PAUL T. ARBETAN

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SUMMARY

Ecologist – Educator – Natural Resources Specialist

An experienced leader, educator and analyst in natural resources seeking opportunities to work collaboratively toward a better understanding of the natural world. Adaptable and creative, with demonstrated success developing research agendas, generating funding, and running projects as a member of a group of researchers and policy-makers, desires a role on a team in education or resource management, working to build programs where science and mathematics are ways among many to understand our shared future.

ACCOMPLISHMENTS

- Alone and as a team member, wrote $10 million in grants for Diné College since 2019.
- Generated millions of dollars in research grants and contracts, supporting 25 projects, over 14 years as a research professor at the University of New Mexico.
- With colleagues, developed a B.S. degree in environmental science and B.S. degree in agriculture at Diné College.
- Developed a team in biology at Diné College to re-envision the biology program for improved matriculation and graduation in ecology.
- Taught ecology for the Whitman College Semester in the West programs where an interdisciplinary field studies program explores climate change, public lands, resource management, collaboration and community issues in the American West.
- Analyzed range data to determine ecologically sustainable grazing rates, BIA, Navajo Nation.
- Analyzed long-term ecological data to assess water resource impacts, U.S. Bureau of Reclamation.
- Created vegetation state and transition models to predict habitat change across the Southwest, U.S. Forest Service.
- Built predictive vegetation R models for Canyon de Chelly, National Park Service.
- Using satellite and airborne imagery, mapped vegetation and assessed map accuracy in mountain, plains, and desert regions of New Mexico, National Park Service and N.M. Department of Military Affairs.
- Investigated natural variation in forb occurrence in New Mexico grasslands and the role of forb seed in post-fire reclamation efforts, NSF LTER.

TESTIMONIAL

"Paul has run a lot of projects for us and gets results that positively affect our ability to conduct operations in New Mexico. He's an excellent listener, researcher and analyst who creatively solves problems under the law and Army regulations, which he knows well. His work is always thorough and his writing and presentations clear and insightful. He respects the work of others and is easy to work with."

Steven Latimer, Cultural and Natural Resources Manager, NM Army National Guard

RESEARCH SKILLS

- Habitat modeling and statistical analysis: *R*, *ESRI ArcGIS and ESSA Vegetation Dynamics Development Tool.*
- GIS and Remote Sensing: *ESRI ArcGIS* and *ERDAS Imagine*.
- Database Management: *Microsoft Access*.
- Wildlife monitoring using radio-telemetry and acoustic detection (bats): *Sonobat* and *Anabat*.
- Sequence analysis: Illumina (current DoD grant for DNA sequencing).

EDUCATION

University of Kansas – Lawrence, KS
Ph.D. Systematics and Ecology

Lawrence University – Appleton, WI
B.A. Biology

EXPERIENCE

Associate Professor Ecology and Evolution • Diné College, 1 Circle Dr., Tsaile, AZ, 86556.
Supervisor: Land Grant Director: Benita Litson 928 724-6940 blitson@dinecollege.edu. August 2019 - Present

- Alone and as a team member, wrote five successful grants to improve the student learning environment.
- With colleagues, developed a B.S. degree in agriculture and a B.S. degree in environmental science.
- To expand our student's professional development, developed a joint field experience with Whitman College students. This project takes both groups out across Navajo to explore the ecology intertwined with the land and its people.
- Developed a team in biology to rewrite the biology program checklist for improved matriculation and graduation for ecology and natural resources students.
- Taught biology for non-majors, general biology (I and II), ecology, evolution, agricultural genetics, agroecology and environmental science.

Ecologist • DDC 4C, Diné Development Corporation, 8840 E. Chaparral Rd. Scottsdale, AZ, 85250 Supervisor: Michael Tremble, Vice President, (757) 618-9075, Michael.Tremble@bric-dine.com. (part-time, as needed)
April 2019 - Present

- Analyzed agricultural range production for the Navajo Nation.
- Analyzed long-term ecological data for the Bureau of Reclamation.
- Developed predictive habitat models for nine plant species of cultural significance.
- Collected vegetation data in Colorado, New Mexico and Arizona.

