2012 Annual Report

Joseph A. Cook

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The Museum of Southwestern Biology (MSB) continues to be a vital contributor to educational initiatives at UNM. Numerous undergraduate projects, graduate theses & dissertations (42 graduate students, 9 completed in this period), or projects in Biology, Anthropology, Art, and elsewhere use MSB specimens as a basis for their studies. Many undergraduate students associated with MSB (76 in this period) continue on to graduate programs, professional schools or obtain jobs in conservation and management agencies in state, federal, or private sector positions. Each division immerses students in natural history, systematics, molecular biology, morphology, species identification, museum specimen preparation and curation, field studies, and web-based informatics. MSB continues to lead in training under-represented students or international students, especially those from Latin America. Indeed, MSB has been the locus of large student-training efforts for many years and sponsors two museum-centered programs (funded by the National Science Foundation) that focus on student success: Undergraduate Opportunities (UnO- $1,010,000) and Aim-up! ($495,000). Many of these students have obtained competitive professional positions and assumed leadership roles in their respective fields.

MSB houses collections of the natural world that document more than a century of environmental change and span broad spatial scales, representing western North America, Central and South America. We also have significant holdings from Asia, Africa, Australia and Europe. MSB consists of 8 divisions (Amphibians and Reptiles, Arthropods, Birds, Fishes, Genomic Resources, Herbarium, Mammals, and Parasites), Natural Heritage New Mexico and the USGS Arid Lands Field Station and Collections. MSB curators have active research and graduate programs that exploit the wealth of specimens and data in the collections. Unlike other faculty, they also commit considerable effort to build a shared resource for the scientific community. Curators and collection managers then strive to make these valuable collections and data accessible to other UNM faculty and students and to the broader scientific community. Such facilities are a hallmark of top-notch research-intensive universities.

MSB provides a key part of the scientific infrastructure necessary for investigators interested in understanding environmental and health issues facing society such as emerging zoonotic pathogens, climate change, invasive species, habitat conversion, and decreasing biodiversity. Annually, the large number of peer-reviewed publications (> 80) supported by our collections attests to their value. This level of research activity places MSB among the most productive research units on campus. Our web-accessible databases constitute an unparalleled informatics resource that contributes to understanding the complexity of planetary life and related ecosystem function on local, regional, and global scales.

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

MSB faculty, staff, and students were heavily involved in a number of academic pursuits in AY 2012-2013 (Table 1&2). There has been considerable emphasis on student training in research and informatics that includes travel to national and international meetings to present their research findings, and on developing new ways for museum data and objects to be incorporated in the classroom. The MSB develops collection resources by winning extremely competitive grants from the National Science Foundation and other federal agencies. MSB Graduate Students excel when applying for awards and recognition from the Department of Biology, and from disciplinary and inter-disciplinary professional societies.

ONGOING MUSEUM-WIDE INITIATIVES THAT INTEGRATE ACROSS DISCIPLINES

Newly renovated space for Parasitology and Arthropod specimens: New dry, wet, and research space for the MSB Division of Parasitology (and wet storage for Arthropods) was renovated in Fall 2012 (beginning in June). This Division is becoming an international resource for systematics, ecology, and epidemiology of helminthes. With new UNM infrastructure, we are attracting new grant support (NSF Biological Research Collections Grant-$495,000, NSF Collaborative Investigations of the Biomes of the Arctic--$900,000) to obtain, curate, and electronically capture parasite specimens.

UnO: The Undergraduate Opportunities program (msb.unm.edu/UnO/education.html) led to high retention and graduation rates for underrepresented students, and successful placement of UNM undergraduate students in graduate school or professional scientific positions. As of December 2012, more than 45 undergraduate students were involved in this program.

AIM-UP! Aim-up! (aim-up.org) is centered at MSB and is a national Research Coordinating Network in Undergraduate Biology Education (RCN-UBE) supported by the national Science Foundation that explores new ways to integrate museum specimens, archives, and databases into undergraduate courses and activities. A workshop was help in February in Fairbanks 2012 that brought educators and museum specialists together to formulate new ways of using museum specimens and data in active learning modules. MSB was also the locus of an interdisciplinary course taught by Szu-Han Ho and Joe Cook entitled “Coevolution: Art and Biology” that enrolled 12 students from Art, Honors, and Biology in a spring seminar.

Museum Studies Program: The MSB, in collaboration with the Maxwell Museum of Anthropology, Meteorites, and UNM Art Museums, continued to make progress on development of a graduate (MS) Museum Studies Program. The graduate program now awaits approval from the State Board of Education. A website provides an overview of the program, a Program Director has been hired through Anthropology, and we anticipate the first Museum Studies students to begin in Fall 2013. MSB has been offering museum-related courses for several years now and Kelly Miller organized a course in Fall 2012 with 15 students that learned from Collections Managers about collections procedures across 7 MSB Divisions.

International Activities: In addition to ongoing projects throughout the Southwestern United States, MSB expeditions throughout Latin America (e.g., Panama, Peru, Venezuela), Asia (e.g., Kazakhstan, Mongolia), Australia and Africa (e.g., South Africa) brought significant new collections of arthropods, birds, mammals and parasites to UNM and provided outstanding opportunities to train a new generation of field biologists in the international research arena.
Table 1. Metrics identify the quality and productivity over the last five years in the Museum of Southwestern Biology. Numbers are compiled from Divisional reports (annual reports are available at [http://msb.unm.edu](http://msb.unm.edu)).

<table>
<thead>
<tr>
<th>METRIC DESCRIPTION</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>5-YEAR AVERAGE</th>
</tr>
</thead>
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<tr>
<td>1. Collection growth (Specimens Cataloged)</td>
<td>389144</td>
<td>136248</td>
<td>301268</td>
<td>64598</td>
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<td>2. Loans Out</td>
<td>125</td>
<td>128</td>
<td>167</td>
<td>185</td>
<td>99</td>
<td>141</td>
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<td>3. Professional Visitors to the Collections</td>
<td>795</td>
<td>953</td>
<td>692</td>
<td>504</td>
<td>307</td>
<td>650</td>
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<td>4. Collection Database Web Site Hits</td>
<td>51287</td>
<td>319745</td>
<td>298360</td>
<td>160880</td>
<td>396362</td>
<td>245327</td>
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<tr>
<td>5. RFIs Answered in Person</td>
<td>1196</td>
<td>1355</td>
<td>1214</td>
<td>1354</td>
<td>522</td>
<td>1128</td>
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<td>6. Outside Publications Citing MSB Specimens</td>
<td>60</td>
<td>68</td>
<td>61</td>
<td>134</td>
<td>76</td>
<td>80</td>
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<td>7. Peer-Reviewed Publications by Staff</td>
<td>54</td>
<td>79</td>
<td>72</td>
<td>52</td>
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<td>8. Technical Reports</td>
<td>30</td>
<td>24</td>
<td>29</td>
<td>29</td>
<td>23</td>
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<td>9. UNM Courses using the Collection</td>
<td>22</td>
<td>25</td>
<td>23</td>
<td>58</td>
<td>79</td>
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<td>10. UNM Courses taught</td>
<td>22</td>
<td>24</td>
<td>22</td>
<td>68</td>
<td>109</td>
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<td>11. Graduate Students</td>
<td>35</td>
<td>51</td>
<td>39</td>
<td>42</td>
<td>42</td>
<td>42</td>
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<tr>
<td>12. Graduate Theses/Dissertations Completed</td>
<td>8</td>
<td>4</td>
<td>5</td>
<td>3*</td>
<td>9</td>
<td>5</td>
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<tr>
<td>13. Undergraduate Students</td>
<td>54</td>
<td>91</td>
<td>102</td>
<td>75</td>
<td>76</td>
<td>80</td>
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<td>14. Grants/Contracts in Force</td>
<td>98</td>
<td>94</td>
<td>98</td>
<td>78</td>
<td>76</td>
<td>89</td>
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<tr>
<td>15. Grants In Force Total Costs</td>
<td>$9,444,626</td>
<td>$11,239,035</td>
<td>$10,741,063</td>
<td>$10,132,206</td>
<td>$8,850,955</td>
<td>$10,081,577</td>
</tr>
<tr>
<td>16. Estimated F&amp;A return</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>$398,059</td>
<td>$528,950</td>
<td>$463,505</td>
</tr>
</tbody>
</table>

* 1 UNM, 2 outside, NR – not reported

**METRIC DESCRIPTIONS**

1. **Collection growth** is the number of newly cataloged specimens and is an important measure of activity. This metric also tracks the annual increase in value of the collections. In 2012, all collections at MSB exhibited growth, with some collections seeing outstanding increases in size. Cataloging of new specimens from regional and international expeditions was responsible for the majority of new specimens. Average growth of over 250,000 cataloged specimens per year places MSB among the fastest growing university-based natural history museums in the nation.

2. **Number of specimen loans made to outside researchers and institutions.** These are specimens, groups of specimens, or tissues loaned in support of ongoing research at other institutions. Loans help establish UNM’s reputation as a significant contributor to research initiatives nationally and internationally. This metric, which is another measure of collection value, visibility and utility, continued to increase in 2012.

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

4. **Collection web 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. The widespread dispersion of web hits suggests MSB specimens have high impact in informatics initiatives globally.
5. **Requests for information (RFIs) answered in person.** Natural history collections staff also perform important advisory functions as indicated by the number of requests for information. Such requests come from academic and government scientists, natural resource management agency personnel, and/or the general public. MSB is one of the primary clearinghouses for knowledge and expertise on natural history of western North America and in several cases globally (e.g., Peru, Mexico, Chile, Bolivia, Panama, Mongolia).

6. **Publications by scientists outside of the MSB.** Curatorial management has direct impact on scholarly production through the provision of specimens and data to other researchers. In 2012, at least 76 publications or graduate theses were supported in part through materials provided by the MSB through loans and data sharing. This contribution to the global scientific infrastructure vastly increases the scholarly impact of MSB and by extension UNM’s reputation as a major player in the environmental and biological sciences.

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

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

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

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

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

12. **Number of graduate theses/dissertations** includes all the graduate students who graduated in 2012 that were mentored by MSB faculty as primary advisor or co-advisor.

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

14. **Number of grants and contracts in force** includes all active grants and contracts that are available to specimen-based research and are being conducted by MSB staff. This number varies little from year to year, but overall funding has steadily increased.

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

16. **Total amount of Facilities and Administration (F&A) funds generated for UNM annually from grants/contracts.** MSB is within the top 5 units in the College of Arts and Sciences.
Table 2. Notable MSB Activities in 2012.

<table>
<thead>
<tr>
<th>MONTH</th>
<th>AWARD OR EVENT</th>
<th>MSB PROGRAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2012</td>
<td>MSB doctoral students, Bryan McLean and Kayce Bell, participated the 4th annual vertebrate/parasite expedition to Mongolia from June until August collecting at multiple localities across the Gobi Desert. Masters student Shane DuBay wins Best Student Talk award at the North American Ornithological Congress in Vancouver, British Columbia, Canada. Mini-ARTS grant ($3,000) from the Society of Systematic Biologists (SSB) to investigate the Diversification and Biogeography of Southern Hemisphere Zopheridae (Coleoptera: Tenebrionoidea). (Lord, N.P., doctoral student) MSB students Randle McCain, Kelly Speer, Donovan Jackson, Galen Rask, and Candice Espinosa completed mammal and parasite surveys on Heceta, Tuxekan, and White Cliff islands of Southeast Alaska.</td>
<td>Mammals</td>
</tr>
<tr>
<td>August</td>
<td>Brantley, Sandra led the arthropod identification for BioBlitz, Sandia Mountains Natural History Center Undergraduates from MSB Graduate!</td>
<td>Arthropods</td>
</tr>
<tr>
<td>October</td>
<td>Sandy Brantley was expert identifier for the Broad Canyon Audubon Area BioBlitz</td>
<td>Arthropods</td>
</tr>
<tr>
<td>January 2013</td>
<td>MSB Collections Managers conduct science outreach at Sandia Prep</td>
<td>MSB</td>
</tr>
<tr>
<td>April</td>
<td>Natural Heritage New Mexico Wins National 2013 NatureServe Network Award for Conservation Impact</td>
<td>Natural Heritage Program</td>
</tr>
<tr>
<td>April</td>
<td>AIM-UP! (Advancing the Integration of Museums into Undergraduate Programs) held its third annual workshop at Harvard University</td>
<td>MSB</td>
</tr>
<tr>
<td>May</td>
<td>MSB Undergraduates wins top honors at Biology Graduation</td>
<td>MSB</td>
</tr>
<tr>
<td>May</td>
<td>Tom Turner and his recovery team wins national recognition from USFWS for efforts related to Gila Trout conservation.</td>
<td>Fishes</td>
</tr>
<tr>
<td>June</td>
<td>Two MSB graduate students win national awards from the 2013 American Society of Mammalogists meeting in June in Philadelphia.</td>
<td>Mammals</td>
</tr>
</tbody>
</table>
Ongoing Challenges to Growth and Development of the MSB

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

IT Support

The National Science Foundation through NIBA and US Federal Agencies through BISON have committed significant resources to the digitization of natural history Collections. MSB has long held a leadership role in these efforts yet we still lack critical information technology support. MSB manages huge digital databases and plays a leadership role nationally in environmental informatics (e.g., VertNet, Arctos, NSCA, TCN); we need state-funded information technology support. IT Technologist/Systems Administrator position or faculty associated line would help develop, utilize, sell, and maintain this growing cyber-infrastructure.

Storage Space

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

Operating budgets

Operating budgets are low for collection care and were further reduced in 2012 by Biology Chair Richard Cripps, the first cut in over 10 years. Support has not kept pace with increased activity in several of the Divisions and now we fall further behind.

Faculty Curators

Currently, faculty curators are not compensated for curatorial work! A more permanent solution is needed to insure faculty leadership and involvement in MSB. UNM administrators have acknowledged this problem and have agreed to rectify. Furthermore, because faculty lines are not permanently tied to collections, any loss of a faculty member (i.e., retirement, resignation) jeopardizes UNM’s long-term investment in this significant resource. More work is ahead of us to rectify these structural governance problems.

Natural Heritage New Mexico

Natural Heritage New Mexico (NMNH) does not have a secure financial future as direct legislative support has been reduced over the past 5 years. This year “bridge funding” from the department and Dean’s office kept the program afloat, but a long-term business plan is needed. NMNH holds a leadership role in UNM’s collaborations with state and federal agencies and private partners related to UNM’s involvement in conservation science projects and plays a significant role in the institutions research and public service portfolios.
DIVISION OF AMPHIBIANS AND REPTILES

DIVISION HIGHLIGHTS

The collection increased by 2,385 specimens in 2012 to a total of 94,550 specimens, with many specimens deposited by New Mexico Department of Game and Fish. Notable additions include 20 accessions from the northwestern corner of New Mexico including two new county records for New Mexico.

For 2012, the collection was queried 10,238 times and served 6,248,259 records via HerpNET, while GBIF reported there were 20,006 searches and downloads of 847,050 records from our collection. Data associated with specimens from the division have been used in at least 24 publications in 2012. We hosted 13 visitors and individually compiled data for others on 28 occasions.

Our activities focus on research and outreach activities that involve students. We continue work with the USGS Colorado Plateau Research Station at Northern Arizona University on projects that examine distributions of amphibians and reptiles. Through this collaboration as well as NSF-funded “Undergraduate Opportunities” program (http://www.msb.unm.edu/UnO/education.html), we provided training to five undergraduate students to work in biological research. Other activities included lending of specimens for teaching purposes to University of New Mexico classes and other educational entities, such as the Bosque Ecological Monitoring Program, and advising students on class projects. We hosted many tours and gave several public presentations and invited lectures, all led by the division’s collection manager. For example, in June we were invited to a local radio show (KUNM) to talk about 2012 as the Year of the Lizard. We continued to work with the New Mexico Department of Game and Fish through participation on boards dedicated to species recovery as well as field outings. Our division also continues to be a leader in regional involvement through a recent election of the collection manager to co-chair of the Southwestern chapter of Partners in Amphibian and Reptile Conservation.

