td>
<td>7</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>13. Undergraduate Students</td>
<td>102</td>
<td>75</td>
<td>76</td>
<td>66</td>
<td>63</td>
<td>76</td>
</tr>
<tr>
<td>14. Grants/Contracts in Force</td>
<td>98</td>
<td>78</td>
<td>76</td>
<td>61</td>
<td>61</td>
<td>75</td>
</tr>
<tr>
<td>15. Grants In Force Total Costs</td>
<td>$10,471,063</td>
<td>$10,132,206</td>
<td>$8,850,955</td>
<td>$8,388,469</td>
<td>$8,489,493</td>
<td>$9,266,437</td>
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<td>16. Estimated F&amp;A return</td>
<td>NR</td>
<td>$398,059</td>
<td>$528,950</td>
<td>$410,871</td>
<td>436,680</td>
<td>$443,640</td>
</tr>
</tbody>
</table>

* 1 UNM, 2 outside, NR – not reported
MSB also has a long history of leading UNM in training students. Many of our students fill jobs with natural resource agencies in the state and elsewhere. We also lead in mentoring international students, especially those from Latin America, with many returning to leadership positions in their respective countries. MSB-affiliated undergraduate and graduate students have taken leadership positions in biology in the US. For example, eight of the 45 past presidents of the American Society of Mammalogists (including the immediate past President and the current President) over the past century come from UNM. A number of leading scientists and administrators at the US National Museum of Natural History (Smithsonian Institution) have been UNM alums. A number of graduate students also work in collections-related activities during their graduate tenure at UNM. Most MSB Curators sponsor a significant number of graduate students and our unit regularly leads the Biology Department in the number of students receiving doctorate or masters degrees.

MSB also is a major contributor at UNM to public service and outreach efforts, especially activities related to thoughtful (science-based) management of dwindling natural resources. We are heavily involved with municipal (Albuquerque and Bernalillo County Open Space Initiatives), 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 ranging from New Mexico to Alaska. Many of our outreach efforts are related to developing effective management plans for state and federal resource agencies. 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 (e.g., hantavirus) and understanding the ecology of zoonotic diseases and wildlife diseases in the western US, but also in a number of international settings. In 2014 due to Ebola emergence, I was keynote speaker at the SciColl Forum at the October Smithsonian Forum on Emerging pathogens and natural history collections.

Because of the vast spatial and temporal biodiversity data served and the world’s largest frozen tissue collection for mammals (and growing repositories for birds, fishes, and herps), MSB is also a key player in national and international efforts in bioinformatics, both environmental and genomic. This activity is recorded in the number of hits (and downloads) from our databases, number of loans and number of publications based on these materials and data. MSB faculty and staff been heavily engaged with faculty in other departments and in other colleges—perhaps more so than other units on campus. We have established and long-term collaborative efforts with the School of Medicine and with the Arts and Ecology Program (College of Fine Arts), and Anthropology, Geography, History, and other disciplines. In 2014, working through the UNM Museum Council, we drafted a shared document (4 October 2014) for the College of Arts and Sciences that codifies curatorial duties. The Dean has instructed all departments with Curators to develop a plan and process for annual evaluation, tenure and promotion evaluation, and revisiting workload, reviews and annual activities with regard to other departmental duties. This impacts primarily Biology, Earth and Planetary Sciences, and Anthropology. We have MOUs in place that are active and productive including one with New Mexico Museum of Natural History and Science (e.g., new exhibits and a video opened there in 2014) & NM State Lands Office (e.g., biotic inventories of sensitive species on state lands slated for development). Our staff serves on national boards including the Board of Directors of American society of Mammalogists, Flora of North America, Society of Ichthyologists and Herpetologists, Entomological Society of America, and the Natural Science Collections Alliance, the primary advocacy group of administrators and curators who oversee research-oriented museums of natural history. This alliance is closely tied to American Institute for Biological Sciences in Washington, DC. MSB staff also serve on Steering Committees for several national initiatives, including VertNet, CollectionsWeb (completed in 2014), Aim-Up!, and the National Integrated Biocollections Alliance, a new NSF sponsored Research Coordinating Network focused on translating the vast digital resources of natural history museums into a catalyst for greater research productivity and educational transformation in the US.
Across the primary missions of UNM in research, teaching, and public service, MSB’s metrics attest to the fact that MSB is among the most productive units on campus.

<table>
<thead>
<tr>
<th>MONTH</th>
<th>AWARD OR EVENT</th>
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</thead>
<tbody>
<tr>
<td>January 2014</td>
<td>Jon Dunnum (MSB Coll Mgr Mammal Division), Tom Giermakowski (MSB Coll Mgr Amphibians and Reptiles), Tom Turner (MSB Curator of Fishes), and Bill Gannon (MSB Research Associate Mammal Division) judged science exhibits at Jefferson Middle School</td>
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<td></td>
<td>The Southwest Carex Working Group visited the MSB Herbarium and reviewed the 1739 specimens of Carex, the sedge genus</td>
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<td>&quot;Combing Chipmunks&quot;, Jefferson Middle School's Suzy Dunnum and her 7th grade gifted science class and MSB's Kayce Bell (Ph.D. candidate MSB Mammal Division) teamed up to help Kayce’s Ph.D. Dissertation research on chipmunks and their parasites.</td>
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<td></td>
<td>Heidi Hopkins, a Ph.D. candidate of Assoc. Professor Kelly Miller recently published a monograph in entitled “A revision of the genus Arenivaga (Rehn) (Blattodea, Corydiidae), with descriptions of new species and key to the males of the genus”. ZooKeys 384 (2014) Special Issue.</td>
</tr>
<tr>
<td></td>
<td>Rachel Mallis, Matt Leister and Kelly Miller (Assoc Professor and Curator of Arthropods) published a “The male of Tengella perfuga Dahl, 1901 with re-description of the female and comparisons with T. radiata (Kulczynski, 1909) (Araneae: Tengellidae)”, Zootaxa, 3709: 185-199, a Nicaraguan spider. Rachel is a graduate student and Matt is an undergraduate student, both working in Assoc. Professor Miller's lab.</td>
</tr>
<tr>
<td>February</td>
<td>The Mammal Division has a new Facebook page <a href="https://www.facebook.com/MSBDivisionofMammals">https://www.facebook.com/MSBDivisionofMammals</a></td>
</tr>
<tr>
<td></td>
<td>Here is the Miller Lab website detailing their research <a href="http://www.kellymillerlab.com/default.asp?action=show_personnel&amp;id=kelly">http://www.kellymillerlab.com/default.asp?action=show_personnel&amp;id=kelly</a>.</td>
</tr>
<tr>
<td></td>
<td>Our Bird Division also has a website detailing their research <a href="http://biology.unm.edu/witt/index.html">http://biology.unm.edu/witt/index.html</a>.</td>
</tr>
<tr>
<td>March</td>
<td>The digital archives of William Jacob Koster, Ph.D. (UNM Professor of Biology1938-1975) are now available through the University of New Mexico Institutional Repository (“LoboVault”) including PDF files of original field notes linked to the cataloged records of New Mexico fishes he collected during his tenure at the University of New Mexico.</td>
</tr>
<tr>
<td></td>
<td>Christopher W. Hoagstrom, Ph.D. Associate Professor of Zoology at Weber State University, Ogden UT arrived in October 2013 to spend a year sabbatical at the University of New Mexico, collaborating with Tom Turner, in the ecology of pelagic-broadcast spawning freshwater fishes. <a href="http://faculty.weber.edu/choagstrom/index.htm">http://faculty.weber.edu/choagstrom/index.htm</a></td>
</tr>
<tr>
<td></td>
<td>Heidi Hopkins successfully defended her Ph.D. dissertation.</td>
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<td></td>
<td>Tom Giermakowski (Coll Mgr of Amphibians and Reptiles) gave a talk March 22, 2014 on Frogs and Toads of the Rio Grande Valley in conjunction with the Bernalillo County Open Space program.</td>
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<tr>
<td></td>
<td>AIM-UP! (Advancing the Integration of Museums into Undergraduate Programs) is a National Science Foundation sponsored network that focuses on how to integrate museum specimens and data into undergraduate teaching held its annual meeting in Asilomar, CA from 27 February to 2</td>
</tr>
<tr>
<td></td>
<td>The staff from the UNM Office of Sponsored Projects (Pre-Award) toured the MSB on March 7, 2014 to learn what the MSB is all about.</td>
</tr>
</tbody>
</table>
Natalie Blea, a native burquena and former UNO Undergraduate Scholar in Steve Poe's laboratory was accepted into the graduate program in Marine Biodiversity and Conservation at Scripps Oceanography at the University of California, San Diego.

Students from New Mexico State University in Dr. Jennifer Frey’s class “The Natural History Museum in Modern Society” traveled to the MSB and met with a series of collections managers to expose the students to all of the purposes and functions of modern natural history museums, especially their role in research, public education, the biodiversity crisis, and service to society.

The Division of Amphibians and Reptiles has recently cataloged its 95,000th specimen and is continuing cataloging of newly deposited specimens from New Mexico’s state and federal agency biologists.

Tom Giermakowski (Coll Mgr Amphibians and Reptiles) and Howard Snell (Curator of Amphibians and Reptiles) have recently been awarded a contract from New Mexico Department of Game and Fish to evaluate the status of the Arizona Toad (Anaxyrus microscaphus) in New Mexico.


The MSB now has a Facebook page! www.facebook.com/msb.unm.edu

On April 1, 2014 the MSB's Divisions of Arthropods and Parasites received the go ahead to start using the new wet collection space

April 4, 2014, the MSB held a mini open house for Research Day. The Biology Department Research Day chose the lucky recipient of the Departmental Staff Award. Alexandra (Lex) Snyder, Collection Manager of the MSB's Division of Fishes is this year's winner. When congratulated, Lex responded "Yes, it IS quite a honor...not to mention a total surprise".

Congratulations to Natalie Wright, who received the Best Oral Presentation as a Graduate Student for her talk: A New Island Rule for Birds: Evolution Towards Flightlessness

Bryan McLean, a doctoral student in the Division of Mammals at MSB, was recently award a Smithsonian Graduate Fellowship for 2014-2015. Bryan will spend a year at the Smithsonian investigating squirrel evolution. His project is entitled "Right on Time?: Towards an Absolute Timescale for Understanding the Radiation of Ground-dwelling Squirrels."

MSB has two Outstanding Colleagues, as nominated by the Biology Department: Alexandra (Lex) Snyder and Chris Witt. Each will receive a $1000 award to go toward professional development. Congratulations to both Lex and Chris. http://biology.unm.edu/.../OutstandingColleaguesAwards-2014.p...

"Diversification and adaptation in the Andes: insights from phylogeography, malaria, and hemoglobin of the house wren (Trogloidytes aedon)" is the title of Spencer Galen's Master Thesis for Biology. Chris Witt is his major advisor and Spencer passed with Distinction on Monday, April 14, 2014.

Friday, April 11, 2014, Bethany Abrahamson successfully defended her Master of Biology. Bethany has been with the MSB first as an undergraduate, and as a graduate student. She is also the first person to complete the requirements for the new Museum Curatorial studies concentration.

Rachael Mallis and Sandy Brantley went to Nicaragua to coffee plantations with preserved
cloudforests, May 18-29, 2014. Two were remote locations, and the other was a well established coffee plantation and preserve. “We went with the goal of collecting Rachael's study spider, Tengella perfuga, as well as more spider specimens for the museum to help document the arthropod diversity of Nicaragua, in partnership with Dr. Jean-Michel Maes, a local entomology professor and museum director.”

May

Ben Hanelt, of UNM Biology, was recently interviewed about parasites and crickets. Ben is a Research Associate of the MSB Parasite Division. http://www.wired.com/2014/05/absurd-creature-horsehair-worm/

Colleague Julie Allen of AIM-UP! attended the Datasphere at the Biosphere meeting and wrote a great blog about it! http://aim-up.blogspot.com/

Grasshoppers Abound! Our own Dave Lightfoot was interviewed for an article in the UNM Daily Lobo regarding the abundance of grasshoppers this spring: http://www.dailylobo.com/article/2014/05/5-27-grasshoppers

Natural history collections at universities have a way of changing student trajectories. On behalf of the Sam Nobel Museum, Dr. Michael Mares just received the National Medal for Museums. Mike was raised in Albuquerque and started his museum odyssey as an undergraduate at the Museum of Southwestern Biology a few decades ago under the tutelage of Jim Findley.

Here is a prime example why museum collections are so important: http://www.livescience.com/45705-mexican-nightsnake-species...

One of the research goals of the MSB is to work collaboratively within UNM. Will Taylor a doctoral student in Anthropology recently reported: “Received some good news recently regarding the horse crania project at the annual Society for American Archaeology conference in Austin: I wanted to thank you and the MSB folks for laying the foundations for this project through your help with collections study of wild and domestic horses. The MSB was the primary source of my data, and deserves much of the recognition.” http://socarchsci.org/awards.html

On May 13, 2014 a group of MESA students from Robertson High School (Las Vegas, NM) toured the MSB.

The Bird Division has another new publication:

June

Don Wilson, a student of Jim Findley's has a new publication: http://www.lynxeds.com/hmw/handbook-mammals-world-volume-4

American Society of Mammalogists 2014 annual meeting in Oklahoma City. Jocie Colella, MS student from the MSB Mammal Division, won the award for Best Poster Presentation for her work entitled "Molecular analysis of species limits and hybridization in ermine".

June 13, 2014 finds the MSB hosting 7 and 8 year olds from a Summer Camp trip from the New Mexico Museum of Natural History. Jon Dunnum, the Collection Manager for the Mammal Division has pulled a number of specimens for the kids to look at and draw.

Congratulations to Sam Loker, Curator of the Parasite Division, on receiving $5.4 million for five years from The National Insitutes of Health (NIH), Centers of Biomedical Research Excellence (COBRE) program.

June 26, 2014 Jon Dunnum hosted 20 people from the Bernalillo County Master Naturalists Program. https://www.bernco.gov/master-naturalist-program-221782/

July

Effective July 1, 2014, Chris Witt was appointed the new Assistant Director of the MSB.

Mike Medrano successfully defended his dissertation titled “A taxonomic revision of the
millipede family Atopetholidae (Chamberlin) (Diplopoda: Spirobolida) with descriptions of new species and the conservation status of Comanchelus chihuanus (Chamberlin 1947) (Diplopoda: Spirobolida: Atopetholidae), a species of concern” on Thursday, 24 July 2014 at 10:30.

The MSB is losing Cheryl Parmenter, Collection Manager for the Division of Genomic Resources to retirement at the close of business on Thursday July 31, 2014. Cheryl was with UNM for 21 years starting at the Health Sciences Center. She was actively involved with the hanta virus discovery and with the development of the DGR.

Mariel L Campbell has accepted the position as Collection Manager of the Division of Genomic Resources. Mariel holds a Masters from the University of California Davis and BS from UNM. Mariel has had a long association with MSB, first working on NSF funded projects in Bolivia in the late 1980s and later in hantavirus monitoring efforts. Most recently Mariel has been the key individual in accessioning, cataloging and data basing the incomparable Rausch collections (parasites and mammals).

August

September

Congratulations to Tom Turner, the MSB Curator of the Fishes Division on his appointment as Associate Dean of Research in the College of Arts and Sciences.

Dr. Ric Yanagihara, University of Hawaii, will present a talk on hantavirus discovery as part of our weekly distributed seminar in the "Advancing the Integration of Museums into Undergraduate Biology" series. He was recently chosen by NIH has one of 13 Biomedical Faces of Science, selected as role models in their fields. He is leader of a COBRE award at the University of Hawaii and has published extensively throughout his career.

October

Sadie Yurista (MSB Mammals 2010-2013) was admitted to the University of Wisconsin-Madison School of Veterinary Medicine. Sadie worked as an undergraduate curatorial assistant while completing her BS in Biology. In addition to a two month collecting trip to Mongolia, Sadie was a key contributor to specimen curation and database development.

MSB undergrad students helped with the Sandia Vista Elementary School (Rio Rancho) first ever Spooky Science Night. They brought pelts for the kids to touch, a baby shark, toads, insects, and an alligator skin (courtesy of US Fish and Wildlife).

November

Earlier this year the Travel Channel filmed a segment at the MSB for 'Mysteries at the Museum'. That segment aired on Friday, October 24, 2014.

Dr. Ben Hanelt’s (Parasitology) research is featured in the November 2014 issue of National Geographic. He studies parasite manipulation of hosts, a common feature of the horse-hair worms. All videos and photography were done here at UNM, and the worms are in the MSB Division of Parasites! [http://ngm.nationalgeographic.com/.../minds.../varma-photography Mindsuckers].

December

Near Peer Mentoring! Lindsey Frederick, a student curatorial assistant in the Mammal Division at MSB, won a $500 scholarship from the College of Arts & Sciences Undergraduate Student Research Initiative to travel to the Smithsonian Institute in Washington D.C. in January 2015. Lindsey is collaborating with a graduate student (Jocelyn Colella) on a geometric-morphometric study of variation in stoats (aka ermine, Mustela erminea). She’ll be taking high-resolution images of over 200 specimens of ermine to test the validity of the 20 North American subspecies.
DIVISION REPORTS FOR 2014

DIVISION OF AMPHIBIANS AND REPTILES

1. DIVISION HIGHLIGHTS

The collection has increased by 485 specimens in 2014 to a total of 95,543 specimens. The majority of the specimens were collected by division staff and students, primarily during surveys for Arizona Toad throughout New Mexico. Additional specimens were deposited by New Mexico Dept. of Game and Fish personnel and collaborators of the MSB. Additions from the 19 accessions catalogued during 2014 include amphibians and reptiles from the Gila National Forest, several records of different species of rattlesnakes, as well as a collection of historical specimens donated by the US Geological Survey.

The number of hits (data queries through external portals) and data downloads is comparable to previous years. During 2014, the collection was queried 8,362 times and served 5,616,861 records via HerpNet, while the Global Biodiversity Information Facility (GBIF) has reported 2,426 searches and a total download of 29,014,367 records from our collection. This staggering number of downloads of records reflects 450 instances of users downloading either the entire dataset available or all data that include geospatial coordinates. More specific searches (e.g. by country or taxon) amounted to a total of 1,759,498 records downloaded and are comparable to previous years. In addition to data served through aggregator portals, specimens from the division have been cited in at least 14 publications in 2014.