Environmental Consultant - self-employed • Pyxis Environmental Services, Western Lands Research, 6109 Rancho del Rey Rd NE, Albuquerque, NM, 87113 (part-time, per contract) January 2014 - Present

- Conducted field surveys for a wide range of plants and animals including *Acarospora clauzadeana* (rare gypsophylic lichen), night-blooming cereus (NM threatened) and Sheer's pincushion cacti (NM endangered), gray-banded kingsnake (NM endangered) and grey vireo (NM threatened).
- Developed models to predict habitat for gray vireo and night-blooming cereus.
- Reviewed and analyzed the history, socio-economics, archeology, ecology, geology, soils, hydrology, and climate of Guard sites for Environmental and Biological Assessments under the National Environmental Policy Act (NEPA), the Sikes Act, the Fish and Wildlife Conservation Act, the Migratory

Bird Treaty Act, Executive Orders 12898 and 13423 (environmental justice), 11988 (floodplains), 11990 (wetlands), and 13693 (sustainability), and NM statues covering plants, wildlife, and habitat.

- Advised NM Army National Guard of EPA rules and guidelines under the Clean Water Act, Clean Air Act, and the National Emission Standard for Hazardous Air Pollutants.
- Designed and helped implement systems to determine long-term land condition trends, provide soldier environmental compliance and stewardship, measure military procedural impacts, mitigate environmental damage and determine remediation procedures.
- Wrote and consulted on NM Army National Guard Integrated Natural Resource Management Plans and Pest Management Plans. Presented the details of these plans to the public, National Guard Bureau, and Guard contractors.
- Analyzed agricultural range production for the Navajo Nation.
- Analyzed long-term ecological data for the Bureau of Reclamation.
- Developed predictive habitat models for nine plant species of cultural significance.
- Collected vegetation data in Colorado, New Mexico and Arizona.

Ecologist • Whitman College – Semester in the West Program, 345 Boyer Ave., Walla Walla, WA, 99362. Supervisor: Phil Brick, Director, (509) 540-9229, philipbrick@icloud.com. Oct 2002 – Oct 2023

- Ecologist in the original Mellon Foundation Grant submitted by Whitman College to develop an interdisciplinary semester-long field studies program, exploring climate change, public lands, resource management, collaboration and community issues in the American West.
- The program sought to contribute to our further understanding of human impacts to the land and initiated a data collection protocol in 2002 to monitor a cienega restoration near Agua Prieta, Chihuahua, Mexico.

Assistant Professor – Research Ecology • Natural Heritage New Mexico, Museum of Southwest Biology, UNM, 1 University of New Mexico, Albuquerque, NM, 87131. Supervisor: Esteban Muldavin, Director, (505) 277-3822, muldavin@unm.edu. August 2000 – March 2015

- Investigator on over 25 projects. Hired, trained, and managed field and office support for any single project.
- Conducted research assessing habitat use by bird species along the Rio Grande River in NM.
- Conducted long-term monitoring of a grey vireo population in central New Mexico to determine reproductive success and guard against human impacts.
- Established monitoring protocols and assessed bat use of riparian/arroyo pool habitat on military lands using acoustic monitoring techniques.
- Established monitoring areas across NM to assess vegetation change and rare and sensitive species.
- Working with the U.S. Forest Service, investigating natural variation in forb occurrence in grasslands and the use of forb seed in reclamation efforts.
- Developed vegetation state and transition models used by the U.S. Forest Service to better predict change across the Southwestern U.S.
- Assessed genetic differences among the remaining populations of Wright's Justicia in New Mexico and Texas.
- Conducted research to map vegetation of Guadalupe Mountains NP, Carlsbad Caverns NP, Valles Caldera National Preserve, and various BLM and DoD properties in New Mexico. Determined sampling protocols including polygon selection, fuel load assessment, and statistical sampling requirements. Devised crew work plans and worked in the field identifying plants and measuring ecological parameters. Developed vegetation maps from satellite and airborne imagery.

