Nicholas A. McMillan, Ph.D.
University of Nebraska-Lincoln
Agronomy and Horticulture | School of Natural Resources
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Education

Oklahoma State University, Stillwater, OK
Doctor of Philosophy May 2022
Natural Resource Ecology and Management
Dissertation: Grassland Heterogeneity and Pyric Herbivory: Implications for Ungulate Movement, Biodiversity Conservation, and Livestock Production in the Anthropocene.

Clemson University, Clemson, SC
Master of Science, May 2017
Wildlife and Fisheries Biology
Thesis: Plant Community Responses to Bison and Cattle in the Northern Great Plains

Clemson University, Clemson, SC
Bachelor of Science, May 2015
Environmental and Natural Resources
Major: Conservation Biology

Employment

University of Nebraska-Lincoln, Lincoln, NE 2023 – Present
Assistant Professor

Oklahoma State University, Stillwater, OK 2022 – 2023
Postdoctoral Research Associate

Oklahoma State University, Stillwater, OK 2018 – 2022
Graduate Research Associate

Archbold Biological Research Station, Venus, FL 2017 – 2018
Research Assistant

Clemson University, Clemson, SC 2015 – 2017
Graduate Research Assistant

Awards & Fellowships

Delores and Jerry Etter Graduate Research Scholarship — Fall 2021 and Spring 2022
($10,000)

Williams Distinguished Graduate Student Fellowship — Fall 2021 and Spring 2022
($2,500)

The Nature Conservancy's J.E. Weaver Grant — Spring 2019
($1,000)

Wade T. Batson Award — Spring 2016
($1,000)

Alexander P. and Lydia Anderson Fellowship — 2015-2016 and 2016-2017 academic years
($600/year; $1,200 total)

Refereed Publications

McMillan, N.A., Fuhlendorf, S.D., Luttbeg, B., Goodman, L.E., Davis, C.A., Allred, B.W., Hamilton, R.G. (2022). Bison movements change with weather: implications for their continued conservation in the Anthropocene. Ecology and Evolution. 12(12):e9586. 10.1002/ece3.9586

Gholizadeh, H., Dixon, A., Pan, K., **McMillan, N.A.**, Hamilton, R.G., Fuhlendorf, S.D., Cavender-Bares, J., Gamon, J. (2022). Mapping plant diversity across the largest contiguous tract of tallgrass prairie on Earth using airborne and DESIS imaging spectroscopy. Remote Sensing of Environment. 281:113254. 10.1016/j.rse.2022.113254

McMillan, N.A., Fuhlendorf, S.D., Goodman, L.E., Davis, C.A., Luttbeg, B., Hamilton, R.G. (2022). Does fire and herbicide benefit cattle production in invaded grassland landscapes? Agriculture, Ecosystems and Environment. 340:108163. 10.1016/j.agee.2022.108163

Saha, A., Boughton, E., Gomez-Casanovas, N., Li, H., **McMillan, N.**, Zhang, X. (2022). Evapotranspiration in a Subtropical wetland savanna using low-cost Lysimeter, Eddy Covariance and Modeling approaches. Ecohydrology. 15(8): e2475. 10.22541/au.164580054.40969819/v1

Gholizadeh, H., Friedman, M.S., **McMillan, N.A.**, Hammond, W.M., Hassani, K., Sams, A. V., Charles, M.D., Garrett, D.R., Joshi, O., Hamilton, R.G., Fuhlendorf, S.D., Trowbridge, A.M., Adams, H.D. (2022). Mapping invasive alien species in grassland ecosystems using airborne imaging spectroscopy and remotely observable vegetation functional traits. Remote Sensing of Environment. 271:112887. 10.1016/j.rse.2022.112887

McMillan, N. A., S. D. Fuhlendorf, B. Luttbeg, L. E. Goodman, C. A. Davis, B. W. Allred, and R. G. Hamilton. (2021), Are bison movements dependent on season and time of day? Investigating movement across two complex grasslands. Ecosphere. 12(1):e03317. 10.1002/ecs2.3317

McMillan, N., Hagan, D., Kunkel, K. and Jachowski, D. (2020), Assessing Large Herbivore Management Strategies in the Northern Great Plains using Rangeland Health Metrics. Natural Areas Journal. 40(3): 273-280. doi: 10.3375/043.040.0324.

McMillan, N., Kunkel, K., Hagan, D. and Jachowski, D. (2019), Plant community responses to bison reintroduction on the Northern Great Plains, USA: A test of the keystone species concept. Restoration Ecology. 27: 379-388. doi:10.1111/rec.12856

Publications in Process

Cady, S.M., Londe, D.W., Fuhlendorf, S.D., Davis, C.A., Kanz, A.J., Knutson, J.K., Barnes, A., **McMillan, N.A.**, Neumann, L.K., Goodman, L.E., *In Review.* Ecologists are broadly failing to provide actionable management recommendations to cope with the uncertainty of climate change. Ecosphere.