Every year 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 2014, we handled over 160 of these requests, hosted six research visitors in the collection and individually compiled data on 11 occasions. Our outreach activities, in addition to general tours of the collection, included a variety of presentations or consultations. We presented on amphibians and reptiles at Valle de Oro National Wildlife Refuge as well as to the City of Albuquerque Open Space Division program. In addition, we were involved in judging scientific posters both at UNM and Albuquerque Public Schools, hosted two high-school interns, and coordinated or gave invited lectures at UNM.

We continue our involvement in research, on top of specimen preparation and curation, by advising undergraduate and graduate students, lending equipment, and collaborating with universities and agencies. During 2014, we continued our work with the USGS Colorado Plateau Research Station at Northern Arizona University on projects that examine distributions of southwestern amphibians and reptiles. This work resulted in a USGS report published in 2014 and our current efforts are now focused on examining riparian areas in the southwestern US. We maintain participation with colleagues in the museum community by attending workshops and meetings. This year the division’s collection manager presented both a talk and a poster at the annual meeting of The Society for Preservation of Natural History Collections in United Kingdom.

2. TABLE OF COLLECTION USE

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection Growth</td>
<td>485</td>
</tr>
<tr>
<td>Loans (outgoing/incoming)</td>
<td>14 (6/8)</td>
</tr>
<tr>
<td>Research Visitors¹</td>
<td>6</td>
</tr>
<tr>
<td>Outreach Visitors¹</td>
<td>160+</td>
</tr>
<tr>
<td>Information Requests Answered</td>
<td>162</td>
</tr>
</tbody>
</table>
Direct Website Access\(^2\) (“Hits”).........................................................................................2,216
Indirect: Specimen Data Queries\(^3\) (“Hits”).............................................................................10,788
Indirect: Specimen Records Downloaded\(^4\).............................................................................7,376,359
Downloads of Division Documents ...........................................................................................593
Publications Citing/Using MSB Herpetological Specimens.......................................................14

\(^1\)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: HerpNET and GBIF and does NOT include downloads of entire dataset
(450 instances in GBIF).

3. COURSES USING THE COLLECTIONS

BIOL 204, Animal Form and Function, spring and fall semesters, 362 students
BIOL 386, General Vertebrate Zoology, spring and fall semesters, 30 students

4. COURSES TAUGHT BY MSB PERSONNEL

A. Faculty/Collection Managers

Giermakowski, J.T.

Spring  
BIOL 402 – Topics in Collections Research, 3 students
BIOL 502 – Topics in Collections Research, 1 student

Fall  
BIOL 502 – Topics in Collections Research, 1 student

Poe, S.

Spring  
BIOL 499 – Undergraduate Problems, 1 student
BIOL 551 – Graduate Research Problems, 1 student
BIOL 599 – Master’s Thesis, 1 student
BIOL 651 – Advanced Field Biology, 1 student
BIOL 699 – Dissertation, 2 students

Fall  
BIOL 499 – Undergraduate Problems, 2 students
BIOL 551 – Graduate Research Problems, 1 student
BIOL 699 – Dissertation, 2 students

Snell, H.L.

Spring  
BIOL 386 – General Vertebrate Zoology, 16 students
BIOL 402 – Conservation Biology, 11 students
BIOL 402 – Topics in Collections Research, 3 students
BIOL 502 – Topics in Collections Research, 1 student

Fall  
BIOL 379 – Conservation Biology, 38 students
B. Graduate Students

Gray, L.N
- BIOL 247 – Anatomy and Physiology Lab, 64 students
- BIOL 248 – Anatomy and Physiology Lab II, 99 students

Latella, I.M.
- BIOL 386 – General Vertebrate Zoology, spring and fall, 36 students

Truett, B.
- BIOL 247 – Anatomy and Physiology Lab, 70 students

5. COLLECTION MANAGEMENT

The collection has increased by 485 specimens in 2014 to a total of 95,543 specimens. The majority of the specimens were collected by division staff and students, primarily during surveys for Arizona Toad. Additional specimens were deposited by New Mexico Dept. of Game and Fish personnel and collaborators of the MSB. Additions from the 19 accessions catalogued during 2014 include amphibians and reptiles from the Gila National Forest, several records of different species of rattlesnakes, as well as a collection of historical specimens donated by the US Geological Survey.

The number of hits (data queries through external portals) and data downloads is comparable to previous years. During 2014, the collection was queried 8,362 times and served 5,616,861 records via HerpNET, while the Global Biodiversity Information Facility (GBIF) has reported 2,426 searches and a total download of 29,014,367 records from our collection. This number of downloads of records reflects 450 instances when the user downloaded either the entire dataset available or all data that included geospatial coordinates. More specific searches (e.g. by country or taxon) amounted to a total of 1,759,498 records downloaded. In addition to data served through aggregator portals, specimens from the division have been cited in at least 14 publications in 2014.

6. AWARDS, GRANTS, AND CONTRACTS


7. PUBLICATIONS

A. Books, Book Chapters, Edited Volumes

B. Journal Articles


C. Web-Based

M.J. Ryan:


D. Technical Reports


E. Theses/Dissertations Completed

None

F. Work In Progress


G. Publications/Reports Based on MSB Specimens/Data


8. ACTIVITIES IN LEARNED SOCIETIES

A. Invited/Plenary Talks and/or Seminars

H.L. Snell


M.J. Ryan

Conservation Biology, Amphibian declines and conservation actions, Fall 2014
Tropical Biology, Climate change and tropical amphibians, Spring 2014

B. Contributed Talks/Posters (*presenter)


**Giermakowski, J.T*, M.J. Ryan, J.A. Cook. Collections as a source of data for education, conservation and monitoring change in a time of extinction: an amphibian example. Oral presentation. The Society for Preservation of Natural History Collections. Cardiff, Wales, United Kingdom. June.**

### C. Attendance at Professional Meetings

**J.T. Giermakowski**

The Society for Preservation of Natural History Collections. Cardiff, Wales, United Kingdom. June.

**H.L. Snell**

Annual Meetings of the Pacific Seabird Group, Juneau, AK, January 2014.

IUCN Iguana Specialist Group Meetings, Puerto Ayora, Galapagos, Ecuador, October 2014.

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

**S. Poe.** Associate Editor. Phyllomedusa.

**H.L. Snell.** Editor of the Museum of Southwestern Biology Publication Series. Major activity in 2014 was working on a 300+ page manuscript “Reptiles of Paraguay” which I hope to have out in 2015.

### E. Service as Officer of Professional Society/Organization

**JT Giermakowski.** Senior Co-chair of the Southwestern Partners in Amphibian and Reptile Conservation Steering Committee.

### 9. OTHER PROFESSIONAL ACTIVITIES

#### A. Presentation to General Audience in a Scholarly Capacity

**J.T. Giermakowski**


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

**H.L. Snell** Provided scholarly input at BLM scoping meeting regarding a Kinder-Morgan permit request for an easement for a CO₂ pipeline across North Central New Mexico.
C. Scholarly Service as a Member of a Local/State/Regional/National Committee, Panel, etc.

H.L. Snell.

Member of IUCN SSC Iguana Specialist Group 2013-2016.
Member of New Mexico Department of Game and Fish Species Recovery Team for Boreal Toads. New Mexico Department of Game & Fish.

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

J.T. Giermakowski.

Senior Co-chair 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.

Appointed to University of New Mexico Institutional Animal Care and Use Committee. 2012-2015.

D. Journal Referee

J.T. Giermakowski. Ecological Modelling

S. Poe. Systematic Biology (1), Phyllomedusa (3), Zootaxa (2)

M.J. Ryan. Herpetological Review: (4), Herpetological Notes (2), Journal of Natural History (2), Herpetologica, Zootaxa, Alytes

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

Work with Whitfield Wildlife Conservation Area, Belen, NM

Member NM Department of Game & Fish Species Recovery Board, Santa Fe & Albuquerque, NM

Elected Board Member, Tierra Grande Improvement Association, Valencia County, NM. Organization oversees 15,000+ acres of protected natural habitat in the southern Manzano Mountains. Work with the New Mexico Mountain Club to promote wilderness activities throughout New Mexico.
M.J. Ryan  
*Conservation*
Amphibian Ark Prioritizing Captive Amphibians for Conservation in Panama: shared data and reviewed species evaluations.

IUCN Anole Lizard Species Survival Group: shared data and reviewed species evaluations.

**UNM Class Contribution**  
Contributor to AIM-UP!, Advancing Integration of Museums into Undergraduate Programs, website: [http://aim-up.blogspot.com/](http://aim-up.blogspot.com/)

*50th Anniversary of Wilderness Act*  
Contributed photo to Anniversary Calendar; facilitated MSB specimens to be used at event

**Educational & Science Outreach**


Museum of Southwestern Biology Research Day Event, Poster and Table session

Bachechi Open Space Naturalist Series, Frogs and Toads of the Rio Grande

**Mentoring:**  
Jari Javier, Sevilleta National Wildlife Refuge LTER Research Experience for Undergraduates  
Brittney White, Independent Undergraduate Research, UNM

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

**I.M. Latella**  
New Mexico Share with Wildlife: Current status of the Arizona Toad (*Anaxyrus microscaphus*) in New Mexico: Identification and evaluation of potential threats to its persistence. $10,800

New Mexico Department of Game and Fish: Conservation of Endangered, Threatened, and Sensitive Amphibians and Reptiles. $12,000 (Field Work, Report Writing)

**M.J. Ryan**  
Lewis and Clark Exploration Fellowship: In search of missing frog species in Costa Rica: rediscovering critically endangered species in a time of extinction, $5,000 (PI)

LTER Graduate Student Fellowship for Summer Research: Lizard Community Response to Short-Term Rainfall Manipulation, $4,500 (PI)

New Mexico Share With Wildlife: Current status of the Arizona Toad (*Anaxyrus microscaphus*) in New Mexico: Identification and evaluation of potential threats to its persistence, $10,800 (PI)

Crowd-funding: Search for Missing Frogs, $1,500

Rufford Conservation Fund. **$9,800.** In search of missing frog species in Costa Rica: rediscovering critically endangered species in a time of extinction. **M.J. Ryan.** (Co-PI with Juan Abarca, Cerro Dantas Wildlife Refuge & Research Center)
New Mexico Department of Game and Fish. **$10,000.** Effects of *Batrachochytrium dendrobatidis* on amphibian communities in New Mexico. **M.J. Ryan.** (Co-PI with Jamie Voyles, New Mexico Institute of Mining and Technology).

**12. DONATIONS AND GIFTS RECEIVED**


**13. CURRENT STAFF**

**A. Faculty/Staff**

Snell, H.L. Professor and Curator

Degenhardt, W.D., Curator and Professor Emeritus

Poe, S., Associate Professor and Associate Curator

Giermakowski, J.T. Sr. Collection Manager

Ryan, M.J. Graduate Assistant (Spring and Fall)

**B. Graduate students**

Gray, L.N., Ph.D. /Poe

Latella, I.M., Ph.D./Poe

Ryan, M.J., Ph.D./Poe

Truett, B./Poe

**C. Undergraduate Student Workers and Volunteers**

Cruz, Paxton. Student employee.

Garcia, Miranda. Student employee.

Hogland, Sarah. Student employee.

Isom, Kaylee. Student employee.

Johnston, Gary. Student employee.

Olivas, Samantha. Student employee.

Ryan, Anastassia. Student employee.

White, Brittney. 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 BIRDS

Collections Growth and Maintenance:
The Division of Birds was productive in 2014. We added ~500 new specimens from the USA (New Mexico, Alaska, New Jersey, Maine, Florida, & Arizona), and ~450 from Peru. The major accomplishments of the Division of Birds this year include a major expedition to Peru, the first systematic efforts to sample the winter avifauna of New Mexico, a major overhaul to the website, and the public release of Arctos records for the first 10% of the MSB Peru Collection.

Our Peru field program restarted in 2014, after permit delays in 2013. We obtained a Genetic Resources Access Permit (activated in November 2013), an outstandingly generous collecting permit (July 2014), and an export permit for 4000 birds or bird parts (September 2014) Our current Peru collections represent over 750 species, of which over 95% are new species or subspecies for the MSB collection. Our avian tissue collection is now gaining international recognition for these outstanding holdings (over 10,000 Peru tissues collected to date, as of January 2015), and this is reflected in the growing research importance of our collection.

>900 specimens actively collected: Peru, Alaska, New Mexico.
>1750 specimens cataloged, including Peru, Alaska, New Mexico, Arizona.

Collecting expeditions in 2014:
2014: New Mexico: Jemez and Sandia and Gila hummingbird research expeditions, May-July.

Development and maintenance of digital relational databases:
All catalogued specimens are fully digitized and web accessible, via the Arctos database (Note: recently collected research specimens are not made public right away in order to allow MSB researchers to capitalize on proprietary data). These online specimen records are directly linked from nine of our peer-reviewed publications listed in this report, and MSB Bird specimens were cited in an additional 14 peer-reviewed publications or theses by other researchers.

A major endeavor that we started in 2014 is the barcoding and mapping of all of our Peru collected tissues into the Arctos system in collaboration with the DGR collections manager, Mariel Campbell. We anticipate that this project will be completed in 2016.

The Bird Division has a new webpage as of 2014, thanks to efforts of many individuals at the MSB (Tom Giernakowski, Adrienne Raniszewski, and Joe Cook), including easy web access to specimen data, publications by division personnel, and publications based on specimens in the collection.

In 2014, personnel of the MSB Bird Division published 14 peer-reviewed articles, plus additional web articles such as blog posts, two technical reports, one MS Thesis (with distinction), and one undergraduate honors thesis (summa cum laude). In 2014, we initiated a Google Scholar account to track the publications and citations impact of MSB Bird Division personnel: https://scholar.google.com/citations?hl=en&user=XpGDgBQAAAAJ&view_op=list_works&authuser=1&sortby=pubdate.
In total, **25 peer-reviewed publications in 2014 utilized MSB Bird Division specimens**; this is a new single-year high (previous high was 13), reflecting the rapid increase in the research importance and public profile of our division. In 2014, we initiated a Google Scholar account to track the publications and citations impact of MSB Bird specimens: https://scholar.google.com/citations?hl=en&user=ul8boF0AAAAJ&view_op=list_works&authuser=2&sortby=pubdate

Figure 1. Citations per year for publications based on MSB bird specimens. Significant financial gifts from Robert W. Dickereman totaling over $60,000. ($50K for Collection Manager fund, plus Alaska, and Australia field trips). Smaller (but no less significant) donations from Christopher Witt, Thomas and Loretta Witt, David Marchiondo, and Sandy Williams.

Table 1. 2014 metrics for Bird Division.

<table>
<thead>
<tr>
<th>Metric</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Collection growth (Specimens Cataloged)</td>
<td>1753</td>
</tr>
<tr>
<td>2. Loans Out</td>
<td>35</td>
</tr>
<tr>
<td>3. Professional Visitors to the Collections</td>
<td>12</td>
</tr>
<tr>
<td>4. Collection Database Web Site Hits</td>
<td>30714</td>
</tr>
<tr>
<td>5. RFIs Answered in Person</td>
<td>105</td>
</tr>
<tr>
<td>6. Peer-Reviewed Pubs by MSB</td>
<td>14</td>
</tr>
<tr>
<td>7. Pubs (Peer-R) Citing MSB Specimens by Other (non-MSB) Authors</td>
<td>12</td>
</tr>
<tr>
<td>8. Technical Reports</td>
<td>2</td>
</tr>
<tr>
<td>9. UNM Courses using the Collection</td>
<td>21</td>
</tr>
<tr>
<td>10. UNM Courses taught</td>
<td>12</td>
</tr>
<tr>
<td>11. Graduate Students</td>
<td>14</td>
</tr>
<tr>
<td>12. Graduate Theses/Dissertations Completed</td>
<td>2</td>
</tr>
<tr>
<td>13. Undergraduate Students</td>
<td>9</td>
</tr>
<tr>
<td>14. Grants/Contracts in Force</td>
<td>2</td>
</tr>
</tbody>
</table>

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.

   \[1753 = 794 \text{ (AK, NM, AZ)} + 959 \text{ (Peru)}\]

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.

   **35 loans were made in 2014.**

3. **Professional Visitors to the Collections.** This metric reflects the number of visiting scientists and other professionals seeking to review specimens. It does not include casual visits by members of the UNM Biology Department.

   **Twelve visits to MSB birds by outside professionals.**

4. **Collection web activity.** This metric (web hits) is under-reported because of electronic dissemination of MSB specimen and locality data that extends beyond our site (e.g., Global Biodiversity Information Facility). Major internal databases supported by the MSB are ARCTOS, the New Mexico Biodiversity Collections Consortium (NMBCC), and conservation databases of the New Mexico Natural Heritage Program.

   **30,714 hits in Arctos**

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.

   **105 (40 CCW + 65 ABJ)**

6. **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.

   **Fourteen total:**


7. 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.

Twelve.


Hayes, FE. 2014. Inland records of the Black Skimmer in the western United States. Western Birds 45: 327-331


8. **Technical reports by museum staff** include reports to agencies in fulfillment of contract deliverables.


