

PROJECT PROPOSAL

Project Title: Evaluating Species Management Guidance and Monitoring Programs for the Great Basin in Nevada
Project Leader or Principal Investigator responsible for completion of project: Principal Investigator: Elisabeth Ammon, Ph.D., Great Basin Bird Observatory ammon@gbbo.org ; 775-323-4226 (office), 775-722-9116 (cell) Project Lead: John Boone, Ph. D., Great Basin Bird Observatory boone@gbbo.org ; 775-323-4226 (office), 775-233-4544 (cell)
Cooperators/Partners and anticipated project contributions: <p>Rachel Mazur (HT National Forest, rmazur@fs.fed.us, 775-355-5386) has agreed to share all species management documents currently used in the Humboldt-Toiyabe District and assist in prioritizing further management guidance needed. Sandra Brewer (BLM Nevada State Office, sbrewer@blm.gov, 775-861-6626) is BLM lead for an ongoing project to quantify meaningful disturbance buffers for migratory birds in Nevada, for which it funded GBBO with \$50,000 to conduct field research and literature review. Steve Siegel (NDOW, ssiegel@ndow.org, 775-688-1561) is also an integral part of the “disturbance buffer working group” and has already contributed significantly to the review of current species management guidelines. The work proposed here will build on the disturbance buffer project and was conceived by the group as an additional urgent need for optimizing species management in Nevada. Jonathan Bart (USGS, jon_bart@usgs.gov, 208-426-5216) is currently funded by GBBO with \$20,000 to conduct a statistical evaluation and revision of our statewide landbird monitoring program to optimize its utility for species conservation needs. The same evaluation and re-design project receives a significant match from GBBO in the form of staff time valued at \$40,000 for 2013. We expect at least one peer-reviewed publication to result from this monitoring program evaluation project.</p>
Project Summary: <p>The proposed project’s objective is to provide a scientific review of (1) current priority species management practices in Nevada, (2) status of our combined scientific knowledge of priority species’ needs and gaps in that knowledge, and (3) adequacy of current monitoring programs of priority species. The project builds on recent, well-researched species conservation plans for Nevada (GBBO 2010, NWPT 2012), and it will leverage funds that are already obligated to research on scientifically based disturbance buffer recommendations and to evaluate GBBO’s statewide landbird monitoring program, the Nevada Bird Count. The outcome of the proposed work will be an online open-source compendium document that summarizes the current knowledge on the value of different species management practices, important gaps in knowledge about priority species, and current status of monitoring coverage.</p>

Project Proposal

Background and Need:

Several recent planning documents, such as the Nevada WAP (NWPT 2012) and Nevada Comprehensive Bird Conservation Plan (GBBO 2010) addressed the prioritization of species and their conservation needs in Nevada from a perspective of reversing regional declines and maintaining species' populations. What these plans were not able to provide are detailed evaluations and assessments of (1) current management guidelines and practices, (2) the adequacy of our knowledge of priority species, and (3) the adequacy of existing monitoring programs. As a result, we continue to receive requests from our management partners for assistance in optimizing their species management programs, usually by providing advice for improving impact avoidance standards or offering new information about species' needs and population status. For example, a "disturbance buffer working group" was recently formed to comprehensively review published scientific data and currently recommended avoidance buffers for migratory birds. Other practices that require better impact avoidance standards are brought to our attention as well, including habitat treatments (such as those addressing pinyon-juniper encroachment), fragmentation effects, collision mortality, mine marker mortalities, and human facilitation of predators. Many times, effectively addressing these informational needs requires better research on the species affected, and/or better monitoring of the populations for estimating effect sizes. In other cases, however, significant research and monitoring has already been done and best practices can be formalized based on current knowledge. The need for systematically evaluating existing management practices, research needs, and monitoring coverage became increasingly clear to us upon discovering that one of the most popular features of the recently completed Comprehensive Bird Conservation Plan was the "confidence ranking" that was assigned to important species facts. Therefore, the proposed project's overall objective is to provide well-informed and fully justified rankings for (1) confidence in adequacy of management practices and standards currently employed in Nevada, (2) urgency of additional research on a species' management needs, and (3) adequacy of a species' current population monitoring program in Nevada.

