

# Nancy A. Beecher

## SENIOR BIOLOGIST

Southern Nevada Water Authority  
Environmental Resources Division  
100 City Parkway, Suite 700  
Las Vegas, Nevada 89106  
nancy.beecher@snwa.com  
(702) 862-3351

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## EDUCATION

- Ph.D.** Indiana University – Bloomington  
*Major:* Evolution, Ecology, and Behavior (2005)  
*Minor:* Public and Environmental Affairs
- M.S.** University of Nebraska – Lincoln  
*Major:* Natural Resource Sciences (1998)  
*Minor:* Biometry (Statistics for Biology)
- B.S.** Pennsylvania State University  
*Major:* Life Science (1992)  
*Minor:* Spanish  
*Study abroad:* University of Salamanca, Spain (spring semester, 1991)

## PROFESSIONAL EXPERIENCE

### 2007-Present Senior Biologist

Southern Nevada Water Authority, Las Vegas, NV

Represent SNWA as a senior environmental scientist. Plan environmental projects in conjunction with SNWA staff and consultants. Projects include environmental surveys in groundwater development areas and rangeland monitoring on federal land. Develop project designs, conduct statistical analyses, and author and edit environmental project reports.

Serve as SNWA primary contact for state and federal agencies to implement stipulated agreements requiring biological monitoring, management, and mitigation plans associated with groundwater development. Work one-on-one and in teams to identify problems and develop cooperative solutions concerning environmental resources. Develop and evaluate biological monitoring plans for a variety of species and habitats, including frogs, fishes, springsnails, springs, streams, and wetland/meadows. Evaluate monitoring objectives and indicators, sampling objectives and designs, and field and analytical methodologies. Analyze effectiveness and efficiency of statistical designs and field methods, and develop and oversee implementation of recommendations to achieve objectives. Prepare reports concerning environmental resources and their association with SNWA groundwater development in eastern Nevada.

Develop and oversee implementation of research designs for surveys and monitoring of sensitive animal and plant species in eastern Nevada and western Utah, such as northern leopard frogs, springsnails, Virgin River chub, and Ute ladies'-tresses. Developed a high-resolution vegetation mapping project in Spring Valley with colleagues and consultants, and oversaw implementation and completion of a geodatabase spanning 38 square miles. Develop rangeland monitoring designs and oversee implementation of monitoring on SNWA-permitted federal grazing allotments that span nearly 1 million acres across 8 hydrographic basins. Conduct and oversee reporting efforts to comply with federal regulations, inform environmental planning efforts, and support sustainable land management.

Contribute to and review federal compliance documents to support SNWA resources and projects. Prepared a Biological Assessment and reviewed an Environmental Impact Statement and Biological Opinion for SNWA groundwater development in eastern Nevada. Conduct policy reviews for federal regulatory proposals and prepare formal comment letters.

Supervised up to 8 staff for 8 years. Oversaw a research team on various environmental projects dealing with resource management and sensitive species. Prepared staffing plans, prioritized workload and assignments, developed budgets, and developed and oversaw contracts. Ensured that environmental research and reports were completed to support environmental compliance for SNWA projects.

**2006-2007 Conservation Director**  
Nevada Wilderness Project, Las Vegas, NV

Planned and oversaw the inventory of over 1 million acres of public land in 8 months. Hired, trained and supervised 5 field researchers to do Wilderness inventories across 3 counties. Participated in a scientific group to conceive a landscape-scale conservation area design for Great Basin.

**1999-2005 Student Researcher and Teaching Assistant**  
Indiana University, Bloomington, IN

Conducted independent research in the Monteverde Cloud Forest Reserve, Costa Rica for 5 years (2000-2004 summers). Developed interdisciplinary research spanning ecology, evolution, physiology, immunology, development, and conservation. Raised research funds and managed logistics for international research. Hired, trained and mentored 2 lab technicians at Indiana University and 5 field researchers in Costa Rica. Collaborated with U.S. and Costa Rican researchers, Reserve personnel, and the Monteverde community. Awarded the Dona G. Graam / I.U. Biology Department fellowship for women in science.

Taught 14 courses and 7 guest lectures in conservation biology, life science, evolution, endocrinology, and animal behavior. Taught in a range of environments (lecture halls, laboratories, and the Costa Rican wilderness), class sizes (20 to 300 students), and academic levels (introductory non-majors to upper level science majors). Awarded the Biology Department 2005 Outstanding Associate Instructor Award (nominated in 2001 and 2002).