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 faculty curators and their staff.
## COURSES USING THE COLLECTIONS

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2014</td>
<td>BIOL 699</td>
<td>Dissertation</td>
<td>2</td>
</tr>
<tr>
<td>Fall 2014</td>
<td>BIOL 599</td>
<td>Masters Thesis</td>
<td>3</td>
</tr>
<tr>
<td>Fall 2014</td>
<td>BIOL 402</td>
<td>T: Ecology Seminar</td>
<td>16</td>
</tr>
<tr>
<td>Fall 2014</td>
<td>BIOL 402</td>
<td>T: Molecular Seminar</td>
<td>6</td>
</tr>
<tr>
<td>Fall 2014</td>
<td>BIOL 502</td>
<td>T: Molecular Systematics Disc</td>
<td>2</td>
</tr>
<tr>
<td>Spring 2014</td>
<td>BIOL 699</td>
<td>Dissertation</td>
<td>2</td>
</tr>
<tr>
<td>Spring 2014</td>
<td>BIOL 300</td>
<td>Evolution</td>
<td>40</td>
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<tr>
<td>Spring 2014</td>
<td>BIOL 599</td>
<td>Masters Thesis</td>
<td>2</td>
</tr>
<tr>
<td>Spring 2014</td>
<td>BIOL 551</td>
<td>Research Problems</td>
<td>1</td>
</tr>
<tr>
<td>Spring 2014</td>
<td>BIOL 400</td>
<td>Senior Honors Thesis</td>
<td>2</td>
</tr>
<tr>
<td>Spring 2014</td>
<td>BIOL 402</td>
<td>T: Avian Sci Specimen Prep</td>
<td>9</td>
</tr>
<tr>
<td>Spring 2014</td>
<td>BIOL 402</td>
<td>T: Ecology Seminar</td>
<td>17</td>
</tr>
<tr>
<td>Spring 2014</td>
<td>BIOL 402</td>
<td>T: Molecular Seminar</td>
<td>9</td>
</tr>
<tr>
<td>Spring 2014</td>
<td>BIOL 402</td>
<td>T: Molecular Systematic Discus</td>
<td>8</td>
</tr>
<tr>
<td>Spring 2014</td>
<td>BIOL 499</td>
<td>Undergraduate Problems</td>
<td>1</td>
</tr>
<tr>
<td>Spring 2014</td>
<td>BIOL 386</td>
<td>General Vertebrate Zoology</td>
<td>40</td>
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<tr>
<td>Fall 2014</td>
<td>BIOL 386</td>
<td>General Vertebrate Zoology</td>
<td>30</td>
</tr>
<tr>
<td>Spring 2014</td>
<td>BIOL 204L</td>
<td>Plant &amp; Animal Frm &amp; Fction</td>
<td>180</td>
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<tr>
<td>Fall 2014</td>
<td>BIOL 204L</td>
<td>Plant &amp; Animal Frm &amp; Fction</td>
<td>180</td>
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<tr>
<td>Fall 2014</td>
<td>BIOL 203L</td>
<td>Ecology and Evolution</td>
<td>240</td>
</tr>
<tr>
<td>Spring 2014</td>
<td>BIOL 203L</td>
<td>Ecology and Evolution</td>
<td>240</td>
</tr>
</tbody>
</table>

10. **UNM courses provided by museum staff** include lecture courses taught by faculty curators or paid staff of the MSB. It also includes laboratory teaching by graduate students paid through MSB GA’s.

**Witt:**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2014</td>
<td>BIOL 502</td>
<td>38520</td>
<td>T: Molecular Seminar</td>
</tr>
<tr>
<td>Fall 2014</td>
<td>BIOL 502</td>
<td>30562</td>
<td>T: Ecology Seminar</td>
</tr>
<tr>
<td>Fall 2014</td>
<td>BIOL 502</td>
<td>39141</td>
<td>T: Molecular Systematics Disc</td>
</tr>
<tr>
<td>Fall 2014</td>
<td>BIOL 509</td>
<td>47601</td>
<td>T: High Altitude Biology</td>
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<tr>
<td>Fall 2014</td>
<td>BIOL 599</td>
<td>13612</td>
<td>Masters Thesis</td>
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<td>Fall 2014</td>
<td>BIOL 699</td>
<td>13711</td>
<td>Dissertation</td>
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<tr>
<td>Spring 2014</td>
<td>BIOL 502</td>
<td>28594</td>
<td>T: Molecular Seminar</td>
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<td>Spring 2014</td>
<td>BIOL 502</td>
<td>38947</td>
<td>T: Molecular Systematics Disc</td>
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<td>Spring 2014</td>
<td>BIOL 502</td>
<td>25366</td>
<td>T: Ecology Seminar</td>
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<tr>
<td>Spring 2014</td>
<td>BIOL 402</td>
<td>32914</td>
<td>T: Avian Sci Specimen Prep</td>
</tr>
</tbody>
</table>
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.

1. Rachel Mallis, Comprehensive Exam, May 2, 2014; Dr. Kelly Miller, Chair.
2. Jessica Weber, Comprehensive Exam, April 30, 2014; Dr. Joseph A. Cook, Chair.
3. Marisa Lim, Stony Brook University (outside committee member); Qualifying Exam, 2014; Dr. Catherine Graham, Chair.
4. Heidi Hopkins, Dissertation Defense, March 24, 2014; Dr. Kelly Miller, Chair.
5. Yadeeh Sawyer, Dissertation Defense, April 28, 2014; Dr. Joseph A. Cook, Chair.
8. John Grady, Comprehensive Exam, September 18, 2014; Dr. James H. Brown, Chair.
9. Natalie Wright: Witt Graduate Student
10. Elizabeth Beckman: Witt Graduate Student
11. Jonathan Schmitt: Witt Graduate Student
12. Andrea Chavez: Witt Graduate Student
13. Spencer Galen: Witt Graduate Student
14. Ariel Gaffney: Witt Graduate Student

12. **Number of graduate theses/dissertations** includes all the graduate students who graduated in 2014 that were mentored by MSB faculty as primary advisor or co-advisor.

Two.


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

Nine.

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.
2011-2015: Montane Biogeography Revealed by Quirks of the Evolutionary Process: Integrative Respiratory Phenotypes for Andean Birds; P.I.: C. C. Witt; co-P.I. Blair Wolf; co-P.I. Joann Mudge; National Science Foundation (Evolutionary Processes Cluster); $650,000; DEB-1146491.


REU Supplement for Montane Biogeography Revealed by Quirks of the Evolutionary Process: Integrative Respiratory Phenotypes for Andean Birds; P.I.: C. C. Witt; $8,000; DEB-1146491-supplement.

ACTIVITIES IN LEARNED SOCIETIES

Invited/Plenary Talks and Seminars


Contributed Talks and Posters


**Attendance at Professional Meetings**

Johnson, A.B.
- American Ornithologists’ Union. Estes Park, CO
- New Mexico Ornithological Society annual meeting Albuquerque, NM

Witt, C.C
- American Ornithologists’ Union. Estes Park, CO
- New Mexico Ornithological Society annual meeting Albuquerque, NM

Wolf, C.J.
- New Mexico Ornithological Society annual meeting Albuquerque, NM

Wolf, B.O.
- American Ornithologists’ Union. Estes Park, CO

Baumann, M. J.
- American Ornithologists’ Union. Estes Park, CO
- New Mexico Ornithological Society annual meeting Albuquerque, NM

Schmitt, C. J.
- American Ornithologists’ Union. Estes Park, CO
- New Mexico Ornithological Society annual meeting Albuquerque, NM

Beckman, E. J.
- American Ornithologists’ Union. Estes Park, CO
- New Mexico Ornithological Society annual meeting Albuquerque, NM

Gaffney, A.M.
- American Ornithologists’ Union. Estes Park, CO
- New Mexico Ornithological Society annual meeting Albuquerque, NM

Williams, S.O.
- New Mexico Ornithological Society annual meeting Albuquerque, NM
- Western Field Ornithologists’ annual meeting San Diego, CA

Dickerman, R.W.
- New Mexico Ornithological Society annual meeting Albuquerque, NM
- Western Field Ornithologists’ annual meeting San Diego, CA
Service as Editor or on Editorial Board of a Journal

Williams, S.O.
Editor, NMOS Bulletin

OTHER PROFESSIONAL ACTIVITIES

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

Witt, C.C.
NSF Panelist for review of grant proposals, October 22-24, 2014; Division of Environmental Biology, Evolutionary Processes Cluster, Evolutionary Ecology Panel, National Science Foundation, Arlington, VA. (Reviewed 17 full proposals).

American Ornithologists Student Travel and Awards Committee Member (2009-2014)

Reviewer for 15 student & postdoc travel award proposals for AOU-COS-SCO 2014 Meeting.

Student Presentation Judge, AOU-COS-SCO 2014 Meeting, Estes Park, Colorado


Reviewer for Wilson Ornithological Society Fuertes Award, 2014.

Service as Officer of Professional Society/Organization

Journal Referee

Witt, C.C.

Wright, N.A.
Ibis (1)

Johnson, A.B.
Western Birds (1)

PUBLIC SERVICE

DONATIONS AND GIFTS RECEIVED

$50K from Robert Dickerman, PLUS Alaska Field work, Australia donation – another 10K

David Marchiondo
Sartor O. Williams III
Chistopher C. Witt
Thomas and Loretta Witt

CURRENT STAFF
Faculty and Staff
Graduate students (affiliated with division in 2014)

Natalie Wright  
Elizabeth Beckman  
Jonathan Schmitt  
Andrea Chavez  
Spencer Galen  
Ariel Gaffney

Undergraduate Student Workers and Volunteers

1. Jason Kitting; 2012-2014; UNM; Red Blood Cell Concentration, and avian specimen preparation.  
2. Ashley Smiley; 2010-2014; UNM; Navajo; UNO and MARC Programs; Avian cardiac morphology; Undergraduate thesis in progress.  
3. Cole Wolf; 2011-2014; UNM; Avian malaria is diverse and geographically structured in the Yellow-rumped warbler (Setophaga coronata) of the southwestern United States; Honors thesis completed in April 2014, summa cum laude.  
4. Jessica Allen; 2013-2014; UNM; Avian malaria survey of Peru.  
7. Nick Wilson; 2013-2014; postbac lab associate; Feather growth bars/ Trinidad expedition.  
8. Laura Pagés; 2013-2014; postbac lab associate; Hispanic; Avian malaria screening and lab management.  
9. Ariel Gaffney; 2014-; postbac lab associate; Avian malaria and hemoglobin evolution in the Andes. (started as MS student in August 2014).

MUSEUM ASSOCIATES

Curatorial Associates  
Robert Dickerman  
John Hubbard

Research Associates  
Donna Schmitt  
Gregory Schmitt  
Sartor O. Williams III  
Matthew J. Baumann
DIVISION OF ARTHROPODS

1. DIVISION HIGHLIGHTS

Renovation of the collection room for alcohol specimens arthropods and parasites was completed. All specimens were moved out of the vertebrate alcohol range into their new space and specimens were completely reorganized to reflect recent taxonomic changes.

Graduate student Rachael Mallis and collection manager Sandra Brantley traveled to Nicaragua in May to collect specimens for Rachael’s dissertation work. In the process, many other spiders and other arachnids were collected for the MSBA. Sites visited were in cloud forest on coffee plantations with old-growth forest remnants.

Kelly Miller engaged in a collecting expedition to Sweden and he and graduate student Grey Gustafson collected in Madagascar including numerous specimens for the MSBA.

Eric Metzler and Dave Lightfoot published the description of a new species of moth that was found during our National Park Service funded inventory of arthropods of White Sands National Monument (NM) and Cuatrociengas Protected Area (Coahuila, MX). Metzler and Lightfoot also presented on the new moth at the 2014 meeting of the Lepidopterist’s Society in Park City, UT. The holotype and paratypes were deposited in the MSB, Div. Arthropods, Type Collection. Over 3,000 arthropod specimens from the White Sands-Cuatrociengas project were databased.

Michael Medrano finished his PhD on millipedes based in large part on specimens in the MSBA.

2. COLLECTION.

Collection Growth: 13,220

Number of outgoing loans (of our specimens) 6

Number of visits from professionals: 6

Number of webpage/database hits: 16,695 for all scan collections

Number of information requests answered in person: 50 + ~70

Number of grad students mentored by MSB staff: 5

Number of grad student theses/dissertations: 2

Number of undergrads trained in the MSB: 6

Number of grants and contracts in force during the year: 5
4. COURSES TAUGHT BY MSB PERSONNEL

<table>
<thead>
<tr>
<th>INSTRUCTOR</th>
<th>TERM</th>
<th>COURSE</th>
<th>COURSE TITLE</th>
<th>STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>K.B. Miller</td>
<td>Spring</td>
<td>Biol203</td>
<td>Ecology and Evolution</td>
<td>181</td>
</tr>
<tr>
<td>K.B. Miller</td>
<td>Fall</td>
<td>Biol409</td>
<td>Animal Sexual Strategies</td>
<td>35</td>
</tr>
</tbody>
</table>

5. COLLECTION MANAGEMENT ACTIVITIES

With the new collection space, we sorted specimens into genus or species jars (most had previously been grouped by family because of lack of space), which required a couple of shifts, many new labels, and some taxonomic changes.

We received several donations of specimens, especially from the Valles Caldera National Preserve, New Mexico, ordered and received 72 new specimens drawers and pinning trays, coordinated the donation of a comprehensive New Mexico butterfly collection, databased over 3,000 specimens from the White Sands arthropod inventory project, responded to and sent 6 specimen loans for research, contributed and prepared specimens for a special display “Conserving New Mexico” at the New Mexico Museum of Natural History and Science, accessioned the holotype and paratypes of a new species of moth from New Mexico.

6. AWARDS, GRANTS, AND CONTRACTS

MCZ Ernst Mayr Travel Grants in Animal Systematics. Summer 2014 **G.T. Gustafson.** $1,500

NSF Systematic Biology and Biodiversity Inventories Grant #DEB–1353426 (**K.B. Miller, PI**). The Phylogeny of Diving Beetles and Extreme Diversification of Sexual Strategies ($520,000), 2014-2016.


Sevilleta Long-Term Ecological Research Program graduate student summer support. June - July 2014. **K.W. Wright.**


Biology Graduate Student Association GRAC Research Grant. Spring 2014. **R.E. Mallis.** $400.

Biology Graduate Student Association GRAC Travel Grant. Summer 2014. **R.E. Mallis.** $150.

Office of Graduate Studies Research Project and Travel Grant Spring-Fall 2014. **R.E. Mallis.** $455.
7. PEER REVIEWED PUBLICATIONS BY MSB FACULTY/STAFF

Journal Articles


Publications Based on MSB Specimens/Data By Other (non-MSB) Authors

Dissertations/Theses Based on MSB Specimens/Data


Reports Based on MSB Specimens/Data

8. ACTIVITIES IN LEARNED SOCIETIES

Invited/Plenary Talks and Seminars

Contributed Talks and Posters


Wright, K.W.

Miller, K.B.

**Attendance at Professional Meetings**

**Brantley, S.L.**
Southwest Jemez Mountains Collaborative Forest Landscape Restoration Project, March; American Arachnological Society Annual Meeting, Newark, Ohio. June; iDigBio Summit IV, October.

**Wright, K.W.**
Entomological Society of America Annual Meeting. Portland, Oregon, November 2014

**Mallis, R.E.**

**Metzler, E. H. and D. C. Lightfoot.** 63rd Annual Meeting of the Lepidopterist’s Society. Park City, UT.

**Miller, K.B.**

**Service as Editor or on Editorial Board of a Journal**

**Gustafson, G.T.**
ACTA Entomologica Musei Nationalis Pragae: English language editor

Lightfoot, D. C. Associate Editor (Entomology), Western North American Naturalist
Service as Officer of Professional Society/Organization

9. OTHER PROFESSIONAL ACTIVITIES

Presentation to General Audience in a Scholarly Capacity

Brantley, S.L.

Introduction to local arthropods for Bernalillo County Open Space Master Naturalists Program, July.

Wright, K.W.


How do our restoration efforts affect native bee communities? Invited speaker. USFWS National and Regional Integrated Pest Management and Invasive Species Coordinators Meeting. March 2014

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

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

Journal Referee

Gustafson, G.T. Peer Review for articles published in following journals: Zootaxa, Zookeys, Journal of the Kansas Entomological Society

Lightfoot, D. C. Peer Review for 2 articles published in: PLOS ONE.

Miller, K.B. Zootaxa, Systematic Entomology, Molecular Phylogenetics and Evolution.

Public Service

Brantley, S.L. (and collection managers from Amphibians and Reptiles, Fishes, Birds, and Mammals). Presentation to Chuck Buxbaum’s Comparative Anatomy and Physiology class at Sandia Prep, 40 students, January.

Brantley, S.L. Presentation to visiting MESA students from Robinson High School, 8 students, May.

Brantley, S.L. Arthropod identifications and information for Experts’ Day at the New Mexico Museum of Natural History and Science, October.

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

11. DONATIONS AND GIFTS RECEIVED
12. CURRENT STAFF

Faculty and Staff

Kelly Miller, Ph.D., curator
Sandra Brantley, Ph.D, senior collection manager
David Lightfoot, Ph.D, senior collection manager

Graduate students

Grey Gustafson, Ph.D candidate
Karen Wright, Ph.D. candidate
Rachael Mallis, Ph.D candidate

Undergraduate Student Workers and Volunteers

Matthew Leister, undergraduate
Emma Cleary, undergraduate
Desiree Sanchez, post-bacc (PREP)
Jennifer Gammage, undergraduate
Anna Gillette, undergraduate
Sharyn Davidson, volunteer

13. MUSEUM ASSOCIATES

Curatorial Associates

Research Associates

Ana Davidson, PhD
Eric Metzler, PhD
Manuel Molles, PhD
Robert Parmenter, PhD
Gavin J. Svenson, PhD
Ernest Valdez, PhD
DIVISION OF GENOMIC RESOURCES

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 from the New Mexico Museum of Natural History, the U.S. Fish and Wildlife Service Mexican Wolf Recovery Program, the U. S. Geological Survey, the New Mexico, Chilean, and Panamanian Hantavirus Surveys, and from other individual researchers and institutions worldwide. The DGR frozen tissue collection is taxonomically broad and contains multiple tissue samples from over 160,000 specimens, including Mammals, Birds, Reptiles and Fishes. The collection is ranked as the largest cryogenic collection of wild mammal tissues and DNA and one of the top ten cryogenic collections of bird tissues worldwide.

Collection Growth.

1. 11,470 cataloged specimens from the Division of Mammals.
2. 959 cataloged specimens from the Division of Birds.
3. Over 2,000 tissue vials from the Division of Amphibians and Reptiles
4. Approximately 27,600 tissue vials archived in the DGR frozen collection, including 18,000 in the new Arctos object tracking system.

Training in specimen based research and curation.

Training in specimen collection, preparation, curation, and data management remains one of the integral goals of all of the MSB divisions. Students gain experience in bioinformatics, natural history collection preparation and curation, and field and laboratory based research. DGR supported one graduate student each semester; one undergraduate and one post-baccalaureate student were hired in DGR through MSB Birds in Fall 2014.

