

DARRELL E. TOWNSEND II

Vice President: Environmental, Ecosystems and Watershed Management
Grand River Dam Authority
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EDUCATION

Oklahoma State University

- Ph.D. 2004 Natural Resource Ecology
Department of Natural Resource Ecology and Management
Dissertation: Landscapes, Heterogeneity, and Habitats: Evaluating
Thermal Properties, Artificial Nest Success, and Small Mammal Response
- M.S. 2000 Wildlife Ecology
Department of Zoology
Thesis: Improving Management for Bobwhite Quail: Re-evaluation of
Movements, Group Dynamics, and Feeding Ecology
- B.S. 1995 Major: Wildlife and Fisheries Ecology
Minor: Agronomy

EMPLOYMENT

Professional Experience

- 2012-Present **Vice President**, Environmental, Ecosystems and Watershed Management,
Grand River Dam Authority:

As Vice President I have developed a well-coordinated effort between GRDA, Oklahoma, Kansas, Arkansas and Missouri to develop a multidisciplinary team of scientist, researchers, and stakeholders tasked with deciphering and understanding complex-feedback relationships associated with broad-scale watershed management. This unique approach is laying the foundation for new and innovative approaches to watershed management designed to protect or enhance water quality throughout the region. This multi-faceted team allows for efficient use of labor, maximizes resources, and takes advantage of a scientific knowledge base spanning multiple scientific disciplines that draws on environmental engineers and modelers, water resource managers, ecologists and social scientists necessary to meet the challenges of these complex ecosystems.

- 2004-2012 **Director**, Office of Ecosystems Management, Grand River Dam Authority:

- 1999-2003 Research Assistant, Department of Plant and Soil Sciences, Oklahoma State University. Major advisor - Dr. Samuel D. Fuhlendorf.
- 1996-1999 Research Assistant, Oklahoma Cooperative Fish and Wildlife Research Unit, Oklahoma State University. Major advisor - Dr. Robert L. Lochmiller (Deceased), Co-advisor Dr. David M. Leslie, Jr.
- 1995-1996 Research Technician, Department of Zoology, Oklahoma State University. Responsible for monitoring white-tailed deer with the use of radio-telemetry at the McAlester Army Ammunition Plant in southeastern Oklahoma.

PROFESSIONAL/COMMUNITY AWARDS

- 2018 Rush for Brush: ***Certificate of Special Congressional Recognition***: June 8th 2018. Congressman Markwayne Mullin, House of Representatives, Washington, DC 20515.
- 2018 Rush for Brush: ***Outstanding Stewards of American Waters Award***. Public Education. *National Hydropower Association*, April 30–May 2, WaterPower Week. Washington, D.C.
- 2018 Grand River Dam Authority/Northeastern Oklahoma A & M College Public Private Partnership: ***Regents Business Partnership Excellence Award***: Oklahoma State Regents for Higher Education. March 13, University of Central Oklahoma, Edmond, Oklahoma.
- 2018 Grand River Dam Authority/Northeastern State University Scenic Rivers and Watershed Research Lab: ***Regents Business Partnership Excellence Award***: Oklahoma State Regents for Higher Education, March 13, University of Central Oklahoma, Edmond, Oklahoma.
- 2017 Rush for Brush: ***Environmental Excellence Award: State Government***. November 18, 2017. Keep Oklahoma Beautiful, Embassy Suites, Norman, Oklahoma.
- 2013 Grand Laker of the Year: ***Grand Lake Association***. December 3, 2013. Shangri-La Resort, Summit Restaurant, Afton, Oklahoma.

FUNDING AWARDS

- 2019 \$100,000: Funding Opportunity Announcement (FOA) No. BOR-DO-18-F005-WaterSMART: Cooperative Watershed Management Program Phase I for Fiscal Year (FY) 2018: ***Development of a Stakeholder Group to Protect and Restore the Lake O' the Cherokees Sub-Watershed*** CWMP-016.