- Analyzed vegetation sampling results to ensure map accuracy standards for the National Park Service including Guadalupe Mountains NP, Carlsbad Caverns NP, Bandelier NM, Pecos NHP.

Assistant Professor, Biology and Environmental Science • Montana State University
1500 University Dr., Billings, MT 59101. August 1999 – July 2000
Supervisor: Tasneem Khaleel, Chair, (406) 657-2017, tkhaleel@msubillings.edu.

- Taught Survey of Biology (Non-majors) (100), General Biology (Majors) (100), Environmental Ecology (200), Evolution and Ecology (300), and Vertebrate Anatomy (400).

Associate Professor, Biology and Environmental Science • Rocky Mountain College
1511 Poly Dr., Billings, MT 59102. August 1993 – July 1999
Contact: Cristi Hunnes, Professor, (406) 657-1154, hunnesc@rocky.edu.

- Taught General Biology (100) Human Sexual Biology (100), Research Methods (100), Genetics (200), Microbiology (200), Ornithology (300), Evolution (300), Ecology (300), Population Genetics (400), Conservation Biology (400), and Natural Resource Assessment using GIS (400).
- With two colleagues, developed and launched the Environmental Science Major.
- AISES faculty advisor.
- Tenure approved April 1999.

Post-Doctoral Associate, Biology • University of Miami
1301 Memorial Drive, Coral Gables, FL 33146 December 1992 – July 1993
Supervisor: Michael Gaines, Professor, 305 284-4647.

- Conducted research to assess meta-population genetics of small mammals among hammock islands in the Florida Everglades.

RECENT COLLEGE GRANTS

- *Advancing National Security through Workforce Development, Diversity, and Next-Generation Sequencing on the Navajo Nation*. U.S. Army, $428,503 (2024–2025). Co-PI.
- *An Integrative Approach to Expanding Agricultural Opportunity on the Navajo Nation*. USDA/NIFA New Beginnings Tribal College Research Grant, $500,000 (2021–2024). Co-writer and contributing faculty.
- *Title III ESEA STEM Building*, $7,000,000 (2020). Co-Writer and leader of the building design team.
- *Tó éí Líná át'é"– "Water is Life" Center*. NSF, Louis Stokes All Nations AMP, $2,500,000 (2021–2026). Co-writer and contributing faculty.
- *NIH BLaST Faculty Pilot Project: Developing Diné Student Biomedical Research Literacy*, NIH, $12,000 (2020). PI.

PROFESSIONAL REPORTS AND PRESENTATIONS (POST 2000)

2024 Arbetan, P. and S. Lee. *Shiprock Navajo Agency McCracken Mesa Range Management Unit of District 12, Range Inventory Report*. US Bureau of Indian Affairs, BRIC, Diné Development Corporation, Scottsdale, AZ.

2024 Arbetan, P. and S. Lee. *Closed Basin Vegetation – Monitoring Report. Volumes 1 and 2. San Luis Valley, Alamosa and Saguache Counties, CO, Upper Colorado Basin*. US Bureau of Reclamation, BRIC, Diné Development Corporation, Scottsdale, AZ.

2019 Arbetan, P. *National Guard Integrated Natural Resource Management Plan (INRMP) and Environmental Assessment (EA)*. Army National Guard, Pyxis Environmental LLC, Albuquerque, NM.

2017 Arbetan, P. *Environmental Assessment - National Guard Readiness Center, Belen, NM*. Army National Guard, Pyxis Environmental LLC. Albuquerque, NM.

2016 Arbetan, P. *Environmental Assessment - National Guard Readiness Center, Las Cruces, NM*. Army National Guard, Pyxis Environmental LLC. Albuquerque, NM.

2013 Arbetan, P., E. Muldavin and R. Pendleton. *Forb Variability over Two Decades in a Chihuahuan Desert Grassland Assemblage – Local dynamics in a regional context*. Poster presentation, Ecological Society of America, Albuquerque NM.

2013 Muldavin, E., Y. Chauvin, T. Neville, P. Neville, A. Kennedy, H. Hulse, P. Arbetan, K. Schultz, M. Hall, and M. Reid. *Vegetation Classification and Map: El Malpais National Monument*. Natural Resource Technical. Report NPS/SPCN/NRTR–2013/803. National Park Service, Fort Collins, Colorado.