COLLECTION USE SUMMARY

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Collection Growth (specimens cataloged)</td>
<td>2,385</td>
</tr>
<tr>
<td>Loans - outgoing</td>
<td>7</td>
</tr>
<tr>
<td>Loans - incoming</td>
<td>2</td>
</tr>
<tr>
<td>Research Visitors</td>
<td>13</td>
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<tr>
<td>Outreach Visitors</td>
<td>&gt;120</td>
</tr>
<tr>
<td>Information Requests Answered</td>
<td>166</td>
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<tr>
<td>Direct Website Access (“Hits”)</td>
<td>4,012</td>
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<tr>
<td>Indirect Specimen Data Queries (“Hits”)</td>
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<tr>
<td>Indirect Specimen Records Downloaded</td>
<td>7,095,309</td>
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<td>Downloads of Division Documents</td>
<td>1,179</td>
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<tr>
<td>Publications Citing/Using MSB Herpetological Specimens</td>
<td>24</td>
</tr>
</tbody>
</table>

1Research visitors are those visiting the collection as part of research activities. Outreach visitors are those visiting as part of tours.
2Direct website access represents access to our Division’s webpages.
3Indirect access represents access to data associated with our specimens via data aggregator websites: HerpNET and GBIF
### COURSES USING THE COLLECTIONS

<table>
<thead>
<tr>
<th>TERM</th>
<th>COURSE</th>
<th>TITLE</th>
<th>STUDENTS</th>
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<tr>
<td>Spring &amp; Fall</td>
<td>BIOL 204</td>
<td>Animal Form and Function</td>
<td>363</td>
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<td>BIOL 386</td>
<td></td>
<td>General Vertebrate Zoology</td>
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<td>BIOL 499</td>
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<td>Herpetology</td>
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### COURSES TAUGHT BY MSB PERSONNEL

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<th>TERM</th>
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<td>BIOL 402</td>
<td>Topics in Herpetology Collection Research</td>
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<td>BIOL 499</td>
<td>Undergraduate Problems</td>
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<td>BIOL 502</td>
<td>Topics in Herpetology Collection Research</td>
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<td>BIOL 551</td>
<td>Graduate Research Problems</td>
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<td>Fall</td>
<td>BIOL 379</td>
<td>Conservation Biology</td>
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<td>BIOL 402</td>
<td>Introduction to GPS for Conservation</td>
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<td>Conservation Biology Seminar</td>
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<td>BIOL 699</td>
<td>Dissertation</td>
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<td>Genetics</td>
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<td>Latella, I.M.</td>
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<td>BIOL 461</td>
<td>Introduction to Tropical Biology</td>
<td>16</td>
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<td></td>
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<td>BIOL 386</td>
<td>General Vertebrate Zoology</td>
<td>37</td>
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</table>
**COLLECTION MANAGEMENT**

The collection increased by 2,385 specimens in 2012 to a total of 94,550 specimens. Many specimens were deposited by New Mexico Department of Game and Fish personnel and collaborators. The most notable additions from the 20 accessions catalogued during 2012 include a large collection of specimens from the Northwestern corner of New Mexico and voucher specimens for at least two new county records of occurrence from New Mexico.

The website of the division continues to receive thousands of hits and the collection receives a lot of queries via aggregator sites. For all of 2012, the collection was queried 10,238 times and served 6,248,259 records via HerpNET while GBIF has reported that for the same period, there were 20,006 searches and downloads of 847,050 records from our collection. In addition to internet queries, data associated with specimens from the division have been used in at least 24 publications in 2012. Many scientists and members of the general public continue to request information on specimens or general aspects of herpetology from our division via telephone, email and directly in person. In addition to responding to these requests, we hosted 13 visitors and individually compiled data on 24 occasions.

**AWARDS, GRANTS, AND CONTRACTS**


**PUBLICATIONS**

**Journal Articles**


**Web-Based**


Work In Progress


M.J. Ryan & S. Poe. Seasonal shifts in forest and riparian habitat use in the lizard *Anolis polylepis* Journal of Herpetology (Rejected, in revisions).

Publications/Reports Based on MSB Specimens/Data


**ACTIVITIES IN LEARNED SOCIETIES**

**Invited/Plenary Talks and Seminars**

**Giermakowski, J.T.**

Techniques in Curation of Amphibians and Reptiles. Invited Lecture: Natural History Collections Curatorial Techniques (BIOL 419/519) Class. April.


Gray, L.N.
XII Reunión Nacional de Herpetología, 6-9 Noviembre 2012, Tuxtla Gutiérrez, Chiapas. Conferencia magistral: Levi N. Gray University of New Mexico, USA “Anolis of Mexico: Systematics, Biogeography, and a New Key”

Snell, H.L.
Snell, H.L. Goals of Ecological Monitoring for the Conservation of Endangered Species. Presented at the Sceloporus arenicolus Research Integration Workshop, College Station, Texas, January 2012.

McInnes, T.L.

Contributed Talks and Posters

Giermakowski, J.T.


Attendance at Professional Meetings

Giermakowski, J.T.
Southwestern Partners in Amphibian and Reptile Conservation, Las Vegas, Nevada. October.

Service as Editor or on Editorial Board of a Journal

Snell, H.L.
Editor of the Publication Series of the Museum of Southwestern Biology

Service as Officer of Professional Society/Organization

Giermakowski, J.T.
Elected Co-chair of the Southwestern Partners in Amphibian and Reptile Conservation Steering Committee.

OTHER PROFESSIONAL ACTIVITIES

Presentation to General Audience in a Scholarly Capacity

Giermakowski, J.T.
Local amphibians and reptiles. Presentation to the Bosque Academy Summer Camp Program, Albuquerque, New Mexico. July.

Lizards in New Mexico. Live radio presentation on Children’s Hour (KUNM). June.

Gray, L.N.

Ryan, M.J.
Lizards in New Mexico. Live radio presentation on Children’s Hour (KUNM). June.

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

Snell, H.L.
Member of New Mexico Department of Game and Fish Species Recovery Team for Boreal Toads. New Mexico Department of Game & Fish.

Invited participant - Sceloporus arenicolus (Dunes Sagebrush Lizard: USFWS Candidate for Endangered Species Status) Research Integration Workshop, College Station, Texas, January 2012.

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

Snell, H.L.
New Mexico Department of Game & Fish Species Recovery Board.
Tenure & Promotion Committee (2012-13)
Museum of Southwestern Biology Publications Committee
Departmental Search Committee for Senior Ecologist (2011-2012)
Museum of Southwestern Biology Executive Committee
Member of the UNM Faculty Senate (through July 2012)
Coordinator and Advisor: Concentration for Conservation Biology within the Biology Department.

Giermakowski, J.T.
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. 2012-2014.

Journal Referee

Ryan, M.J.
Biological Conservation; Herpetological Conservation and Biology; South American Journal of Herpetology; EcoHealth

PUBLIC SERVICE

Snell, H.L.

Invited participant - Sceloporus arenicolus (Dunes Sagebrush Lizard: USFWS Candidate for Endangered Species Status) Research Integration Workshop, College Station, Texas, January 2012. NOTE – This is also listed above in B. The workshop was in two parts and we provided both types of contributions to different audiences on different days.

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

Work with Whitfield Wildlife Conservation Area, Belen, NM

Work with the New Mexico Mountain Club to promote wilderness activities throughout New Mexico.
Chairman of the New Mexico Mountain Club’s Technical Rock Climbing Section for 2013 – primary responsibility is running the NMMC Technical Rock Climbing School to teach and promote safe mountaineering.

**Ryan, M.J.**

Sevilleta National Wildlife Refuge LTER Research Experience for Undergraduates (REU): Hannah Marti – Ant and lizard diversity across habitats on the Sevilleta NWR.

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

**Latella, I.M.**

The University of New Mexico Grove Summer Research Grant. $2500

**Ryan, M.J.**

Graduate Student Fellowship for Summer Research at the Sevilleta LTER
The University of New Mexico Department of Biology Travel Grant

**McInnes, T.L.**

The University of New Mexico Graduate and Professional Student Association Travel Grant. Summer 2012.

**DONATIONS AND GIFTS RECEIVED**


**CURRENT STAFF**

**Faculty and Staff**

Snell, H.L., Professor and Curator
Degenhardt, W.D., Curator and Professor Emeritus
Poe, S., Associate Professor and Associate Curator
Giermakowski, J.T., Collection Manager
Ryan, M.J. Graduate Assistant (Spring)
Gray, L. N., Graduate Assistant (Fall)

**Graduate students**

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

**Undergraduate Student Workers and Volunteers**

Chour, Jobette. Student employee (UnO)
Gibboney, Krista. Student employee
Hostak, Emily. Student employee
White, Amy. Student employee
Wilson, Cassandra. Student employee
MUSEUM ASSOCIATES

Curatorial Associates

Painter, C.W., New Mexico Dept. of Game & Fish
Stuart, J.N., New Mexico Dept. of Game & Fish

Research Associates

Fitzgerald, L., Texas A&M University
Fritts, T.H., retired
DIVISION HIGHLIGHTS

Highlights for the Division (in conjunction with the research laboratory of KB Miller) include initiation or continuation of multiple NSF grants, a US National Park Service grant and USDA grants totaling $2.8 million. One of these an NSF grant specifically for improvement to the Arthropod Division ($453,444) which officially completed during 2012. Another is also specifically collections-related as part of the NSF Emerging Frontiers program to digitize many of our specimens of southwestern insect ground-dwelling arthropod species. This is a large initiative with about 10 institutions variously involved and over $1.2 million in total funding (our portion in collaboration with Northern Arizona University is about $366,333). We shifted our databased specimens to Symbiota software to align with this initiative. Major field campaigns for insect collecting were conducted to Costa Rica and Nicaragua as well as locally in the southwest producing large numbers of new specimens for the collection. Renovation began for the alcohol collections of Arthropods and Parasitology in Spring 2012. The area is the former conference room next door to Arthropods alcohol lab. Panama trip.

COLLECTION USE SUMMARY

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COURSES USING THE COLLECTION

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COURSES TAUGHT BY MSB PERSONNEL

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<td>Lightfoot, D.C.</td>
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AWARDS, GRANTS, AND CONTRACTS

Lord, N.P. Entomological Society of America (ESA) Systematics, Evolution, and Biodiversity (SysEB) travel award ($1,000) April 2012.
Lord, N.P. Ernst Mayr Travel Grant, Museum of Comparative Zoology, Harvard University ($1,500) April 2012.

Lord, N.P. Alvin R. and Caroline G. Grove Doctoral Scholarship ($3,000), and the Lynn A. Hertel Graduate Research Award ($2,000), both from UNM, April 2012.

Lord, N.P. Sigma Xi GIAR (Grants-in-Aid of Research) travel grant ($669) as well as UNM's OGS Graduate Research Supplement Grant ($2,000), April 2012.

Lord, N.P. Mini-ARTS grant ($3,000) from the Society of Systematic Biologists (SSB) to investigate the Diversification and Biogeography of Southern Hemisphere Zopheridae (Coleoptera: Tenebrionoidea), July 2012.

Lord, N.P. UNM Office of Graduate Studies, Summer RPT Grant ($620), July 2012.

Lord, N.P. UNM Biology Graduate Research Allocations Committee, Research ($304) and Travel grant ($150), July 2012.

Lord, N.P. American Museum of Natural History, Weevil Course Stipend ($500), August 2012.

Miller, K.B. and E.H. Nearns. USDA/APHIS ($77,825). This grant will fund Gino's postdoctoral research at the U.S. National Museum, Smithsonian Institution, to develop phase two of "Longicorn ID: Tool for Diagnosing Cerambycoid Beetles" beginning in January 2013.

Nearns, E.H. Entomological Society of America (ESA) Student and Young Professionals Committee Travel Award for travel to the International Congress of Entomology (ICE 2012), Daegu, Korea, ($1000) in August 2012.

Hopkins, H. UNM Office of Graduate Studies, Summer RPT Grant, ($630) July 2012.

Wright, KW. Harry Wayne Springfield Scholarship for excellence in research and academic record. University of New Mexico Biology Department. ($2500) March 2012.

Wright, KW. Sevilleta Long-Term Ecological Research Program graduate student summer support. University of New Mexico Biology Department. ($3500) Summer 2012.

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

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

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

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


PUBLICATIONS
Journal Articles


C. Web-Based

Brantley, S.L., editor, Spiders of the Arid Southwest, authors are Richman, D.B., D.A. Dean, S.L. Brantley, and B. Cutler


**Technical Reports**


**Theses and Dissertations Completed**


**Publications and Reports Based on MSB Specimens/Data by Outside Researchers**


**ACTIVITIES IN LEARNED SOCIETIES**

**Invited/Plenary Talks and Seminars**


Nearns, E.H. International Congress of Entomology (ICE 2012), Daegu, Korea, symposium on the systematics of Cerambycidae and Buprestisidae, August 2012.


**Contributed Talks and Posters**

Leister, M.P. and R.E. Mallis. Rediscovery of Tengella perfuga Dahl and description of the male, American Arachnological Society, Green Bay, WI; July 2012; presentation


Mallis, R.E. and M.P. Leister. Natural history notes on Dahl’s lost species, Tengella perfuga Dahl, and comparison with T. radiata (Kulczinski), American Arachnological Society, Green Bay, WI; July 2012; presentation.


Homziak, N. A revision of the genus Heteranassa Smith (Lepidoptera: Erebidae: Erebinae), Entomological Society of America, Knoxville, TN, November 2012; poster.


Attendance at Professional Meetings

Leister, M. Arachnological Society of America National Meeting, Green Bay, WI, 07/2012.
Mallis, R. Arachnological Society of America National Meeting, Green Bay, WI, 07/2012.
Homziak, N. Entomological Society of America, Knoxville, TN, 11/2012.
Wright, KW. Entomological Society of America, Knoxville, TN, 11/2012.
Miller, KB. Entomological Society of America, Knoxville, TN, 11/2012.
Brantley, S. Arachnological Society of America National Meeting, Green Bay, WI, 07/2012.

Service as Editor or on Editorial Board of a Journal

Lord, N.P. Subject editor (Coleoptera: Cucujiformia), Zootaxa.
Lightfoot, D.C. Associate editor (entomology and ecology) Western North American Naturalist

Service as Officer of Professional Society/Organization

Homziak, N. President, UNM Chapter of the New Mexico Wilderness Alliance, 2012-2013.


Lord, N.P. Faculty Search Committee Representative, UNM Biology Graduate Student Association, 2012-2013.

Miller, K.B. President, Systematics, Evolution and Biodiversity Section, Entomological Society of America, 2012.
OTHER PROFESSIONAL ACTIVITIES

Presentation to General Audience in a Scholarly Capacity


Miller, KB. Invited research talks (2), University of Southern Mississippi, Sep 2012.

Journal Referee


Mallis, R.E. Reviews for Insect Conservation and Diversity, specifically Arachnids


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

SERVICE

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


Public Service

Brantley, S.L. Training session on spider identification for Robert Delph, biologist at Dugway Proving Ground, UT. May 7-12, 2012, UNM.

Brantley, S.L. Museum of Natural History and Science BioBlitz, Sandia Mountains Natural History Center, August 2012.

Hopkins, H. Expert consultant to Laurel Kriesel-Bigler, Anderson High School, Austin, TX for biology project on *Gromphadorhina portentosa*, October 2012.

Hopkins, H. Provide cockroach identification for National Geographic photographer David Liittschwager, August 2012.

Hopkins, H. Provide cockroach identifications for Ecuador Entomofauna Field Guide to Kelly Swing PhD, Director Estacion Tiputini, Colegio de Ciencias Biológicas y Ambientales, Universidad San Francisco de Quito, Spring 2012.

Hopkins, H. Volunteer, Dine with a Graduate Student, UNM Biology Open House for Prospective Graduate Students, February 2012.


Hopkins, H. Consultant to BugGuide.net on cockroach identification and public inquiries on cockroaches, 2010-present.

Hopkins, H. Judge for UNM Biology Department Research Day, April 2012.

Hopkins, H. Mentor to an undergraduate biology student Nicholas Homziak in the UnO (Undergraduate Opportunities) program, 2012.

Hopkins, H. Judge for Rayos Elementary Science Fair, May 2012.

Wright, KW. Identification of Melissodes bees for Sandra Rehan (PhD Student), Brock University, St. Catharines, ON, Canada; Molly MacLeod (PhD Student), Rutgers University; Elaine Evans (PhD Student) University of Minnesota; David Drons (MS Student) South Dakota State University; David Smith (USFW); and David Lowenstein (MS Student) University of Wisconsin.

**DONATIONS AND GIFTS RECEIVED**

Maes, J.-M. 1800 specimens. Personal spider collection from Nicaragua.

Walker, H. and G. Harper. Several hundred vials and insect preparation materials (pins, Schmitt boxes, pinning blocks, etc.)