2019 \$100,000: EPA's Environmental Education Grant (NE-01F627-01).
Grand Lake Watershed Elementary Education and Guard the Grand Initiative 2019-2021: Promoting Environmental Stewardship through formal and informal education programs.

FACULTY MEMBERSHIP

2020-Present Adjunct Faculty, **University of Oklahoma**, School of Civil Engineering and Environmental Science, Norman, Oklahoma.

2015-2019 Affiliated Faculty, **University of Oklahoma**, School of Civil Engineering and Environmental Science, Norman, Oklahoma.

2007-Present Adjunct Faculty, **Oklahoma State University**, Department of Integrated Biology, 430 Life Sciences West, Stillwater, Oklahoma.

2003 Adjunct Faculty, **Tulsa Community College**, Department of Math and Biological Sciences, West Campus, 7505 w 41st, Tulsa, OK 74107.
Instructor for Introductory Biology BISC 1114. Lectures and laboratory experiments were based on selected principles in biological science specifically designed for non-science majors that included cell concepts, organization of multi-cellular systems, plants and animals as organized systems, and man in relation to his environment. Responsibilities included conducting class lectures, laboratory exercises, and developing and administering class exams.

2001-2004 Teaching Assistant, **Oklahoma State University**, Department of Zoology, Laboratory instructor for Introductory Biology (BISC 1114).

GRADUATE COMMITTEE MEMBER

Member (MS)-Maxwell O'Brien, University of Oklahoma, Water Survey, **2019-Present**. Thesis: To be determined.

Member (Ph.D.)-Juan Arango, **University of Oklahoma**, School of Civil Engineering and Environmental Science, **2017-Present**. Dissertation: To be determined.

Member (Ph.D.)-Zepei Tang, **University of Oklahoma**, School of Civil Engineering and Environmental Science, **2016-Present**. Dissertation: Metal and nutrient cycling at the sediment-water interface in Grand Lake o' the Cherokees.

Member (MS) -Brendan Furneaux, **University of Oklahoma**, School of Civil Engineering and Environmental Science, **2011-2012**. Thesis: Biodiversity assessment of a passive treatment system for metals-contaminated mine drainage.

Co-Chair (MS) -Kevin Burgess, **Oklahoma State University**, Department of Zoology, **2005-2008**. Thesis: Use of Water Quality Measurements to Detect Potential Septic System Input at Grand Lake, Oklahoma.

PROFESSIONAL PUBLICATIONS

Morrison, S., S. Nikolai., **D. Townsend**, J. Belden. 2018. Distribution and Bioavailability of trace metals in shallow sediments from Grand Lake, OK. Archives of Environmental Contamination and Toxicology: 69(2)1-11.

Fuhlendorf, D. S., **D. E. Townsend II**, R. D. Wilmore, and D. M. Engle. 2010. Pyric-herbivory to promote rangeland heterogeneity: evidence from small mammal communities. Rangeland Ecology & Management 63(6):670-678.

Townsend, D. E., II, and S. D. Fuhlendorf. 2010. Evaluating relationships between spatial heterogeneity and the biotic and abiotic environments. American Midland Naturalist: 163:351-365.

Limb, R.F., S.D. Fuhlendorf, and **D. E. Townsend II**. 2009. Heterogeneity of thermal extremes: driven by disturbance or inherent in the landscape. Environmental Management 43:100-106.

Townsend, D. E., II. 2009. The power of restoration: Oklahoma's Indian-Territory Chapter Partners With Power Company for Quail. Quail Forever: Journal of Quail Conservation 4(2):31. (Invited).

Townsend, D. E., II and B. Davis. 2008. 'Rush for brush' improves habitat for fish. Hydro Review XXVII (5): 90-91, 102. (Invited).

Townsend, D. E., II, S. S. Ditchkoff, and S. D. Fuhlendorf. 2007. Transmitter height influences error of ground-based radio □-telemetry. Wildlife Biology 13: 98-101.

Townsend, D. E., II. 2006. Developing a database to track structures on the shoreline of a reservoir. Hydro Review XXV (4):108-110. (Invited).