2012 Arbetan, P. *NM Army National Guard Integrated Natural Resource Management Plan (INRMP) and Environmental Assessment (EA).* Army National Guard, Pyxis Environmental LLC.

2012 Muldavin, E., Y. Chauvin, L. Arnold, T. Neville, P. Arbetan and P. Neville. *Vegetation classification and map: Petroglyph National Monument*. Natural Resource Technical Report NPS/SCPN/NRTR—2012/627. National Park Service, Fort Collins, Colorado.

2012 Arbetan, P. *Genetic variation in Wright's Justicia,* Justicia wrightii, *across its range*. Talk, Botanical Society of America, Austin, TX.

2012 Muldavin, E., Y. Chauvin, P. Neville, T. Neville, L. Arnold, P. Arbetan, and A. Fettes. *A vegetation classification and map: Pecos National Historical Park*. Natural Resource Technical Report NPS/SOPN/NRTR–2012/601. National Park Service, Fort Collins, Colorado.

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

2009 Arbetan, P. *Field observations at Camel Tracks Training Site for the Gray Vireo*. Natural Heritage New Mexico Publ. No. 09-GTRdb-343. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2008. Arbetan, P., Y. Chauvin, and E. Muldavin. *Report of surveys for the New Mexico Army National Guard Onate Headquarters Complex*. Natural Heritage New Mexico Publ. No. 08-GTR-338. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2008. Arbetan, P., Y. Chauvin, and E. Muldavin. *Report of surveys for the New Mexico Army National Guard Rio Rancho Site.* Natural Heritage New Mexico Publ. No. 08-GTR-339. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2007. Arbetan, P., T. Neville, Y. Chauvin, P. Neville, and E. Muldavin. *The vegetation of the New Mexico Army National Guard Roswell Weekend Training Site*. Natural Heritage New Mexico Publ. No. 08-GTR-331. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2007. Arbetan, P. *Gray vireo nests and territories, 2004-2007 at Camel Tracks Training Site, New Mexico National Guard*. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2006. Arbetan, P. and E. Muldavin. *Report of gray vireo monitoring surveys at the New Mexico Army National Guard Camel Tracks Training Area*. Natural Heritage New Mexico Publ. No. 06-GTR-293. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2006. Arbetan, P., T. Neville, Y. Chauvin, P. Neville, K. Mann, and E. Muldavin. *The vegetation of the New Mexico Army National Guard Happy Valley Training Site*. Natural Heritage New Mexico Publ. No. 06-GTR-326. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2006. Arbetan, P. and E. Muldavin. *Report of a survey for Wright's Justicia (Justicia wrightii) in Southeastern New Mexico*. New Mexico Army National Guard. Natural Heritage New Mexico, University of New Mexico.

2005. Arbetan, P. and E. Muldavin. *Monitoring report for night-blooming cereus (Peniocereus greggii var. greggii) at the New Mexico Army National Guard Black Mountain Training Area*. Natural Heritage New Mexico Publication No. 05-GTR-287. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2005. Arbetan, P, E. Muldavin, P. Neville, Y. Chauvin, and E. Clary. *The vegetation of the New Mexico Army National Guard Black Mountain Training Site*. Natural Heritage New Mexico, Museum of Southwestern Biology, University of New Mexico, Albuquerque, NM.

2005. Arbetan, P., Y. Chauvin, and E. Muldavin. *Report for survey for night-blooming cereus (Peniocereus greggii var. greggii) at the New Mexico Army National Guard Black Mountain Training Area.* Natural Heritage New Mexico Publication No. 05-GTR-288. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2004. Arbetan, P, T. Neville, and E. Muldavin. *Military training area management units at the New Mexico Army National Guard Camel Tracks Training Area, NM*. 04-GTR-263 . Natural Heritage New Mexico, Museum of Southwestern Biology, University of New Mexico, Albuquerque, NM.