**CURRENT STAFF**

**Faculty/Staff**

Kelly Miller, Assistant Professor, Curator
Manuel Molles, Professor Emeritus, Curator Emeritus
Sandra Brantley, Research Assoc. Professor, Senior Collection Manager
David Lightfoot, Research Assoc. Professor, Senior Collection Manager

**Graduate Students**

Nathan Lord, Ph.D. candidate
Eugenio Nearns, Ph.D. candidate
Michael Medrano, Ph.D. candidate
Heidi Hopkins, Ph.D. candidate
Karen W. Wright, Ph.D. candidate
Grey Gustafson, Ph.D. student
Rachael Mallis, Ph.D. student
Bethany Abrahamson, Masters student
Rafael Braga, Ph.D. student visiting from Universidade Federal do Rio de Janeiro (UFRJ)
Undergraduate Student Workers and Volunteers

Sharyn Davidson, volunteer
Martha Lara
R. Antonio Gomez, (UNM MARC program, honors)
Nicholas Homziak, (UNM UNO program, honors)
Stephen Baca
Sarah Jogi
Matthew Leister
Aaron Prairie
Emily Schmeltzer

MUSEUM ASSOCIATES

Research Associates

Ana Davidson, postdoctoral fellow, UNM and UNAM
Eric Metzler, Ohio State University, retired
Robert Parmenter, Valles Caldera National Preserve
Ernest Valdez, USGS
Marc Roland, retired
DIVISION OF BIRDS

DIVISION HIGHLIGHTS

Five major expeditions to Peru that collected over 1700 new specimens along altitudinal gradients (pending export).

Field expedition to South Africa with MSB Parasite Division that added 120 bird specimens to the MSB collection.

Overall growth by 1038 cataloged specimens.

18 scientific papers published.

Four student presentations at the North American Ornithological Congress in Vancouver, British Columbia, Canada.

Masters student Shane DuBay wins BEST STUDENT TALK award at the North American Ornithological Congress in Vancouver, British Columbia, Canada.

Two Masters Degrees awarded Graduated in summer. (Phred Benham and Shane DuBay)

Undergraduates C. Jonathan Schmitt (*summa cum laude*) and Bethany Abrahamson (*cum laude*) complete honors theses in Biology

Three MSB Birds students won prestigious doctoral fellowships starting in fall 2012:
  Shane DuBay (M.S. 2012), Ph.D. Fellowship at the University of Chicago
  Phred M. Benham (M.S. 2012), NSF-IGERT Fellow at Univ. Illinois
  Sabrina McNew (Postbac researcher, 2011-2012), NSF GRF Fellow at Univ. Utah

Curator Emeritus Robert W. Dickerman honored by Festschrift in *Western Birds*, Volume 43, number 4, including three papers by MSB Birds personnel.

COLLECTION USE SUMMARY

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<td>Publications Citing/Using MSB Bird Specimens</td>
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## COURSES USING THE COLLECTIONS

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## COURSES TAUGHT BY MSB PERSONNEL

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Johnson, A.B.  

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COLLECTION MANAGEMENT

Synopsis of 2012 Management Activities

Our colleagues in South Africa welcomed us back in January 2012 for continued field work in Free State Province. This time Ernie Valdez and Andy Johnson went with Sara Brant and Erika Gendron of the Parasite Division. The parasitologists were interested in water birds, and we were able to put together a trip that was beneficial to both divisions. After the parasitologists left, Andy and Ernie stayed another two weeks and worked in some highland sites in eastern Free State near the Lesotho and Kwazulu-Natal Border. We found the birds to be amazing, our hosts extremely hospitable, and ended up adding 120 more specimens to our collection.

Beginning in May, we began working in Peru. Our efforts there by our team of 18 ornithologists from both New Mexico and Peru collected 1700 specimens from four different sites in northern Peru. Our efforts in this region added a tremendous amount of data to our ongoing projects on avian physiology, elevational adaptation, phylogeography, flight muscle evolution, and also contributed to the greater understanding of birds in that poorly-known region.

Closer to home, we continued to work at Boone’s Draw in Roosevelt County, New Mexico, and also took trips to Elk Mountain in the Sangre de Cristo Mountains, several spots in the Gila River Drainage, the Jemez Mountains including the Valle Grande, and the Chuska Mountains.

We said our goodbyes to some very good people this summer. Two masters’ students, Shane DuBay and Phred Benham, both of whom successfully defended in the spring semester, moved on to Ph.D. programs. Phred is at the University of Illinois, and Shane is at the University of Chicago. Lab Tech Sabrina McNew, who received an NSF Pre-Doctoral Fellowship, also left us to begin her graduate work at University of Utah.

Division personnel attended the fifth North American Ornithological Congress in Vancouver, BC in August. Several students presented their work, and Shane DuBay won an award for best student presentation. Spencer Galen and Sabrina McNew attended a Malaria workshop in Shepherdstown, WV.

Adrienne Raniszewski continued to excel for us as a coordinator for skeleton preparation. Through her hard work and two work-study students, Madeline Cauthen and Travis Romero, we cleaned and prepared 700 bird skeletons.

Travel for Research

Libby Beckman
   LSU Museum of Natural Science (1 week)

Phred Benham
   Peru expedition, May – July 2012
   Gila National Forest, November 2012

Jennifer Clark
   Peru expedition, May - July 2012

Robert Dickerman
   Burke Museum, Univ. British Columbia, August 2012

Shane DuBay
   American Museum of Natural History, Feb 2012
   Field Museum of Natural History, Feb 2012
   Peru expedition, May – June 2012

Spencer Galen
Peru expedition, May – July 2012
Malaria workshop, July 2012

Andrew Johnson
South Africa Expedition, January – February 2012
Peru expedition, June – July 2012

Sabrina McNew
Peru expedition, May – June 2012
Malaria workshop, July 2012

Iris Olivas
Peru expedition, May – June 2012

Jonathan Schmitt
Peru expedition, May – July 2012
Bolivia, December 2012

Greg Schmitt
Peru expedition, May – July 2012
Chuska Mts, NM, October 2012

Donna Schmitt
Chuska Mts, NM, October 2012

Ashley Smiley
Peru expedition, May – July 2012

Ernie Valdez
South Africa expedition, January – February 2012

Christopher C. Witt
Peru expedition, June – July 2012

Natalie Wright
Florida Museum of Natural History, 1 week in April 2012, 1 week in December 2012
Burke Museum of Natural History and Culture, 3 days in July 2012
Gregory Lab at University of Guelph estimating genome sizes, 2 weeks in June
Flight Lab with Bret Tobalske at University of Montana, 1 week in September

AWARDS, GRANTS, AND CONTRACTS

Christopher. C. Witt

Submitted To All Agencies In 2012


2012: NSF-REU Supplement: Montane Biogeography Revealed by Quirks of the Evolutionary Process: Integrative Respiratory Phenotypes for Andean Birds; P.I.: C. C. Witt; National Science Foundation (Evolutionary Processes Cluster); $15,000. Supplement to DEB-1146491.


Awarded With 2012 Initial Start Date

2012: NSF-REU Supplement: Montane Biogeography Revealed by Quirks of the Evolutionary Process: Integrative Respiratory Phenotypes for Andean Birds; P.I.: C. C. Witt; National Science Foundation (Evolutionary Processes Cluster); $15,000. Supplement to DEB-1146491.


In Force From Previous Years

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

2010-2012: Seed Grant from Center for Evolutionary and Theoretical Immunology: Diversity and host-parasite dynamics of avian malaria along a tropical altitudinal gradient. ~1 December 2010 – 1 December 2012. PI- C. C. Witt; subaward of NIH-CETI grant to P.I.’s E. S. Loker and R. Miller; $80,000.


Elizabeth Beckman

Awarded

Chapman Grant - $2210.00
UNM Biology - $1500
CETI 454 voucher - ~$10,000

Grants Applied For And Not Received

Wilson Ornithological Society Research Grant
Latin America and Iberian Institute PhD fellowship
Lewis and Clark Research Grant
Graduate Resources Allocation committee research grant

Shane DuBay

Awarded
North American Ornithological Conference Student Presentation Award (Cooper Ornithological Society Board of Directors Award) $300

North American Ornithological Conference Student Travel Award $500
Spencer Galen

Pending
NSF GRF

Sabrina McNew

Awarded
NSF Graduate Research Fellowship, 3-yr fellowship

Iris Olivas

Awarded
Alliance for Minority Participation Undergraduate Research Assistantship $2000

C. Jonathan Schmitt

Applied For and Not Received
NSF GRFP

Natalie Wright

Awarded
UNM Biology Department Caughran Memorial Scholarship, awarded $2,500 for research travel and conference attendance
UNM PiBBs fellowship, renewed for 2012-2013 school year ~$30,000
UNM PiBBs Student Enrichment Opportunity, $500 for research travel

Pending
NSF Doctoral Dissertation Improvement Grant November 2012, $14,742

Applied For and Not Received
Sigma Xi March 2012, $1,000

PUBLICATIONS (MSB BIRDS PERSONNEL IN BOLD; STUDENTS DENOTED WITH ASTERISK*)

Peer-reviewed Journal Articles


Johnson, A.B. 2012. A Vaux’s Swift specimen from New Mexico with a review of Chaetura records from the region. Western Birds 43: 229-235


Web-Based

http://www.museum.lsu.edu/~Remsen/SACCprop525.html


Technical Reports


Theses and Dissertations Completed

Benham, P.M. 2012. The role of geological history, topography, and environmental heterogeneity in the diversification of an endemic Andean radiation : the Metallura hummingbirds. University of New Mexico Masters’ Thesis


Work In Progress


Baumann, M. J., S. M. McNew, & C. C. Witt. 2013. Morphological and molecular evidence confirm the first definitive eastern White-breasted Nuthatch (Sitta carolinensis) for New Mexico. Western Birds, in press.


Publications and Reports Based on MSB Bird Division Specimens/Data


Johnson, A.B. 2012. A Vaux’s Swift specimen from New Mexico with a review of Chaetura records from the region. Western Birds 43: 229-235.


**ACTIVITIES IN LEARNED SOCIETIES**

**Invited/Plenary Talks and/or Seminars**


**Contributed Talks and Posters**


Abrahamson, B. L., and C. C. Witt. 2012. Distribution limits and competitive dynamics of black-chinned and broad-tailed hummingbirds on an elevational gradient. 50th Annual Meeting of the New Mexico Ornithological Society, Albuquerque, NM.


**Attendance at Professional Meetings**

Beckman, E.J.

50th Annual NMOS, Albuquerque, NM, March 2012.
NAOC-V, Vancouver, BC. August 2012

Benham, P.M.
New Mexico Ornithological Society Meeting, Albuquerque, NM. April 2012
NAOC-V, Vancouver, BC. August 2012

Dickerman, R.W.
NAOC-V, Vancouver BC August 2012
Western Field Ornithologists meeting Petalouma CA September 2012

DuBay, S.G.
NAOC-V, Vancouver, BC. August 2012

Galen, S.C.
Second Annual International Workshop on Malaria and Related Haemosporidian Parasites of Wildlife
Shepherdstown, West Virginia - National Conservation Training Center August 5 – 9

McNew, S.M
Second Annual International Workshop on Malaria and Related Haemosporidian Parasites of Wildlife
Shepherdstown, West Virginia - National Conservation Training Center August 5 – 9

Olivas, I.
Society for Advancement of Chicanos and Native Americans in Science National Conference; Seattle,

Schmitt, C. J.
50th Annual NMOS, Albuquerque, NM, March 2012.

Smiley, A.
Society for Advancement of Chicanos and Native Americans in Science National Conference; Seattle,

Williams, S. O. III
50th Annual NMOS, Albuquerque, NM, March 2012.

Witt, C. C.
50th Annual NMOS, Albuquerque, NM, March 2012.

Wright, N.A.
NAOC-V, Vancouver, BC. August 2012

Service as Editor or on Editorial Board of a Journal

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

Service as Officer of Professional Society/Organization

Wright, N.A.
AOU Collections Committee

Witt, C. C.
AOU Student Awards Committee

OTHER PROFESSIONAL ACTIVITIES
Presentation to General Audience in a Scholarly Capacity


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

Williams, S.O.
Secretary of the New Mexico Bird Records Committee

Witt, C. C.
Reviewer for National Science Foundation systematics proposal
Grant reviewer 8 student proposals for Mewaldt-King Student Award, Cooper Ornithological Society
Reviewer for Explorer’s Club Grant Program 2012.
Reviewer for NAOC Student Travel Awards 2012.
Reviewer for Wilson Ornithological Society Student Awards, 2012 rounds.
Reviewer and Committee Member for AOU student travel awards 2012.
Reviewer and Committee Member for AOU postdoc travel awards 2012.

Journal Referee

Beckman, E.J
Auk (1)
Biological Journal of the Linnean Society (1)

Witt, C. C.
UNM Press (1 book)
Molecular Ecology (2 articles)
Cotinga (1 article)
Auk (1 article)
Journal of Avian Biology (1 article)
Zootaxa (1 article)

SERVICE

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

Wright, N.A. Hosted researcher Bret Tobalske, March 2012, SiBBs speaker

Public Service

Williams, S.O. III
New Mexico Coordinator of the North American Breeding Bird Survey (BBS)

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

Beckman, E.L.
UNM Biology Graduate Student Association (BGSA) Secretary (2011-2012 school year)
UNM Dept. of Biology: Research Day Undergraduate Poster Judge, 2012
Biology Graduate Student Association: Grant reviewer Fall 2012
DuBay, S.G.
   BGSA Co-president Jan-May 2012

Galen, S.C.
   BGSA Space Allocations Committee at UNM

Johnson, A.B.
   UNM Dept. of Biology: Research Day Undergraduate Poster Judge, 2012

Witt, C. C.
   UNM Dept. of Biology: Research Day Undergraduate Poster Judge, 2012
   2011-2012: Ecology Junior-Faculty Search Committee (270+ applications).

Wright, N.A.
   Grad student rep on the Biology department graduate admissions committee
   Grad student rep on the BUGS-BGSA mentoring organization
ADVANCED STUDY, HONORS, AWARDS, FELLOWSHIPS, ETC.

Beckman, E.J.: 2nd place for Biology graduate student poster presentation, UNM Biology Research Day 2012.

Dubay S. G.; Best student talk award, North American Ornithological Conference, Vancouver.

Three MSB Birds students won prestigious doctoral fellowships starting in fall 2012:
Shane DuBay (M.S. 2012), Ph.D. Fellowship at the University of Chicago
Phred M. Benham (M.S. 2012), NSF-IGERT Fellow at Univ. Illinois
Sabrina McNew (Postbac researcher, 2011-2012), NSF GRF Fellow at Univ. Utah

DONATIONS AND GIFTS RECEIVED

Robert W. Dickerman: ~25,000
David Marchiando: $100
Thomas and Loretta Witt: $500
Dr. Robert Newman: $50

CURRENT STAFF

Faculty/Staff

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

Graduate Students

Natalie Wright, Ph.D Student
Elizabeth Beckman, Ph.D Student
William Talbot, Ph.D. Student
Phred Benham, Masters’ Student
Shane DuBay, Masters’ Student
Spencer Galen, Masters’ Student
Nick Pederson, Masters’ Student
Matthew Baumann, Masters’ Student
Andrea Chavez, Masters’ Student
Carl Jonathan Schmitt, Masters’ Student

Undergraduate Student Workers and Volunteers

Bethany Abrahamson; 2009-2012; UNMHummingbird distribution limits in NM; Undergraduate thesis cum laude; current graduate student at UNM.

Kobie Boslough; 2009-2013; Albuquerque Academy; Bird specimen curation and Molecular lab work

Catherine Bradt; 2012; UNM; Red Blood Cell Concentration and malaria in birds.

Madeline Cauthen; 2012-2013; UNM; Bird specimen curation

Jennifer Clark; 2012; UNM; Avifauna of elevational gradients in the Marañon region

Mariela Combe; 2012; Univ. Agraria La Molina, Lima-Peru; Hispanic; Avifauna of elevational gradients in the Marañon region
Monica Flores; 2009-2012; Univ. Peruana Cayetana-Heredia; Hispanic; Endangered Polylepis forests of Apurimac

Michael Hilchey; 2009-2013; UNM; Phylogeography of the Curve-billed Thrasher in New Mexico.; Undergraduate thesis in progress

José Huaroto; 2012; Univ. Agraria La Molina, Lima-Peru; Hispanic; Avifauna of elevational gradients in the Marañon region

Jason Kitting; 2012; UNM; Red Blood Cell Concentration in Birds.

Sabrina McNew; 2010-2012; UNM; Avian malaria diversity across an elevational gradient; current NSF-GRF Fellow and doctoral student at Univ. Utah.

Matthew O'Donnell; 2010-2012; UNM; Microscopy surveys for avian malaria.

Iris Olivas; 2011-2013; UNM; Hispanic; MARC Program; Malaria prevalence across environmental gradients in Peru; Undergraduate thesis in progress

Paloma Ordoñez; 2012; Univ. Agraria La Molina, Lima-Peru; Hispanic; Avifauna of elevational gradients in the Marañon region

Erika Pohl; 2011-2013; UNM; Lab techniques in ornithology.