Publications citing MSB DGR specimens.

The MSB DGR tissue resource has become a foundation for considerable research worldwide. DGR attempts to track all publications utilizing our tissue specimens and incorporate the manuscripts into the ARCTOS database with linkages to specimen records, loans, and GenBank information. During 2014 DGR specimens were cited in at least 78 studies published in over 35 journals or books. Tracking publications is now easier with the advent of electronic information sharing, but some publications using our specimens or their derivatives (e.g., sequences) are still unreported.

Theses/Dissertations.

MSB Arctos database and collection accessibility.

A. **Arctos database and collection accessibility.** The Arctos database is a cutting-edge relational database that continues to provide an invaluable resource for biodiversity and environmental questions for researchers, educators, public health workers, and natural resource managers worldwide. Arctos is web-accessible and greatly enhances the visibility of the MSB. See MSB Mammal summary of Arctos usage.
Queries containing records from MSB Mammals, DGR Mammals, MSB Birds, or DGR Birds:

<table>
<thead>
<tr>
<th>Collection</th>
<th>Queries</th>
<th>Specimen Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>DGR Mammals</td>
<td>3,559</td>
<td>227,106</td>
</tr>
<tr>
<td>MSB Mammals</td>
<td>66,789</td>
<td>34,619,220</td>
</tr>
<tr>
<td>DGR Birds</td>
<td>2,095</td>
<td>26,853</td>
</tr>
<tr>
<td>MSB Birds</td>
<td>30,728</td>
<td>2,146,283</td>
</tr>
<tr>
<td>MSB Fish (tissues)</td>
<td>571</td>
<td>93,314</td>
</tr>
<tr>
<td>MSB Herps (tissues)</td>
<td>594</td>
<td>28,227</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>104,336</strong></td>
<td><strong>37,141,003</strong></td>
</tr>
</tbody>
</table>

2. **COLLECTION USE**

<table>
<thead>
<tr>
<th>Collection Growth (specimens catalogued)</th>
<th>Loans (outgoing)</th>
<th>Loans (incoming)</th>
<th>Visitors</th>
<th>Information Requests Personally Responded to</th>
<th>Publications Citing MSB DGR Specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>11,469 * 959 **</td>
<td>33(614)****</td>
<td>0</td>
<td>&gt;500****</td>
<td>78+</td>
<td></td>
</tr>
<tr>
<td>12,428 Total</td>
<td>15 (214)*****</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>~ 27,600 Mamm and Bird Vials</td>
<td>48 (828)Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>~ 2,000 MSB Herp</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>~ 30,000 vials Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Mammals
** Birds
*** Mamm/DGR Mamm combined tissue loans
**** Birds/DGR Birds combined tissue loans
***** Mammals/Birds/DGR

**Collection Usage.** In total, 28,300 new NK numbers were issued from DGR to the MSB mammal and MSB bird divisions for use in their projects in Panama, Mongolia, Alaska, Peru, Canada, the Pacific Northwest and New Mexico. In 2014 the DGR received close to 30,000 tissue vials. Loans processed include 33 tissue loans for the MSB Mammal division containing 614 specimens, and 15 loans for the MSB Bird division, containing 214 bird specimens, for a total of 48 loans (828 specimens) to 14 states, and 4 foreign countries. Loans included 15 tissue loans for 6 UNM post-baccalaureate, graduate, and postdoctoral students.

3. **COURSES USING THE COLLECTION**

**UNM Classes receiving loans of DGR material for educational purposes**

BIOL 599 – Masters Thesis. Spring (1 student, 3 tissue loans)
BIOL 699 – Dissertation. Spring (3 students, 4 tissue loans)
BIOL 699 – Dissertation. Fall (2 students, 3 tissue loans)
UNM courses or programs using the DGR collection through visits or staff presentations.

- BIOL 486L - Mammalogy, Fall (19 students, 2 instructors)
- UNM Biology student interest group (10 students, 1 instructor)
- UNM prospective grad students' tour (24 students, 1 instructor)

Visiting researchers: Institutions or Departments:
- UNM Stable Isotopes Group (25)
- UNM Pre-Award Office (10)

Other Visitors:
- Dr. Jennifer K. Frey, New Mexico State University (with 11 students)

4. COURSES TAUGHT BY MSB PERSONNEL

Faculty/Collection Managers

See MSB Mammal/MSB Bird Division reports

5. COLLECTION MANAGEMENT

MSB DGR added ~12,428 new specimens and approximately 30,000 new frozen vials during 2014.

Current projects generating specimens for DGR

Collaborative Integrative Investigations of Biomes of the Arctic (CIIBA)
- Joseph Cook, Kurt Galbreath, Eric Hoberg—NSF 1258010

High Latitude Contact Zones - Andrew Hope, Joseph Cook – Alaska (USGS, NPS)

Ladder Ranch and Greater Gila Ecosystems Project Project - Joseph Cook, Amanda Jones (UNM, GPSA)

Peruvian Bird Survey –Chris Witt (NSF)

Mexican wolf reintroduction – ongoing, Jon Dunnum, USFWS

Panama Hantavirus – Joseph Cook, Jon Dunnum, Blas Armien—Gorgas Institute

Mammalogy and Tropical Biology classes - Joseph Cook (UNM)

The majority of staff time was spent:

1. Developing the ARCTOS database.
2. Conversion of DGR locator to Arctos object tracking system
3. Integration of all former Arctos DGR specimens into their respective databases in MSB Mamm, MSB Birds, and the transfer of all DGR Fish records to a new MSB Fish portal; DGR has been removed as a separate database in Arctos; all new loans and accessions are processed through respective divisions as of August 2014.
4. Processing MSB mammal and MSB bird tissue loans.
5. Preparation, cataloging, and installation of new specimens.
6. Data entry for new accessions.
7. Supervising and training students and personnel in field and lab specimen and data collection and preparation
9. Equipment monitoring 24 hours a day, 7 days a week.
10. Maintaining the DGR Bio-safety Level II Laboratory.
11. USDA, UNM Bio-safety inspections and compliance.
12. Rausch specimen integration NSF 1057383

6. AWARDS, GRANTS, AND CONTRACTS
See MSB Mammal/MSB Bird/MSB Parasite divisional reports

7. PUBLICATIONS

MSB Bird Publications referencing DGR (see MSB Bird Division Report):


MSB Mammal Publications referencing DGR (see MSB Mammal Division Report):


44. Plyusnin, A., & Sironen, T. (2014). Evolution of hantaviruses: Co-speciation with reservoir hosts for more than 100MYR. Virus research.


A. **Books, Book Chapters, Edited Volumes**

B. **Journal Articles**
See Bird and Mammal Division reports

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

D. **Technical Reports**
Annual Report, Division of Genomic Resources, Museum of Southwestern Biology

E. **Theses/Dissertations Completed**
See Bird and Mammal Division reports

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

G. **Publications/Reports Based on MSB Specimens/Data by Outside Researchers**
See Bird and Mammal Division Reports

H. **Theses/Dissertations**
See Bird and Mammal Division Reports

8. **ACTIVITIES IN LEARNED SOCIETIES**
A. **Invited/ Plenary talks**

B. **Attendance at Professional Meetings**
C. Service as Editor or on Editorial Board of a Journal

D. Service as Officer or Professional Society/Organization

9. OTHER PROFESSIONAL ACTIVITIES

A. Presentations to General Audience in a Scholarly Capacity

B. Seminars

C. Workshops

Campbell, Mariel L.
Arctos Database and Collections Management System Demo Workshop, University of Michigan, Ann Arbor, Dec 14-16, 2014

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

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

Campbell, Mariel L.
Arctos database advisory committee

F. Journal Referee

G. Hosting Professional Colleagues and Groups

9. SERVICE

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

B. Public Service

General

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

Parmenter, C.A.
Divisional tours and presentations – provided educational tours and information for visitors and school groups, January – July 2014

Campbell, Mariel L.
Divisional tours and presentations – provided educational tours and information for visitors and school group for MSB DGR, MSB Mamm, and MSB Para, August – December 2014.

C. University and Departmental Committees

10. DONATIONS AND GIFTS RECEIVED
11. CURRENT STAFF

Faculty/Staff

J.A. Cook, Curator
C.A. Parmenter, Collection Manager (retired July 2014)
Mariel L. Campbell, Collection Manager (August 2014 to present)

Graduate students

Cook, J.A.
  (Reported in Mammal Division report)
Witt, C.
  (Reported in Bird Division report)

Grad Student Research Assistant DGR

  1. Bryan Mclean (Spring 2014)
  2. Jocelyn P. Colella (Fall 2014)

Undergraduate Student Workers and Volunteers

  1. Matthew P. Segura (Fall 2014)
  2. Chauncey Gadeck (Fall 2014)

12. MUSEUM ASSOCIATES

Curatorial Associates

Research Associates

See Bird and Mammal Division Reports
DIVISION OF FISHES

1. DIVISION HIGHLIGHTS

Currently, the MSB Division of Fishes has 96,657 cataloged lots of fishes (4,169,658 specimens). During the year, 1,894 lots of fishes (61,140 specimens) were cataloged and integrated into the main collections. To date, there are 69,073 digital files of field notes and 650 jpg files of habitat photographs and specimens (for color). There are 38,881 specimen locality records, georeferenced using decimal latitude and longitude.

MSB fish records are now available through FishNet2, http://fishnet2.net/aboutFishNet.html and can be mapped using this portal. Through a three year NSF grant, Collaborative Research: Georeferencing US Fish Collections, a community-based model for georeferencing natural history collections, the Division hired a full-time georeferencing technician to work collaboratively with other museum georeferencing technicians, to assign mapping coordinates to specimen records for 15 collections of fishes, including the MSB.

Guests hosted by Dr. Thomas F. Turner, Curator of Fishes: Dr. Christopher Hoagstrom, Associate Professor, Weber State University, sabbatical visitor AY 2013-2014. Dr. Mark Pyron, Professor, Ball State University, sabbatical visitor, 1 November 2014 – 4 November 2014, seminar speaker. Also hosted were Dr. Allison Pease, Assistant Professor, seminar speaker from Texas Tech University and Dr. Manda Jost, Professor, seminar speaker from Western New Mexico University.

Outreach Summary: Sandia Preparatory School, January 2014 (3 hours), UNM Museum Studies Program 476/576 (1 hour), UNM College Arts and Sciences tour (1 hour), UNM Stable Isotope Seminar Group Tour (15min), UNM Biology New Graduate Student Tour (15min), UNM Honors College 201 People and Animals (1 hour), Montessori of the Rio Grande Charter School 1st to 3rd Grades Tour (1 hour), New Mexico Natural History Museum Meet the Experts (3 hours).

2. TABLE OF COLLECTION USE

<table>
<thead>
<tr>
<th>Collection Growth</th>
<th>Loans Out</th>
<th>Professional Visitors</th>
<th>Collection Web Activity</th>
<th>Requests for Information</th>
<th>Publications by MSB Staff &amp; Assoc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>61,140 specimens</td>
<td>11</td>
<td>28</td>
<td></td>
<td>47</td>
<td>27</td>
</tr>
<tr>
<td>Publications by others using MSB specimens/data</td>
<td>Technical Reports by MSB Staff</td>
<td>UNM Courses using MSB resources</td>
<td>UNM Courses taught by MSB staff</td>
<td>Graduate Students MSB mentored</td>
<td>MSB Graduate Students’ Theses/Dissertation</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Undergraduate Students employed</td>
<td>Grants and contracts in force</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>18</td>
<td></td>
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</table>
3. UNM COURSES USING THE COLLECTIONS

<table>
<thead>
<tr>
<th>TERM</th>
<th>COURSE</th>
<th>TITLE</th>
<th>STUDENTS</th>
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<tbody>
<tr>
<td>Fall</td>
<td>ART 106</td>
<td>Drawing I</td>
<td>22</td>
</tr>
<tr>
<td>Spring &amp; Fall</td>
<td>BIOL 204L</td>
<td>Plant and Animal Form and Function</td>
<td>60</td>
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<tr>
<td>Spring</td>
<td>MSST 476/576</td>
<td>Museum Collection Management</td>
<td>12</td>
</tr>
<tr>
<td>Spring</td>
<td>NMSU-FWCE 450</td>
<td>The Natural History Museum in Modern Society</td>
<td>9</td>
</tr>
</tbody>
</table>

4. UNM COURSES TAUGHT BY MSB STAFF

<table>
<thead>
<tr>
<th>INSTRUCTOR</th>
<th>TERM</th>
<th>COURSE</th>
<th>TITLE</th>
<th>STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>T.F. Turner</td>
<td>Spring &amp; Fall</td>
<td>BIOL. 402/502</td>
<td>Ecology and Evolution of Fishes</td>
<td>15</td>
</tr>
<tr>
<td>T.F. Turner</td>
<td>Spring &amp; Fall</td>
<td>BIOL. 599</td>
<td>Master’s Thesis</td>
<td>3</td>
</tr>
<tr>
<td>T.F. Turner</td>
<td>Spring &amp; Fall</td>
<td>BIOL. 699</td>
<td>Dissertation</td>
<td>1</td>
</tr>
<tr>
<td>T.F. Turner</td>
<td>Spring</td>
<td>BIOL. 400</td>
<td>Senior Thesis</td>
<td>1</td>
</tr>
</tbody>
</table>

5. COLLECTION MANAGEMENT

On 24 July 2014, the NM Department of Homeland Security and Emergency Management (Region 6 FEMA) awarded the Museum of Southwestern Biology funds to purchase restraint bars for the shelves that hold all of the MSB fluid preserved collections. These shelving bars will help prevent jars of irreplaceable collections from falling over the edges of the shelves during seismic events.

Four undergraduate student Research and Curatorial Assistants and one staff Curatorial Assistant and the Collections Manager processed specimens, genetic samples, and digitized field notes received from several ongoing projects: Wyoming Dept. Game and Fish, USFWS NM/TX Fish and Wildlife Conservation Office (Albuquerque), US Bureau of Reclamation (Salt Lake City and Albuquerque), US Bureau of Land Management (Taos and Las Cruces), BioPark Aquatic Conservation Facility (Albuquerque), American Southwest Ichthyological Researchers, New Mexico Dept. Game and Fish, New Mexico Dept. of Environment, and supported Turner Lab research: Megan J. Osborn, Ph.D., Evan W. Carson, Ph.D., Nathan R Franssen, Ph.D., and Michael Schwemmel, Ph.D.

6. AWARDS, GRANTS, AND CONTRACTS:  *F&A for MSB at 75%

Acquisition of Instrumentation for Compound-Specific Stable Isotope Analysis at the University of New Mexico. National Science Foundation S. Newsome (PI) & T. Turner (co-PI with 4 others). Total: $314,315  F&A: $160,300

17 April 2014 to 30 December 2014. Total: $164,000  F&A: $63,200

Razorback Sucker Diversity Assessment. T. F. Turner (PI) UNM subcontract for Wayne State University, Detroit. 1 August 2014 to 30 June 2015. Total: $21,125  F&A: $3,146.

Effects of the Whitewater-Baldy Complex Fire. T.F. Turner (PI) and T. J. Pilger (coPI)
New Mexico Department of Game and Fish. 1 March 2014 to 30 June 2016. Total: $72,000 Annual: $24,000  F&A: $4,800.


*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 CoPI. New Mexico Department of Game and Fish. 1 July 2012 to 30 Jun 2015. Total: $140,000. Annual: $20,000 F&A: $1,818.


7. PUBLICATIONS

A. Books, Book Chapters, Edited Volumes


B. Journal Articles


C. Technical Reports


D. Theses/Dissertations Completed: NONE TO REPORT

E. Work In Progress


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


8. ACTIVITIES IN LEARNED SOCIETIES
A. Invited/Plenary Talks and/or Seminars (Presenters’ name in bold)


B. Contributed Talks/Posters (Presenters’ name in bold)
Refuge. 46th annual meeting of the Desert Fishes Council, San José del Cabo, Baja California Sur, México.


**C. Attendance at Professional Meetings**

E.W. Carson

R.K. Dudley
  - San Juan River Basin Recovery Implementation Program, Biology Committee. Fort Lewis College, Durango, CO. 26–27 February 2014.

M.A. Farrington
  - San Juan River Recovery Implementation Program, Biology Committee. Fort Lewis College, Durango, CO. February 2014.

N.R. Franssen
• San Juan River Recovery Implementation Program, Biology Committee. San Juan Public Lands Center, Durango, CO. 26-27 February 2014.
• Southwestern Association of Naturalists. Stillwater, OK. April 17-20 2014.
• San Juan River Recovery Implementation Program, Biology Committee. San Juan Public Lands Center, Durango, CO. 21-22 May 2014.
• San Juan River Recovery Implementation Program, Biology Committee. San Juan Public Lands Center, Durango, CO. November 3-4 2014.
• San Juan River Recovery Implementation Program, Biology Committee. San Juan Public Lands Center, Durango, CO. December 3-4 2014.

D.L. Propst
• Desert Fishes Council, 46th Annual Meeting, Cabo San Jose, Baja Sur, 19-23 November 2014.

S.T. Ross
• San Juan River Recovery Implementation Program, Biology, Public, and Coordination Committee meetings. U.S. Forrest Service Office, Durango, CO. 21-23 May 2014.
• 94th annual meeting of the American Society of Ichthyologists and Herpetologists, Chattanooga, TN. 30 July-3 August 2014

A.M. Snyder
• 94th annual meeting of the American Society of Ichthyologists and Herpetologists, Chattanooga, TN. 12-15 July 2014

M.R. Schwemm
• Mississippi Interstate Cooperative Resource Association, Paddlefish and Sturgeon Steering Committee, Miami, OK. March 2015.
• Southern Division of the American Fisheries Society, Charleston, SC. January 2014.
• 94th annual meeting of the American Society of Ichthyologists and Herpetologists, Chattanooga, TN. 12-15 July 2014.
• 61st annual meeting of the Southwestern Association of Naturalists, Stillwater in Oklahoma. April 2014.
• Oklahoma and Texas chapters of the American Fisheries, Pottsboro, Texas. January 2014.
• Southern Division of the American Fisheries Society, Charleston, SC. January 2014.