McMillan, N.A., Fuhlendorf, S.D., Davis, C.A., Goodman, L.E., Luttbeg, B., Hamilton, R.G., *In Preparation.* A plea for scale, and why it matters for invasive species management, biodiversity, and conservation. Ecology.

McMillan, N.A., Fuhlendorf, S.D., Davis, C.A., Goodman, L.E., Luttbeg, B., Hamilton, R.G., *In Preparation*. Growing season fires and herbicide may not be a silver bullet to long-term *Lespedeza cuneata* management in the tallgrass prairie. Rangeland Ecology and Management.

Harris, J.P., **McMillan, N.A.**, Neumann, L.K., *In Preparation*. Why do animals move? Unifying thermal, optimal foraging, and predation effects on movement. Ecology Letters.

Past Research Projects and Employment

Oklahoma State University, Natural Resource Ecology and Management, Stillwater, OK — May 2022 – December 2022

Postdoctoral Research Fellow

- Researcher with the USDA-NIFA Prairie Project – a collaborative effort between Oklahoma State University, Texas A&M University, and the University of Nebraska-Lincoln seeking to investigate how pyric herbivory and multi-species grazing affect rangeland structure and function.

Oklahoma State University, Natural Resource Ecology and Management, Stillwater, OK — August 2018 – May 2022

Graduate Research Associate

Dissertation: Grassland Heterogeneity and Pyric Herbivory:. Implications for Ungulate Movement, Biodiversity Conservation, and Livestock Production in the Anthropocene

- Developed, designed, and conducted rangeland ecology research through a collaboration between The Nature Conservancy and Oklahoma State University to identify the interactive effects between fire, herbicide treatment, and grazing on rangeland plant communities.

- Utilized pre-existing, fine-scale movement data to investigate how landscape patterns affect bison movement across two sites in the southern Great Plains.

Archbold Biological Station, MacArthur
Agro-Ecology Research Center,
Lake Placid, FL May 2017 – July 2018

Research Assistant

- Assisted with the continued development, conceptualization, data collection, and analysis of projects falling within a broader long term agroecosystem research (LTAR) effort; a collaboration among the University of Florida's Range Cattle Research and Education Center (RCREC), Archbold Biological Station's MacArthur Agro-Ecology Research Center (MAERC), and the LTAR network.
    a. Aided in the formation, implementation, and collection of the following data:
        i. Plant community composition
        ii. Greenhouse gas (CO_2, N_2O, NH_4) flux
        iii. Detailed soil composition (pH, carbon, nitrogen, phosphorus, mehlich-acid, bulk-density, etc.)
        iv. Aboveground net primary production
        v. Landscape-scale vegetation-gap development using photography from unmanned aerial vehicle (UAV) flights
        vi. Cattle behavioral response (using GPS data) to seasonal fire in saw-palmetto (*Serenoa repens*) rangeland
        vii. Evapotranspiration estimation and modelling using lysimeter data

Clemson University, School of Forestry and
Environmental Conservation, Clemson, SC May 2015 – May 2017

Wildlife and Fisheries Biology,

Graduate Assistantship

Thesis: Plant Community Responses to Bison and Cattle in the Northern Great Plains

- Developed, designed, and conducted research through a collaboration between Clemson University, the USFWS, the BLM, and the American Prairie Reserve aiming to evaluate ecological impact differences between bison, cattle, and cattle exclusion in Northeastern Montana, USA.
    a. Established and sampled vegetation survey plots following the NCVS protocol developed by Peet et al. (1998) to collect and evaluate robust, species level vegetative data between disturbance treatments.

Clemson University, School of Forestry and
Environmental Conservation, Clemson, SC May 2014 – August 2014

Management and Impacts of Wild Hogs

(Sus scrofa) in South Carolina

S. Sullivan (2015)*, Research Technician*

- Aided with establishing and sampling vegetative plots throughout five trapping sites in Orangeburg county, and Hampton county, SC following the NCVS protocol, with species identification to the species level.
    a. Determined species incidence, cover for herbaceous level.
    b. Determined species incidence, diameter-breast-height (DBH), and canopy cover for anything above herbaceous level.

Walker Century Farm, Anderson, SC August 2013 – March 2014

Range Management Researcher

- Designed and constructed a new grazing system for the Walker Century Farm in Anderson, SC utilizing a paddock/grazing cell design on a "wagon-wheel" pattern.
    a. Plan, observe, and re-plan management strategies in response to changes in water availability, forage growth rates, mineral cycling, energy flow in or out of the system, and the requirements for the farm's cattle in relation to production goals.
    b. Worked with landowners to achieve higher economic production (measure of cattle numbers sustained per acre per year) while increasing ecosystem productivity (measured by wildlife diversity and richness increases).
- Designed a plan for restoring native prairie through reintroducing native grasses, sedges, forbs, legumes, and wildflowers (most of which are endangered) and managed the restoration site by setting up periodic fire and grazing plans.

