

# GEORGE C. BROOKS

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## EDUCATION

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<b>Ph.D.</b>	Virginia Tech, Fish and Wildlife Conservation	2020
<b>M.S.</b>	University of Sheffield, Zoology	2014
<b>B.S.</b>	University of Sheffield, Zoology	2013

## PROFESSIONAL EXPERIENCE

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<b>Research Scientist</b> , University of Wisconsin-Madison	2026-present
<b>Scientific Advisory Board Member</b> , The Orianne Society	2025-present
<b>Postdoctoral Researcher</b> , University of Wisconsin-Madison	2024-2025
<b>Postdoctoral Researcher</b> , Virginia Tech	2020-2024
<b>Graduate Teaching Assistant</b> , Virginia Tech	2015-2020
<b>Natural History Collections Manager</b> , Virginia Tech	2015-2019
<b>Environmental Control Advisor</b> , Biffa Waste Services	2014-2015

## PUBLICATIONS

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### In review

**Brooks, G. C.**, P. N. Frater, O. P. Jensen, G. J. A. Hansen, C. Paukert, M. Verhoeven, L. Wszola, L. Xu, and Z. S. Feiner. Mixed support for the temperature-size rule in wild freshwater fishes.

**Brooks, G. C.**, Z. S. Feiner, A. Trudeau, and O. P. Jensen. Gradually, then suddenly: transient dynamics of collapsing fisheries in a warming climate.

Martin, A. K., K. C. Jones, **G. C. Brooks**, H. C. Chandler, C. Ewers, B. K. Rincon, and C. A. Haas. Successful translocation of an imperiled amphibian following targeted habitat restoration efforts.

Cayuela, H., **G. C. Brooks** et al. Global patterns and drivers of amphibian survival.

### Published (31 peer-reviewed articles, 18 first author, \* indicates co-author is a student or technician)

Castello, L., A. Abreu, **G. C. Brooks**, J. V. Campos-Silva, P. R. Cunha, A. Fleischmann, C. Franco, A. C. Gonçalves, E. Hultin, H. K. Kindsvater, E. Martins, C. I. B. Silva, M. G. Sorice, and E. S. Brondizio. *accepted*. Integrating social-ecological feedbacks to assess small-scale fisheries. *Ambio*

**Brooks, G. C.**, E. A. Hultin, E. G. Martins, L. Castello, M. G. Sorice, and H. K. Kindsvater. *accepted*. Accounting for unreported harvest in fisheries with diverse social dynamics. *Ecosphere*

Jacobs, L., B. Paneru, **G. C. Brooks**, A. K. Downing, J. F. Munsell, J. H. Fike, and G. Pent. 2026. Fast-growing broiler chickens range more in a silvopasture than a grass pasture based on live observations. *Frontiers in Animal Science* 6:1721759.

Chandler, H. C., **G. C. Brooks**, Y. Jiao, and C. A. Haas. 2025. Predicting long-term population viability for an imperiled salamander under future climate changes. *Journal of Wildlife Management* e70158.

\*Hilt, M., **G. C. Brooks**, \*E. Faison, and M. K. Hamed. 2025. Factors affecting the growth of a moss species necessary for restoring nesting habitat of the Four-toed Salamander. *Amphibian and Reptile Conservation* 19:e347.

Martin, A. K., **G. C. Brooks**, H. C. Chandler, \*K. C. Jones, \*B. K. Rincon, and C. A. Haas. 2025. Tracking Reticulated Flatwoods Salamander (*Ambystoma bishopi*) recovery in response to habitat restoration. *Conservation Science and Practice* 7:e70144.

**Brooks, G. C.**, \*R. M. Moore, \*B. K. Rincon, T. A. Gorman, and C.A. Haas. 2025. Phenological differences of two sympatric Ranid frogs in the southeastern United States. *Ichthyology and Herpetology* 113:335-344.

**Brooks, G. C.**, T. A. Gorman, C. M. Proctor, \*B. K. Rincon, and C. A. Haas. 2025. Prescribed fire promotes site colonization by the Florida Bog Frog. *Fire Ecology* 21:1-14.