T. F. Turner
• 94th annual meeting of the American Society of Ichthyologists and Herpetologists, Chattanooga, TN. 12-15 July 2014

D. Service as Editor or on Editorial Board of a Journal
N.R. Franssen
• Contributing Editor - Southeastern Naturalist, since 2012.

T.F Turner
• Contributing Editor – Aquatic Biology, since 2008

E. Service as Officer of Professional Society/Organization
E.W. Carson
• Conservation Committee for Cuatro Ciénegas. 2002-present. Desert Fishes Council.

T.J. Pilger
• Treasurer of University of New Mexico Biology Graduate Student Association
• Graduate Student Representative UNM Faculty Search Committee
S.T. Ross  
• Member, Long Range Planning and Policy Committee, American Society of Ichthyologists and Herpetologists, 2007-2014.  
• Board of Governors, American Society of Ichthyologists and Herpetologists, 2012-2017
A.M. Snyder  
• Board of Governors, American Society of Ichthyologists and Herpetologists, 2011-2016.
T. F. Turner  
• Board of Governors, American Society of Ichthyologists and Herpetologists, 2013-2018

9. OTHER PROFESSIONAL ACTIVITIES

A. Presentation to General Audience in a Scholarly Capacity  
T.J. Pilger  

B. Presentations in a Scholarly Capacity at Hearings, Workshops, Legislative Committees  
D.L. Propst  
• Aquatic Ecologist, TNC Gila River Flows Workshop, Silver City, NM, 8-9 January 2014.
• Aquatic Ecologist, NM Legislature Interim Water and Natural Resources Committee, Environmental Effects of Modified Flows on Gila River Aquatic Fauna, Las Vegas, NM, 1 October 2014.

C. Scholarly Service as a Member of a Local/State/Regional/Nat’l Committee, Panel  
R.K. Dudley  
• Member of Technical Subgroup, Rio Grande Silvery Minnow (Hybognathus amarus) Recovery Team, US Fish and Wildlife Service.

M.A. Farrington  
• Member (Conservation Representative) for the Citizen Advisory Committee Habitat Stamp Improvement Program, New Mexico Department of Game and Fish.

M.J. Osborne  
• Member, Rio Grande Silvery Minnow Propagation and Genetics Workgroup

D.L. Propst  
• Member & Team Leader, Gila Trout and Chihuahua Chub Recovery Team (U.S. Fish and Wildlife Service)
• National Conservation Training Center. Rotenone & Antimycin Use in Fisheries Management. 4-8 March 2014, Albuquerque, NM

S.T. Ross  
• Member, Peer Review Panel, San Juan River Basin Recovery Implementation Program (SJRRIP). 2014
A.M. Snyder
  • Vice Chair and Scientific Member, UNM Institutional Animal Care and Use Committee. 2010-2016.

T.F. Turner
  • Member, Gila Trout and Chihuahua Chub Recovery Team
  • Member, Rio Grande Silvery Minnow Propagation and Genetics Workgroup
  • Appointed UNM Representative to the Executive Committee, Middle Rio Grande Endangered Species Act Collaborative Program (MRGESACP).
  • Member Independent Science Advisory Board, Northwest Power and Conservation Council
  • UNM Representative to New Mexico Department of Game & Fish Statewide Conservation Plan meeting.
  • Invited participant, Middle Rio Grande Conservancy District Conservation Planning meeting.

D. Journal Referee
E. W. Carson
Biological Conservation (1), Conservation Genetics (3) Ecology of Freshwater Fishes (1), Environmental Biology of Fishes (1), Evolutionary Ecology (3), Hydrobiologia (1), Journal of Fish Biology (1)

N.R. Franssen
Biological Journal of the Linnean Society (2), Evolutionary Applications (1), Hydrobiologia (3), Environmental Biology of Fishes (1), Freshwater Science (1), Freshwater Biology (2), Copeia (1), Diversity and Distributions (1), Journal of Fish Biology (1), Aquatic Conservation: Marine and Freshwater Ecosystems (1), PLOS ONE (1), Southeastern Naturalist (3)

M.J. Osborne
Molecular Ecology (1) Conservation Genetics (1)

D.L. Propst
Freshwater Biology (1), Southwestern Naturalist (1)

S.T. Ross
Aquatic Biology (1)

M.R. Schwemm
Ecology of Freshwater Fishes (1), Environmental Biology of Fishes (1), Southeastern Fishes Council Proceedings (1)

T.F. Turner
American Midland Naturalist (1), Bioscience (2), Copeia (1), Ecology (1), Evolution (1), Fishes of Arkansas – Book Chapter (1), Freshwater Biology (2), J Heredity (1), Marine Ecology Progress Series (1), NSF Proposals (2).

E. Hosting Professional Colloquia and Groups NONE TO REPORT

10. SERVICE
A. Symposia, Workshops, Conferences etc. Sponsored, Organized, Held, etc.
T. F. Turner
  • Panelist and Presenter, Workshop on Biological Impacts of Proposed Diversion under the Arizona Water Settlement Act (AWSA). Organized by The Nature Conservancy and hosted by the University of New Mexico.
• 2014: Invited speaker and panelist for Biorama-UNM Department of Biology, Life After a Bachelor’s in Biology? Working in Research.


B. Public Service NONE TO REPORT

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

E.W. Carson
• 2014 Desert Fishes Council Conservation Award, Mitochondrial DNA variation in the Pupfishes (Cyprinodontidae) of Chihuahua, México. $980
• 2014 Desert Fishes Council Conservation Award, Feasibility, design, and establishment of a refuge population for the critically endangered Carbonera Pupfish, Cyprinodon fontinalis. Shared award with Mauricio De la Maza-Benignos, Pronatura Noreste, A.C. $5,000

D.L. Probst
• 2014 Lifetime of Achievement, in Conservation, Education and Research Award, Fifth Natural History of the Gila Symposium, Silver City, NM
• 2014 Trout Unlimited—Trout Conservation Award: Professional, Santa Fe, NM

A.M. Snyder
• 2014 UNM Biology Dept. Staff Award $1,000

12. DONATIONS AND GIFTS RECEIVED (non-specimen)
Astrid Kodric-Brown, UNM Emeritus. Donation of ichthyological books for MSB library

13. CURRENT STAFF
A. Faculty/Staff
Evan W. Carson, Research Assistant Professor
Nathan R. Franssen, Postdoctoral Researcher
Megan J. Osborne, Research Assistant Professor
Steven P. Platania, Associate Curator of Fishes
David L. Probst, Curatorial Associate and UNM Adjunct Professor of Biology
Stephen T. Ross, Curator Emeritus and UNM Adjunct Professor of Biology
Alexandra M. Snyder, Collections Manager
Maribel Solis, Staff Curatorial Assistant
Michael Schwenmm, Visiting Research Scholar
Thomas F. Turner, Curator of Fishes, UNM Professor of Biology, and UNM Associate Dean for Research

B. Graduate students
Museum Research Assistants-Graduate Student TA
Rosalee A. Reese Fall 2014

MSB Fishes Graduate Students, UNM Biology
Adam L. Barkalow, M.Sci. student
Michael A. Farrington, M.Sci. student
Tyler J. Pilger, Ph.D. student
Rosalee A. Reese, M.Sci. student
C. Undergraduate Student Employees, Lab and Museum
Kendra Brunet Lecomte, A&S Biology
Larissa E. Garcia, UNM School of Business
Alyssa Sanchez, A&S Biology

14. MUSEUM ASSOCIATES
A. Curatorial Associates

B. Research Associates

W. Howard Brandenburg, American Southwest Ichthyological Research, Albuquerque
Stephani Clark Barkalow, M.S. American Southwest Ichthyological Research, Albuquerque
James E. Brooks, retired US Fish and Wildlife Service, Albuquerque
Brooks M. Burr, Ph.D. Southern Illinois University, Carbondale
John M. Caldwell, M.S. New Mexico Dept. Game and Fish, Santa Fe
Michael Collyer, Ph.D. Western Kentucky University, Bowling Green
Thomas E. Dowling, Ph.D. Wayne State University, Detroit
Robert K. Dudley, Ph.D. American Southwest Ichthyological Research, Albuquerque
Michael A. Farrington, American Southwest Ichthyological Researchers, Albuquerque
Keith B. Gido, Ph.D. Kansas State University, Manhattan KS
Eliza I. Gilbert, M.S. New Mexico Dept. Game and Fish, Santa Fe
Jennifer L. Kennedy, American Southwest Ichthyological Research, Albuquerque
Astrid Kodric-Brown, Ph.D. Emeritus, University of New Mexico, Albuquerque
Richard L. Mayden, Ph.D. St. Louis University, St. Louis MO
Andrew Monie, M.S. New Mexico Dept. Game and Fish, Santa Fe
Kirk A. Patten, M.S. and J.D. New Mexico Dept. Game and Fish, Santa Fe
Norman Mercado Silva, Ph.D. El Colegio de la Frontera Sur, Unidad Chetumal & Univ. de la costa Sur, Univ. de Guadalajara
1. DIVISION HIGHLIGHTS

The UNM herbarium contained more than 130,680 accessioned specimens of vascular and non-vascular plants at the end of 2014. Each specimen represents the field efforts of the collector and is mounted individually by student employees, databased, stored, and available for web-based, in-house, or outgoing-loan access by the public.

This year our primary focus was on accomplishing much-needed curatorial tasks, and modernizing our web-based database for better stability and accessibility by the public.

Two projects of note are the Brother Arsene collection that was given to UNM by the College of Santa Fe and the recent gift of 1317 specimens from the Bureau of Land Management, Rio Puerco office. Each of the Brother Arsene specimens, most from the 1920s, was imaged in its original condition and then removed from its paper and remounted, preserving the original label. Many of the specimens in the Rio Puerco gift are not archival in their present condition and will require careful attention as part of the accessioning process.

We have imaged over 11,000 specimens and have been working with the UNM libraries to make these images web-accessible in 2015. These images will be tied to a new mirror of the Arizona-based bioinformatics server SEINet, making herbarium records available to the public. The Southwest Environmental Information Network or SEINet (121,701 individuals visited the site in 2014; 224,320 total visits to http://swbiodiversity.org/seinet/, with over 1 million page views).

Interpretive activities or collections-related outreach includes tours for the public, including K-12 and UNM students. The Herbarium works closely with the Native Plant Society of New Mexico (NPSNM) and the New Mexico Rare Plant Technical Council, as well as local schools and the Bosque Ecosystem Monitoring Project.

2. TABLE OF COLLECTION USE

<table>
<thead>
<tr>
<th>Collection Growth (specimens catalogued &amp; entered in collection)</th>
<th>Loans/# specimens (outgoing)</th>
<th>Visitors (not including some tour groups)</th>
<th>Information Requests Personally Responded to</th>
<th>Publications Citing MSB Specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>752</td>
<td>15/441</td>
<td>146</td>
<td>130</td>
<td>XXX</td>
</tr>
</tbody>
</table>

3. COURSES USING THE COLLECTIONS

Fall 2014: Biol. 463-Flora of New Mexico-11 students (9 undergrads, 1 graduate student, 1 audit).
Summer 2014: Water Resources 573-12 student (10 graduate, 2 undergraduate)
4. COURSES TAUGHT BY MSB PERSONNEL

A. Faculty

Lowrey, T.K.
Fall 2014: Biol. 463- Flora of New Mexico-11 students
Biology 502- The Impact on Botany on Society in Western Europe. UNM Summer Program at Schloss Dyck, Germany-5 students.

B. Graduate Students/ Research Associates

Bixby, R.J.
Courses taught:
Summer 2014: WR 573 (Water Field Methods) (12 students)
Spring, Summer 2014: BIOL 551- Research Problems (2 students)

Guest lectures:
BIOL 495 (Limnology): “Chemical composition of waters”, “Benthic algae I and II”, undergraduate and graduate, Spring 2014
BIOL 496 (Limnology lab): Algae lab, Spring 2014
BIO 535 (Freshwater Ecology): “Southwestern rivers”, Fall 2014

5. COLLECTION MANAGEMENT

The UNM Herbarium remounted 1100 specimens from the early 1900s. These specimens, part of the Brother Arsene Collection, were imaged in their original condition and then removed from their acidic paper. Once free they were mounted onto acid-free paper using modern techniques to preserve both the specimen and the historic label. We processed and added 752 new acquisitions to the collection. Our division received 10 gifts from various collectors and institutions, resulting in an increase of 752 accessioned specimens. All records were databased and made available for public access via SEINet.

The herbarium made 15 loans and logged more than 140 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.

6. AWARDS, GRANTS, AND CONTRACTS

NM Water Resources Research Institute Student Water Research Grant, “Fire ash influences on aquatic primary producers through changes in water quality, $5220, Awarded to Clark and Bixby, 2014-2015

7. PUBLICATIONS

A. Books, Book Chapters, Edited Volumes


B. Journal Articles


C. Curriculum Development

Biology 402/502. HIST 300, INTS410: The Impact on Botany on Society in Western Europe. UNM Summer Program at Schloss Dyck, Germany.

D. Technical Reports

Survey of State Trust Land for *Townsendia gypsophila* Lowrey & P.Knight (Asteraceae) and *Abronia bigelovii* Heimerl. T. Lowrey. New Mexico State Land Office.


By Herbarium Associates:


E. Theses/Dissertations Completed

Spring 2014, Maureen Meyer, M.S. Geography
Spring 2014, Heidi Hopkins, Ph.D. Biology
Spring 2014, Michael Medrano, Ph.D. Biology
Summer 2014, Roxanne Candelaria-Ley, M.S. Biology

F. Work In Progress


**Ph.D. Advisement:**
**University of New Mexico**

Committee member for Karen Wright, Ph.D. candidate.

**Becky Bixby:**

Shannon Rupert, 2008-present, present, Bixby, co-advised with Cliff Dahm

Committee member for doctoral students:

John M. Roesgen, Ph.D., Department of Biology, University of New Mexico, 2013-present

Mark Horner, Ph.D., Department of Biology, University of New Mexico, 2011-present

Virginia Thompson, M.S., Department of Biology, University of New Mexico, 2010-present

**M.S. Advisement:**
Committee Member:
Tim Lowrey. Spring 2013, William Maxwell, M.S. Geography Department
Tim Lowrey, Spring and Fall 2013, Maureen Meyer, M.S. Geography Department

**Becky Bixby:**
Advisor:

April Fox, Master in Water Resources, 2014-present.
Committee Member for completed M.S. degree
Committee member for additional master student
Steve Scholle, M.S. Department of Biology, University of New Mexico, 2009-present

**Undergraduate Advisement:**

Alex Clark, University of New Mexico, directed study, 2012-present. “Epiphytic diatom patterns on macrophytes in the East Fork of the Jemez River.” [Undergraduate Travel Award, Society for Freshwater Science, $600, Honors thesis].

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

Older, but not reported previously:
Available at: http://scholarship.claremont.edu/aliso/vol30/iss2/3


8. ACTIVITIES IN LEARNED SOCIETIES

A. Invited/Plenary Talks and/or Seminars

C. Contributed Talks/Posters


Thompson, V. F., Bixby, R. J., Dahm, C. N. 2014. Effects of catastrophic forest fire on submerged aquatic macrophytes in a mountain stream. Joint Aquatic Sciences Meeting, Portland, Oregon.


C. Attendance at Professional Meetings

Bixby, R.J. Joint Aquatic Sciences Meeting, Portland, OR, May 2014

D. Service as Editor or on Editorial Board of a Journal
Co-organizer and associate editor for special issue of Freshwater Science, “Impacts of fire on freshwater ecosystems” (publication 12/15, 25 papers)

E. Service as Officer of Professional Society/Organization
Lowrey, T.K.
Member, Board of Directors, Flora North America, Elected.

Flora North America Editorial Board

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

**Bixby, R.J.**
Co-Chair, Public Information and Publicity Committee, Society for Freshwater Science, 2013-present
Research Associate, New Mexico Museum of Natural History and Science.

9. OTHER PROFESSIONAL ACTIVITIES

A. Presentation to General Audience in a Scholarly Capacity (*presenter)

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

Museum Studies Degree Program, Higher Education Department, State of New Mexico March 2013
N.M. State Board of Finance, July 2014

Grant Proposal Reviewer, Institute of Museum and Library Services, Washington, D.C. April 2013

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

**Bixby, R.J.**

UNM representative (appointed), Consortium of Universities for the Advancement of Hydrologic Sciences, Inc. (CUAHSI), 2013-present
Science-Cyberinfrastructure liaison, Bioalgal energy group, NM EPSCoR “Energize New Mexico” grant, 2013-present

Lead, graduate student externship program (exchange program among NM universities), NM EPSCoR “Energize New Mexico” grant, 2013-present

Member, Literature Review Committee, Society for Freshwater Science

Member, American Society of Limnology and Oceanography
Member, Ecological Society of America
Member, International Society for Diatom Research
Member, New Mexico Academy of Science
Member, Organization for Tropical Studies
Member, Phycological Society of America
Member, Society for Freshwater Science

**Lowrey, T.K.**
Member, Editorial Board of Flora North America (still current).
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.
Regional Reviewer for the Flora of North America Project.

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

D. Journal Referee

Bixby, R.J.
Algal Research-1
Diatom Research-1
Hydrobiologia-1
New Mexico Journal of Geology-1

Lowrey, T.K.
Taxon – 1
Systematic Botany-1

E. Hosting Professional Colloquia and Groups

F. Field Research

10. SERVICE

A. Symposia, Workshops, Conferences etc. Sponsored, Organized, Held, etc.
   Special session on fire impacts of ecosystems at Joint Aquatic Sciences Meeting, Portland, OR,
   May 2014, 16 presenters

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 in New
Mexico. Current focus is on the conservation botany of the Todsen’s Pennyroyal (Hedeoma todsenii).