Lone Butte Ranch, Logan county, KS June – July 2013

Ranch Management, Internship

- Assisted ranch manager/owner with moving and monitoring cattle grazing across a 10,000-acre ranch, daily, to increase the function and health of native shortgrass rangeland.
    a. Observed and measured grazing pressure on native forages (*Buchloe dactyloides*, *Bouteloua gracilis*, *Aristida purpurea*, etc.).
    b. Performed basic ranch-hand duties such as fence mending and ranch infrastructure maintenance.
- Observed and monitored prairie wildlife pressure and interaction with cattle on forage and water, while also documenting the nutrient cycling (from dead animals, dunging, etc.) performed by insects, detritivores, etc.

Clemson University School of Forestry and
Environmental Conservation, Clemson, SC March – August 2011

Sustainable Forestry Initiative (SFI),

Research Technician

- Utilized the NCVS protocol to record species incidence, cover, tree DBH, canopy cover, leading to a report of the richness, diversity, and structure of three different management strategies for sustainable forestry (i.e. winter burn vs. spring burn vs. herbicide) in the Clemson Experimental Forest, Clemson, SC.
    a. Identified and collected species for a collective taxa record being compiled for the Clemson Experimental Forest by the Clemson University Herbarium.

Teaching Experience

Oklahoma State University, Stillwater, OK August 30, 2022

Applied Ecology (NREM 3013)

Invited Guest Lecture

Oklahoma State University, Stillwater, OK January 31, 2022

Wildlife Management for Game Species (NREM 4533)

Invited Guest Lecture

University College Dublin, Dublin, Ireland December 7, 2020

Landscape Ecology (BIOL 30020)

Invited Guest Lecture

Oklahoma State University, Stillwater, OK August 2019 – December 2019

Applied Ecology (NREM 3013)

- Assisted with the implementation of the course throughout the semester
    a. Administered examinations
    b. Assisted in the grading of examinations

Clemson University, Clemson, SC August 2015 – May 2017

Wildlife and Fisheries Biology,

Teaching Assistantship

- Taught a single section of Wildlife Biology (WFB 3010 in Clemson University Undergraduate Course Catalog) for four consecutive semesters (fall/spring).
    a. Course focused on the practice of identifying wildlife species that are: (1) common to South Carolina or (2) globally relevant.
    b. Assessed students' ability to identify common wildlife species using common methods (physical characteristics, habitat, vocalizations, etc.).
    c. Assessed students' ability to reference wildlife using both common and latin names, and habitat.

Clemson University, Clemson, SC February 3, 2017

Conservation Biology (WFB 3130),

Invited Guest Lecture

Professional Presentations and Posters

2023

McMillan, N.A., Fuhlendorf, S.D., Hamilton, R.G. "Scale, biodiversity, and invasion in the tallgrass prairie: a test of the Invasion Paradox across large working rangelands.". *Society for Range Management Annual Conference*. February 2023. Boise, Idaho. Contributed Oral Presentation.

2022

McMillan, N.A., Fuhlendorf, S.D., Hamilton, R.G. "Do Invasive Plants Affect Diversity in Heterogeneous Grasslands? The Effect of Sericea Lespedeza (Lespedeza cuneata) Invasion on the Tallgrass Prairie". *Ecological Society of America Annual Conference*. August 2022. Contributed Oral Presentation.

McMillan, N.A. "An active-learner approach to range education". University of Nebraska-Lincoln. August 2022. Lincoln, Nebraska. Invited Talk.

McMillan, N.A. "Rangeland ecology with a landscape perspective: feedbacks between structure, herbivory, and rangeland function". University of Nebraska-Lincoln. August 2022. Lincoln, Nebraska. Invited Talk.

McMillan, N.A. "A plea for scale, and why it matters for invasive species management and biodiversity conservation across the North American tallgrass prairie." The Swiss National Park. June 2022. Zernez, Switzerland. Invited Talk.

McMillan, N.A. "Rangeland ecology with a landscape perspective: feedbacks between structure, herbivory, and rangeland function". Montana State University. April 2022. Bozeman, Montana. Invited Talk.

McMillan, N.A., Fuhlendorf, S.D., Hamilton, R.G. "Do Invasive Plants Affect Diversity and Livestock Productivity in Heterogeneous Grassland?". *Society for Range Management Annual Conference*. February 2022. Albuquerque, New Mexico. Invited Talk.