2004. Arbetan, P and E. Muldavin. *Report of gray vireo surveys and monitoring at the New Mexico Army National Guard Camel Tracks Training Area*. Natural Heritage New Mexico Publ. No. 04-GTR-277. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2004. Arbetan, P, Y. Chauvin, and E. Muldavin. *Monitoring report for Wright's Justicia wrightii at the New Mexico Army National Guard Happy Valley Training Area*. Natural Heritage New Mexico Publ. No. 04-GTR-262. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2003. Chauvin, Y and P. Arbetan. *Noxious weed report for the New Mexico Army National Guard - 2003*. Natural Heritage New Mexico, University of New Mexico, Albuquerque.

2003. Arbetan, P and E. Muldavin. *Report of Bird Surveys at the New Mexico Army National Guard Camel Tracks Training Area for 2003*. Natural Heritage New Mexico Publ. No. 02-GTR-260, Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2003. Arbetan, P., Y. Chauvin, and E. Muldavin. *Military Training Impacts on Vegetation at the New Mexico Army National Guard Camel Tracks Training Area, NM. Year 1 Monitoring Report*. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2003. Chauvin, Y, P. Arbetan, and E. Muldavin. *A floristic survey for the New Mexico Army National Guard Las Vegas Training Area*. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2003. Arbetan, P. and E. Muldavin. *Report of bird surveys at New Mexico Army National Guard Training Areas, Camel Tracks, Roswell Weekend, Happy Valley*. Natural Heritage New Mexico Publ. No. 03-GTR-259. Natural Heritage New Mexico, University of New Mexico, University of New Mexico, Albuquerque, NM.

2003. Muldavin, E, P. Neville, P. Arbetan, Y. Chauvin, A. Browder, and T. Neville. *A vegetation map of Carlsbad Caverns National Park, New Mexico*. Publication No. 03-GTR-258. Natural Heritage New Mexico, Museum of Southwestern Biology, University of New Mexico, University of New Mexico, Albuquerque, NM.

2002. Arbetan, P, E. Chauvin, and E. Muldavin. *Report of floral survey for Writght's justicia* (Justicia wrightii*) at the New Mexico Army National Guard Happy Valley Training Site*. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2002. Arbetan, P., E. Muldavin, P. Neville, and Y. Chauvin. *The vegetation of the New Mexico Army National Guard Camel Tracks Training Site*. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2002. Arbetan, P., Y. Chauvin, and E. Muldavin. *Report of vegetation monitoring after tamarisk removal at the New Mexico Army National Guard Roswell Weekend Training Site*. Natural Heritage New Mexico, University of New Mexico, Albuquerque, NM.

2002. Chauvin, Y and P. Arbetan. *Noxious weed report for the New Mexico Army National Guard*. Natural Heritage New Mexico, Museum of Southwestern Biology, University of New Mexico, Albuquerque, New Mexico.

2002. Arbetan, P., K. Johnson, and E. Muldavin. *Report of faunal surveys for the Gray Vireo, and Black-tailed and Gunnison's Prairie Dogs at the New Mexico Army National Guard Camel Tracks Training Site*. Natural Heritage New Mexico Publ. No. 02-GTR-231. Natural Heritage New Mexico, University of New Mexico, University of New Mexico, Albuquerque, NM.

2000. Chauvin, Y., J.P. Oliva, P. Arbetan, and E. Muldavin. *A Floristic Survey and Vegetation Map for the New Mexico Army National Guard Happy Valley Training Site*. Natural Heritage New Mexico, University of New Mexico, University of New Mexico, Albuquerque, NM.

2000. Chauvin, Y., J.P. Oliva, P. Arbetan, and E. Muldavin. *New Mexico Army National Guard Happy Valley and Camel Tracks training sites vegetation and community delineation.* Natural Heritage New Mexico, University of New Mexico, University of New Mexico, Albuquerque, NM.

2000. Chauvin, Y., Oliva, J.P., Arbetan, P., and E. Muldavin. *A Floristic Survey and Vegetation Map for the New Mexico Army National Guard Camel Tracks Training Site*. New Mexico Natural Heritage, University of New Mexico, University of New Mexico, Albuquerque, NM.