Travis Romero; 2012-2013; UNM; Hispanic; Bird specimen curation

Ashley Smiley; 2010-2013; UNM; Navajo; UNO and MARC Programs; Avian cardiac morphology; Undergraduate thesis in progress

Rosemary Steinberg; 2012-2013; UNM; Genetic and plumage variation in Cassin’s Finches.; Undergraduate thesis in progress

Raymond VanBuskirk; 2009-2013; UNM; Rosy Finch PCR-based sex determination.; Undergraduate thesis in progress.

Karen Verde; 2012; Univ. Agraria La Molina, Lima-Peru; Hispanic; Avifauna of elevational gradients in the Marañon region.

Cole Wolf; 2011-2013; UNM; Yellow-rumped Warbler ecology and genetic variation in New Mexico.

MUSEUM ASSOCIATES

Curatorial Associates

Robert W. Dickerman
John P. Hubbard

Research Associates

Sartor O. Williams, III
C. Gregory Schmitt
Donna C. Schmitt
Mary Alice Root (deceased 31 Jan 2013)
J. David Ligon
DIVISION OF FISHES

DIVISION HIGHLIGHTS

Currently, the MSB Division of Fishes has 87,807 catalogued lots of fishes (3,822,727 specimens). During the year, 1,118 lots of fishes (16,923 specimens) were cataloged and integrated into the main collections. To date, there are 49,616 digital files of field notes, habitat photographs, specimens (for color), and data sheets available along with 38,878 specimen locality records. 2012 funding, through grants and contracts, was $566,360 and supported ichthyological research, aquatic studies, and museum curation of fish collections.

Thomas F. Turner, Curator of Fishes took sabbatical leave January to August 2012. During this time, he collaborated with Thomas Dowling and Paul Marsh, Arizona State University on genetics and management of Razorback Sucker (Xyrauchen texanus) in the lower Colorado River with special emphasis on developing time-series analyses to understand the species demographic and genetic responses to management actions. He also collaborated with Keith B. Gido, Kansas State University and David L. Propst, New Mexico Dept. of Game and Fish (retired) on design and implementation of an aquatic ecosystem monitoring program in the upper Gila River to evaluate responses to the recent Whitewater-Baldy Fire.

Stephen T. Ross, Curator Emeritus was elected to the Board of Governors of the American Society of Ichthyologists and Herpetologists, Class of 2017.

Outreach Summary: Cibola High School Gifted Student Mentor, January to May 2012 (170 hours) Volcano Vista High School Gifted Student Mentor, January to May 2012 (170 hours). Bosque Club, Coronado Elementary After School Program, December 2012, (4 hours).

COLLECTION USE SUMMARY

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1 specimen loans, return of loans, gifts, exchanges, and tissue (consumptive) transfers
2 loans, gifts or tissue transfers from other institutions
3 research, accessing specimens, or info exchange (not tour groups)/number of visitor days
4 emails, letters, telephone calls (not tour groups or website “hits”) averaging 1 hour to respond
5 publications in peer review journals
## COURSES USING THE COLLECTIONS

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## COURSES TAUGHT BY MSB PERSONNEL

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<td></td>
<td></td>
<td>BIOL 651</td>
<td>Advanced Field Biology</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIOL 699</td>
<td>Dissertation</td>
<td>1</td>
</tr>
<tr>
<td>Krabbenhoft, C.A.</td>
<td>Spring</td>
<td>BIOL 496L</td>
<td>Limnology</td>
<td>6</td>
</tr>
</tbody>
</table>
COLLECTION MANAGEMENT

Graduate student Curatorial Assistant, Tracy A. Diver, devised a protocol for freeze drying fish specimen tissues for long-term storage in the MSB fish collections and conservation of DNA. Using a Labconco Freeze Fryer (purchased by the Conservation Services, New Mexico Dept. of Game and Fish), Diver processed over 1,500 tissues from a Rio Grande cutthroat trout study (ACC2002-VIII:21) and *Etheostoma* spp. collections from the early 1990s (ACC1998-XI:11). This work was continued by Corey L. Krabbenhoft, Graduate Student Curatorial Assistant, summer of 2012 and Alyssa R. Hopkins, fall 2012.

Four undergraduate Curatorial Assistants 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, US Bureau of Reclamation, US Bureau of Land Management, Aquatic Conservation Facility of Albuquerque BioPark, American Southwest Ichthyological Researchers, New Mexico Dept. Game and Fish, and postdoctoral research, conducted in the Turner Lab by Megan J. Osborne, Ph.D. and Evan W. Carson, Ph.D.

AWARDS, GRANTS, AND CONTRACTS

Grant Agreement for Curatorial Services between Bureau of Reclamation upper Colorado Region and the Museum of Southwestern Biology at the University of New Mexico and San Juan River Data Analysis. R11AP40025. A.M. Snyder PI and T.F. Turner CoPI. U.S. Bureau of Reclamation. Total Award (UNM): $146,425. 1 April 2011 to 31 March 2015. Annual budget $31,066

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. Total Award (UNM): $140,000. 1 July 2012 to 30 Jun 2015. Annual budget $20,000.


Baseline Genetic Studies of Fishes Native to the Gila River Basin. T.F. Turner PI and T.J. Pilger CoPI. New Mexico Department of Game and Fish. Total Award (UNM): $10,000 1 July 2011-30 June 2012. Annual Budget $10,000.


Genetic monitoring in support of Gila Trout recovery from a catastrophic fire. T.F. Turner PI. New Mexico Department of Game & Fish. Total Award (UNM): $415,800. 1 October 2012 to 30 June 2018. **Annual budget $68,000**


**PUBLICATIONS**

**Journal Articles**


Technical Reports


Theses and Dissertations Completed


Work In Progress


following impoundment. Journal of Fish Biology.


**Publications and Reports Based on MSB Specimens/Data by Outside Researchers**


**ACTIVITIES IN LEARNED SOCIETIES**

**Invited/Plenary Talks and Seminars (Presenters’ name in bold)**

**Franssen, N.R.** Reservoirs as a model system to investigate contemporary evolution. Michael Blum Laboratory Seminar. Tulane University, New Orleans, LA. April 2012.


**Turner, T. F.** Retrospective stable isotope analysis reveals ecosystem-level responses to river regulation over the last century. Departmental Seminar, University of Toronto, Toronto, ON. Canada. 28 Sep 2012.

**Turner, T. F.** Retrospective stable isotope analysis reveals ecosystem-level responses to river regulation over the last century. Departmental Seminar, Western Kentucky University, Bowling Green, KY. October 2012.

**Contributed Talks and Posters (Presenters’ name in bold)**


Snyder, A.M. *Curating and managing project-based collections of fishes.* World Congress of Herpetology and 92nd American Society of Ichthyologists and Herpetologists, Vancouver, BC, Canada. August 2012.


Attendance at Professional Meetings

Brandenburg, W.H.
San Juan River Recovery Implementation Program, Biology Committee. Fort Lewis College, Durango, CO. 21-23 Feb 2012.

Carson, E.W.

Diver, T.A.

Farrington, M.A.
San Juan River Recovery Implementation Program, Biology Committee. Fort Lewis College, Durango, CO. 21-23 Feb 2012.

Hopkins, A.R.

Krabbenhoft, C.A.

Krabbenhoft, T.J.

Osborne, M.J.

Pilger, T.J.
Western Division of the American Fisheries Society Annual Meeting, Jackson, WY. 26-29 March 2012.

Ross, S.T.
World Congress of Herpetology and 92nd Annual Meeting for American Society of Ichthyologists and Herpetologists, Vancouver, BC Canada. 8-14 August, 2012.

Snyder, A.M.
World Congress of Herpetology and 92nd Annual Meeting for American Society of Ichthyologists and Herpetologists, Vancouver, BC Canada, 8-14 August, 2012.

Turner, T.F.
World Congress of Herpetology and 92nd Annual Meeting for American Society of Ichthyologists and Herpetologists, Vancouver, BC Canada. 8-14 August, 2012.


Colorado River Aquatic Biologists Meeting, Laughlin, NV. 11-12 January 2012.

Service as Editor or on Editorial Board of a Journal

Franssen, N.R.
Contributing Editor – Southeastern Naturalist, since 2012.

Turner, T. F.
Contributing Editor – Aquatic Biology since 2009.

Service as Officer of Professional Society/Organization

Diver, T.A.
Social Chair, Biology Graduate Student Association (BGSA) Department of Biology, University of New Mexico. 2012

Pilger, T.J.
Co-President, Biology Graduate Student Association (BGSA) Department of Biology, University of New Mexico. 2012

Ross, S.T.
Member, Long Range Planning and Policy Committee, American Society of Ichthyologists and Herpetologists, 2007-2013.

Member, Local Host Committee for the 2013 Joint Meeting of Ichthyologists and Herpetologists, Albuquerque NM.

Co-organizer, “Fish out of Water: evolutionary and ecological issues in the conservation of fishes in water-altered environments” symposium for the 2013 Joint Meeting of Ichthyologists and Herpetologists, Albuquerque, NM.

Snyder, A.M.
Board of Governors, American Society of Ichthyologists and Herpetologists, 2011-2016.

Local Committee for the 2013 Joint Meeting of Ichthyologists and Herpetologists, Albuquerque NM.

Turner, T. F.
Chair, Local Committee, 2013 Joint Meeting of Ichthyologists and Herpetologists, Albuquerque NM.

Co-organizer, “Fish out of Water: evolutionary and ecological issues in the conservation of fishes in water-altered environments” symposium for the 2013 Joint Meeting of Ichthyologists and Herpetologists, Albuquerque, NM.

Member, Education and Human Resources Committee, American Society of Ichthyologists and Herpetologists, 2009-2012.

OTHER PROFESSIONAL ACTIVITIES
Presentation to General Audience in a Scholarly Capacity


A. R. Hopkins Life history variation of Gambusia nobilis (Pecos Gambusia) at Bitter Lake National Wildlife Refuge. Brown Bag Seminar, Department of Biology, University of New Mexico, Albuquerque, NM. April 2012.

C.A. Krabbenhoft The contribution of young-of-year fishes to aquatic food web dynamics in an arid-land river system (Rio Grande, New Mexico). Master’s Thesis Defense, Department of Biology, University of New Mexico. Albuquerque, NM. May 2012.

C.A. Krabbenhoft Benthic Invertebrates. BIOL. 495 Limnology, C. Dahm, University of New Mexico, Albuquerque, NM. April 2012.

C.A. Krabbenhoft Aquatic Insects. BIOL. 495 Limnology, C. Dahm, University of New Mexico, Albuquerque, NM. April 2012.

C.A. Krabbenhoft Paleolimnology. BIOL. 495 Limnology, C. Dahm, University of New Mexico, Albuquerque, NM. April 2012.


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


Scholarly Service as a Member of a Local/State/Regional/Nat’I Committee, Panel

Carson, E. W.
Technical advisor, Conocimiento y conservación de la biodiversidad del Churince, Cuatro Ciénegas, Coahuila, Universidad Nacional Autónoma de México (UNAM) and Pronatura Noreste, A. C., Monterrey, NL México. 2012

Dudley, R.K.

**Osborne, M. J.**
Member, Rio Grande, silvery minnow controlled propagation and genetics working group.

Member, Rio Grande, silvery minnow Big Bend Reintroduction Technical team (U.S. Fish and Wildlife Service).

Technical advisor, Chihuahua Chub Recovery Team

Poster Judge, 21st Annual Research Day, Department of Biology, University of New Mexico 2012

**Ross, S.T.**
Judge, Storer Award Committee, Ichthyology, World Congress of Herpetology and American Society of Ichthyologists and Herpetologists, Vancouver, BC, Canada August 2012.

Member, Speed Networking Workshop for graduate students, Joint Meeting of Ichthyologists and Herpetologists, Vancouver, BC Canada. August 2012.

Member, Peer Review Panel, San Juan River Basin Recovery Implementation Program. 2012.

**Snyder, A.M.**
Scientific Member, UNM Institutional Animal Care and Use Committee. 2010-2013.

**Turner, T.F.**
UNM Biology Department Third-Floor Space Committee (Ad-hoc).

UNM Biology Department Tenure and Promotion Committee.

Judge, Stoye Award in Conservation, World Congress of Herpetology and American Society of Ichthyologists and Herpetologists, Vancouver, BC, Canada August 2012.

**Journal Referee**

**E.W. Carson**
Environmental Biology of Fishes (2)
Evolutionary Ecology (1)
Genetica (1)
Journal of Experimental Marine Biology (1)
Journal of Fish Biology (1)
Pan-American Journal of Aquatic Sciences (1)
PlosOne (1)

**N.R. Franssen**
Ecology of Freshwater Fish (1)
Southeastern Naturalist (2)
Hydrobiologia (2)
Journal of Fish Biology (1)
Copeia (1).

**T.J. Krabbenhoft**
African Journal of Agricultural Research (1)
Biological Journal of the Linnean Society (1)
Journal of Fish Biology (2)
Journal of Freshwater Ecology (1)
Marine Biotechnology (1)
Zootaxa (1)

M.J. Osborne
Molecular Ecology (2)
Molecular Phylogenetics and Evolution (1)
Journal of Heredity (1)
Heredity (1)
Immunogenetics (1)

T.J. Pilger
Copeia (1)
Ecology of Freshwater Fishes (1)
Hydrobiologia (1)
Journal of Fish Biology (1)

T.F. Turner
Aquatic Biology (2)
Journal of Heredity (2)
Genetics (1)
Molecular Ecology (2)
Hydrobiologia (2)
Evolutionary Applications (1)
Evolutionary Ecology (1)
National Science Foundation Proposals (2)

SERVICE

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

M. J. Osborne

Public Service

W.H. Brandenburg
Lecture, Coronado Elementary Bosque Club, After school program, December 2012, 15 students (3rd - 5th grade)

T.A. Diver
Habitat Restoration, Albuquerque Wildlife Federation, Albuquerque, NM. 2012

C.A. Krabbenhoft
Lecture, Grade School/Aquatic Science Outreach Day, Erdenebulgan, Mongolia, July 2012.

A.M. Snyder
Student Mentor, Cibola High School, Albuquerque NM. January to May 2012 (170 hours).
Student Mentor, Volcano Vista High School, Albuquerque NM. January to May 2012 (170 hours).

T.F. Turner
Member, Gila Trout and Chihuahua Chub Recovery Team. January to December 2012.

ADVANCED STUDY, HONORS, AWARDS, FELLOWSHIPS, ETC.

Diver, T.A. 3rd Place for best Graduate Student Poster at the 21st Annual UNM Biology Department Research Day

Krabbenhoft C.A. Clifford Crawford Scholarship, Department of Biology, University of New Mexico. $1500.

Krabbenhoft C.A. Alvin R. & Caroline G. Grove Summer Research Scholarship, Department of Biology, University of New Mexico. $1000.


Krabbenhoft T.J. and N. Mercado-Silva. US-Mongolia Field Fellowship, American Center for Mongolian Studies. $8,000.

Krabbenhoft T.J. Student participant: NSF International Research Experiences for Students. Five weeks field research in Mongolia.

Pilger T.J. Student Conference Award Program, Career Services, University of New Mexico. $600.