Townsend, D. E., II, D. M. Leslie, Jr., R. L. Lochmiller, S. A. Cox and A. D. Peoples. 2003. Fitness costs and benefits associated with dispersal in northern bobwhites (*Colinus virginianus*). The American Midland Naturalist 150:73-82.

DeMaso, S. J., **D. E. Townsend, II**, S. A. Cox, E. S. Parry, R. L. Lochmiller, and A. D. Peoples. 2002. The effect of quail feeders on northern bobwhite density in western Oklahoma. Pages 241-244 in S. J. DeMaso, W. P. Kuvlesky, Jr., F. Hernandez, and M. E. Berger, eds. Quail V: Proceedings of the

Fifth National Quail Symposium, Texas Parks and Wildlife Department,
Austin, TX.

Townsend, D. E., II, R. E. Masters, R. L. Lochmiller, D. M. Leslie, Jr., and A. D. Peoples. 2001. Characteristics of nest sites of northern bobwhites in western Oklahoma. *Journal of Range Management* 54:260-264.

Townsend, D. E., II, R. L. Lochmiller, S. J. DeMaso, D. M. Leslie, Jr., A. D. Peoples, S. A. Cox, and E. S. Parry. 1999. Use of supplemental food and its influence on survival of northern bobwhite (*Colinus virginianus*). *Wildlife Society Bulletin* 27:1074-1081.

PROFESSIONAL MEMBERSHIPS

2019 to Present. Environmental Federation of Oklahoma. Secretary.

2016 to Present. Environmental Federation of Oklahoma. Board Member.

2007 to Present. Grand Lake Watershed Alliance Foundation Inc., Board Member.

2005 to Present. American Fisheries Society, Grand River Dam Authority.

2007 to 2009. Oklahoma Water Research Advisory Board, Member.

MANUSCRIPTS REVIEWED

Arabian Journal for Science and Engineering (2016, 2017)

American Society of Mining and Reclamation (2011)

Koedoe -African Protected Area Conservation and Science (2010)

Conservation Biology (2004)

American Midland Naturalist (2004)

PROFESSIONAL PRESENTATIONS

Townsend, D. E. II. 2019. Balancing Threats to Health and Public Safety in Communities Dependent on a Recreational Economy. Tulsa Law School. Tulsa, Oklahoma.

Townsend, D. E. II. 2018. Environmental Law. December 13, 2018. Tulsa Law School, Tulsa, Oklahoma.

Townsend, D. E. II. 2018. A Project with Northeastern State University Undergraduate Students in New and Innovative Approaches to Multifaceted Watershed Management. 9th Annual Promoting Undergraduate Research Conference: Virtual Communities of Undergraduate Research and Scholarly Activities. September 28, 2018. Northeastern State University, Tahlequah, Oklahoma.

Townsend, D. E. II. 2018. Hydropower and Management of Invasive Mussels. National Hydropower Association Southwest Regional Meeting. March 1, 2018. Creekside Foyer, Sheraton Austin Hotel at the Capitol, Austin, Texas.

Townsend, D. E. II. 2018. Ag Production and Natural Resource Management: A

Unique Partnership between the Grand River Dam Authority and Northeastern Oklahoma A & M College. February 26, 2018. Northeastern Oklahoma A & M College, Miami, Oklahoma.

Townsend, D. E. II. 2017. Crisis Communication and Resource Management. Science and Technology Seminar Series. March 22, 2017. Northeastern State University, Tahlequah, Oklahoma.

Townsend, D. E. II. 2016. Grand Lake: Its Watershed and the Great HAB of 2011. Arkansas Water Resources Center's Annual Water Conference: Nutrients, Water Quality, and Harmful Algal Blooms. July 26-27, 2016. Fayetteville, Arkansas.

Townsend, D. E. II. 2016. Responding to Extreme Weather Events: A Lake Management Perspective on Harmful Algal Blooms, Drought and Historic Flooding. HydroVision International. July 25-29, 2016. Minneapolis Convention Center, Minneapolis, Minnesota.