Objective:

GBBO is well-positioned to pursue the objectives of the proposed project. It recently completed the Nevada Comprehensive Bird Conservation Plan (GBBO 2010), is an active partner in both Nevada Partners-in-Flight (PIF) and the "disturbance buffer working group" (and funded with \$50,000 by the BLM to conduct research on disturbance buffers for geothermal developments), and is currently undertaking a comprehensive statistical evaluation of its Nevada Bird Count (a statewide habitat-stratified landbird monitoring program) for which it provides its own funding of \$60,000. The objectives of the proposed project are:

- 1) Consolidation, comparison, and evaluation of existing guidance and management standards and practices for priority birds, mammals, reptiles, and amphibians for the Great Basin portion of Nevada.
- 2) Incorporating findings from a BLM-funded project to systematically investigate disturbance buffers for migratory birds
- 3) Incorporating findings from a current project to generate predicted distributions of

priority bird species based on habitat condition in the Great Basin.

- 4) An updated review and evaluation of existing knowledge on the management needs and existing monitoring programs for priority species. Part of this monitoring evaluation element is covered by a current GBBO project to evaluate monitoring coverage of Great Basin landbird priority species under the ongoing Nevada Bird Count program, but this will be supplemented by querying partners who are knowledgeable on research and monitoring coverage for reptiles, amphibians, and mammals in Nevada's portion of the Great Basin.

The compendium document generated by this project will emphasize usability by management agencies, and will provide a cross-agency blueprint for identifying areas of strength and weakness in current species management practices and monitoring programs. The document will be provided online to be accessible by all partners and the public. Acknowledgments will be included for all contributing partners.

Methods:

The proposed project will involve the following steps:

- 1) Convene the panel of cooperating management agencies to determine a priority species and species group list, not to exceed 35-40 species or species groups with similar management needs (hereafter: priority species). We expect that many species can be naturally grouped into "management guilds", e.g., "waterbirds that nest in or near marshes", so the total number of species considered will be larger than 40. Determination of priority species will be based on current status in the Nevada Wildlife Action Plan, BLM Sensitive Species list, FS Sensitive Species list, PIF rankings, Natural Heritage rankings, and other factors.
- 2) By means of thorough literature review and examination of existing data, consolidate available information on status, distribution, and management issues for priority species.
- 3) Review, consolidate, and evaluate all existing agency and statutory guidance and standards for priority species. Project cooperators will provide the bulk of this material, which may include district and regional management plans, agency stipulations, best management practices documents, conservation plans, conservation measures and guidance for taxonomic groups or species, and similar documents and guidelines.
- 4) Gather information on recommended and existing monitoring programs for priority species, evaluate adequacy of existing monitoring efforts, and make recommendations for implementing and sustaining suitable monitoring programs.
- 5) Review available research on priority species and evaluate their adequacy for species management.
- 6) Where possible or appropriate, identify and summarize critical seasons for priority species impact avoidance.
- 7) Integrate results from a concurrent project investigating disturbance buffers for migratory birds. This project will involve review of literature and existing data along with targeted field studies conducted within the framework of the Nevada Bird Count program. The goal of this BLM-funded study is to inform BLM stipulations for geothermal

development, but the project is also designed to gather information that will be relevant to a broader array of management applications.

- 8) Where applicable, rank management actions for impact avoidance, such as defensible disturbance buffers, seasonal limitations, operational practices, and project design.
- 9) Rank adequacy of currently available species research for the purpose of informed management, and rank adequacy of current species monitoring programs.
- 10) Produce a compendium document incorporating all of the material generated in Methods items 1-9. The BCP will provide a model for the organizational principles of this document, which stresses efficient layout of information and ease of usability by a wide array of managers. However, this compendium will have considerably more detail on evaluation of current management practices and status of research and monitoring.
- 11) Post the resulting compendium in an “open”, cloud-based internet format that can be amended by approved partners as more research becomes available, and accessed by a broader range of users. This approach will create a living resource that will remain relevant over time.

Geographic Extent:

The focal region is the Great Basin portion of Nevada, but the project will be applicable to priority species and species groups whose ranges extend into other portions of the Great Basin.

Timeline of Schedules, Products and Outcomes:

This is a single-year project, with a completion date scheduled within 11 months of projected project initiation. Major milestones, assuming a project initiation date of 1 May, 2013, are listed below.

15 May 2013: Convene project cooperators to begin process of defining priority species and species groups and initiate requests for existing guidance documentation. Begin literature review.

30 June 2013: Finalize priority species and species group list.

31 July 2013: Complete collection of existing guidance documentation. Begin Steps 3- 6 in Methods to review, consolidate, and evaluate existing guidance.