CURRENT STAFF

Faculty/Staff

Evan W. Carson, Research Assistant Professor
Nathan R. Franssen, Postdoctoral Researcher
Kylie R. Naegele, Staff Curatorial Assistant
Megan J. Osborne, Research Assistant Professor
Steven P. Platania, Associate Curator of Fishes
Stephen T. Ross, Curator Emeritus and UNM Adjunct Professor of Biology
Alexandra M. Snyder, Collections Manager
Thomas F. Turner, Curator of Fishes and MSB Director

Graduate students

Museum Research Assistants-Graduate Student TA
Tracy A Diver, Spring 2012
Corey A. Krabbenhoft, Summer 2012
Alyssa R. Hopkins, Fall 2012

MSB Fishes Graduate Students, UNM Biology
Mary A. Brandenburg, M.Sci. student
Tracy A. Diver, M.Sci. student
Michael A. Farrington, M.Sci. student
Corey A. Krabbenhoft, M.Sci. completed 2012
Trevor J. Krabbenhoft, Ph.D. completed 2012
Tyler J. Pilger, Ph.D. student

Undergraduate Students

Curatorial Assistants
Kendra Brunet Lecomte, A&S Biology
Kylie R. Naegele, A&S Biology, Graduated May 2012
Devin Sims, UNM School of Engineering
Maribel Solis, A&S Biology, Graduated December 2012

Research Students
Samantha Sanchez
Hailey Conover
Michelle Sandoval

MUSEUM ASSOCIATES

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

Research Associates
W. Howard Brandenburg, American SW Ichthyological Research, Albuquerque
Eliza I. Gilbert, MS New Mexico Dept. Game and Fish, Santa Fe
Astrid Kodric-Brown, Ph.D. Emeritus, University of New Mexico, Albuquerque
Brooks M. Burr, Ph.D. Southern Illinois University, Carbondale
Michael Collyer, Ph.D. Western Kentucky University, Bowling Green
Thomas E. Dowling, Ph.D. Arizona State University, Tempe
Robert K. Dudley, Ph. D. American SW Ichthyological Researchers, Albuquerque
Michael A. Farrington, American SW Ichthyological Researchers, Albuquerque
Keith B. Gido, Ph.D. Kansas State University, Manhattan KS
Richard L. Mayden, Ph.D. St. Louis University, St. Louis MO
Norman Mercado Silva, Ph.D. Ecology and Natural Resources, Centro Universitario de la Costa Sur
(Universidad de Guadalajara).
DIVISION OF GENOMIC RESOURCES

DIVISION HIGHLIGHTS

The Division of Genomic Resources (DGR) of the Museum of Southwestern Biology (MSB) is a centralized repository for cryogenic material from all MSB divisions at the University of New Mexico and other individuals and institutions worldwide for which archival agreements are extant. The DGR frozen tissue collection is taxonomically broad and contains multiple tissue samples from over 150,000 specimens, including Mammals, Birds, Reptiles and Fishes. The collection is ranked as one of the largest collections of its kind worldwide. In total, 9,000 new NK numbers were issued to the MSB mammal division and used in DGR for projects in Panama, Mongolia, Alaska, Peru, the Pacific Northwest and New Mexico. In 2012 the collection manager processed 41 outgoing loans for the mammal division containing 1,878 specimens, and 6 loans for the bird division, containing 57 bird specimens to 14 states, and 4 foreign countries, including 22 tissue loans for UNM students. DGR consistently adds approximately 20,000 new tissues to the collection every year.

COLLECTION USE SUMMARY

<table>
<thead>
<tr>
<th>Collection Growth</th>
<th>20000</th>
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<tbody>
<tr>
<td>Loans - outgoing</td>
<td>47</td>
</tr>
<tr>
<td>Loans - incoming</td>
<td>0</td>
</tr>
<tr>
<td>Visitors</td>
<td>200</td>
</tr>
<tr>
<td>Information Requests Answered</td>
<td>&gt;500</td>
</tr>
<tr>
<td>Publications Citing/Using MSB DGR Specimens</td>
<td>41</td>
</tr>
</tbody>
</table>

DGR Loans 2007 - 2012

- # Loans, 2012, 47
- # Specimens, 2012, 1878
- # Loans, 2011, 42
- # Specimens, 2011, 1870
- # Loans, 2010, 41
- # Specimens, 2010, 6151
- # Loans, 2009, 32
- # Specimens, 2009, 805
- # Loans, 2008, 41
- # Specimens, 2008, 1057
- # Loans, 2007, 45
- # Specimens, 2007, 2392
MSB mammal specimens archived 2012 = 3209 specimens, 281 species in multiple tubes.

MSB bird specimens archived 2012 = 1038 specimens, 347 species in single tubes.

COURSES USING THE COLLECTIONS

UNM classes receiving loans of material for educational purposes (13 classes serving 1,125 students)

<table>
<thead>
<tr>
<th>TERM</th>
<th>COURSE</th>
<th>TITLE</th>
<th>STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>BIOL 599</td>
<td>Masters Thesis</td>
<td>1</td>
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<td></td>
<td>BIOL 699</td>
<td>Dissertation</td>
<td>3</td>
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<tr>
<td></td>
<td>NTSC 262L</td>
<td></td>
<td>36</td>
</tr>
<tr>
<td>Spring</td>
<td>BIOL 599</td>
<td>Masters Thesis</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>BIOL 699</td>
<td>Dissertation</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>NTSC 262L</td>
<td></td>
<td>53</td>
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</tbody>
</table>

UNM courses or programs using collection through staff presentations

<table>
<thead>
<tr>
<th>TERM</th>
<th>COURSE</th>
<th>TITLE</th>
<th>STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>BIOL 419/519</td>
<td>Natural History curation/techniques</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>Museum Studies</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>UNM Biology graduate student orientation</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>UNM prospective grad students tour</td>
<td>24</td>
</tr>
<tr>
<td>Summer</td>
<td>---</td>
<td>SEIS (Mammals of NM/ Value of Nat Hist Coll)</td>
<td>9</td>
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</tbody>
</table>

K-12 schools and educational groups

<table>
<thead>
<tr>
<th>TERM</th>
<th>COURSE</th>
<th>TITLE</th>
<th>STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>---</td>
<td>Microbiology class - St. Pius High School</td>
<td>25</td>
</tr>
</tbody>
</table>

COLLECTION MANAGEMENT

Current projects generating specimens for DGR

- Beringian Coevolution Project - NSF
- Mexican wolf reintroduction – USFWS
- Mongolian Vertebrate Parasite Project – NSF
- Panama Hantavirus – ICIDR NIH
- Panama Climate Change Project - STRI/Gorgas
- Bighorn Sheep Reintroduction Program – NMGF
- ISLES—USDA Forest Service
- Jackson Whitman Idaho collection
- Black bear/elk predation project – NMDGF
- Mammalogy and Tropical Biology classes
- Valles Caldera National Preserve
Peru Birds - Witt
Mammal & Bird Prep Room

The majority of DGR staff time was spent

Preparation, cataloging and installation of museum specimens
Data entry for the incoming accessions
Filling information requests
Processing loan material
Assisting with UNM courses utilizing MSB specimens and facilities
Equipment maintenance
Alarm systems maintenance
Computer maintenance
Procuring Supplies

AWARDS, GRANTS, AND CONTRACTS

(SEE OTHER DIVISIONS)

Technical Reports


Theses/Dissertations Completed


124 Cited Specimens

Publications and Reports Based on MSB Specimens/Data by Outside Researchers

DGR specimens: Mammals and Birds. These publications will also be listed for the individual divisions in their reports.

18 Cited Specimens

15 Cited Specimens
http://dx.doi.org/10.1644//11-MAMM-A-341.3

MSB specimens
http://dx.doi.org/10.1007/s12686-012-9697-3

79 Cited Specimens
http://dx.doi.org/10.1016/j.bse.2012.06.009

Briones-Salas, Miguel C. Lavariaga e Ivan Lira-Torres. 2012. Distribution actual y potencial del jaguar (Panthera onca) en Oaxaca, Mexico. Revista Mexicana de Biodiversidad 83: 246-257
MSB specimens
MSB specimens
http://dx.doi.org/10.1894/0038-4909-57.3.345

10 Cited Specimens
http://dx.doi.org/10.1007/s10530-012-0323-9

MSB specimens
http://dx.doi.org/10.1644/11-mamm-a-058.1

MSB specimens
http://dx.doi.org/10.1016/j.ympev.2012.04.002

http://dx.doi.org/10.1515/mammalia-2012-0071

1 Cited Specimens
http://dx.doi.org/10.1098/rspb.2012.0705

5 Cited Specimens
http://dx.doi.org/10.1644/11-MAMM-A-409.1

MSB specimens
http://dx.doi.org/10.1644/11-MAMM-A-107.1

4 Cited Specimens
1 Cited Specimens
http://dx.doi.org/10.3398/064.072.0215

47 Cited Specimens
http://dx.doi.org/10.1644/10-MAMM-A-380.1

2 Cited Specimens
http://dx.doi.org/10.1093/molbev/mss126

22 Cited Specimens
http://dx.doi.org/10.11644/11-MAMM-A-280.1

32 Cited Specimens
http://dx.doi.org/10.1644/11-MAMM-A-326.2

318 Cited Specimens
http://dx.doi.org/10.1016/j.ympev.2012.05.021

56 Cited Specimens
http://dx.doi.org/10.1111/jbi.12056

24 Cited Specimens
http://dx.doi.org/10.1111/j.1365-2699.2011.02616.x

MSB specimens
http://dx.doi.org/10.1111/j.1365-294X.2012.05663.x

1 Cited Specimens
http://dx.doi.org/10.1645/GE-3045.1
MSB specimens
http://dx.doi.org/10.1007/s10592-012-0417-z

123 Cited Specimens
http://dx.doi.org/10.1111/j.1600-0587.2011.06994.x

13 Cited Specimens
http://dx.doi.org/10.1007/s10914-012-9193-2

MSB specimens
http://dx.doi.org/10.1644/11-MAMM-A-335.1

1 Cited Specimens
http://dx.doi.org/10.1093/GE-2943.1

79 Cited Specimens
http://dx.doi.org/10.1111/j.1472-4642.2011.00866.x

1 Cited Specimens
http://dx.doi.org/10.1007/s13364-011-0070-9

MSB specimens
http://dx.doi.org/10.11644/11-MAMM-A-010.1

5 Cited Specimens
http://dx.doi.org/10.1093/sysbio/syr114

19 Cited Specimens


Theses and Dissertations Using MSB Specimens


ACTIVITIES IN LEARNE D SOCIETIES

Hosting Professional Colleagues and Groups

Parmenter, C.A.

Personally hosted Dr. Greg Glass, Johns Hopkins University and gave a DGR tour and assisted his students in field work planning.

CURRENT STAFF

Faculty/Staff

Joseph A. Cook: Interim-Curator.
Cheryl Parmenter: Collection manager 1.0FTE.

Students

Graduate Assistant Joeline Rearick .025FTE Summer Semester 2012.
Graduate Assistant Bryan McLean .05FTE. Winter &Fall Semesters 2012.

MUSEUM ASSOCIATES

Research Associates

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

DIVISION HIGHLIGHTS

The UNM herbarium contained more than 127,200 accessioned specimens of vascular and non-vascular plants at the end of 2012. In addition we moved the Bandelier National Monument collection to UNM; this National Park Service herbarium consists of 1996 specimens.

Interpretive activities or Collections-related Outreach includes tours for K-12 and UNM students. The Herbarium works closely with Native Plant Society of New Mexico (NPSNM) and the New Mexico Rare Plant Technical Council. This year Bob Sivinski, Herbarium Associate, organized and/or taught seven NPSNM workshops for amateur botanists.

The Herbarium continues to provide the leadership for the statewide collection database, New Mexico Biodiversity Consortium (NMBCC), which serves natural history specimen data via the World Wide Web, and contributes to regional web-served data on The Southwest Environmental Information Network or SEINet (133,816 individuals visited the site in 2012; 232,582 total visits to http://swbiodiversity.org/seinet/).

COLLECTION USE SUMMARY

| Collection Growth (specimens cataloged) | 2814 |
| Loans – outgoing | 8 |
| Loans – incoming | 0 |
| Research Visitors | 150 |
| Information Requests Answered | 146 |
| Publications Citing/Using MSB Herbarium Specimens | 8 |

COURSES USING THE COLLECTIONS

<table>
<thead>
<tr>
<th>TERM</th>
<th>COURSE</th>
<th>TITLE</th>
<th>STUDENTS</th>
</tr>
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<tbody>
<tr>
<td>Fall</td>
<td>BIOL 463</td>
<td>Flora of New Mexico</td>
<td>15</td>
</tr>
<tr>
<td>Spring</td>
<td>BIOL 419/519</td>
<td>Biological Museum Curatorial Technique</td>
<td>19</td>
</tr>
<tr>
<td>BIOL 406</td>
<td>Plants and People</td>
<td>12</td>
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</table>

COURSES TAUGHT BY MSB PERSONNEL

<table>
<thead>
<tr>
<th>INSTRUCTOR</th>
<th>TERM</th>
<th>COURSE</th>
<th>TITLE</th>
<th>STUDENTS</th>
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<tbody>
<tr>
<td>Lowrey, T.K.</td>
<td>Fall</td>
<td>BIOL 463</td>
<td>Flora of New Mexico</td>
<td>15</td>
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<tr>
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<td>Spring</td>
<td>BIOL 406</td>
<td>Plants and People</td>
<td>12</td>
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<tr>
<td>Tonne, P.C.</td>
<td>Spring</td>
<td>BIOL 419/519</td>
<td>Biological Museum Curatorial Techniques</td>
<td>19</td>
</tr>
<tr>
<td>Bixby, R.J.</td>
<td>---</td>
<td>BIOL 400</td>
<td>Senior Honors Thesis</td>
<td>1</td>
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<td></td>
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<td>BIOL 551</td>
<td>Research Problems</td>
<td>1</td>
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<td></td>
<td></td>
<td>WR 598</td>
<td>Professional Project</td>
<td>1</td>
</tr>
</tbody>
</table>
Guest Lectures


BIOL 495 (Limnology): “Phytoplankton in lakes”, ”Nutrient dynamics and limitation,” and “Phosphorus cycle,” undergraduate and graduate, Winter 2012

BIOL 496 (Limnology lab): Algae lab, March 2012

COLLECTION MANAGEMENT

We processed and added 818 new acquisitions to the collection. The UNM Herbarium received gifts of 818 accessioned specimens, and 1996 National Park Service Specimens from Bandelier National Monument.

The herbarium logged more than 150 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.

AWARDS, GRANTS, AND CONTRACTS

Awarded

$2000. BLM, Grants.gov award to begin imaging specimens in 2013.

$20,000 Synthesis of stream ecosystem responses to nutrient enrichment at multiple trophic levels.” LTER Synthesis Working Group, 2012, Co-PI: R Bixby


PUBLICATIONS

Books, Book Chapters, Edited Volumes


Journal Articles


**Technical Reports**


**Ph.D. Advisement**

Jack Triepke, Tim Lowrey, Co-supervised with Dr. Esteban Muldavin. In Progress.

Tim Lowrey served as a Ph.D. Committee Member for two competed dissertations in 2012

  - Gino Nearns- Ph.D.
  - Heather Simpson-Ph.D.

And is a committee member or three Ph.D. candidates:

  - Heidi Hopkins
  - Nathan Lord
  - Karen Wright

**Masters of Water Resources Advisement**

Shannon Rupert, 2008-2012, present, Bixby, co-advised with Cliff Dahm

Virginia Thompson, 2010-present, Bixby, co-advised with Cliff Dahm

**Masters of Water Resources Advisement**

Constance Jones, 2010-present. Bixby, co-advised with Bruce Thomson (Civil Engineering)

**Undergraduate Advisement**


**Publications and Reports Based on MSB Specimens (including outside researchers)**

UNM plays a critical role in the development of the Flora of North America (FNA), a series of publications based on specimens and records made available by the herbarium. Bob Sivinski, Herbarium Associate, reviewed 32 FNA manuscripts as a Regional Reviewer in 2012. UNM specimens are cited in the published volumes to date:

Volume 2 Pteridophytes and Gymnosperms
31 families Volume 3 Magnoliophyta: Magnoliidae and Hamamelidae
32 families Volume 4 Magnoliophyta: Caryophyllidae, Part 1
10 families Volume 5 Magnoliophyta: Caryophyllidae, part 2
3 families Volume 7 Magnoliophyta: Salicaceae to Brassicaceae
11 families Volume 8 Magnoliophyta: Paeoniaceae to Ericaceae
19 families Volume 19 Asteraceae (with volumes 20 and 21)
1 family Volume 20 Partial, Enter from Volume 19
1 family Volume 21 Partial, Enter from Volume 19
1 family Volume 22 Magnoliophyta: Alismatidae Arecidae, Commelinaeidae (In part), and Zingiberidae
30 families Volume 23 Magnoliophyta: Commelinaeidae (in part): Cyperaceae
1 family Volume 26 Magnoliophyta: Liliidae: Liliales and Orchidales
11 families

FLORA NEOMEXICANA – a three volume flora for the state of New Mexico published in 2012:

Volume I : Annotated Checklist, 2nd edition, 2012. by Kelly W. Allred. The 3783 species (and 4204 total taxa) of vascular plants occurring in the wild in New Mexico are listed, with synonymy, common names, whether native or exotic, references, and a complete accounting of all names that have been reported for New Mexico. Also included is an introduction to the climate, geologic history, soils, ecoregions, vegetation types, botanical history, and endemic, exotic, and noxious plants of the state. Available in paper- and hardbound versions; 6 x 9 inches; 603 pages.

Volume II : Glossarium Nominum, 2nd edition, 2012. by Kelly W. Allred. The etymology, definition, and usage of each of the scientific names of New Mexico vascular plants are explained. Available in paper- and hardbound versions; 6 x 9 inches; 151 pages.

Volume III : An Illustrated Identification Manual, 1st edition, 2012. by Kelly W. Allred & Robert DeWitt Ivey (Eugene Jercinovic, editor). Identification keys are provided for the 3783 species (and 4204 total taxa) of vascular plants found in New Mexico. Approximately 1600 species are illustrated. A glossary of terms, and notes on habitat, distribution, and ecology are provided for each species. Available in paper- and hardbound versions; 8.5 x 11 inches; 719 pages.