Townsend, D. E. II. 2015. Harmful Algae Blooms and Crisis Communication. Risky Business: The Art and Science of Risk and Crisis Communication. November 5, 2015. Miller Theater of the Bicknell Family Center for the Arts, Pittsburg State University.

Townsend, D.E. II. 2015. Development of GRDA's Bacteria Guidance Document. 20th Annual Inter-Tribal Environmental Council Conference. July 7-9, 2015. Hard Rock Hotel & Casino, Catoosa Oklahoma.

Townsend, D. E. II. 2015. Water Management for Electric Power Generation. April 7, 2015. Tulsa Law School, Tulsa Oklahoma.

Townsend, D. E. II. 2014. Lake Management, Harmful Algae Blooms and Climate Change. Panel Discussion: Oklahoma Clean Lakes and Watersheds Association. April 2-3. Wes Watkins Conference Center, Stillwater, Oklahoma.

Townsend, D. E. II. 2014. Lake Management & Water Quality: Balancing Competing Interests between Recreation, Economic Development and associated Risks to Health and Public Safety. Oklahoma Environmental Agencies Roundtable, sponsored by the Oklahoma Bar Association's Environmental Law Section, The University of Tulsa College of Law Sustainable Energy & Resources Law Program, and the Master of Jurisprudence in Energy and Indian Law Programs. January 24. Tulsa Law School, Tulsa, Oklahoma.

Nikolai, S. and **D. Townsend.** 2014. Dredging Management in Grand Lake O' The Cherokees, Oklahoma: Developing Permitting Strategies Using Shoreline Classifications, Substrate Characteristics, and Contaminant

Concentrations. American Society of Mining and Reclamation 31st National Meeting, June 14-20, Oklahoma City, OK.

Nairn, R.W. and **D. Townsend**. 2014. Soil metal concentrations in proposed wetland development areas near the Tri-State Lead-Zinc Mining District. American Society of Mining and Reclamation. 31st National Meeting. June, Oklahoma City, OK.

Morrison, S., S.J. Nikolai, **D. Townsend** and J. Belden. 2014. Investigations of bioavailability, toxicity and accumulation of trace metals from shallow sediments in Grand Lake, following simulated disturbance events. American Society of Mining and Reclamation 31st National Meeting, June 14 – 20 ,Oklahoma City, OK.

Morrison, S., S.J. Nikolai, **D. Townsend** and J. Belden. 2014 Distribution and Bioavailability of Trace Metals in Shallow Sediments from Grand Lake, OK. Ozark-Prairie Regional SETAC Meeting, Stilwell, KS.

Morrison, S., S.J. Nikolai, **D. Townsend** and J. Belden 2014 Trace Metal Concentrations in Shallow Sediments from Grand Lake, OK. Poster Presentation. Oklahoma Clean Lakes and Watersheds 23rd Annual Conference. Stillwater, OK.

Townsend, D. E. II. 2013. Nonpoint Sources and the Grand Lake Watershed. Kansas Department of Health and Environment's Nonpoint Source Conference, April 16-17, Junction City, Kansas.

Townsend, D. E. II. 2013. Panel Discussion: FERC Relicensing and Compliance. National Hydropower Association. National Hydropower Association's Annual Conference. April 22-24. Washington, D.C.

Townsend, D. E. II. 2013. Environmental Compliance and Reservoir Management. April 4, 2013. Tulsa Law School, Tulsa Oklahoma.

Zawrotny, S.C., J. Arango-Calderon, L. Diede, A. McLeod, G. Rutelonis, M. Salisbury, M.P. Beltran Zuniga, G.A. Busch, K.R. Douglas, E.F. Garifalos, L. Lie, N. Nabavizadeh, M. Rice, D.W. Stevens, J.A. LaBar, **D. E. Townsend II**, R.C. Knox, and R. W. Nairn. 2013. Chemical constituents in water and sediment from Grand Lake O' the Cherokees, Oklahoma, downstream from the Tri-State Lead-Zinc Mining District. Proceedings of the 30th National Conference of the American Society of Mining and Reclamation. June. Laramie, WY.