September 2013, November 2013, and January 2014: Convene cooperator group to evaluate progress, review draft materials, and provide feedback.

30 November 2013: Incorporate results from BLM-funded project on migratory bird disturbance buffers and results from Nevada Bird Count evaluation.

December 2013 – February 2014: Final stages of preparation of compendium.

15 February, 2014: Draft compendium to cooperator group for final review.

31 March, 2014: Final compendium delivered and posted online on GBBO website (or else on a cooperating agency’s website as deemed appropriate by consensus).

Budget:

GBBO has several existing funding agreements with the Nevada State Offices of the BLM, the USFS, and the USFWS. One of these agreements could potentially be modified to accommodate the scope and budget of this project.

Itemized Budget:

Principal Investigator: 2 months salaries and benefits.....	\$11,500
Project Lead: 3 months salaries and benefits	\$14,375
Data Analyst: 1 month salary and benefits	\$4,312
GIS Mapping and Analysis	\$3,600
GBBO Overhead, 15% of direct costs	\$5,068
TOTAL FUNDING REQUESTED	<u>\$38,855</u>

Matching Funds:

Bureau of Land Management, Cooperative Agreement to generate guidance for migratory bird disturbance buffers (1 April 2013 through 30 November 2013)	\$50,000
GBBO funding for staff time and subcontracts to conduct an evaluation and redesign of the Nevada Bird Count program (completion date 31 October 2013).....	\$60,000

Literature Cited

GBBO (Great Basin Bird Observatory). 2010. Nevada Comprehensive Bird Conservation Plan, ver. 1.0. Great Basin Bird Observatory, Reno, NV. Available online at www.gbbo.org/bird_conservation_plan.html

NWPT (Nevada Wildlife Action Plan Team). 2012. Nevada Wildlife Action Plan. Nevada Department of Wildlife, Reno. 547 pp. <http://www.ndow.org/wild/conservation/cwcs/>

ELISABETH MARIA AMMON, PH.D.

Great Basin Bird Observatory, 1755 E. Plumb Lane #256A • Reno, NV 89502 • phone (775) 323-GBBO • ammon@gbbo.org

SPECIALITY

Ecology and conservation of birds and other wildlife. Emphasis is placed on building partnerships with resource management agencies, research organizations, and the public to conduct applied research and implement the results in bird habitat management and restoration planning.

EMPLOYMENT AND EDUCATION

EXECUTIVE DIRECTOR	September 2007 – present
SCIENCE DIRECTOR	May 2003 – September 2007
BIRD MONITORING COORDINATOR	May 2002 – May 2003

Great Basin Bird Observatory, Reno, Nevada

The Executive Director of the Great Basin Bird Observatory (GBBO) is in charge of fundraising for the organization, recruitment of volunteers, staff, and contractors, and the design and implementation of state-wide and local bird monitoring programs for Nevada. The flagship project for GBBO is the Nevada Bird Count, a breeding bird monitoring program for the state that relies heavily on the involvement of volunteers and partner agencies for implementation. The program's purpose is to provide agencies charged with the management of Nevada's birds with scientifically valid data on bird populations and the habitats they use. Duties of the Science Director focus on fundraising for the program and on building partnerships for the implementation of the conclusions of GBBO's projects. Further, the Science Director has been instrumental to completing the *Atlas of Breeding Birds of Nevada* book, which was published in April 2007 (Floyd et al. 2007). Other job duties include (1) being co-editor of *Great Basin Birds*, a technical publication of GBBO that emphasizes peer-reviewed articles and updates by initiatives that address large-scale bird conservation in the region; (2) doing active outreach to the community to recruit citizen-scientists and to educate the public on bird conservation issues; (3) overseeing one permanent employee, six temporary contractors, two interns, and up to 40 long-term volunteers; (4) conducting fundraising for all activities of the organization; (5) being an active peer-reviewer for research articles of the field's professional societies and other research projects; (6) publishing one or two newsletters for GBBO per year; and (7) producing scientifically-valid reports on the programs and projects conducted by GBBO and participating in professional meetings.

RESEARCH ASSISTANT PROFESSOR/ BIOLOGICAL STUDIES COORDINATOR	1996 - 2003
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Utah Reclamation Mitigation and Conservation Commission, Salt Lake City, Utah

Research Assistant Professor of the University of Nevada, Reno, who oversees and implements most of the wildlife data collection and habitat restoration for a large-scale river restoration project near Heber City, Utah. The project required habitat restoration planning for sensitive birds and amphibians, design of a monitoring program that tracks restoration progress, and research on avoiding impacts to sensitive wildlife and on site management problems.