**1998-1999 Biostatistician and Geographical Imaging Analyst**  
University of Nebraska, Lincoln, Nebraska

Created GIS database for sandhill crane migration project in central Nebraska. Conducted geospatial and statistical analyses for a project aimed at analyzing landscape use by birds and developing a model to categorize wetlands using satellite imagery. Conducted statistical analyses of horticulture and agroforestry projects for University professors.

**1994-1998 Student Researcher**  
University of Nebraska, Lincoln, Nebraska

Developed and implemented experimental designs for two research projects on birds, vegetation, and arthropods. Performed field work at 30 agricultural sites over 2 field seasons. Developed a collaborative relationship and completed questionnaires with 22 private landowners. Wrote grants and managed research funds. Hired, trained and supervised 1 undergraduate in the field and 2 undergraduates in the laboratory.

Assisted on a project in Chihuahua, Mexico studying overwintering grassland birds for genetic conservation (February, 1999).

**1992-1993 Editor/Analyst of Scientific Literature**  
BIOSIS (Biological Abstracts), Philadelphia, PA

Read, analyzed, and indexed biological journal abstracts to create library databases. Trained employees and maintained quality control after 8 months of employment.

**1992-1993 Undergraduate Student Observer / Volunteer**

Observed surgeries and volunteered in emergency rooms and hospital wards.

**SELECT SCIENTIFIC REPORTS (PRIMARY CONTRIBUTING AUTHOR OR EDITOR)**

Biologic Resources Team. 2011. Biological monitoring plan for the Delamar, Dry Lake, and Cave Valley Stipulation. 195 p.

Biological Work Group (BWG). 2009. Biological monitoring plan for the Spring Valley Stipulation. February. 385 p.

BWG. 2014. Evaluation of fish sampling designs for the Spring Valley Stipulation. March. 166p.

BWG. 2015. Evaluation of springsnail and macroinvertebrate sampling designs for the Spring Valley Stipulation. January. 147 p.

BWG. 2016. Evaluation of leopard frog sampling designs for the Spring Valley Stipulation. February. 113 p.

BWG. 2016. Evaluation of fixed-station photography and site assessment sampling designs for the Spring Valley Stipulation. May. 130 p.

Marshall, Z. L., Prieur, J. P., Beecher, N. A., and Luptowitz, L. M. 2017. Technical analysis report supporting the Spring Valley and Delamar, Dry Lake, and Cave Valleys, Nevada, 3M Plans. Presentation to the Office of the Nevada State Engineer. Southern Nevada Water Authority, Las Vegas, Nevada. 486 p.

Southern Nevada Water Authority (SNWA). 2009. Clark, Lincoln, and White Pine Counties Groundwater Development Project: 2008 wildlife surveys. August. 86 p.

SNWA. 2010. Spring Valley Stipulation Biological Monitoring Plan 2009 annual report. Southern Nevada Water Authority, Las Vegas, Nevada. March. 354 p.

SNWA. 2011. Spring Valley Stipulation Biological Monitoring Plan 2010 annual report. Southern Nevada Water Authority, Las Vegas, Nevada. March. 394 p.

- SNWA. 2013. Big Springs/Lake Creek native fish community 2011 survey report. Southern Nevada Water Authority, Las Vegas, Nevada. July. 25 p.
- SNWA. 2013. Greater sage-grouse (*Centrocercus urophasianus*) movements, SNWA ranchland and rangeland use, and core use areas in Spring Valley, Nevada. Southern Nevada Water Authority, Las Vegas, Nevada. May. 46 p.
- SNWA. 2013. Relict dace 2011-2012 survey report. Southern Nevada Water Authority, Las Vegas, Nevada. December. 32 p.
- SNWA. 2014. Northern leopard frog egg mass 2011-2013 survey report with 2014 addendum. Southern Nevada Water Authority, Las Vegas, Nevada. August. 38 p.
- SNWA. 2014. Springsnail (*Pyrgulopsis kolobensis* and *P. anguina*) and water quality 2011-2012 study in Spring and Snake Valleys, Nevada. Southern Nevada Water Authority, Las Vegas, Nevada. August. 108 p.
- SNWA. 2016. A 2009-2015 Assessment of northern leopard frog (*Lithobates pipiens*) reproduction on Southern Nevada Water Authority ranches in Spring Valley, Nevada. Southern Nevada Water Authority, Las Vegas, Nevada. October. 50 p.
- SNWA. 2017. SNWA monitoring, management, and mitigation plan for Delamar, Dry Lake, and Cave valleys, Nevada. Southern Nevada Water Authority, Las Vegas, Nevada, Doc. No. WRD-ED-0044.
- SNWA. 2017. SNWA monitoring, management, and mitigation plan for Spring Valley, Nevada. Southern Nevada Water Authority, Las Vegas, Nevada, Doc. No. WRD-ED-0045.