Morrison, S., S.J. Nikolai, **D. Townsend** and J. Belden 2013 Distribution and Bioavailability of Trace Metals in Shallow Sediments from Grand Lake, OK. Third annual 2013 Student Water Research Conference, Oklahoma State University, Stillwater OK.

- Morrison, S., S.J. Nikolai, **D. Townsend** and J. Belden 2013 Trace Metal Concentrations in Shallow Sediments from Grand Lake, OK. Poster Presentation. SETAC North America 34rd Annual Meeting, Nashville, TN.
- Morrison, S., S.J. Nikolai, **D. Townsend** and J. Belden 2013 Trace Metal Concentrations in Shallow Sediments from Grand Lake, OK. Poster Presentation. Governor's Water Conference and Research Symposium, Midwest City, OK.
- Nairn, R. W., K. A. Strevett, **D. E. Townsend**, J. Luedecke, J. Long and M. Grigsby. 2012. Toward Sustainability In Passive Treatment: Using Stakeholder Partnerships to Ensure Sound Science. American Society of Mining and Reclamation 29th Annual National Conference. June 8-15, Tupelo, Mississippi.
- Long, J., R.W., Nairn, K.A. Strevett, **D.E. Townsend**, J. Luedecke and M. Grigsby. 2012. Toward Sustainability in Passive Treatment: Using Stakeholder Partnerships to Ensure Sound Science. 14th National Conference on Tar Creek. September, Miami, Oklahoma.
- Townsend, D. E., II.** 2012. BGA Outbreak of 2011 & Lessons Learned. 20th National Nonpoint Source Monitoring Workshop. The Secrets of Success: Making the Most of Available Resources. October 14-17. Tulsa, Oklahoma.
- Townsend, D. E., II.** 2011. BGA Outbreak of 2011. 13th Annual National Tar Creek Conference. September 22-23, Miami Civic Center, Miami, Oklahoma.
- Townsend, D. E., II.** 2011. Grand Lake's Blue-Green Algae Outbreak of 2011. Watershed Alliance Foundation's Board Meeting. September 13th, Grove Chamber of Commerce, Grove, Oklahoma.
- Townsend, D. E., II.** 2011. The Grand River Dam Authority and Ecosystems Management. September 12th, Oklahoma University's School of Civil Engineering and Environmental Science, Norman, Oklahoma.
- Townsend, D. E., II.** 2011. The Grand River Dam Authority (GRDA) and the Blue-Green Algae Outbreak of 2011. Leadership Oklahoma Alumni's Annual Meeting. August 12th, GRDA's Ecosystem and Education Center, Langley, Oklahoma.
- Townsend, D. E., II.** 2011. An Alternative View on Mitigation: the Grand River Dam Authority and the "Other Side of the Story." March 1, 2011, Rogers State University, Claremore, Oklahoma.
- Townsend, D. E., II.** 2010. Water Quality and the Grand Lake Watershed. 12th Annual National Tar Creek Conference. September 22-23, Miami Civic Center, Miami, Oklahoma.