POST-DOCTORAL RESEARCHER	1995 - 1996
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University of Nevada, Reno

USDA-funded study of livestock impacts on riparian bird populations with Dr. Peter B. Stacey, University of Nevada, Reno, NV.

PH.D. PROGRAM IN ENVIRONMENTAL BIOLOGY

1990-1995

University of Colorado, Boulder, Colorado

Ph.D. program of the Environmental, Population and Organismic Biology Department of the University of Colorado, Boulder; advisor Dr. Alexander Cruz. Dissertation title (published in May 1995): "Reproductive strategies and factors determining nest success in subalpine ground-nesting passerines."

MAJOR PROJECTS AND STUDIES

LOWER COLORADO RIVER RIPARIAN BIRD MONITORING

Great Basin Bird Observatory, Executive Director

Implementation of first comprehensive riparian bird monitoring program of the Lower Colorado River Multi-Species Conservation Program, using double-sampling approach for random sampling plan on 500 miles of Colorado River (Lake Mead to Southerly International Border with Mexico).

RADIOTELEMETRY RESEARCH ON PINYON JAYS AND ELF OWLS

Great Basin Bird Observatory, Executive Director

Intensive research using radiotelemetry on Pinyon Jays to determine their habitat use and home range shifts in light of pinyon-juniper treatment programs in Nevada. Funded by National Fish and Wildlife Foundation, Nevada Department of Wildlife, and the U.S. Forest Service. Project started in 2008 and is ongoing. Also, radiotelemetry research on detection rates of Elf Owls in the Bill Williams River area, funded by the Lower Colorado River MSCP 2009-2010.

NEVADA BIRD COUNT: BIRD MONITORING PLANNING AND IMPLEMENTATION

Great Basin Bird Observatory, Ongoing

Initiation of the first long-term, comprehensive breeding bird monitoring program for Nevada's thirteen principal habitat types. Involved scientific study design, recruitment of field technicians and volunteers, coordination with a diverse set of agencies and organizations, data processing, GIS analysis, and reporting of results.

NEVADA COMPREHENSIVE BIRD CONSERVATION PLAN

Great Basin Bird Observatory, Completed in 2010

First all-taxa bird conservation planning document that entailed the revision of the Nevada Partners-in-Flight Plan of 1999 and included all non-landbird species of conservation priority. GBBO's long-standing partnerships were a big part of making this comprehensive effort successful.

SELECT PUBLICATIONS AND REPORTS

Floyd, T., C. S. Elphick, G. Chisholm, K. Mack, R. G. Elston, **E. M. Ammon**, and John D. Boone. 2007. *Atlas of the Breeding Birds of Nevada*. University of Nevada Press, Reno, Nevada. 581 pp.

Rood, S. B., C. R. Gourley, **E. M. Ammon**, L. G. Heki, J. R. Klotz, M. L. Morrison, D. Mosley, G. G. Scopettone, S. Swanson, and P. L. Wagner. 2003. Flows for floodplains and forests: A successful riparian restoration. *BioScience* 53:647-657.

Ammon, E. M. 2002. Changes in the bird community of the lower Truckee River, Nevada, 1868 – 2000. *Great Basin Birds* 5:13-20.

Ammon, E.M., and P. B. Stacey. 1997. Avian nest success in relation to past grazing regimes in a montane riparian system. *Condor* 99:7-13.

Ammon, E. M., C. R. Gourley, K. W. Wilson, D. A. Ross, and C. R. Peterson. 2003. Advances in Habitat Restoration for the Columbia Spotted Frog (*Rana luteiventris*): A Case Study from the Provo River Population. In *California Riparian Systems: Processes and Floodplain Management, Ecology, and Restoration*. 2001 Riparian Habitat and Floodplains Conference Proceedings, Riparian Habitat Joint Venture, Sacramento, CA. pp. 348-356.

Ammon E. M. and W. M. Gilbert. 2000. Wilson's Warbler (*Wilsonia pusilla*). In: *The Birds of North America*, No. 478 (A. Poole and F. Gill, eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.:The American Ornithologists' Union.

Ammon, E. M. 1995. Lincoln's Sparrow (*Melospiza lincolni*). In: *The Birds of North America*, No. 191 (A. Poole and F. Gill, eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists' Union.