O’Kane, S.L., Jr., K.N. Smith, and K.A. Arp. 2012. Physaria iveryana (Brassicaceae), a new species from the Sandia Mountains, New Mexico. Phytoneuron 2012-53: 1–6. Published 4 June 2012. ISSN 2153 733X


ACTIVITIES IN LEARNED SOCIETIES

Invited/Plenary Talks and/or Seminars


Contributed Talks and Posters


Attendance at Professional Meetings

Lowrey, T.K. Botany 2012 National Meeting, Columbus, Ohio, July 2012
Service as Editor or on Editorial Board of a Journal


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.

Panel Member, National Science Foundation, Biodiversity: Discovery and Analysis, April 2012

OTHER PROFESSIONAL ACTIVITIES

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

Tim Lowrey. Council of NM University Graduate Deans- June 2012
Tim Lowrey. Higher Education Department- December 2012

Seven Native Plant Society of New Mexico Workshops – presented and/or organized by Bob Sivinski:

INTRODUCTION TO PLANT MORPHOLOGY AND IDENTIFICATION TERMINOLOGY
April 28-29, UNM Museum of Southwestern Biology, Albuquerque
Presented by: Tim Lowrey and Bob Sivinski

CACTACEAE – CACTUS FAMILY
May 19-20, Co-sponsored by City of Albuquerque – Rio Grande Botanic Garden
Presented by: Dave Ferguson and Steve Brack

TREES AND SHRUBS OF NEW MEXICO
Albuquerque, July 7-8, UNM Museum of Southwestern Biology with Jack Carter and Bob Sivinski
Farmington, July 14-15, San Juan Community College with Bob Sivinski and Ken Heil
Silver City, July 28-29, Western New Mexico University with Jack Carter and Bill Norris
Santa Fe, July 21-22, IAIA with Jack Carter and Bob Sivinski

ASTERACEAE – ASTER FAMILY
September 14-16 (updated!), Sevilleta National Wildlife Refuge, UNM Ecological Research Station
Presented by: Tim Lowrey
Scholarly Service as a Member of a Local/State/Regional/National Committee, Panel, etc.

Bixby, R.J.
Member, Public Information and Publicity Committee, Society for Freshwater Science
Member, Literature Review Committee, Society for Freshwater Science
Editor/Writer, Benthos News on society website, Society for Freshwater Science

Special session at Tri-State EPSCoR meeting, “The interface of hydrology, biogeochemistry, and ecology in riverine systems,” co-organized with C. Dahm, Sun Valley, ID, April 2012

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

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

Journal Referee

Bixby, R.J.
Biomass and Bioenergy -1
Georgia Journal of Science -1
Marine and Freshwater Research -1
PLoS ONE -1
Polar Research -1

Lowrey, T.K.
Madrono-5 papers
Journal of the Botanical Research Institute of Texas-1
Botanical Journal of the Linnean Society-1
American Journal of Botany-1
Arizona Journal of Science-1

SERVICE

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)
University and Departmental Committees

Lowrey, T.K.
Policy Committee, UNM Faculty Senate, Vice-chair.
Committee on Governance, Vice-chair.
Interim Co-Director, Museum Studies Program

ADVANCED STUDY, HONORS, AWARDS, FELLOWSHIPS, ETC.

Tonne, P. Herbarium Techniques Course, Offered by Brooklyn Botanic Garden and Royal Botanic Gardens, Kew, August 20–Friday, August 31

DONATIONS AND GIFTS RECEIVED

$500 annually. Native Plant Society donation for New Mexico Herbaria.

CURRENT STAFF

Faculty/Staff

Lowrey, T.K., Curator
Tonne, P., Collection Manager

Graduate students

Wetherill, Karen (Spring 2012)
Robinson, Eva (Fall 2012)
Hopkins, Heidi (Summer 2012)

Undergraduate Student Workers and Volunteers

Alex Clark, Employee for Bixby, Sophomore
Ryan Kelly, Employee for Bixby, Senior
Summer Woods-Tunney, Employee for Bixby, Senior

MUSEUM ASSOCIATES

Curatorial Associates

Sivinski, R., New Mexico State Botanist

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

DIVISION HIGHLIGHTS

Collection Growth

The DOM added 3,209 new specimens to its catalogue and converted 17,525 DGR records to MSB mammal records during 2012 and now contains 250,001 cataloged specimens. The collection is currently the 3rd largest collection in the Western Hemisphere and in the top 5 worldwide. New accessions of mammalian material amounted to between 4000-5000 specimens.

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.

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

Specimen Growth Through Fieldwork

Directed specimen-based studies within Joseph Cook’s research program.

Highly successful fieldwork in a wide variety of projects spanning the Western Hemisphere, eastern Asia (Mongolia), 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.

New initiatives focused on building the collection in certain geographic regions.

Specimen growth through donation

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.

Donations of personal collections from individual researchers.

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 2012.

36 students worked in the division in 2012
  2 graduate students
  13 paid undergraduates
  6 high school interns/volunteers
  15 volunteers

Of these 36
  22 were females
  14 males
  9 were from under-represented groups
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 2012 DOM specimens were cited in at least 40 studies published in 26 journals including: American Museum Novitates, Acta Theriologica, Biological Invasions, Biological Journal of the Linnean Society, Biochemical Systematics and Ecology, Conservation Genetics, Conservation Genetics Resources, Diversity and Distributions, Ecography, Journal of Biogeography, Journal of Parasitology, Journal of Mammalian Evolution, Journal of Mammalogy, Mammalia, Molecular Biology and Evolution, Molecular Ecology, Molecular Phylogenetics and Evolution, PLoS ONE, Proceedings of the Royal Society B: Biological Sciences, Revista Mexicana de Biodiversidad, Russian Journal of Theriology, Systematic Biology, The Southwestern Naturalist, Virology Journal, Western North American Naturalist, Zootaxa.

Theses/Dissertations

In 2012, at least 6 theses or dissertations from 5 institutions (UNM, Texas Tech University, University of Arizona, San Angelo State, Eastern Michigan University) were completed that utilized MSB mammal specimens.

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. Web visits to the database tracked via Google analytics = 131,664 visits From 199 countries 6,453 visitors referred to our site were from GenBank.

Educational Modules

The DOM has expanded our collaboration with the UNM Art and Ecology program (College of Fine Arts). Presentations on the collections are regularly delivered to A&E classes. In Spring 2012, we also co-taught a class (15 students 3 two-day workshops) with Dr. Szu-Han Ho of the Art and Ecology Program that was entitled “Coevolution: Art and Biology”. This course developed web-based educational or “dispersion” modules using museum specimens to illustrate various evolutionary concepts that can be viewed online and used by K-12 and UNM classes.

COLLECTION USE SUMMARY

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection Growth (specimens cataloged)</td>
<td>20,734 (3,209/17,525)*</td>
</tr>
<tr>
<td>Loans – outgoing</td>
<td>30(753) / 41(1878)**</td>
</tr>
<tr>
<td>Loans – incoming</td>
<td>7</td>
</tr>
<tr>
<td>Research Visitors</td>
<td>489***</td>
</tr>
<tr>
<td>Information Requests Answered</td>
<td>&gt;500****</td>
</tr>
<tr>
<td>Publications Citing/Using MSB Mammal Specimens</td>
<td>40</td>
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</tbody>
</table>

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

** Loans originating in DOM / loans of mammal tissue originating in DGR Combined total of 71 loans of 2631 specimens of traditional voucher specimens, mammalian parasites, and tissue samples.

*** 32 visiting researchers from 19 institutions, 104 students and 26 teachers from 17 K-12 schools, 16 UNM classes (230 students and 18 instructors), 79 other visitors.

**** Estimate of email or phone requests to Jon Dunnum and Joe Cook.
COURSES USING THE COLLECTIONS

UNM classes receiving loans of material for educational purposes (13 classes serving 1,125 students)

<table>
<thead>
<tr>
<th>TERM</th>
<th>COURSE</th>
<th>TITLE</th>
<th>STUDENTS</th>
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</thead>
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<tr>
<td>Fall</td>
<td>BIOL 204L</td>
<td>Plant and Animal Form and Function</td>
<td>180</td>
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<tr>
<td></td>
<td>BIOL 203L</td>
<td>Ecology and Evolution</td>
<td>240</td>
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<tr>
<td></td>
<td>BIOL 486L</td>
<td>Mammalogy</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>BIOL 386L</td>
<td>General Vertebrate Zoology</td>
<td>37</td>
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<tr>
<td></td>
<td>BIOL 599</td>
<td>Masters Thesis</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>BIOL 699</td>
<td>Dissertation</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>NTSC 262L</td>
<td></td>
<td>36</td>
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<tr>
<td>Spring</td>
<td>BIOL 204L</td>
<td>Plant and Animal Form and Function</td>
<td>180</td>
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<td></td>
<td>BIOL 203L</td>
<td>Ecology and Evolution</td>
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<td>BIOL 386L</td>
<td>General Vertebrate Zoology</td>
<td>40</td>
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<td>Dissertation</td>
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<tr>
<td></td>
<td>NTSC 262L</td>
<td></td>
<td>53</td>
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</tbody>
</table>

UNM courses or programs using collection through visits or staff presentations (230 students, 18 instructors from 16 classes/programs)

<table>
<thead>
<tr>
<th>TERM</th>
<th>COURSE</th>
<th>TITLE</th>
<th>STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>ART 141</td>
<td>Intro to Art and Ecology</td>
<td>18</td>
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<tr>
<td></td>
<td>BIOL 486</td>
<td>Mammalogy</td>
<td>19</td>
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<tr>
<td></td>
<td>---</td>
<td>UNM Biology graduate student orientation</td>
<td>25</td>
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<tr>
<td>Spring</td>
<td>ART 141</td>
<td>Intro to Art and Ecology</td>
<td>26</td>
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<td></td>
<td>ART</td>
<td>Drawing I</td>
<td>21</td>
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<tr>
<td></td>
<td>---</td>
<td>UNM prospective grad students tour</td>
<td>24</td>
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<tr>
<td>Summer</td>
<td>ART</td>
<td>Drawing I</td>
<td>14</td>
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<td></td>
<td>SEIS</td>
<td>Mammals of NM/Value of Natural History Collections</td>
<td>9</td>
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<td>BIOL 402</td>
<td>Aim-up Student Projects</td>
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<td>ART HIST</td>
<td>Student Projects</td>
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<td></td>
<td>BIOL 461/561</td>
<td>Tropical Biology</td>
<td>16</td>
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<td></td>
<td>ART 389/429/529</td>
<td>Art Studio</td>
<td>15</td>
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<tr>
<td></td>
<td>BIOL 419/519</td>
<td>Nat Hist curation/techniques</td>
<td>18</td>
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<tr>
<td></td>
<td>MUS</td>
<td>Studies</td>
<td>15</td>
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<tr>
<td>K-12 schools and educational groups: 104 students, 26 teachers from 17 schools</td>
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<tr>
<td>Bandelier Elementary School (SEIS class)</td>
<td>(1 teacher)</td>
<td></td>
<td></td>
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<tr>
<td>Belen Middle School</td>
<td>(26 students, 4 teachers)</td>
<td></td>
<td></td>
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<tr>
<td>Desert Willow Family School</td>
<td>(10 students, 3 teachers)</td>
<td></td>
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<tr>
<td>East San Jose Elementary School</td>
<td>(8 students, 2 teachers)</td>
<td></td>
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<tr>
<td>Hawthorne Elementary School (SEIS class)</td>
<td>(1 teacher)</td>
<td></td>
<td></td>
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<tr>
<td>Highland High school</td>
<td>(2 students, 1 teacher)</td>
<td></td>
<td></td>
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<tr>
<td>Jefferson Middle school</td>
<td>(1 student)</td>
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<td></td>
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<tr>
<td>Jimmy Carter Elementary School (SEIS class)</td>
<td>(1 teacher)</td>
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<tr>
<td>Longfellow Elementary School (SEIS class)</td>
<td>(1 teacher)</td>
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<tr>
<td>Manzano Day School (SEIS class)</td>
<td>(1 teacher)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rwamagana Lutheran School (Rwanda)</td>
<td>(2 students, 1 teacher)</td>
<td></td>
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<tr>
<td>Sandia High School (SEIS class)</td>
<td>(1 teacher)</td>
<td></td>
<td></td>
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<tr>
<td>Silverton Middle/High School (CO)</td>
<td>(16 students, 4 teachers)</td>
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<tr>
<td>St. Pius High School (Microbiology class)</td>
<td>(25 students, 1 teacher)</td>
<td></td>
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<tr>
<td>St. Michaels Indian School (AZ)</td>
<td>(15 students, 2 teachers)</td>
<td></td>
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</tr>
<tr>
<td>St. Thomas Aquinas (SEIS class)</td>
<td>(1 teacher)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valley High School (SEIS class)</td>
<td>(1 teacher)</td>
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<td></td>
</tr>
</tbody>
</table>

| Visiting researchers: 32 from 19 institutions or departments |
|---|---|
| Angelo State University | (1) |
| Denver Museum of Nature and Science | (2) |
| Harvard Medical School | (1) |
| Jefferson Middle School | (1) |
| Portland State University | (1) |
| Louisiana State University | (1) |
| School of Visual Arts | (1) |
| Texas Tech University | (2) |
| Univ of Alaska-Fairbanks | (1) |
| Univ of Florida | (1) |
| Univ of Kansas/FMNH/TTU | (1) |
| Univ Nebraska-Kearney | (1) |
| UNM Anthropology | (4) |
| UNM Art / Art History | (3) |
| UNM Biology | (5) |
| UNM HSC (Biochemistry) | (1) |
| UNM non-degree | (1) |
| UNM Office of President | (3) |
| Utah State University | (1) |

| Other visitors: 79 |
|---|---|
| Bernalillo Co. Open Space | (1) |
| Bernalillo Co. Master Naturalists Program | (34) |
| Indiana University | (2) |
| Sacramento State University | (1) |
| Texas A&M-Kingsville | (1) |
| La Calandria & Assoc. (for San Juan Pueblo) | (3) |
National Park Service (4)
New Mexico Dept Game and Fish (2)
UNM Psychiatry (2)
US Fish and Wildlife Service (3)
US Geological Survey (1)
USGS high school interns and mentors (15)
West Virginia University (1)
Dean Linda Lacey, Graduate School NMSU (1)
Other (9)

COURSES TAUGHT BY MSB PERSONNEL

<table>
<thead>
<tr>
<th>INSTRUCTOR</th>
<th>TERM</th>
<th>COURSE</th>
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<th>STUDENTS</th>
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<tbody>
<tr>
<td>Cook, J.A.</td>
<td>Fall</td>
<td>BIOL 489</td>
<td>Mammalogy</td>
<td>19</td>
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<td>BIOL 502</td>
<td>Evolutionary Genomics</td>
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<td>Research Problems</td>
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<td>Spring</td>
<td>BIOL 461</td>
<td>Intro Tropical Biology</td>
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<td>BIOL 402</td>
<td>Advanced Tropical Biology</td>
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<td>BIOL 402/502</td>
<td>Coevolution: Art and Biology</td>
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<td>Art and Biology</td>
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<td>BIOL 502</td>
<td>Environmental Genetics</td>
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<td>Panama Diversity Field Methods</td>
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<td>BIOL 699</td>
<td>Dissertation</td>
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<td>Dunum, J.L.</td>
<td>Spring</td>
<td>BIOL 419/519</td>
<td>Nat Hist curation/techniques</td>
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<td>BIOL 502</td>
<td>Panama Diversity Field Methods</td>
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<td>Summer</td>
<td>SEIS</td>
<td>Mammals of NM and the Value of Nat Hist Coll</td>
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<td>Graduate Students</td>
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<td>BIOL 486L</td>
<td>Mammalogy</td>
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<td>Spring</td>
<td>BIOL 402</td>
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<td>Advance Tropical Biology</td>
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<td>Aim-up</td>
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<td>BIOL 386L General Vertebrate Zoology Lab</td>
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</table>

Undergraduate Student Mentoring (35 students)

Andrea Jackson, NSF-UNO
Sarah Garcia (BIO 499)
Donavan Jackson, NSF-UNO
Schuyler Liphardt, museum tech - workstudy
Diego Matek, NSF-UNO
Amber McArdle, NSF-UNO
Randle McCain, NSF-UNO
Steven Kevin McCormick, NSF-UNO
Galen Rask (3 month summer internship from Swarthmore College)
Abbie J. Reade, museum tech
Kelly Speer, NSF-UNO
Angelica Swanson, NSF-UNO
Amber Trujillo, NSF-UNO
Jocelyn Colella, undergrad volunteer
Anna Gillette, undergrad volunteer
Alanna Jornigan, volunteer, USGS
Neesha Karanth, undergrad volunteer
Sinjin Alan Leyva, undergrad volunteer
Brittany Quintana, undergrad volunteer
Rosemary Steinberg, undergrad volunteer
Heather Toman, undergrad volunteer
Andrew Vanetsky, undergrad volunteer
Sienna Wright, workstudy & NSF BRC
Alexander Clark, undergrad volunteer
Fernando Salazar, NSF-UNO
Richard Apodaca (high school intern/volunteer)
Susan Alex Shomaker (high school intern/volunteer)
Kathryn Cook (high school intern/volunteer)
Rachel Lentz (high school intern/volunteer)
Lucy Gerhart (high school intern/volunteer)
Jonathon Brearley (high school intern/volunteer)
Hannah R Johnson (volunteer)
Lila Badash (undergrad volunteer)
Brooke Rodrigues (volunteer)
Tomas Cook (volunteer)

COLLECTION MANAGEMENT

The DOM received 98 new accessions of material (~4000-5000 specimens) and added approximately 20,000 specimens to its catalogue during 2012 including new material and records converted from DGR.