2021

Gholizadeh, H., Friedman, M.S., **McMillan**, **N.A.,** Hammond, W.M., Hassani, K., Sams, A., Charles, M., Garrett, D., Hamilton, R.G., Fuhlendorf, S.D., Trowbridge, A.M., and Adams, H. "Mapping Invasive Alien Plants in Grasslands through Remote Estimation of Vegetation Functional Traits". *American Geophysical Union*. December 2021. New Orleans, Louisiana. Oral Presentation.

McMillan, N.A., Fuhlendorf, S.D., Allred, B.W., Hamilton, R.G. "Bison movements change with climate: Implications for conservation in the Anthropocene." *Ecological Society of America Annual Conference*. August 2021. Virtual Conference Presentation.

McMillan, N.A., Fuhlendorf, S.D. "Managing Invasion and Biodiversity with Heterogeneity and Pyric Herbivory". *Prairie Project USDA Grant Meeting.* June 2021. Sonora, Texas. Oral Presentation.

2020

Gholizadeh, H., **McMillan, N.,** Fuhlendorf, S., H., Gamon, J., Hammond, W., Hassani, K., Adams, Sams, A., Charles, M., Garrett, D., and Cavender-Bares, J. "Scale-dependence of remote sensing of biodiversity: A test in grasslands under different management practices". *American Geophysical Union*. December 2020. Virtual Conference Presentation.

McMillan, N.A., Fuhlendorf, S.D., Luttbeg, B., Goodman, L.E., Davis, C.A., Allred, B.W., Hamilton, R.G. "What Drives Movement for the American Plains Bison?". *Natural Resource Ecology and Management Seminar*. September 2020. Stillwater, Oklahoma. Oral Presentation.

McMillan, N.A., Fuhlendorf, S.D. "Seasonal Movement Patterns of the American Plains Bison". *International Association for Landscape Ecology Annual Conference*. May 2020. Virtual Conference Presentation.

2019

Saha, A., **McMillan, N.**, Li, H., Boughton, E. "Low-cost Lysimeters Measure Evapotranspiration in a Subtropical Wetland Savanna". *American Geophysical Union*. December 2019. San Francisco, California. Poster Presentation.

McMillan, N.A., Fuhlendorf, S.D. "Pyric Herbivory and the Shifting Mosaic: Measuring Instantaneous Rate of Greenup in the Tallgrass Prairie of Oklahoma, USA". *International Association for Landscape Ecology Annual Conference*. May 2019. Fort Collins, Colorado. Poster Presentation.

2018

Judge, P., **McMillan, N.**, Li, H., Saha, A., Boughton, E. "Evapotranspiration measurements in a Subtropical Wetland Savanna using Lysimeters". *South Florida Graduate Research Symposium*. March 2018. Immokalee, Florida. Poster Presentation.

2016

McMillan, N.A., Kunkel, K.E., Jachowski, D.S. "Plant Community Responses to Bison and Cattle in the Northern Great Plains". *American Bison Society Conference*. October 2016. Banff, Alberta. Poster Presentation.

Peer Review Activity

Community	*Count*	*Class*
Rangeland Ecology and Management	3	Manuscript Review
Natural Areas Journal	1	Manuscript Review
African Journal of Range and Forage Science	1	Manuscript Review
National Science Foundation	1	Grant Proposal Review
Scientific Reports	1	Manuscript Review
Ornithological Applications	1	Manuscript Review

Professional Society Memberships

Society

Ecological Society of America

ESA – Rangeland Ecology Section

International Association for Landscape Ecology

Natural Areas Association

Society for Range Management

Livestock Foraging Behavior Committee

Academic Leadership Experience

Organization	*Years*	*Position*
Oklahoma State University Natural Resource Ecology and Management Graduate Student Organization	2021- 2022	President
Oklahoma State University Natural Resource Ecology and Management Graduate Student Organization	2020 - 2021	Faculty Liaison

Undergraduate Mentoring

Student	*Years*	*Current Position*
Lydia Laughlin	2021 - Present	Undergraduate Researcher in Oklahoma State University's department of Natural Resource Ecology and Management; collaborative project with Dr. Colter Chitwood
Kayla Johnson	2021 - 2022	Research technician and upcoming M.S. Student in Oklahoma State University's department of Natural Resource Ecology and Management beginning 2022 under Dr. Laura Goodman

Aisha Sams	2019 – 2021	M.S. Student at Oklahoma State University department of Natural Resource Ecology and Management under Dr. Gail Wilson

Volunteer Experience

Craig's Pond Vegetative Survey	Barnwell county, SC
Florida Bay Vegetative Survey	Francis Marion National Forest, SC

Outreach Activities

Program	*Media*	*Date*	*Role*
SC Public Radio's Your Day – Birding Call In	Radio	October, 2016	Co-Host
NY Times Interview for "New York High School Students Trade Skyscrapers for Big Sky"	Newspaper	August, 2015	Interviewee
SC Native Plant Society	Talk and Walk	March, 2015	Speaker