Bixby, R.J. Hosted Integrated Field Program, University of Georgia, Field exercise comparing
vegetation and groundwater levels in the Rio Grande bosque, June 2014

C. University and Departmental Committees
Lowrey, T.K.
Committee on Governance, Co-chair.
Associate Deans of Research Committee
UNM Economic Development Committee
UNM Academic Program Review Committee
OGSnet
Provost’s Committee on Academic Success
Administrative Units Assessment Committee

Bixby, R.J.
Program committee (appointed), Water Resources Program

11. ADVANCED STUDY, HONORS, AWARDS, FELLOWSHIPS, ETC.
Alex Clark (undergraduate), Water Resources Research Institute Student Research Grant, $5220

12. DONATIONS AND GIFTS RECEIVED
$500 annually. Native Plant Society donation for New Mexico Herbaria.
Plant Specimens
Wood Block Collection – local and world-wide specimens – David Bleakly

13. CURRENT STAFF (List Faculty/Staff, Students and Volunteers)

A. Faculty/Staff
Lowrey, T.K., Curator and Associate Dean of Graduate Studies.
Tonne, P., Collection Manager

B. Graduate students
Wetherill, Karen (Spring/Summer/Fall 2014)
Gautreaux, Matthew (Fall 2014).

C. Undergraduate Student Workers and Volunteers
Alex Clark, Student and employee for Bixby, Junior (Fall and Spring 2014)
Melissa Bacigalupa - Volunteer (Spring/Summer 2014)
Ali Fretz – Volunteer (Summer 2014).

14. MUSEUM ASSOCIATES

A. Curatorial Associates
Sivinski, R., Former New Mexico State Botanist – Forestry Division EMNRD

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

1. DIVISION HIGHLIGHTS.

B. Collection Growth. The DOM added 11,469 new specimens to its catalogue during 2013 and now contains 267,842 cataloged specimens. The collection is currently the 3rd largest collection in the Western Hemisphere and in the top 4 worldwide. New accessions of mammalian material amounted to >11,000 specimens.

The continued exceptional growth is the result of several facets of our operation:

a. Specimen growth through fieldwork
   i. Directed specimen-based studies within Joseph 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 key geographic regions and for critical taxa.

b. Specimen growth through donation
   i. A well-developed network of researchers and agencies worldwide are now heavily invested in the DOM, by continuing to deposit their material here and later track and retrieve information via the Arctos database.
   ii. Donations of personal collections from individual researchers.

Continued growth and use, in addition to recognition by several agencies that DOM is a primary repository for research material, points to the strength and good standing of this infrastructure in the greater scientific community.

C. Training in specimen based research and curation. Training remains one of the integral goals of the DOM. Students gain experience in bioinformatics, natural history collection preparation and curation, and field and laboratory based research. Students were involved in all activities of the division during 2014.

   a. 21 UNM students worked in the division in 2014
      i. 4 graduate students
      ii. 9 paid undergraduates
      iii. 7 volunteer undergraduates
   b. Of these 23:
      i. 15 were females
      ii. 5 males
      iii. 5 were from under-represented groups
   c. 13 Albuquerque Public Schools high school interns/volunteers

Publications citing MSB DOM specimens. The DOM collection continues to be utilized heavily in a wide range of disciplines and is the basis for a large number of peer-reviewed publications and agency reports. Tracking all publications that utilize our specimens is difficult, as not all authors are careful to acknowledge use of DOM specimens. Thus the number of publications that are based on our material should be viewed as an underestimate.
During 2014 DOM specimens were cited or specimen data was utilized in at least 79 studies published in 44 journals:

1. Acta Palaeontologica Polonica
2. American Museum Novitates
3. Animal Behaviour
4. Annales Zoologici Fennici
5. Archives of Virology
6. Biological Journal of the Linnean Society
7. BioScience
8. Bulletin de l'Academie veterinaire de France
9. Canadian Journal of Zoology
10. Check List
11. Comparative Parasitology
12. Conservation Genetics
13. Conservation Genetics Resources
14. Emerging Infectious Diseases
15. Epidemiology and Infection
16. Evolution
17. Gene
18. Heredity
19. Infection, Genetics and Evolution
20. Journal of Biogeography
22. Journal of Heredity
23. Journal of Mammalogy
24. Journal of Virology
25. Mammalia
26. Mastozoología Neotropical
27. Methods in Ecology and Evolution
28. Molecular Biology and Evolution
29. Molecular Phylogenetics and Evolution
30. Northwestern Naturalist
31. Occasional Papers, Museum of Texas Tech University
32. Parasites & Vectors
33. PloS One
34. Proceedings of the Biological Society of Washington
35. Revista Mexicana de Mastozoologia
36. Special Publications, Museum of Texas Tech University
37. The American Journal of Tropical Medicine and Hygiene
38. The Southwestern Naturalist
39. Trends in Microbiology
40. Virus research
41. Viruses
42. ZooKeys
43. Zoologica Scripta
44. Zoological Journal of the Linnean Society

D. Theses/Dissertations.
   a. In 2014, at least 3 theses or dissertations from 3 institutions (UNM, Louisiana State University, and Universidade da Lisboa (Portugal), were completed that utilized MSB mammal specimens.
E. **Arctos database and collection accessibility.** The Arctos database is a cutting-edge relational database that continues to provide an invaluable resource for researchers, educators, public health workers, and natural resource managers worldwide. Arctos is web-accessible and greatly enhances the visibility of the MSB.

a. Web visits to Arctos db tracked via Google analytics = 123,084 visits
b. 5,909 visitors referred to our site were from GenBank.
c. From 211 countries
d. Queries containing records from DOM, DGR Mammals, or DOM observations:

<table>
<thead>
<tr>
<th>Collection</th>
<th>Queries</th>
<th>Specimen Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>DGR Mammals</td>
<td>3,559</td>
<td>227,106</td>
</tr>
<tr>
<td>MSB Mamm Obs</td>
<td>198</td>
<td>497</td>
</tr>
<tr>
<td>DOM</td>
<td>66,789</td>
<td>34,619,220</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>70,546</strong></td>
<td><strong>34,846,823</strong></td>
</tr>
</tbody>
</table>

F. **Educational Modules.**

In Spring 2014, Joe Cook co-taught a class with Eileen Lacey at the University of California Berkeley (8 students) on Climate Change and Museums. This course included a number of speakers (mostly from Berkeley and Stanford) covering topics related to how museum resources address the biology of climate change. We also developed web-based educational modules using museum specimens to illustrate various climate change concepts that can be viewed online and used by K-12 or undergraduate instructors. A paper outlining these approaches was published in *Bioscience*.

In Fall 2014, Joe Cook taught a web-distributed seminar on the Human Dimension of Natural History. This course included a series of speakers from biology, art, and geography departments on campus and elsewhere (e.g., Rob Dunn (North Carolina State University), Allison Miller (St Louis University), Sue Kutz (University of Calgary), Nancy Huntly (Utah State University), Eric Hoberg (USDA), Ric Yanagihara (U Hawaii), Szu-Han Ho (UNM)) who explored how museum collections impact various aspects of humanity (invasive species, pathogens, food security, domestic crops, etc). A module using hosts and parasites is now under development that will be accessible via the AIM-UP! website.

2. **COLLECTION USE**

<table>
<thead>
<tr>
<th>Collection Growth (specimens catalogued)</th>
<th>Loans (outgoing)</th>
<th>Loans (incoming)</th>
<th>Visitors</th>
<th>Information Requests Personally Responded to</th>
<th>Publications Citing MSB DOM Specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>11,469</td>
<td>42(707) / 20(461)**</td>
<td>4</td>
<td>447***</td>
<td>&gt;500****</td>
<td>79</td>
</tr>
</tbody>
</table>

* Total growth (Newly cataloged/converted from DGR catalog)

** Loans originating in DOM / loans of mammal tissue originating in DGR. Combined total of 62 loans of 1,168 specimens of traditional voucher specimens, skin clips and tissue samples.
47 visiting researchers from 17 institutions, 62 students and 7 teachers from 5 K-12 schools, 14 UNM classes (179 students and 14 instructors), 138 other visitors.

Estimate of email or phone requests to Jon Dunnum and Joe Cook.

3. COURSES USING THE COLLECTIONS

UNM Classes receiving loans of material for educational purposes (14 classes serving 1,036 students)

- BIOL 204L - Plant and Animal Form and Function. Spring (180 students)
- BIOL 204L - Plant and Animal Form and Function. Fall (180 students)
- BIOL 203L – Ecology and Evolution. Spring (240 students)
- BIOL 203L – Ecology and Evolution. Fall (240 students)
- Biol 419/519 – Ecology of the Past (10 students)
- BIOL 486L – Mammalogy. Fall (18 students)
- BIOL 386L – General Vertebrate Zoology. Fall (30 students)
- BIOL 386L – General Vertebrate Zoology. Spring (40 students)
- BIOL 599 – Masters Thesis. Spring (1 student, 3 loan)
- BIOL 599 – Masters Thesis. Fall (1 student, 1 loan)
- BIOL 699 – Dissertation. Spring (2 students, 3 loans)
- BIOL 699 – Dissertation. Fall (2 students, 4 loans)
- NTSC 262L – Spring (46 students)
- NTSC 262L – Fall (46 students)

UNM courses or programs using collection through visits or staff presentations (179 students, 14 instructors from 14 classes/programs).

- ART Studio 141 (Intro art/ecol), Spring (7 students, 1 instructor)
- ART Studio 141 (Intro art/ecol). 2 sections, Fall (28 students, 2 instructor)
- ART / ART HIST (20 students, 1 instructor)
- ART / ART HIST – Drawing I. 2 sec, Spring/Fall (39 students, 2 instructors)
- Bio Art/Design (Polli) (7 students, 1 instructors)
- BIOL 486L - Mammalogy, Fall (18 students, 1 instructors)
- MSST 476/576 Mus Studies (Traxler) (10 students, 1 instructor)
- UNM Mus Studies (Szabo) (8 students, 1 instructor)
- UNM Biology graduate student orientation (22 students, 1 instructor)
- UNM MARC Program (5 students, 1 instructor)
- UNM Honor’s students’ tour (7 students, 1 instructor)
- UNM Summer Teaching Program (8 students, 1 instructor)

K-12 schools and educational groups: 62 students, 7 teachers from 5 schools.

- Jefferson Middle school (1 student)
- Montessori on the Rio Grande (11 students, 2 teachers)
- Bosque School (36 students, 3 teachers)
- Amy Biehl High School (1 teacher)
- Cleveland Middle School AVID Program (13 students, 2 teachers)

Visiting researchers: 47 from 17 institutions or departments

- UNM Dept of Anthro/Contract Archaeology (20)
- UNM Dept of Biology (6)
- University of Nebraska-Kearney (1)
University of Nebraska-Lincoln  (1)
George Mason University  (1)
Brown University  (1)
National University of Mongolia  (1)
USGS Western Ecological Research  (3)
University of Sydney  (5)
New Mexico Dept Game and Fish  (1)
Wyoming Dept Game and Fish  (1)
North Dakota Dept Game and Fish  (1)
Montana Dept Wildlife and Parks  (1)
University of Alberta, Edmonton  (1)
World Wildlife Fund  (1)
USDI NPS Badlands NP  (1)
New Mexico Museum of Natural History / Science  (1)

Other visitors: 138
UNM Stable Isotope Working Group  (25)
UNM Geo-Epidemiology Workshop  (7)
UNM Alumni Office  (2)
UNM Pre-Award Office  (10)
UNM Biology  (4)
NMSU Wildlife Resources class (J.K. Frey)  (11)
CNM STEM Program  (10)
Catholic University of Ecuador  (3)
New Mexico Museum Natural History  (8)
Los Alamos National Labs  (1)
Sandia National Labs  (4)
Middle Rio Grande ESA  (11)
Travel Channel  (3)
Other  (39)

4. COURSES TAUGHT BY MSB PERSONNEL

A. Faculty/Collection Managers

Cook, J. A.

Spring:
- Biology 561 Tropical Biology  2
- Biol 502 006 Animal Hybridization  3
- Biol 502-004 Climate Change and Museums  5
- Bio 551 Research Problems  1
- Biol 699 Dissertation  4
- Biol 402/502 006 Animal Hybridization  4
- Biology 461 Tropical biology  14

Fall
- Biol 502 053 Human Dimension of Natural History  2
- Biol 502-055 Evolutionary Genomics  2
- Biol 551 Research Problems  1
- Biol 599 Master thesis  2
Student Mentoring

Undergraduates
1. Ryan Barber, UNM, May 1 to December 17.
2. Fernando Salazar-Miralles, Minority Access to Research Careers Program, UNM January 1 to August 30.
3. Kendall Calhoun, MARC, Summer visiting student from UC Berkeley, June-August.
4. Schuyler Liphardt, volunteer/paid, UNM, January to December.

High School Students
NSF-Research Activities for High School Students (RAHSS) 2014:
1. Moses Nagurski, Amy Biehl High School
2. Victoria Crosby, Amy Biehl High School
3. Gabriella Albert, Sandia Prep High School
4. Hannah Qualls, Sandia Prep High School

B. Graduate Students (labs, etc.)
BIOL 486L – Mammalogy
BIOL 402/502 - AIM-UP

5. COLLECTION MANAGEMENT
The DOM received 115 new accessions of material (>11,000 specimens) and added approximately 11,500 specimens to its catalogue during 2014.

Current projects generating specimens for DOM
Beringian Coevolution Project - NSF
Mexican wolf reintroduction – USFWS
Mongolian Vertebrate Parasite Project – NSF
Panama Hantavirus – ICIDR NIH
Bighorn Sheep Reintroduction Program – NMGF
ISLES---USDA Forest Service
Jackson Whitman Idaho collection
Black bear/elk predation project – NMDGF
Robert Rausch parasite host collection
Mammalogy and Tropical Biology classes
Troy Best collections

The majority of staff time was spent:
15. Training student technicians in museum work.
16. Preparation, cataloging and installation of museum specimens.
17. Data entry for the incoming accessions.
18. Filling information requests.
19. Processing loan material.
20. Assisting with UNM courses utilizing MSB specimens and facilities.
21. Outreach to K-12 schools.
### 6. AWARDS, GRANTS, AND CONTRACTS

#### Bell, K. C.
1. Grant-in-Aid of Research, *American Society of Mammalogists* $3,000
2. Joseph Alvin Gaudin Jr. Scholarship *Biology Department, UNM* $2750

#### Colella, J.
1. NESCent Academy Phylogenetic Analysis Using RevBayes, Travel Grant $600
2. University of New Mexico, Joseph Gaudin Fellowship $1,000
3. University of New Mexico, Graduate and Professional Student Association. Professional Development Grant $500
4. University of New Mexico, Biology Graduate Student Association, Graduate Resource Allocation Committee $400
5. University of New Mexico, Biology Graduate Student Association, Graduate Research, Allocation Committee, Travel Grant $150

#### Cook, J.A.
1. USGS Specimen Georeferencing (7/1/14-3/31/15) $49,980
2. NSF-REU Supplement to DEB 1258010 (3/1/13-2/28/16) $6000
3. NSF-REU Supplement to DEB 1057383 1/1/14-12/31/14 $11,000
4. NM Department of Homeland Security, Museum Seismic Mitigation 8/30/14-6/30/15 (co-PI) $81,829
5. USGS Cooperative Agreement, Tundra Preserves (6/11-12/14) now $123,000
6. USGS Cooperative Agreement, Tundra Preserves (6/11-12/14) now $123,000
7. 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 5/01/2010-4/30/2015. $485,648
8. NSF-DEB 1057383 1/11/12-32/14 Integration and Curation of the Robert and Virginia Rausch Helminthological Collection- A Resource for Science and Society in the MSB Division of Parasitology $489,490
9. College of Arts and Sciences, Turner Ranch Research Fund $10,000

#### Dunnum, J. L.
1. USGS Specimen Georeferencing (7/1/14-3/31/15) Co-PI $49,980
Jones, Amanda K.
1. The Joseph Gaudin Scholarship, UNM Department of Biology $2500
2. UNM GPSA New Mexico High Priority Research Grant $5000

McLean, Bryan
1. Research Grant, UNM Graduate Research Allocations Committee $400
2. Horner Award & Grant-in-Aid of Research, American Society of Mammalogists $2000
3. The Joseph Gaudin Scholarship, UNM Department of Biology $2750
4. Student Research Grant, UNM Graduate and Professional Student Assoc. $500
5. Research Grant, UNM Graduate Research Allocations Committee $400
6. Travel Grant, UNM Graduate Research Allocations Committee $150
7. Peter Buck Predoctoral Fellowship, National Museum of Natural History, Washington, DC $32,000

7. PUBLICATIONS

A. Books, Book Chapters, Edited Volumes

B. Journal Articles

Bell, K.C


Cook, J. A.


McLean, B.


C. Web-Based

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

D. Technical Reports

Annual Report, Division of Genomic Resources, Museum of Southwestern Biology
Annual Report, Division of Mammals, Museum of Southwestern Biology
Annual Director’s Report, Museum of Southwestern Biology
Annual (4) NSF reports

E. Theses/Dissertations Completed

Abrahamson, Bethany

Sawyer, Yadeeh Escobedo
F. Work In Progress (Only *in press* and already submitted)

Dunnum, J.


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


111. Patrick, L. E., & Stevens, R. D. (2014). Investigating sensitivity of phylogenetic community struct...


121. Semedo, T. B. F., Brandão, M. V., Carmignotto, A. P., Da Silva Nunes, M., Farias, I. P., Da Silva, M. N. F., & Rossi, R. V. (2014). Taxonomic status and phylogenetic relationships of Marmosa agilis peruana Tate, 1931 (Didelphimorphia: Didelphidae), with comments on the


Theses/Dissertations


8. ACTIVITIES IN LEARNED SOCIETIES

A. Invited/ Plenary talks

Cook, J.A.


4. “Advancing the Integration of Museums into Undergraduate Education”. Symposium on Museum resources in Undergraduate Education at the American Society of Mammalogists 94th Annual
Meeting, Oklahoma City, OK. June 2014.

B. Contributed Talks/Posters
Bell, K.C.
2. Calhoun, K., K. Bell, J. Cook. 8 August 2014. Parasite and Host Coevolution: Comparative Phylogenetics of Chipmunks (Rodentia) and Pinworms (Oxyurida). UNM Biomedical Symposium, Albuquerque, NM.

Colella, J

Cook, J.A.
7. Giermakowski, JT, MJ Ryan, & JA Cook. 2014. Collections as a source of data for education, conservation and monitoring change in a time of extinction: an amphibian example. SPNHC,


Jones, Amanda K.


McLean, B.


Rearick, Jolene


C. Attendance at Professional Meetings

Bell, K.C.