Current projects generating specimens for DOM

- Beringian Coevolution Project - NSF
- Mexican wolf reintroduction – USFWS
- Mongolian Vertebrate Parasite Project – NSF
- Panama Hantavirus – ICIDR NIH
- Panama Climate Change Project - STRI/Gorgas
- 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

The majority of staff time was spent

- Development of the Arctos database
- Reorganizing and relabeling of dry collections
- Training student technicians and UnO students in museum work
Preparation, cataloging and installation of museum specimens
Data entry for the incoming accessions
Filling information requests
Processing loan material
Assisting with UNM courses utilizing MSB specimens and facilities

AWARDS, GRANTS, AND CONTRACTS

Bell, K.C.

Grants-in-Aid of Research, American Society of Mammalogists, $1500
UNM CETI 454 Next Generation Sequencing voucher, $6000

Cook, J.A.

NSF-DEB 1258010 (submitted 7/12, awarded for 3/13-12/28/16)
Collaborative & Integrative Inventories of Biomes of the Arctic
(with K Galbreath, Northern Michigan University & E. DeChaine, Western Washington University) ($450K to UNM) $945,000

DOI-USFWS-Zapus h. preblei conservation (8/12-12/12) $28,000

DOI-USGS Cooperative Agreement, Tundra Preserves (6/11-12/13) $58,000

USDA Forest Service
ISLES—Amendment 2 (6/12-12/13) (Total $220K) $40,000

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

NSF-DEB 0956129   5/01/2010-4/30/2015
RCN-UBE: Advancing Integration of Museums into Undergraduate Programs (AIM-UP!) (w/ E. Lacey, S. Edwards, S. Ickert-Bond) $485,648

College of Arts and Sciences, Turner Ranch Research Fund $10,000

NSF-DEB 0731350  08/01/07 - 08/01/13
URM: Undergraduate Opportunities (UNO) $1,014,659

Dunnum, J. L.

Improved housing of Mexican wolf (Canis lupus baileyi) specimens and its conservation in New Mexico. U. S. Fish and Wildlife Service. Total $7,000 (No F&A).

McLean, B.

GRAC Grant, UNM Graduate Research Allocations Committee - $400
Research Grant, National Speleological Society - $750
Research Grant, Prairie Biotic Research, Inc. - $900
The Joseph Gaudin Scholarship, UNM Department of Biology - $1000
Research Grant, T&E of New Mexico - $2500
PDG Grant, UNM Graduate Student Professional Association - $500
Jessica Weber

UNM PiBBs fellowship, renewed for 2012-2013 school year ~$30,000

PUBLICATIONS

Books, Book Chapters, Edited Volumes

Cook, J.A.


Journal Articles

Cook, J. A.


Dunnum, J.L.


McLean, B.


Web-Based

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

Technical Reports

Four ISLES Quarterly Reports for USDA Forest Service.

Work In Progress (Only in press and already submitted)

Cook, J.A.


Dunnum, J.


**Publications and Reports Based on MSB Specimens/Data by Outside Researchers**


**Theses and Dissertations**


Tipps, Teresita Marie. 2012 Morphological and Molecular Variation in Townsend's Big-Eared Bat (Corynorhinus Townsendii) in West Texas. Masters Thesis. Angelo State University.


ACTIVITIES IN LEARNED SOCIETIES

Invited/ Plenary talks

Cook, J.A.

Contributed Talks and Posters

Bell, K.C.

Chavez, A.
Poster, American Society of Mammalogists 92nd Annual Meeting, Reno, NV, June 2012

Cook, J.A.
Speer, K., Brooks Kohli and Joseph Cook. 2012. Clarifying the Diversity of Mountain Voles (Genus Alticola) in Mongolia. 21st Annual Research Day UNM, Albuquerque, NM.

Dunnum, J.L.

Malaney, J.
Historical biogeography informs conservation – (Mayr award symposium) 2012 Evolution Meetings.
Historical biogeography informs conservation – American Society of Mammalogists meeting

McLean, B.

Reade, A.
Animal Behavior Society/Human Behavior and Evolution Society, at UNM June 2012, poster, Differences in Body Shape in a Sympatric Species Flock of Pupfish.
UNM Research Day 2012, poster, Differences in Body Shape in a Sympatric Species Flock of Pupfish.

Swanson, A.
UNM Research Day 2012, poster, Niche Space and Freezing Tolerance in Hylidae.

Speer, K.
Poster. American Society of Mammalogists 92nd Annual Meeting, Reno, NV, June 2012

Attendance at Professional Meetings

Reade, A.
Animal Behavior Society/Human Behavior and Evolution Society, June 2012

Bell, K.C.
American Society of Mammalogists 92nd Annual Meeting, Reno, NV, June 2012

Cook, J.A.
American Society of Mammalogists 92nd Annual Meeting, Reno, NV, June 2012

Dunnum, J.L.
American Society of Mammalogists 92nd annual meeting, Reno, NV, June 2012
Arctos database Advisory meeting, Reno, NV 21-22 June 2012

Kohli, B.
American Society of Mammalogists 92nd Annual Meeting, Reno, NV, June 2012
Evolution meetings, Montreal, June 2012

Malaney, J.
American Society of Mammalogists 92nd Annual Meeting, Reno, NV, June 2012
Evolution meetings, Montreal, June 2012

Speer, K.
American Society of Mammalogists 92nd Annual Meeting, Reno, NV, June 2012
Chavez, A.
American Society of Mammalogists 92nd Annual Meeting, Reno, NV, June 2012

Service as Editor or on Editorial Board of a Journal

Cook, J.A.
International Advisory Board Member, Editorial Board, *Zoologia*, Brazilian Journal of Zoology


Service as Officer or Professional Society/Organization

Bell, K
Graduate student representative, Board of Directors, American Society of Mammalogists 2010-2013.

Cook, J.A.
Board of Directors, American Society of Mammalogists, Member, 2011-2014

McLean, B.
UNM Graduate Student Professional Association Representative, Biology Department (Fall 2012)

OTHER PROFESSIONAL ACTIVITIES

Presentations to General Audience in a Scholarly Capacity

Malaney, J.
JL Malaney and JA Cook (2012) Incomplete sampling leads to erroneous conservation assessment (again): a significant range expansion for the federally “endangered” Preble’s jumping mouse – (Invited Seminar) Smithsonian Tropical Research Institute, Panama City, Panama, March

JL Malaney (2012) Incomplete sampling leads to erroneous conservation assessment (again): a significant range expansion for the federally "endangered" Preble’s jumping mouse – UNM Brownbag, February

Speer, K.
Presentation on Mexican wolf conservation. Wolf Day at UNM 2012

Swanson, A.
Junior Scientist Outreach Program, Summer 2012

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

Cook, J.A.
External Reviewer, Doctoral Dissertation Committee, Aaron Shafer, University of Alberta, Edmonton, April, 2012

2011-2013, Member Steering Committee, VertNet

2011-2013, Member Steering Committee, CollectionsWeb Research Coordinating Network

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

2008-2013, Convener and Lead, Genetic Resources, Arctic Biodiversity Assessment, Conservation of Arctic Fauna and Flora (CAFF)
2011-2015, Chair, MSB Executive Committee

2003-2013, Editorial Board, MSB Publications Series

2008-2013, Member, Latin American Scholarship Committee, American Society of Mammalogists

2012-2013, Chair, Conservation Awards Committee, American Society of Mammalogists

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

2009-present, Steering Committee, ARCTOS on-line museum database

2011-present, Board of Directors, National Systematics Collection Alliance

2007-2013, Director, Undergraduate Opportunities for Minorities (NSF-URM)

2011-2015, UNM Representative to the federal Colorado Plateau Cooperative Extension Studies Unit.

Developed and Established Memorandum of Understanding with New Mexico State Land Office and Museum of Southwestern Biology.

Developed and Established Memorandum of Understanding with New Mexico Museum of Natural History.

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

Weber, J.
Graduate Policy Representative for the UNM BGSA

Swanson, A.
Board of Directors, Junior Scientist Outreach Program, Summer 2012

Journal Referee

Bell, K.C.
Ad hoc reviewer for Journal of Mammalogy

Cook, J.A.
Journal of Mammalogy (2 ms)
Molecular Phylogenetics and Evolution (1 ms)

Dunnum, J.L. (7 total in 2012)
Checklist (1 manuscript)
Journal of Zoo and Wildlife Medicine (1 manuscript)
Mastozoologia Neotropical (1 manuscript)
Mammalia (3 manuscripts)
Occasional Papers, Museum of Southwestern Biology (1 manuscript)

Hosting Professional Colleagues and Groups

We hosted 32 visiting academics and professionals from 19 outside institutions or departments and they primarily visited the collections for research purposes.
Joe Cook personally hosted three Visiting Artists invited to UNM based on their work in integrating biology with themes and practices in contemporary art in Spring 2012. Each Visiting Artist delivered a lecture at UNM that was free and open to the public and then led a two-day workshop.

Brandon Ballengée (New York), *Cataloguing Wonder*
Suzanne Anker (New York), *Fluid Taxonomy*
Brian Conley (San Francisco), *Morphology and Evolution*

**SERVICE**

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

*Cook, J.*

Organizer, AIM-UP! Education and Museums Workshops, Fairbanks, AK Feb. 2012 (3 day workshop, 22 participants)


**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.

*Cook, J. A.*

Divisional tours and presentations – provided educational tours and information for over many visitors and several school groups (e.g., New Graduate Student Orientation 14 Aug 2012; Dean of Graduate School, NMSU)

Organized and hosted 12 Staff and the Director of the NM Museum of Natural History in tour and meet and greet (25 Sept 2012).

Invited Research Lecture to Honor’s Program (31 Jan. 2012)

*Dunnum, J. L.*

Divisional tours and presentations – provided educational tours and information for over 400 visitors and school groups including New Graduate Student Orientation 14 Aug 2012.

2012 BIO Blitz – Served as mammal expert and gave presentation and walking tour at the Sandia Mountain Natural History Center and NMMNH sponsored annual event.

Presentation on mammalian skulls, teeth, and evolution and adaptations – Longfellow Elementary School.


*Swanson, A.*

Junior Scientist Outreach Program, Summer 2012

**University and Departmental Committees**

*Cook, J.A.*

College of Arts and Sciences, Deans and Directors Council
Director, Museum of Southwestern Biology and Chair, MSB Executive Committee
Interim Curator, Division of Genomic Resources, Museum of Southwestern Biology
Curator, Division of Mammals, Museum of Southwestern Biology
Director, Undergraduate Opportunities Program, (46 students to date)
Biology Department, Tenure and Promotion Committee
UNM Museum Council, Vice Chair
Faculty Sponsor, Student Chapter of the New Mexico Wilderness Alliance

DONATIONS AND GIFTS RECEIVED

Robert and Virginia Rausch marine mammal specimens (20)
Bruce Hayward endowment/photograph collection ($220,000)

CURRENT STAFF

Faculty and Staff

J.A. Cook, Curator
J.L. Dunnum, Collection Manager
C.A. Ramotnik, USGS Collection Manager
M.A. Bogan, Emeritus Curator
J.S. Findley, Emeritus Curator
Stephen O. MacDonald, Curator II
Gordon Jarrell, Cyber Coordinator
Adrienne Ransiszewski, Curatorial Assistant

Graduate Students

Barker, Brittany. Received Ph.D. degree. 2012. Landscape genetics of two frogs from Puerto Rico: Eleutherodactylus antillensis and E. portoricensis. (co-advised with R. Waide)

Bell, Kayce. 2nd year Ph.D. student. Systematics and phylogeography of chipmunk lice.

Escobedo, Yadeeh. 6th year Ph.D. Linkage corridors along the North Pacific Coast.


Rearick, Jolene. 6th year Ph.D. Phylogeography and molecular evolution of freeze tolerance in Lithobates sylvaticus.


Jessica Weber. 2nd year Ph.D student. Hypoxia tolerance and adaptive responses in Caviomorph rodents.

Undergraduate Student Workers and Volunteers

Undergraduate Workers

Andrea Jackson
Sarah Garcia (BIO 499)
Donavan Jackson
Schuyler Liphardt
Diego Matek
Amber McArdle
Randle McCain
Steven Kevin McCormick
Galen Rask (internship)
Abbie J. Reade
Kelly Speer
Angelica Swanson
Amber Trujillo

Undergraduate Volunteers
Jocelyn Colella
Anna Gillette
Alanna Jornigan
Neesha Karanth
Sinjin Alan Leyva
Brittany Quintana
Rosemary Steinberg
Heather Toman
Andrew Vanetsky
Sienna Wright
Alexander Clark
Amber McArdle
Schuyler Liphardt
Donavan Jackson
Fernando Salazar

High School Volunteers
Richard Apodaca
Susan Alex Shomaker
Kathryn Cook
Rachel Lentz
Lucy Gerhart
Jonathon Brearley

Other Volunteers
Hannah R Johnson (possible grad student)
Lila Badash (Master Naturalist)
Steven Allen (Master Naturalist)
Brooke Rodrigues
Tomas Cook

Total volunteer hours: ~745

MUSEUM ASSOCIATES

Curatorial Associates

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

Research Associates

J. Scott Altenbach, UNM Department of Biology
Sydney Anderson, American Museum of Natural History, New York
Robert J. Baker, The Museum, Texas Tech University, Lubbock, TX
Troy L. Best, Department of Biology, Auburn University
M. Scott Burt, San Angelo State
Fernando Cervantes, UNAM, Mexico City, Mexico
Paul J. Cryan, Ft. Collins, Colorado
John Demboski, Denver Museum of Science and Nature, Denver, Colorado
In 2012, the Natural Heritage New Mexico Division continued to work with agencies and private partners to conduct a suite of conservation science projects and build its conservation information data systems. Within the division, there are four working groups: Conservation Data Center, Ecology, Zoology, and Botany.

The Conservation Data Center Group (Rayo McCollough, Lead; Teri Neville, GIS manager) worked on projects to make conservation data more readily available via the web and to support effective conservation management. We initiated a collaborative project the with the NM Department of Game and Fish (NMDGF) to build a Crucial Habitat Assessment Tool (CHAT) for the state that was integrated to a west-wide Western Governors Association (WGA) decision support system to help guide energy development and avoid conservation conflicts. We delivered the beta version WGA in October and we are continuing to work on the final version for rollout in 2013. In addition, we implemented 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, U.S. Forest Service (USFS), and the Bureau of Land Management, we also continued to gather additional data and provide quality control on target sensitive species to build tools for dissemination of that information via the web.

The Ecology Group (Esteban Muldavin, Lead; Elizabeth Milford, Riparian Ecologist; Yvonne Chauvin, Senior Botany Tech; Hannah Varani, Senior Ecology Tech, and Paul Arbetan, Ecologist) we the development of a comprehensive “New Mexico Rapid Assessment Method” (NMRAM) for New Mexico’s wetlands and riparian areas in collaboration with New Mexico Environment Department (NMED). In 2012, we concentrated on the big river version of the NMRAM and conducted workshops and field sampling on the Gila River and Mimbres River watersheds. 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. To complement the NMRAM, we developed a Vegetation Index of Biological Integrity (VIBI) that provides an assessment of wetland status based on plant species in a similar way to IBSs that are based on aquatic macroinvertebrates. With respect to our upland projects, we completed vegetation classifications and maps for El Malpais National Monument, Pecos National Monument, and Fort Davis National Monument, and we continued work on Guadalupe Mountains National Park. The data collected on national parks will provide a valuable reference dataset for comparing the potential conservation value of other sites around the state. We continued providing biological monitoring and assessment for New Mexico Army National Guard lands.