**Brooks, G. C.**, J. C. Uyeda, \*N. Bone, \*H. Conrad, C. Mull, and H. K. Kindsvater. 2025. Fundamental constraints on vertebrate life history are shaped by aquatic-terrestrial transitions and reproductive mode. *Nature Ecology and Evolution* 9:857-866.

**Brooks, G. C.**, S. Goodman, \*W. Moore, H. C. Chandler, N. M. Caruso, J. A. Smith, T. A. Gorman, C. A. Haas. 2025. Gopher Tortoise (*Gopherus polyphemus*) burrow associate communities are depauperate in modified landscapes. *Community Ecology* 1-15.

Chandler, H. C., N. M. Caruso, **G. C. Brooks**, and C. A. Haas. 2024. Wetland hydrology, not altered phenology, challenges Reticulated Flatwoods Salamander (*Ambystoma bishopi*) management under future climate change. *Ichthyology and Herpetology* 112:531-543.

**Brooks, G. C.**, H. C. Chandler, C. A. Haas, and H. K. Kindsvater. 2024. Ten principles from evolutionary ecology for the effective conservation of reptiles and amphibians. *Journal of Herpetology* 53:9-28.

\*Ulans, A., **G. C. Brooks**, and L. Jacobs. 2024. Environmental complexity impacts anxiety in broiler chickens depending on genetic strain and body weight. *Scientific Reports* 14:17535

Feaga, J. B., J. Barron, **G. C. Brooks**, E. A. Frimpong, C. A. Haas, M. Holden, and E. Hultin. 2024. A hydrologic and land cover-based habitat model for use in bog turtle (*Glyptemys muhlenbergii*) conservation. *Aquatic Conservation: Marine and Freshwater Ecosystems* 34:e4215

**Brooks, G. C.**, W. A. Hopkins, and H. K. Kindsvater. 2024. Concurrent threats and extinction risk in a long-lived, highly fecund vertebrate with parental care. *Ecological Applications* e2946

**Brooks, G. C.**, T. A. Gorman, and C. A. Haas. 2024. Variation in flatwoods salamander survival is unrelated to temperature and rainfall. *Ichthyology and Herpetology* 112:31-40

**Brooks, G. C.**, H. C. Chandler, D. Z. Childs, Y. Jiao, and C. A. Haas. 2024. Predicting the population viability of an endangered amphibian under environmental and demographic uncertainty. *Population Ecology* 66:184-195

Chandler, H. C. and **G. C. Brooks**. 2023. The relationship between female body size and clutch size in flatwoods salamanders. *Southeastern Naturalist* 22:588-594

**Brooks, G. C.** 2023. Why are vertebrates so big? *Functional Ecology*, 37:2764-2766

**Brooks, G. C.**, N. M. Caruso, H. C. Chandler, and C. A. Haas. 2023. Niche partitioning and the storage effect facilitate coexistence in an amphibian community. *Ecology and Evolution* 13:e10629

**Brooks, G. C.**, T. A. Gorman, \*K. C. Jones, H. C. Chandler, \*B. K. Rincon, M. A. Sission, J. Himes, and C. A. Haas. 2023. Removing duff layers in fire-suppressed wetlands can aid habitat restoration efforts. *Wetlands* 43:95

Chandler, H. C., N. M. Caruso, D. L. McLaughlin, Y. Jiao, **G. C. Brooks**, and C. A. Haas. 2023. Forecasting the flooding dynamics of flatwoods salamander breeding wetlands under future climate change scenarios. *PeerJ* 11:e16050

\*Evans, L., **G. C. Brooks**, \*M. G. Anderson, \*A. M. Campbell, and L. Jacobs. 2023. Environmental complexity and reduced stocking density promote positive behavioral outcomes in broiler chickens. *Animals* 13:2074

Hopkins, W. A., \*B. F. Case, \*J. Groffen, **G. C. Brooks**, C. M. Bodinof Jachowski, S. T. Button, \*J. J. Halligan, \*R. S. M. O'Brien, and H. K. Kindsvater. 2023. Filial cannibalism leads to chronic nest failure of eastern hellbender salamanders. *The American Naturalist* 202:92-106