Cook, JA.

Annual Meeting of the American Society of Mammalogists, Oklahoma City, June Joint meeting on Education, Ecological Society of America and others, Implementing Vision and Changes, San Jose State University, CA, October.

Arctic Biodiversity Congress, Trondheim, Norway, December.

Colella, J.

Annual Meeting of the American Society of Mammalogists, Oklahoma City, June Whalefest (Sitka, AK - November)
Workshop: RevBayes (Durham, NC - September)

**Dunnum, J.L.**  
Annual Meeting of the American Society of Mammalogists, Oklahoma City, June

**Jackson, D.**  
Evolution 2014, Raleigh, NC, June 2014

**Jones, A.**  
Annual Meeting of the American Society of Mammalogists, Oklahoma City, June

**McLean, B.**  
Annual Meeting of the American Society of Mammalogists, Oklahoma City, June  
Evolution 2014, Raleigh, NC, June 2014

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

**E. Service as Officer of Professional Society/Organization**

**Bell, Kayce**  
Board of Directors (elected student member), American Society of Mammalogists  


Program Committee, American Society of Mammalogists. 1/2013 - present.

**Cook, J.A.**  
Board of Directors, American Society of Mammalogists, Member, 2011-2017 (re-elected in 2014 to 3 year term)

Board of Directors, National Systematics Collection Alliance 2011-2017 (re-elected in 2014)

UNM Representative to the Colorado Plateau Cooperative Extension Studies Unit (federal).  
2011-2015 (appointed)

**9. OTHER PROFESSIONAL ACTIVITIES**

**A. Presentations to General Audience in a Scholarly Capacity**

**Seminars**

**Colella, J.**
1. Molecular analysis of species limits and hybridization in ermine (Mustela erminea) in southeast Alaska. University of Alaska SE. Whalefest, Sitka, AK.
2. Island biogeography: A mammalian perspective in southeast Alaska. University of Alaska SE. Whalefest, Sitka, AK.

**Cook, J.A.**
1. Opportunities for Graduate Education at the Museum of Southwestern Biology, Department of Biology (in Spanish). Presentation during 3 day UNM recruiting trip to Universidad Central,
2. “Advancing the Integration of Museums into Undergraduate Education”. Symposium on Museum resources in Undergraduate Education at the American Society of Mammalogists 94th Annual Meeting, Oklahoma City, OK. June 2014.

**Workshops**

**Cook, J.A.**

2. Co-Organizer, AIM-UP! Climate Change and Museums Workshop, 26 Feb.-2 March 2014, Asilomar, CA.
3. Organizer, Next Steps for the Research Coordinating Network, Workshop, 2-5 May 2014, Hale Key, FL.

**Bell, K.**

1. Co-Organizer, Advancing the Integration of Museums into Undergraduate Education (AIM-UP!) NSF-funded RCN-UBE: including 3 day workshop at Asilomar in April 2014.

**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.**

**Cook, J.A.**

- **2011-2014** Member Steering Committee, VertNet
- **2010-2014** Chair, Steering Committee, AIM-UP! Research Coordinating Network in Undergraduate Biology Education
- **2011-2015** Chair, MSB Executive Committee
- **2003-2015** Editorial Board, MSB Publications Series
- **2012-2015** Chair, Conservation Awards Committee, American Society of Mammalogists
- **2009-present** Steering Committee, ARCTOS on-line museum database
- **2014-present** Steering Committee, National Integrated Biocollections Alliance, NSF sponsored RCN

External Tenure and Promotion review for faculty member at Southern Illinois University

NSF Proposal reviewer—Sept 2014, Systematic Biology

UnO-Undergraduate Opportunities-Director
Although funding for UnO ended in 2013, several additional papers were published with partial support from this grant in 2014 bringing the total number of publications to 21 over a 6 year period.

UNM Institutional Representative-- Colorado Plateau-Cooperative Extension Service Unit

Dunnum, J.L.
Systematic Collections Committee, American Society of Mammalogists
Arctos database advisory committee

D. Journal Referee

Bell, K
Journal of Mammalogy (1)
BMC Evolutionary Biology (1)

Cook, J.A.
Conservation Biology (1, 2x)
Trends in Parasitology (1)
Journal of Biogeography (1)
Journal of Mammalogy (1)
USGS External manuscript reviewer (1 ms-Yellow Loon genetics)

Dunnum, J.L.
Mammalia (1)
Southwestern Naturalist (1)
Journal of Zoo and Wildlife Medicine (1)

E. Hosting Professional Colleagues and Groups
We hosted 47 visiting academics and professionals from 17 institutions or departments and they primarily visited collections that I curate for research purposes.

Cook personally hosted the following individuals:
Dr. Eric Hoberg, USDA National Parasite Lab
Nyamsuren Batsaikhan, National University of Mongolia
Altangerel Tsogtsaikhan Dursahinhan, University of Nebraska State Museum

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.

Colella, J
1. NM Museum of Natural History and Science - Meet The Expert Day
2. Introduction to collecting and the scientific importance of museums. Sitka High School.
Cook, J. A.

1. Divisional tours and presentations – provided educational tours and information for over many visitors and several school groups.

Dunnum, J. L.

1. Divisional tours and presentations – provided educational tours and information for 447 visitors including 47 visiting researchers from 17 institutions, 62 students and 7 teachers from 5 K-12 schools, 14 UNM classes (179 students and 14 instructors), and 138 other visitors.
2. Tour and presentation on NM mammals and mammalian adaptations for Bernalillo County Master Naturalists program.
3. Jefferson Middle School science fair judge
4. Presentation at Sandia Prep High School on MSB and the use and value of natural history research collections.
5. Volunteer coach for Duke City Soccer Organization. 15 girls.

C. University and Departmental Committees

Cook, J.A.

1. Chair, MSB Executive Committee*
2. Curator, Division of Genomic Resources, Museum of Southwestern Biology
3. Curator, Division of Mammals, Museum of Southwestern Biology
4. Chair, Annual Faculty Evaluation Committee*
5. College of Arts and Sciences, Deans and Directors Council
6. UNM Museum Council—Chair*

Dunnum, J.L

1. MSB Space Committee

12. DONATIONS AND GIFTS RECEIVED

Robert and Virginia Rausch mammal specimens (2000) + $5000
Troy Best mammal specimens (1000)
Bruce Hayward endowment ($250,000)
Jack Whitman (1500 specimens)
New Mexico Museum of Natural History and Science (ca. 3500 mammalian tissue samples)

13. CURRENT STAFF

A. Faculty/Staff

J.A. Cook, Curator
J.L. Dunnum, Collection Manager
C.A. Ramotnik, USGS Collection Manager (retired)
M.A. Bogan, Emeritus Curator
J.S. Findley, Emeritus Curator
Stephen O. MacDonald, Curator II (retired)
Gordon Jarrell, Cyber Coordinator
Adrienne Raniszewski, Curatorial Assistant
B. Graduate students

**Bell, Kayce.** 4th year Ph.D. student. Systematics and phylogeography of chipmunk lice.

**McLean, Bryan.** 3rd year Ph.D. student. Systematics and phylogeography of ground squirrels.

**Sawyer, Yadeeh.** Received Ph.D. Linkage corridors along the North Pacific Coast.

**Rearick, Jolene.** 8th year Ph.D. Phylogeography and molecular evolution of freeze tolerance in *Lithobates sylvaticus*.

**Jessica Weber.** 4th year Ph.D student. Hypoxia tolerance and adaptive responses in Caviomorph rodents.

Grad Student workers

3. Marie Westover
4. Jocie Colella
5. Bryan McLean
6. Dianna Krejsa

C. Undergraduate Student Workers and Volunteers

Undergraduate Workers

1. Lena Bolling
2. Lindsey Frederick
3. Richard Apocada
4. Stephanie Mladinich
5. Ellie Johnson
6. Amber Trujillo
7. Schuyler Liphardt
8. Amber McArdle
9. Kimberly Wong

Undergraduate Volunteers

1. Alexander Hendrickson
2. Amber West
3. Michael Smith
4. Omega Delgado (student volunteer through Master Naturalist Program)
5. Mercedes Metzgar
6. Cheyanne Corona
7. Kendall Lovely

High School Volunteers – 186 hours

1. Irving Flores (Amy Biehl HS)
2. 12 students from Amy Biehl HS that have volunteered three times.

Other Volunteers – 50 hours

1. Teresa Skiba (non-student volunteer through Master Naturalist Program)
2. Adrienne Warner (non-student volunteer through Master Naturalist Program)
3. Mark Bundy (non-student volunteer through Master Naturalist Program)
4. Omega Delgado (student volunteer through Master Naturalist Program)
Total volunteer hours: 412

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
David J. Schmidly, UNM Department of Biology

B. Research Associates

J. Scott Altenbach, UNM Department of Biology (retired), NM
Sydney Anderson, American Museum of Natural History (retired), NY
Robert J. Baker, The Museum, Texas Tech University, Lubbock, TX
Troy L. Best, Department of Biology, Auburn University (retired), AL
Fernando Cervantes, UNAM, Mexico City, Mexico
Paul J. Cryan, Ft. Collins, CO
Natalie Dawson, University of Montana, Missoula, MT
John Demboski, Denver Museum of Science and Nature, Denver, CO
Guillermo D’Elia, Universidad de Valdivia, Chile
Eugene Fleharty, Ft. Hayes University (retired), KS
Melissa Fleming, Poulsbo, WA
Jennifer K. Frey, Las Cruces, NM
Kurt Galbeath, Northern Michigan University, Marquette, MI
Scott L. Gardner, Dept. Nematology, Curator, University Nebraska, NE
Keith Geluso, Lincoln, NE
Ken Geluso, Albuquerque, NM
David J. Hafner, New Mexico Museum Nat. History (retired)
Art Harris, University of Texas (retired), El Paso, Texas
Heikki Henttonen, Finnish Forest Research Institute, Finland
Edward J. Heske, Illinois Biological Survey, IL
Eric Hoberg, Beltsville, MD
Andrew Hope, Kansas State University, Manhattan, KS
Clyde Jones, The Museum Texas Tech University (retired), Lubbock, TX
Tom Jung, Whitehorse, Yukon
Sue Kutz, University of Calgary, Alberta
Enrique Lessa, Universidad de la Republica, Montevideo, Uruguay
Stephen MacDonald, Gila, NM
Jason Malaney, University of Nevada, Reno, NV
Michael Mares, Oklahoma University, Norman, OK
Pablo Marquet, Universidad Catolica, Santiago, Chile
Rodrigo Medillín, UNAM, Mexico City, Mexico
Tony R. Mollhagen, Lubbock, TX
Gary Morgan, New Mexico Museum Natural History, NM
Thomas J. O’Shea, Ft. Collins, CO
Eduardo Palma, Universidad Catolica, Santiago, Chile
Robert Parmenter, Valles Caldera, Jemez, NM
James L. Patton, Museum of Vertebrate Zoology (retired), Berkeley, California
Reggie Rausch, Burke Museum, University of Washington, Seattle, WA
Brett R. Riddle, University of Nevada, Las Vegas, NV
Jorge Salazar Bravo, Texas Tech University, Lubbock, TX
C. Greg Schmitt, Farmington, NM
Fred Szalay, Los Ranchos de la Rio Grande, NM
Sandy Talbot, Molecular Ecology Lab- USGS Anchorage, AK
Fernando Torres Perez, Vina del Mar, Chile
Ernie Valdez, USGS-UNM, Tijeras, NM
Alasdair Veitch, Department of Renewable Resources, Norman Wells, NWT, Canada
Jack Whitman, Ketchum, ID
Don E. Wilson, Smithsonian (retired), Washington, DC
Nyamsuren Batsaikhan, National University of Mongolia, Ulaan Baatar
1. DIVISION HIGHLIGHTS

In 2014, the Natural Heritage New Mexico Division continued to develop conservation biology-related research projects, technological applications, and education and outreach programs with agencies, private partners, and the public. Within the division, there are four working groups: Conservation Data Center, Ecology, Zoology, and Botany.

The Conservation Data Center Group (Rayo McCollough, Lead; Mark Horner, GIS manager) worked on ongoing development of the New Mexico Conservation Information System to make conservation data more readily available via the web and to support effective conservation management. We embarked on a collaborative project with the NM Department of Game and Fish (NMDGF) to revise the State Wildlife Action Plan (SWAP) using MSB specimen data in combination with external observation data. We continued a joint U.S. Fish and Wildlife Service (USFWS) and NMDGF project 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 (EMNRD), U.S. Forest Service (USFS), and the Bureau of Land Management (BLM), 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. Lastly, we engaged the UNM Libraries, updating our website and developing a joint project on web hosting and data archiving.

The Ecology Group (Esteban Muldavin, Lead; Elizabeth Milford, Riparian Ecologist; Yvonne Chauvin, Senior Botany Tech; Hannah Varani, Senior Ecology Tech, and Paul Arbetan, Ecologist) continued the development of the “New Mexico Rapid Assessment Method” (NMRAM) for New Mexico’s wetlands and riparian areas in collaboration with New Mexico Environment Department (NMED) by adding a new module on for the Rio Grande and Pecos Rivers. We also continued our work on the playas module and conducted field-training workshops. 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. We delivered the final Middle Rio Grande Conservation Action Plan to the Middle Rio Grande Conservancy District that was the outcome of MSB-sponsored science and managers workshops. We initiated a project with the BLM to evaluate ecological restoration projects in the context of projected climate change scenarios. We continued work on the Guadalupe Mountains National Park and White Sands National Monument vegetation maps. 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.

The Zoology Group (Kristine Johnson, lead; Jackie Smith, Senior Zoology Tech) conducts field research and modeling of the habitats of animal species of conservation concern in New Mexico. We provide habitat management recommendations and create management plans for animals of conservation concern and their habitats. In 2014, we collaborated with the University of Nevada Reno to use 27 years of NHNM data to model population trends for the Lesser Prairie-chicken. We provided the results to the USFWS for its status review of this threatened grouse species of southeastern New Mexico. In cooperation with Animas Biological Studies, Durango, CO, we completed the second year of a nest-scale habitat modeling study of pinyon-juniper birds of conservation concern at the BLM Farmington, NM Resource Area. We created a monitoring program for Pinyon Jays for NMDGF. We continued work on a three-year habitat analysis for the dunes sagebrush lizard, a sensitive species of southeastern New Mexico. We completed a habitat use study of grassland and shrubland birds at Holloman Air Force Base (HAFB), surveyed HAFB shrublands for raptors, and continued a long-term monitoring project of wetland invertebrates and birds at the HAFB Wetlands.
The Botany Group (Temporary Lead Esteban Muldavin) worked with the BLM, to conclude a project to survey and model the distribution of the rare Tharps’s bluestar (*Amsonia tharpii*). We are also working with the State Botanist, Daniela Roth, at the NM EMN RD to integrate rare-plant species databases between the department and the division and to develop a ranking protocol for the conservation status of rare plants.

### 2. TABLE OF COLLECTION USE

<table>
<thead>
<tr>
<th>Collection Growth (specimens catalogued)</th>
<th>Loans (outgoing)</th>
<th>Loans (incoming)</th>
<th>Visitors</th>
<th>Information Requests Personally Respond to</th>
<th>Publications Citing MSB Specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>20,512 new records, 32,431 updated records</td>
<td>NA</td>
<td>NA</td>
<td>14,026 visitors to web site</td>
<td>126 Custom 283,287 Downloads</td>
<td>UNKNOWN (all downloads carry a citation)</td>
</tr>
</tbody>
</table>

### 3. COURSES USING THE COLLECTIONS

### 4. COURSES TAUGHT BY MSB PERSONNEL

A. Faculty/Collection Managers

B. Staff

### 5. COLLECTION MANAGEMENT

As part of our service role in the museum to provide conservation data to the public and researchers, in 2014 the Conservation Data Management Group worked on several initiatives to add to our conservation information. Under the supervision of our assistant data manager, three student employees added 20,512 observations to the database and updated another 32,431.

Through our one-of-a-kind program to database Section 10 and section 6 reports from USFWS, we were able to add over 1,000 new observations to our database on federally listed species. We continued our collaborative work with NMDGF to host their BISON-M database and work with them on data exchange and creating decision-support systems. We also worked on several initiatives to build our conservation information system (see Section 1). As an outcome of our database activities, we completed 126 formal information requests and provided 283,287 publications and data downloads via our website.

### 6. AWARDS, GRANTS, AND CONTRACTS

**NHNM AWARDS:**


$25,000. NM Military Affairs Dept. Banner #0480CF. Las Cruces Training Lands conservation species surveys **Paul Arbetan**, PI. 05/13-04/14. $16,983 (F&A $2,831).
$15,000. NM Military Affairs Dept. Banner #0480CG. Camel Tracks Grey Vireo surveys Paul Arbetan, PI. 05/13-09/14. $4,355 (F&A $726).

$45,000. NM Military Affairs Dept. Banner #0480CH. Roswell WETS bat surveys Paul Arbetan, PI. 04/13-06/15. $25,334 (F&A $4,222).

$48,000. NM Military Affairs Dept. Banner #0480CI. Carlsbad Happy Valley bat surveys Paul Arbetan, PI. 04/13-06/15. $32,686 (F&A $5,448).

$75,000. BLM. Banner #0480C4. Habitat use by pinyon-juniper birds. Kristine Johnson, PI. 10/12-04/14. $7,197 (F&A $1071).


$99,554. Dept. of Defense. Banner #0480AS. Habitat use at multiple scales by pinyon-juniper birds. Kristine Johnson, PI. 08/12-03/14. $61,554 (F&A $5,186).

$34,864. BLM. Banner #0480FO. Habitat use by Grey Vireo and Pinyon Jay in the BLM Farmington Resource Area. Kristine Johnson, PI. 04/14-02/15. $34,097 (F&A $3100).


$40,000. Dept. of Defense. Banner #0480FT. Raptor management at Holloman AFB. Kristine Johnson, PI. 04/14-04/16. $11,024 (F&A $2,478).


$18,000. NM Dept. of Game and Fish. Banner #0480FB. Pinyon Jay monitoring program in New Mexico. Kristine Johnson, PI. 04/14-12/14. $17,925 (F&A $1,630).