Ammon, E. M., and K. W. Wilson. 2001. The roles of habitat creation, natural colonization, and repatriation in the Provo River population of the Wasatch Front Columbia spotted frog (*Rana luteiventris*). Final research report to the Species-At-Risk Program of USGS, November 2001 (Award #00HQGR0047) 50 pp.

Ammon, E. M. 2000. Sustaining western riparian bird habitats: Are we? Review of government and other publications. *Rivers* 7:258-261.

GBBO (Great Basin Bird Observatory). 2010. Nevada Comprehensive Bird Conservation Plan, Version 1. Published Online at http://www.gbbo.org/bird_conservation_plan.html.

MEMBERSHIPS OF PROFESSIONAL SOCIETIES

American Ornithologists' Union, since 1991.
Cooper Ornithological Society, since 1992.
Wilson Ornithological Society, since 1991.
American Field Ornithologists, since 1995.
The Wildlife Society, since 2001.
Western Field Ornithologists, since 2006.

REFERENCES

Available upon request.

CONTACT INFORMATION

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JOHN D. BOONE, PH.D.

SPECIALTY

Ecology, mammalogy, wildlife-habitat relationships, ornithology, disease ecology, research design and analysis

EMPLOYMENT

GREAT BASIN BIRD OBSERVATORY <i>Research Coordinator</i>	2006 - Present <i>Reno, Nevada</i>
UNIVERSITY OF NEVADA, RENO <i>Assistant Professor</i> Disease ecology	2000 - 2006 <i>Reno, Nevada</i>
UNIVERSITY OF NEVADA, RENO <i>Postdoctoral Biologist</i> Disease ecology	1995 - 1999 <i>Reno, Nevada</i>
UNIVERSITY OF DENVER <i>Adjunct Professor</i>	1994 <i>Denver, Colorado</i>
UNIVERSITY OF COLORADO AND DENVER MUSEUM OF NATURAL HISTORY <i>Research Associate</i> Ecology and mammalogy	1991 - 1994 <i>Boulder and Denver, Colorado</i>
UNIVERSITY OF COLORADO <i>Teaching Assistant</i>	1991, 1995 <i>Boulder, Colorado</i>
IDAHO STATE UNIVERSITY AND U.S. DEPARTMENT OF ENERGY <i>Research Assistant</i> Ecology and mammalogy	1988 - 1990 <i>Pocatello, Idaho</i>
IDAHO STATE UNIVERSITY <i>Teaching Assistant</i>	1988 <i>Pocatello, Idaho</i>

EDUCATION

BIOLOGY, PH.D. <i>University of Colorado</i>	1991 - 1995 <i>Boulder, Colorado</i>
BIOLOGY, M.S. <i>Idaho State University</i>	1987 - 1990 <i>Pocatello, Idaho</i>
BIOLOGY (MAJOR) AND PHYSICS (MINOR), B.S. <i>George Washington University</i>	1981 - 1986 <i>Washington, D.C.</i>

SELECTED PROJECTS AT GREAT BASIN BIRD OBSERVATORY

UTAH STATEWIDE SPOTTED FROG MONITORING PLAN (2006)
Co-author

FINAL REPORT TO THE UTAH MITIGATION RECLAMATION AND RESTORATION COMMISSION (UMRRC) ON POST-RESTORATION HABITAT MAPPING AND RECOVERY (2006-2007) ON THE PROVO RIVER
Co-author

FINAL MANAGEMENT PLAN TO THE UMRRC ON BEAVER ACTIVITY AND IMPACTS (2006-2007)
Primary author

ATLAS OF THE BREEDING BIRDS OF NEVADA (2007 publication), *Co-author*

MULTIPLE GREATER SAGE-GROUSE RADIO-TELEMETRY PROJECTS FOR THE BUREAU OF LAND MANAGEMENT, US FISH AND WILDLIFE SERVICE, AND NATIONAL FISH AND WILDLIFE FOUNDATION
Project Director

NEVADA COMPREHENSIVE BIRD CONSERVATION PLAN (2010 publication)
Project Co-director and co-author

FINAL PROTOCOL FOR ELF OWL SURVEYS FOR THE BUREAU OF RECLAMATION, LOWER COLORADO RIVER MULTI-SPECIES CONSERVATION PLAN PROGRAM (2011)
Project Director