- Townsend, D. E., II.** 2009. Resource Mitigation: Developing Strategies to Alleviate High Costs. Grand River Dam Authority's Customer Conference. October 8th-9th, 6808 S. 107th East Avenue, Renaissance Tulsa Hotel and Convention Center, Tulsa, Oklahoma.
- Belden, J., K. Burgess, **D. Townsend** and J. Bidwell (2009) Presence of Organic Wastewater Contaminants in Grand Lake, OK. SETAC North America Annual Meeting, New Orleans, LA.
- Townsend, D. E., II.** 2008. Ecosystems "What's in it for you?" Grand River Dam Authority's Customer Conference. October 9th-10th, Doubletree Hotel, Warren Place, 6110 S Yale Ave, Tulsa, Oklahoma.
- Townsend, D. E., II.** 2008. Grand Lake and Its Watershed: A Comprehensive Approach to Conservation and Restoration. Our Water Future: The Regional View, Sharing Information...Exchanging Ideas. September 11th-12th, Joplin, Missouri.
- Townsend, D. E., II.** 2008. Comprehensive Watershed Planning. Four-State Regional Environmental Conference. March 28th, Missouri Southern State University, Joplin, Missouri.
- Townsend, D. E., II.** 2006. Permitting Habitable Structures. Federal Energy Regulatory Commission's Southeastern Shoreline Management Workshop. September 26th-28th, Columbia, South Carolina.
- Townsend, D. E., II.** 2005. Grand Lake and Its Watershed: Directions in Conservation and Restoration. Presented to Kansas Water Authority. November 17th-18th, Parsons Kansas.
- Townsend, D. E., II.** 2005. Shoreline Inventory and Ecosystem Compliance. Federal Energy Regulatory Commission's Southeastern Shoreline Management Workshop. September 13th-14th, Roanoke, Virginia.
- Townsend, D. E., II.** 2005. Managing Complex Shorelines and Land Issues at Hydroprojects. Federal Energy Regulatory Commission's Midwest Shoreline Management Workshop. September 28th-29th, Ogallala, Nebraska.
- Townsend, D. E., II.** 2005. Directions in conservation and restoration. 14th Annual Symposium Oklahoma Clean Lakes and Watersheds Conference. April 6th-8th, Ardmore, Oklahoma.
- Townsend, D. E., II,** and S. D. Fuhlendorf. 2002. What is Grassland Habitat Structure: Exploring the Role of Temperature and Predation. Society for Range Management 55th Annual Meeting. February 13th-19th, Kansas City, Missouri.

- Townsend, D. E., II**, and S. D. Fuhlendorf. 2001. Thermal heterogeneity of mixed grass prairie: Importance of structure, grazing, and topographic position. Southwestern Association of Naturalists 48th Annual Meeting. April 19th-21st, Fort Hays State University, Hays, Kansas.
- Townsend, D. E., II**. 2000. Pros and Cons of Quail Feeding. Bollenbach Quail Symposium. August 4th, Kingfisher, Oklahoma.
- Townsend, D. E., II**. 2000. Ecology and rangeland management of ground nesting avian species. Annual Meeting of the Oklahoma Chapter of the Wildlife Society. August 3rd, Chisholm Trail Technology Center, Watonga, Oklahoma.
- Townsend, D. E., II**, R. L. Lochmiller, S. J. DeMaso, D. M. Leslie, Jr., A. D. Peoples, S. A. Cox, and E. S. Parry. 1999. Use of supplemental food and its influence on survival of northern bobwhite (*Colinus virginianus*). Sixth Annual Conference of the Wildlife Society. September 7th-11th, Austin, Texas.
- Townsend, D. E., II** and C. Boyd. 1997. Insect sampling and birds. Joint Meeting of the Oklahoma Section of the Society for Range Management and the Oklahoma Chapter of the Wildlife Society. September 12th-13th, Oklahoma State University, Stillwater, Oklahoma.
- Townsend, D. E., II**. 1996. Bobwhite Ecology and Management. Payne County Chapter of Quail Unlimited. October 6th, Stillwater, Oklahoma.

ACADEMIC MANUSCRIPTS

- Townsend, D. E., II**, and S. D. Fuhlendorf. 2004. Ecological heterogeneity: evaluating small mammal communities, soil surface temperature and artificial nest success within grassland ecosystems. Ph.D. Dissertation. Oklahoma State University, Stillwater, Oklahoma. 162pp.
- Townsend, D. E., II**, R. L. Lochmiller, D. M. Leslie, Jr., and R. E. Masters. 2000. Improving management for bobwhite quail: re-evaluation of movements, group dynamics, and feeding ecology. Masters Thesis. Oklahoma State University, Stillwater, Oklahoma. 96pp.
- Townsend, D. E., II**, R. L. Lochmiller, and D. M. Leslie, Jr. 1999. Improving management for bobwhite quail: re-evaluation of movements, group dynamics, and feeding ecology. Final Report, Oklahoma Department of Wildlife Conservation, Oklahoma City. 56pp.