$18,750. BLM. Banner #0480GT. BLM data exchange 2014. Rayo McCollough, PI. 06/14-09/17. $11,985 (F&A $1,785).

$275,000. NM Dept. of Game and Fish. Banner #0480A1. BISON-M database management. Rayo McCollough, PI. 06/12-05/17. $62,483 (F&A $5,680).

$120,000. NM Dept. of Game and Fish. Banner #0480D7. NM crucial habitat tool (CHAT). Rayo McCollough, PI. 05/12-09/14. $36,898 (F&A $3,356).

$124,000. NM Dept. of Game and Fish. Banner #0480A5. Organizing federally listed species information. Rayo McCollough, PI. 06/12-10/15. $19,188 (F&A $1,744).


$75,000. BLM. Banner #0480B0. Tharp’s blue star inventory. **Esteban Muldavin**, PI. 10/12-09/17. $20,059 (F&A $2,987).

$30,000. BLM. Banner #0480BR. Santa Fe River vegetation and channel morphology monitoring. **Esteban Muldavin**, PI. 10/12-09/17. $13,861 (F&A $2,064).

$18,749. BLM. Banner #0480GS. Restore New Mexico projects and climate change. **Esteban Muldavin**, PI. 05/14-12/15. $0 (F&A $0).


$35,000. NPS. Banner #04808X. Assess impacts of Las Conchas fire and suppression activities on park vegetation. **Esteban Muldavin**, PI. 03/12-07/15. $4,568 (F&A $680).


$18,000. NPS. Banner #0480GN. Monitoring sensitive vegetation after the Carlsbad loop fire: 2014. **Esteban Muldavin**, PI. 08/14-06/15. $8,770 (F&A $1,306).


$10,000. NM Dept. of Game and Fish. Banner #0480DN. Southern Great Plains CHAT data support. **Esteban Muldavin**, PI. 07/13-12/15. $2,112 (F&A $192).


$17,000. NM Environment Dept. Banner #0480BH. NM RAM training workshop. **Esteban Muldavin**, PI. 06/13-10/16. $6,510 (F&A $1,343).

$202,000. NM Environment Dept. Banner #0480CK. Rapid assessment for NM playa region, southern high plains. **Esteban Muldavin**, PI. 06/12-10/15. $24,220 (F&A $2,202).


$44,000. NMSU. Banner #0480CZ. Modeling the effects of environmental change on crucial wildlife habitat. **Esteban Muldavin**, PI. 07/13-08/15. $10,365 (F&A $1,352).


**PUBLICATIONS**

**A. Books, Book Chapters, Edited Volumes**

**B. Journal Articles**


**C. Web-Based**

**D. Technical Reports**


E. Theses/Dissertations Completed

F. Work In Progress


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: Biodiversity without Boundaries, NatureServe Network annual meeting. New Orleans, LA.

E. Muldavin: Ecological Society of America Panel on Vegetation Classification Workshop, 2014 Baltimore MD.

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

E. **Service as Officer of Professional Society/Organization**

E. Muldavin: Executive Committee, Ecological Society of America Panel on Vegetation Classification.

9. **OTHER PROFESSIONAL ACTIVITIES**

A. **Presentation to General Audience in a Scholarly Capacity**

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


E. Milford and E. Muldavin: NM RAM applications, New Mexico Wetlands Roundtable 2013.

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

E. Muldavin: Ecological Society of America Panel on Vegetation Classification.

K. Johnson: NM Prairie Dog Working Group, New Mexico Burrowing Owl Working group.

E. Muldavin, R. McCollough, New Mexico Rare Plant Technical Council.

R. McCollough: Jemez Mountains salamander recovery team; Dune Sagebrush Lizard GIS Group.

D. **Journal Referee**

K. Johnson: Southwestern Naturalist

E. Muldavin: Journal of Vegetation Science

E. **Hosting Professional Colloquia and Groups**

Middle Rio Grande Conservation Action Plan Workshop Playa Science Workshop, MSB, University of New Mexico, June 2014.

10. **SERVICE**

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

E. Milford New Mexico Rapid Assessment Training Workshop, Santa Fe, NM, June 2014.
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
   Mitchell East, Data Analyst
   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
   Hannah Varani, Sr. Field Research Tech

B. Graduate students
   Hannah Varani

C. Undergraduate Student Workers and Volunteers
   Amy Adams
   Kimberly Allen
   Maren Geisler
   Natalia Moore
   Casey Myers
   Brett Reynolds

14. MUSEUM ASSOCIATES
   None
DIVISION OF PARASITES

Metric Descriptions

<table>
<thead>
<tr>
<th>Specimens Accessioned</th>
<th>Loans (outgoing)</th>
<th>Loans (incoming)</th>
<th>Visitors</th>
<th>Information Requests</th>
<th>Publications Citing MSB Specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parasites 700</td>
<td>2</td>
<td>6</td>
<td>3</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>Hosts 151</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. DIVISION HIGHLIGHTS

Our division is now up to 20,506 catalogued parasite specimens: Plathyhelminthes 8,659, Nematoda 7,451, Acanthocephala 292, Nematomorpha 122, Arthropoda 2,505 and 15,594 catalogued host specimens

Through efforts of Collections Manager for Division of Fishes, Alexandra snyder, who obtained a FEMA grant, the division obtained ledges for the slide collection shelving

Continuation of NSF and NIH grant work

Expeditions to Kenya (Loker), Argentina (Brant, Gendron)

Snail collections for digenetic trematodes (Brant, Gendron)

Included Division of Parasites webpage

Of the Rausch Helminth Collection (RHC):

2. COURSES USING THE COLLECTIONS

3. COURSES TAUGHT BY MSB PERSONNEL

Eric S. Loker

Spring

Biology 402 – Parasites and Hosts – 2 students
Biology 490 – Biology of Infectious Organisms (split with Bruce Hofkin) – 95 students
Biology 400 – Honors Thesis – 1 student
Biology 502- Parasites and Hosts – 4 students
Biology 490 – Biology of Infectious Organisms (with Bruce Hofkin) – 4 students
Biology 699 – Dissertation - 3 students

Fall

Biology 402 – Parasites and Hosts – 1 student
4. COLLECTION MANAGEMENT ACTIVITIES

1. Rausch Collection Progress Summary:

<table>
<thead>
<tr>
<th></th>
<th>Total Est. Nalgene jars/slide boxes</th>
<th>Data Capture Only</th>
<th>Number of Lots</th>
<th>% Complete</th>
<th>Data Capture and Object Tracking</th>
<th>Number of Lots</th>
<th>% Complete</th>
<th>Total Number Lots Handled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet Collection-2007 Accn</td>
<td>100 jars</td>
<td>31 jars</td>
<td>1395 vials</td>
<td>31%</td>
<td></td>
<td></td>
<td></td>
<td>1395</td>
</tr>
<tr>
<td>Wet-New 2012 Accn</td>
<td>50 jars</td>
<td></td>
<td></td>
<td></td>
<td>50 jars</td>
<td>1676 vials</td>
<td>95%</td>
<td>1676</td>
</tr>
<tr>
<td>Wet Collection – Total</td>
<td>150 jars</td>
<td>84 jars</td>
<td>3071 vials</td>
<td>56%</td>
<td>50 jars</td>
<td>1676 vials</td>
<td>30%</td>
<td>3071</td>
</tr>
<tr>
<td>Slide Collection</td>
<td>400+ slide boxes</td>
<td></td>
<td></td>
<td></td>
<td>304 boxes</td>
<td>19,293 slides</td>
<td>75%</td>
<td>19,293</td>
</tr>
</tbody>
</table>

Rausch Wet Collection:
Data capture and object tracking of 50 large Nalgene jar equivalents= 1676 vials; 95% of 2012 new accession; 30% of entire collection is completed and ready to move to new wet collection space for cataloging. All data for these samples has been archived in the MSB Para Dropbox.
Data capture has been completed on 84 of the 150 Nalgene jar equivalents = over 50% of the collection. Total number of vials handled so far: 3071 out of estimated 5,500.

**Rausch Slide Collection:**
Slide box data capture, conservation assessment, object tracking completed:
=129 boxes, 9,016 slides

**Rausch Records in Arctos Database:**
MSB Hosts records entered: 4731 records loaded to Arctos, up to record 30,000 out of original 42,000.
MSB Para records: 2127 parasite records corresponding to above
Additional 4,000 Rausch records transcribed, to host number 34,000.

**Rausch Media:**
Rausch Host-Parasites card file scanned and loaded to Arctos; initial tagging of specimens to card will start in 2015
Total number of Rausch records tagged to ledger and card file media: 121 tags

2. Continued development of the Arctos Database for hosts and parasites

3. Designed and implemented shelf organization and barcoding for the wet collection room 125
Alcohol collection for Arthropods and Parasites and slide room for Parasites; Continued prepping alcohol and slide specimens across the collection to move to RM 125 and slide room

4. Integrating schistosomes from Schistosome Diversity Project, about 75% catalogued for the helminths.

5. We conducted 10 tours through the division – about 6 were from classes/groups within UNM, the rest were from the Albuquerque area.

6. Other than specimens from paper submissions, local people and projects that generate specimens for the Division include the Schistosome Diversity Project - NSF; Nematomorph Diversity Project - NSF; Beringia Coevolution Project - NSF; the ongoing RHC.

5. **AWARDS, GRANTS, AND CONTRACTS**

**Awarded:**
1. E. S. Loker (PI) Development of a common, untapped resource (amphistome flukes) to control schistosomiasis in snails in Africa OPP1098449 Bill & Melinda Gates Foundation 11/1/2013 - 4/30/2015 $100,000

2. Cook JA (PI) REU for 2 students from grant NSF-DEB 1057383 Integration and Curation of the Robert and Virginia Rausch Helminthological Collection- A Resource for Science and Society in the MSB Division of Parasitology $12,000

**Ongoing:**
1. S. Brant (PI) NSF DEB-1021427 REVSYS: Phylogenetic and Revisionary Systematics of a Diverse Clade of Avian Schistosomes. 09/01/2010 – 08/31/2015 $60,000 (annual direct cost).

2. E. S. Loker (PI) NIH/NCR COBRE: Center for Evolutionary and Theoretical Immunology. 9/30/2003 – 5/31/2015 $1.4M (annual direct cost)
3. E. S. Loker (PI) NIH/NIAID 1R01AI101438-01 Snail-Related Studies of Transmission and Control of Schistosomiasis in Kenya 04/01/2012 – 05/30/2017 $250,000 (annual direct cost)

4. Cook JA (PI) NSF-DEB 1057383 1/1/11-12/32/14 Integration and Curation of the Robert and Virginia Rausch Helminthological Collection- A Resource for Science and Society in the MSB Division of Parasitology, $489,490

6. PEER REVIEWED PUBLICATIONS BY MSB PERSONNEL (bolded); * indicates publication with specimens from more than one division

Journal Articles that used or deposited specimens


*Ubelaker JE, Bretton S, Griffin, Genevieve M. Konicke, Duszynski DW and Harrison RL. 2014. Helminth Parasites from the Kit Fox, Vulpes macrotis (Carnivora: Canidae), from New Mexico. Comparative Parasitology 81(1):100-104. doi: 10.1654/4657.1

*Ubelaker, JE, Griffin, BS, Mendoza, KM, Duszynski, DW, & Harrison, RL. (2014). Distributional records of helminths of the swift fox (Vulpes velox) from New Mexico. The Southwestern Naturalist, 59(1), 129-132.


Journal Articles - other


pfefferi in Kenya: a compatible association characterized by lack of strong local adaptation, and presence of some snails able to persistently produce cercariae for over a year Parasites & Vectors 2014, 7:533 (26 November 2014)


Publications Based on MSB Specimens/Data By Other (non-MSB) Authors

Dissertations/Theses Based on MSB Specimens/Data

Tabitha Rossman - Senior Thesis project book for Documentary Photography: University Research Collections in New Mexico “The Collection”. Advisor Dr. Jennifer Fry, New Mexico State University. 2014. – this was completed for all divisions except DGR.

Reports Based on MSB Specimens/Data

none

7. ACTIVITIES IN LEARNED SOCIETIES

1. Invited/Plenary Talks and Seminars


2. Contributed Talks and Posters (bolded MSB personnel and “*” the presenter, ‘^’ a student)

E. T. Gendron*, E. S. Loker, N. Davis¹, S. V. Brant. ORAL: Comparative Phylogeography and Population Genetics of a Globally Distributed Parasite and Host: Trichobilharzia querquedulae and Physa acuta. Southwestern Association of Parasitologists, Lake Texoma OK 10-12 April 2014


M. L. Campbell, G. Jarrell, R. Barber*,^ and K. Chavez^. POSTER: Specimen Object Tracking in the ARCTOS Collections Database. Southwestern Association of Parasitologists, Lake Texoma OK 10-12 April 2014


Buddenborg S*^, Mkoji G, Loker ES. "RNA-seq analysis of field-derived Biomphalaria pfeifferi naturally infected with Schistosoma mansoni from western Kenya" North American Comparative Immunology (NACI) poster presentation


3. Attendance at Professional Meetings

Loker, E.S.
American Society of Parasitologists, New Orleans, Louisiana, July
North American Comparative Immunology (NACI)
National IDeA Symposium Biomedical Research Excellence (NISBRE) Washington, D.C
American Society for Tropical Medicine and Hygiene, New Orleans, 2-6 Nov 2014.
13th International Congress of Parasitology, Mexico City, 10-15 Aug 2014.

Brant, S.V.
Southwestern Association of Parasitologists, Lake Texoma, Oklahoma, April.
American Society of Parasitologists, New Orleans, Louisiana, July

Gendron, E.T.
Southwestern Association of Parasitologists, Lake Texoma, Oklahoma, April.
American Society of Parasitologists, New Orleans, Louisiana, July.

Laidemitt, M.R.
American Society of Parasitologists, New Orleans, Louisiana, July
American Society for Tropical Medicine and Hygiene, New Orleans, 2-6 November 2014.

Buddenborg, S.
North American Comparative Immunology (NACI)
National IDeA Symposium Biomedical Research Excellence (NISBRE) Washington, D.C
American Society of Parasitologists, New Orleans, Louisiana, July

Lu, L.
American Society of Parasitologists Meeting, New Orleans, Louisiana, July

Campbell, ML
American Society of Parasitologists, New Orleans, Louisiana, July
Southwestern Association of Parasitologists, Lake Texoma, Oklahoma, April.

4. Service as Editor or on Editorial Board of a Journal
Loker, E.S. Journal of Helminthology

5. Service as Officer of Professional Society/Organization

Loker, E.S.
As immediate past president, member of Council, American Society for Parasitologists

Brant, S.V.
President for the Southwestern Association of Parasitologists
Member of the Membership Committee for American Society of Parasitologists

8. OTHER PROFESSIONAL ACTIVITIES

1. Presentation to General Audience in a Scholarly Capacity

Brant, S.V.; Gendron, E.T.; Hanelt B.
*Parasites in New Mexico* Presentation to the Bosque Club afterschool program for Coronado Elementary School, Albuquerque, New Mexico. November.

Gendron, E.T. November 2014 - Preparation of educational modules for the transmission and treatment of human helminth disease in the Peruvian Amazon – she created educational podcasts and did 'on-site' education

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

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

Loker, E.S.
Member, advisory review panel for Senegal aquaculture project, gates foundation, Senegal, 26-30 March 2014

Member, schistosomiasis consortium for operational research and evaluation (score), funded by Bill and Melinda Gates foundation, meeting, MAY, Athens, GA.

Reviewer for World Health Organization document “guidelines for laboratory and field testing efficacy of molluscicides for schistosomiasis control”

Internal advisory committee, north campus BRAIN COBRE program

Informal advisor, Dr. Vojo Deretic, COBRE application organization

Pibbs advisory board and retreat, 3 October 2014

Service on NIH study section for review of INBRE programs as part of the NIH IDEA program, November, 2014

Brant, S.V.
2011 - present: Scientific voting member of UNM IACUC committee
UNM Dept. of Biology: Research Day Undergraduate Poster Judge

4. Journal Referee

About 18 papers for about 8 different journals

Public Service

-Jefferson Middle School Honors Science Classes, November
-Bosque Club, Coronado Elementary After School Program, November

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

Gendron, E. T. American Society of Parasitologists Marc Dresden Travel Award $500

10. DONATIONS AND GIFTS RECEIVED

-Received the library collection of Dr. and Mrs. Rausch, from Mrs. Rausch
-Received the Leitz research scope of Dr. and Mrs. Rausch, from Mrs. Rausch
-Helminth slides and field ledger of Larry Schultz, via Dr. Eric Hoberg USNPC
-Arctic seabird helminth ethanol collection of Dr. Doug Causey, University of Alaska-Anchorage

11. CURRENT STAFF

Faculty and Staff

- Dr. Eric S. Loker, Curator of Division of Parasites, Director of CETI
- Dr. Sara V. Brant, Senior Collections Manager Division of Parasites
- Mariel Campbell, Program Specialist Arctos for Division of Parasites Jan-Aug 2014

Graduate students

- Ms. Erika T. Gendron (GA for Division of Parasites)
- Mr. Ramesh Devkota
- Ms. Martina Laidemitt
- Ms. Sarah Buddenborg
- Ms. Lujin Lu

Undergraduate Student Workers and Volunteers

Rausch REU students in collection in 2014-2015
- Ryan Lee Barber (Rausch and CIIBA collections, field work, meeting presentations)
- Kelly Chavez (Rausch slide and wet collections)
- Elias Alejandro Salazar (Rausch slide and wet collections)
- Kristin Meyer (cataloged BCP Arostrilepis to MSB Para)
- Alexander Hendrickson (Rausch mammals, slides)
- Nicolette Ochoa (Rausch wet collection)
- Brooke Thurston (Rausch wet collection)
- Lizon Cenac (Rausch skins, linking skins to MSB Host and Para records in database)
- Laurel Cenac (Rausch skins, linking skins to MSB Host and Para records in database)
High School RAHSS Students:
Hannah C. Qualls (field work, lab parasite prep in MSB Para)

Volunteers:
James Will Brunt (field work, Sevilleta curation)
Meghan Bentz (Sevilleta curation)

12. MUSEUM ASSOCIATES

Curatorial Associates

Research Associates