NEVADA STATEWIDE GOLDEN EAGLE NEST SITE INVENTORY PROJECT FOR BUREAU OF LAND MANAGEMENT (2011)
Project Director

REGIONAL SURVEY OF YELLOW-BILLED CUCKOO PRESENCE / ABSENCE IN UNDERSURVEYED SITES IN NEVADA
Project Director

PINYON JAY RADIOTELEMETRY STUDIES IN MANAGED PINYON-JUNIPER WOODLANDS (ongoing)
Project Director

PUBLICATIONS

- Boone, J. D. and B. L. Keller. 1993. Temporal and spatial patterns of small mammal density and species composition on a radioactive waste disposal area: the role of edge habitat. *Great Basin Naturalist* 53:341-349.
- Hayes, J. P., C. A. Bible, and J. D. Boone. 1998. Repeatability of mammalian physiology: evaporative water loss and oxygen consumption of *Dipodomys merriami*. *Journal of Mammalogy* 79:475-485.
- Boone, J. D., E. W. Otteson, K. C. McGwire, P. Villard, J. E. Rowe, and S. C. St. Jeor. 1998. Ecology and demographics of hantavirus infections in rodent populations in the Walker River Basin of Nevada and California. *American Journal of Tropical Medicine and Hygiene* 59:445-451.
- Feuer R., J. D. Boone, D. Netski, S. Morzunov, and S. C. St. Jeor. 1999. Temporal and spatial analysis of Sin Nombre virus quasispecies in naturally infected rodents. *Journal of Virology* 73:9544-9554.
- Borucki M. K., J. D. Boone, J. E. Rowe, M. C. Bohlman, E. A. Kuhn, R. DeBaca, and S. C. St. Jeor. 2000. The role of maternal antibody in natural infection of *Peromyscus maniculatus* with Sin Nombre virus. *Journal of Virology* 74(5).
- Boone, J. D., K.C. McGwire, E.W. Otteson, R. S. DeBaca, E. A. Kuhn, P.Villard, P.F. Brussard, and S.C. St. Jeor. 2000. Remote sensing and geographic information systems: charting Sin Nombre virus infections in deer mice. *Emerging Infectious Diseases* 6(3).
- Boone, J. D., K. C. McGwire, E. W. Otteson, R. S. DeBaca, E. A. Kuhn, and S. C. St. Jeor. 2002. Infection dynamics of Sin Nombre virus after a widespread decline in host populations. *American Journal of Tropical Medicine and Hygiene* 67(3):310-318.
- Bock, C. E., K. T. Vierling, S. L. Haire, J. D. Boone, and W. W. Merkle. 2003. Patterns of rodent abundance on open-space grasslands in relation to suburban edges. *Conservation Biology* 16(6):1653-1658.
- Boone, J. D., McGwire, K., and St. Jeor, S. 2005. Mapping the distribution of Sin Nombre virus infections in deer mice using remote sensing and geographic information systems. pp. 448-458 in "Wildlife Diseases: Landscape Epidemiology, Spatial Distribution and Utilization of Remote Sensing Technology", eds. S. K. Majumdar, J. Huffman, F. J. Brenner, and A. I. Panah. Pennsylvania Academy of Sciences, Easton PA.
- Pearce-DuVet, J. M. C., St. Jeor, S. C., Boone, J. D. and Dearing, M. D. 2006. Changes in Sin Nombre virus antibody prevalence in deer mice across seasons: the interaction between habitat, sex, and infection in deer mice. *Journal of Wildlife Diseases* 42(4):819-824.
- Floyd, T., Elphick C. S., Chisholm G., Mack K., Elston R. G., Ammon E. M., and Boone J. D. 2007. Atlas of the Breeding Birds of Nevada. University of Nevada Press, Reno NV.
- GBBO (Great Basin Bird Observatory). 2010. Nevada Comprehensive Bird Conservation Plan, ver. 1.0. Great Basin Bird Observatory, Reno, NV. Available online at www.gbbo.org/bird_conservation_plan.html

HONORS

PHI BETA KAPPA (1985)
George Washington University

PUBLIC SERVICE

University of Nevada Exploratory Committee to establish the Academy for the Environment
(Member 2004)

SPCA of Northern Nevada {Board chair (2002 – 2008) and board member (2001 - present)}

Maddie's Spay/Neuter Project in Nevada (Project coordinator, 2006 – 2008)

Alliance for Contraception in Cats & Dogs (Scientific advisory board member, 2010 –
present)