The Zoology Group conducts field research and modeling of the habitats of animal species of conservation concern in New Mexico. We provide habitat management advice and create management plans for animals of conservation concern and their habitats. In 2012, we completed year four of a four-year, multi-scale habitat modeling study of pinyon-juniper birds on three Department of Defense installations, in conjunction with a three-year study of Pinyon Jays and their habitats at Kirtland Air Force Base. We completed a study of habitat use by grassland birds at Holloman Air Force Base (HAFB). We created the HAFB avian protection plan, which is designed to reduce bird mortalities and power outages caused by avian-powerline interactions. At the Lake Holloman Wetland Complex Area, we surveyed migrating and breeding wetland birds and completed a monitoring plan for aquatic macroinvertebrates. In collaboration with experts at the NMDGF, USFWS, and Texas A&M University, we began work on a habitat map and model for the dunes sagebrush lizard, a sensitive lizard of southeastern New Mexico. We performed a trend analysis on Lesser Prairie-chicken data from the NMBiotics database and submitted the results to the USFWS listing review for the species.

For the Botany Group (Temporary Lead and Esteban Muldavin). Working with the Bureau of Land Management (BLM), we participated in the five-year review of the endangered Kuenzler’s hedgehog cactus and conducted a range-wide survey of in the Sacramento and Guadalupe Mountains to assess population trends among the major population centers. We also initiated a project jointly with the BLM and Robert Sivinski to model the distribution of the rare Tharps’s bluestar (Amsonia tharpii) to guide surveys in 2013. Lastly, are working with the state Botanist, Daniela Roth, at the NM Energy, Minerals, and Natural Resources Department to integrate rare plant species database between the department and the division.
2. TABLE OF COLLECTION USE

<table>
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<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 Specimens</th>
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</thead>
<tbody>
<tr>
<td>6,038 new records, 17 updated records</td>
<td>NA</td>
<td>NA</td>
<td>9712 visitors to website</td>
<td>124 personally, 146818 publications downloaded</td>
<td>UNKNOWN</td>
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</table>

3. COURSES USING THE COLLECTIONS

4. COURSES TAUGHT BY MSB PERSONNEL

A. Faculty/Collection Managers

E. Muldavin: BIOL419/519 NATURAL HISTORY COLLECTIONS CURATORIAL TECHNIQUES

B. Staff

None.

5. COLLECTION MANAGEMENT

As part of our service role in the museum to provide conservation data to the public and researchers, in 2012 the Conservation Data Management Group worked on several initiatives to add to our conservation information. We were able to hire a new assistant data manager to update and improve our data entry process.

We implemented a one-of-a-kind program to database Section 10 and section 6 reports from USFWS, which have valuable current data on federally listed species. We began working with NMDGF to host their BISON-M database and collaborate with them on data exchange and creating decision support systems. We also worked on several initiatives to build our conservation database (see Section 1). As an outcome of our database activities, we completed 124 formal information requests, and 146,818 publications and data downloads were obtained from our website.

6. AWARDS, GRANTS, AND CONTRACTS

NHNM AWARDS:

$81,238. NM Military Affairs Dept. Banner #04805F. Integrated Natural Resources Management Plan Revision. Paul Arbetan, PI. 10/10-03/12. $37,893 (F&A $6463).


$85,000. Dept. of Defense. Banner #04803X. Grassland bird surveys at Holloman AFB. Kristine Johnson, PI. 05/10-12/12. $64,595 (F&A $14,521).

$40,000. Dept. of Defense. Banner #04803Y. Raptor surveys at Holloman AFB. Kristine Johnson, PI. 05/10-12/12. $28,048 (F&A $6,305).

$110,000. Dept. of Defense. Banner #04808Z. Grassland bird surveys at Holloman AFB. Kristine Johnson, PI. 03/12-12/13. $12,665 (F&A $2,847).

$40,000. Dept. of Defense. Banner #04809A. Raptor surveys at Holloman AFB. Kristine Johnson, PI. 03/12-03/13. $13,888 (F&A $3,122).


$26,909. NM Dept. of Game and Fish. Banner #04807A. Black-tailed prairie dog web map. Kristine Johnson, PI. 7/11-06/12. $24,996 (F&A $4,166).

$15,000. BLM. Banner #04804D. Biological resources data collection and storage 2010. Rayo McCollough, PI. 10/09-09/12. $8,497 (F&A $500).

$50,000. BLM. Banner #04807L. Biological resources data collection and storage 2011. Rayo McCollough, PI. 10/09-12/12. $47,127 (F&A $7,017).


$6,827. NM Dept. of Game and Fish. Banner #0480B8. BISON-M document management web page. Rayo McCollough, PI. 10/12-01/13. $0 (F&A $0).

$275,000. NM Dept. of Game and Fish. Banner #0480A1. BISON-M database management. Rayo McCollough, PI. 06/12-05/17. $11,173 (F&A $1,016).

$120,000. NM Dept. of Game and Fish. Banner #0480A2. NM crucial habitat tool (CHAT). Rayo McCollough, PI. 05/12-09/14. $31,477 (F&A $2,862).

$7,000. NM Dept. of Game and Fish. Banner #0480A3. NMGDF permits and documents database. Rayo McCollough, PI. 06/12-06/13. $0 (F&A $0).

$124,000. NM Dept. of Game and Fish. Banner #0480A5. Organizing federally listed species information. Rayo McCollough, PI. 06/12-10/15. $7,375 (F&A $670).


$20,000. BLM. Banner #04806N. Pediomelum pentaphyllum surveys Esteban Muldavin, PI. 10/09-09/12. $4,547 (F&A $677).

$75,000. BLM. Banner #0480B0. Tharp’s bluestar inventory. Esteban Muldavin, PI. 10/12-09/17. $0 (F&A $0).
$30,000. BLM. Banner #0480BR. Santa Fe River vegetation and channel morphology monitoring. Esteban Muldavin, PI. 10/12-09/17. $0 (F&A $0).


$14,900. NPS. Banner #04801H. Plant species inventory and herbarium specimen verification, Petroglyph Nat’l. Monument. Esteban Muldavin, PI. 05/09-07/12. $11,607 (F&A $1,729).


$31,164. NPS. Banner #04801H. Plant species inventory and herbarium specimen verification, Petroglyph Nat’l. Monument. Esteban Muldavin, PI. 05/09-07/12. $11,607 (F&A $1,729).


$185,000. NM Environment Dept. Banner #04809Z. Rapid assessment of wetlands in the Gila watershed. Esteban Muldavin, PI. 06/12-10/14. $84,970 (F&A $5,906).


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. Portland, OR
E. Muldavin: Ecological Society of America Panel on Vegetation Classification meeting at the Ecological Society of America, 2012 Annual Meeting, Portland OR.

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

E. Service as Officer of Professional Society/Organization

None

9. OTHER PROFESSIONAL ACTIVITIES

A. Presentation to General Audience in a Scholarly Capacity

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

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

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

E. Muldavin: Ecological Society of America Panel on Vegetation Classification meeting at the Ecological Society of America, 2012 Annual Meeting, Portland OR.

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

P. Tonne: Rare Plant Technical Council

E. Milford: New Mexico Wetlands Roundtable

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

D. Journal Referee

K. Johnson: Southwestern Naturalist

E. Muldavin: Journal of Arid Environments

E. Hosting Professional Colloquia and Groups

10. SERVICE

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

New Mexico Rapid Assessment Training Workshop, Santa Fe New Mexico October 1, 2011

B. Public Service

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

12. DONATIONS AND GIFTS RECEIVED

13. CURRENT STAFF

A. Faculty/Staff

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

B. Graduate students  
Keith Woodell, M.A.

C. Undergraduate Student Workers and Volunteers  
Katherine Carillo  
Jeff Hess  
Hugh Hulse  
Natalie Sommer  
Adam Summers  
Matthew Wilder

14. MUSEUM ASSOCIATES  
None
DIVISION OF PARASITES

DIVISION HIGHLIGHTS

Obtained the remaining life collection of Robert L. and Virginia R. Rausch. This included 40,000 slides, ~2000 vials/jars of alcohol specimens, journal and reprint collection, various binders and boxes with notes related to specimens.

Renovations of the new division were completed. This $500,000 renovation with state funds encompasses about 1800 sq ft and includes: a) a wet prep area for dissections, staining, working with worms in fluids, and specimen preparation, to name a few. It has a fume hood, point exhaust for microscope work with chemicals, a deep stainless steel sink and counter for dissections. It has lab top area for at least 5 people, and an area dedicated to preparing worms for slides. b) a dry prep area that will include a microscope set up with computer and camera for imagining, another large table set up for compound and dissecting scope work with space to spread out slides, papers, make drawings. There are also 3 spots for people to sit. c) a slide storage room that has limited access to protect the valuable slides that include types and vouchers. This space can hold approximately 150,000 slides. d) A new wet storage facility dedicated to fluid collections that will be shared with the Arthropod Division. The room will hold at minimum about 300,000 storage vials and is near completion.

Year 2 of the NSF Collection Improvement Grant for the Robert L. and Virginia R. Rausch Collection: (1) continued to capture primary ledger data, (2) through a workshop held in October, made specific conceptual and programming progress in fitting these data into the emerging (web-accessible) bioinformatics infrastructure (Arctos), and (3) accessioned important new Rausch material.

We are now up to 14,629 catalogued records, and of these 14,372 are linked relationally to hosts in Arctos. For example:

- some of the Rausch material (including linking to other parasite collections)

New Mexico fox parasite collection, about 171 vials. This series of fox parasites is the first to include specimens deposited at all three national parasite collections: the MSB, the US National Parasite Collection, and the Harold W. Manter Laboratory of Parasitology, U Nebraska at Lincoln. All have host vouchers in MSB Mammals. This is the first complete parasite collection that is linked to the host vouchers in MSB Mammals.


- redescription of a cestode genus Arostriplepis linked with host records

Major field collections for parasites conducted in South Africa (collaborative with Division of Birds), Kenya, China, and around the US (with a focus on New Mexico parasites). We collected about 100 specimens. Our specimens will be linked with the hosts in Division of Birds.

COLLECTION USE SUMMARY

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<th>Specimens Accessioned</th>
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<td>Loans - incoming</td>
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<td>Information Requests Answered</td>
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<td>Publications Citing/Using MSB Parasite Specimens</td>
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COURSES USING THE COLLECTION

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<tr>
<th>TERM</th>
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<th>STUDENTS</th>
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<tbody>
<tr>
<td>Spring</td>
<td>BIOL 419/519</td>
<td>Museum Techniques</td>
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COURSES TAUGHT BY MSB PERSONNEL

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<th>INSTRUCTOR</th>
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<tbody>
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<td>Loker, E.S.</td>
<td>Fall</td>
<td>BIOL 371</td>
<td>Invertebrate Biology</td>
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<td>Undergraduate Research Problems</td>
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<td>Host-Parasite Interactions Seminar</td>
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<td>Devkota, R</td>
<td>Fall and Spring</td>
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<td>Cell Biology</td>
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<td>Gendron, E</td>
<td>Fall and Spring</td>
<td>BIOL 203L</td>
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COLLECTION MANAGEMENT

Continued work with the Rausch collection NSF Improvement grant

Ongoing development and refinement of the data entry page (and associated codes, taxonomy) specific for parasites for Arctos database. The long term benefit of this effort will be the informatics level retrieval of parasite AND host data

Entering the Rausch collection ledger-stabilized the Rausch wet collection

Time was spent working with Parasitologist on campus and involving our community of Parasitologist through the American Society of Parasitologists to gain recognition for the new division and also best serve the community of parasitologists who wish to preserve and use the collections.

S. V. Brant and Mariel Campbell traveled to Beltsville, Maryland to spend time at the US National Parasite Collection, as well as work with the curator Dr. E. Hoberg and the collections manager, Ms. P. Plitt. The goals was both to learn the practices of the museum as well as to collate data on where there are Rausch specimens, so that we can make such notation in Arctos – thus linking the major parasite holdings for Bob Rausch. This is a goal we will have for all our collections. For example, we have done this as well with the fox parasite data, with specimens housed at the Manter Collection in Nebraska.

AWARDS, GRANTS, AND CONTRACTS

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

Submitted: S. Brant (PI) NSF REU Supplemental for NSF DEB-1021427 Phylogenetic and Revisionary Systematics of a Diverse Clade of Avian Schistosomes (Platyhelminthes: Schistosomatidae) $6,240

Submitted: S. Brant (PI), D. Jouet, H. Ferte NSF Systematics: Biodiversity and diversification of a clade of the avian blood fluke genus *Trichobilharzia*: host switching and population structure.

Submitted: E. Loker (PI), S. Brant, NSF Physiological and Structural Systems-Symbiosis, Defense and Self-Recognition: Revealing the mechanistic basis of host switching, a pervasive process among parasites

Ongoing: S. Brant (PI) NSF DEB-1021427 REVSYS: Phylogenetic and Revisionary Systematics of a Diverse Clade of Avian Schistosomes. 09/01/2010 – 08/31/2013 $60,000 (annual direct cost).

Ongoing: E. S. Loker (PI) NIH/NCR COBRE: Center for Evolutionary and Theoretical Immunology. 9/30/2003 – 5/31/2014 $1.4M (annual direct cost)

**PUBLICATIONS**

**Books, Book Chapters, Edited Volumes**


**Journal Articles**


**ACTIVITIES IN LEARNED SOCIETIES**

**Contributed Talks and Posters (*presenter*)**

Hudgell, MA*, Forys MA, Loker ES. (2012). Revealing the mechanistic determinants of host specificity: using the parasite Schistosoma mansoni and the snail Biomphalaria obducta as a model system. POSTER. Research Day Department of Biology, University of New Mexico. 30 March 2012.

Devkota R*, Brant SV, Thapa A, Loker ES. (2012). Sharing of schistosomes: The elephant schistosome Bivitellobilharzia nairi also infects the greater one-horned rhinoceros (Rhinoceros unicornis) in Chitwan National Park, Nepal. POSTER. Research Day Department of Biology, University of New Mexico. 30 March 2012.


Brant SV*, Loker ES. (2012). Introducing a new museum for parasites – the Parasite Division of the Museum of Southwestern Biology at the University of New Mexico in Albuquerque. POSTER. Southwestern Association of Parasitologists 12-14 April Lake Texoma, Oklahoma.


**Attendance at Professional Meetings**

**Loker, E. S.**

- June 2012 American Society of Parasitologists, Richmond, Virginia
- November 2012 Tropical Medicine and Hygiene

**Brant, S.V.**

- April 2012 Southwestern Association of Parasitologists, Lake Texoma, Oklahoma.
- June 2012 American Society of Parasitologists, Richmond, Virginia

**Devkota, R.**
June 2012 Nepal Academy of Science and Technology, Kathmandu Nepal

Gendron, E. T.
April 2012 Southwestern Association of Parasitologists, Lake Texoma, Oklahoma.
June 2012 American Society of Parasitologists, Richmond, Virginia

Service as Officer of Professional Society/Organization

E.S. Loker, President of the American Society of Parasitologists

OTHER PROFESSIONAL ACTIVITIES

Journal Referee

Loker, E. S. Journal of Helminthology, International Journal for Parasitology,
Brant, S. V. Comparative Parasitology, Journal of Invertebrate Pathology, Journal of Wildlife Disease,
Journal of Parasitology, Parasite International, and ZooTaxa

Hosting Professional Colleagues and Groups

Dr. Bill Font, Southeastern Louisiana State University
Dr. Jean-Pierre Pointier, Université de Perpignan, France
Dr. Sean Locke, Environment Canada, Montreal

SERVICE

Public Service

S. V. Brant – voting member of the Institutional Animal Care and Use Committee (IACUC) on Main Campus

ADVANCED STUDY, HONORS, AWARDS, FELLOWSHIPS

E. S. Loker, Curator, Distinguished Professor at UNM

DONATIONS AND GIFTS RECEIVED

The life collection of Robert L. and Virginia R. Rausch. This included 40,000 slides, ~2000 vials/jars of alcohol specimens, journal and reprint collection, various binders and boxes with notes related to specimens

CURRENT STAFF

Faculty/Staff

Eric S. Loker, Distinguished Professor, Curator
Sara Brant, Research Asst. Professor, Senior Collection Manager Parasite Division

Graduate Students

Mr. Ramesh Devkota/Loker
Ms. Erika Gendron/ Brant and Loker

Undergraduate Student Workers and Volunteers

Ms. Eva Zawadzki volunteer
Ms. D’Eldra Malone paid student
Mr. Randle McCain (UnO)