#### **PEER-REVIEWED SCIENTIFIC PUBLICATIONS**

- Beecher, N. A., Johnson, R. J., Brandle, J. R., Case, R. M., and L. J. Young. 2002. Agroecology of birds in organic and nonorganic farmland. *Conservation biology* 16 (6), 1620–1631.
- Freedberg, S., Grieves, T. J., Beecher, N., Ewert, M. A., Nelson, C. and Demas, G. E. (2008). Incubation environment affects immune system development in a turtle with environmental sex determination. *Journal of Herpetology*, 42, 536-41.

#### **DISSERTATION AND THESIS**

- Beecher, N. A. 1998. Birds and agroecological relationships in organic and non-organic farmland. M.S. Thesis, University of Nebraska, Lincoln, Nebraska. 158 p.
- Beecher, N. A. 2006. Frog declines: Exploring connections among climate change, immunity and disease. Ph.D. Dissertation, Indiana University, Bloomington, Indiana. 112 p.

## PUBLISHED ABSTRACTS AND PRESENTATIONS

- Averill-Murray, L., and Beecher, N. A. 2009. Biological Monitoring Plan for the Spring Valley Stipulation (poster). Nevada Water Resources Association Annual Meeting (Reno, NV. February).
- Beecher, N. A. 2004. Reducciones de anfibios, cambio climático y enfermedades: explorando conexiones. Translation: Amphibian declines, climate change, and disease: exploring connections. (Presentation to Reserve personnel, scientists and the public at the Monteverde Cloud Forest Reserve, Costa Rica.)
- Beecher, N. A., Demas, G. E., and Nelson, C. 2005. Frog declines: exploring connections between climate change, immunity and disease. Center for the Integrated Study of Animal Behavior conference. (Bloomington, IN. April 22).
- Beecher, N. A., Demas, G. E., and Nelson, C. 2005. Frog declines: exploring connections between climate change, immunity and disease. Proceedings of the Society for Integrative and Comparative Biology 44:522. (San Diego, CA. April 22).
- Beecher, N. A., Demas, G. E., and Nelson, C. 2005. Frog declines: exploring connections between climate change, immunity and disease. Student Conference on Conservation Science (Duke University, Durham, NC. March 16-18).
- Beecher, N. A., Johnson, R. J., Case, R. M., Brandle, J. R. 1996. Poster on M.S. research. Proceedings of the American Society of Agronomy Annual Meeting. (Indianapolis, IN. Nov. 3-8). p. 54.
- Beecher, N. A., Johnson, R. J., Case, R. M., Brandle, J. R. 1996. Presentation on M.S. research. Proceedings of the Midwest Fish and Wildlife Conference 58:86. (Omaha, NE. Dec. 8-11).
- Beecher, N. A., Johnson, R. J., Case, R. M., Brandle, J. R., and Young, L. J. 1996. Birds and agroecological relationships in organic and non-organic farmland. Proceedings of the Nebraska Academy of Sciences Conference. 116:16. (Lincoln, NE. Apr. 26).
- Beecher, N. A., Johnson, R. J., Case, R. M., Brandle, J. R., and Young, L. J. 1997. Birds and agroecological relationships in organic and non-organic farmland. Proceedings of the Midwest Fish and Wildlife Conference 59:141. (Milwaukee, WI. Dec. 7-10).
- Johnson, R. J., Brandle, J. R., Sunderman, N. J., Fitzmaurice, R. L., Beecher, N. A., Case, R. M., Dix, M. E., Young, L. J., Harrell, M. O., Wright, R. J., and Hodges, L. 1996. Wildlife as natural enemies of crop pests. Proceedings of the 8th National Extension Wildlife and Fisheries Specialists Workshop. (Bellingham, WA. June 26-29).