**Brooks, G. C.**, J. H. Roberts, \*A. S. Wendt, and C. A. Haas. 2023. Comparing estimates of census and effective population size in an endangered amphibian. *Animal Conservation* 26:839-850

**Brooks, G. C.** and H. K. Kindsvater. 2022. Early development drives variation in amphibian vulnerability to global change. *Frontiers in Ecology and Evolution* 10:813414

**Brooks, G. C.** and C. A. Haas. 2021. Using historical dip net data to infer absence of flatwoods salamanders in stochastic environments. *PeerJ* 9:e12388

**Brooks G. C.**, T. A. Gorman, Y. Jiao, and C. A. Haas. 2020. Reconciling larval and adult sampling methods to model growth across life-stages. *PLoS One* 15:e0237737

Petters, J. L., **G. C. Brooks**, J. A. Smith, and C. A. Haas. 2019. The impact of targeted data management training for field research projects. *Data Science Journal* 18:1–7

**Brooks, G. C.**, J. A. Smith, E. Frimpong, T. A. Gorman, H. C. Chandler, and C. A. Haas. 2019. Indirect connectivity estimates of amphibian breeding wetlands from spatially explicit occupancy models. *Aquatic Conservation: Marine and Freshwater Ecosystems* 29:1815–1825

**Brooks, G. C.**, J. A. Smith, T. A. Gorman, and C. A. Haas. 2019. Discerning the environmental drivers of annual migrations in an endangered amphibian. *Copeia* 107:270–276

## SELECT CONFERENCE PRESENTATIONS

**Oral** (Presenter: 8, Co-author: 16, \*Undergraduate mentee: 2, Total: 26)

**Brooks, G. C.** 2025. Is climate change really shrinking fish? UW–Madison Postdoctoral Research Symposium, Madison, WI, USA.

**Brooks, G. C.**, Z. S. Feiner, A. Trudeau, and O. P. Jensen. 2025. Gradually, then suddenly: transient dynamics of collapsing fisheries in a warming climate. Joint Meeting of Ichthyologists and Herpetologists, St. Paul, MN, USA.

Martin, A. K., **G. C. Brooks**, H. C. Chandler, K. C. Jones, B. K. Rincon, and C. A. Haas. 2025. Analyzing wetlandscapes to inform Reticulated Flatwoods Salamander (*Ambystoma bishopi*) recovery, including translocation strategies for public and private lands. Southeast Partners in Amphibian and Reptile Conservation Annual Meeting, Guntersville, AL, USA.

Kaloczi, J., **G. C. Brooks**, M. J. Hamel, G. Jones, R. N. Hupfeld, R. M. Krogman, and M. M. Moore. 2025. Comparing methods to estimate age and growth of Shovelnose Sturgeon in the Cedar River. Iowa Chapter of the American Fisheries Society Annual Conference, Boone, IA, USA.

McDonnell, T. S., **G. C. Brooks**, M. T. Holden, J. D. Buckwalter, J. W. Snodgrass, and C. A. Haas. 2024. Investigating summertime vegetation density preference in bog turtles under grazing regime variation. Hudson Housatonic Recovery Unit Bog Turtle Meeting, Cold Spring, NY, USA.

Kindsvater, H. K., **G. C. Brooks**, J. C. Uyeda, H. Conrad, N. Bone, and C. Mull. 2024. Fundamental constraints on the evolution of vertebrate life histories. Joint Congress on Evolutionary Biology, Montreal, QC, Canada

Castello, L., A. Abreu, E. S. Brondizio, **G. C. Brooks**, S. J. Campos, P. Cunha, A. Fleischmann, C. Franco, E. A. Hultin, D. Hymans, H. K. Kindsvater, E. Martins, and M. Sorice. 2024. An approach to assess the integrated social-ecological dynamics of freshwater fisheries. Workshop on the Ostrom Workshop, Bloomington, Indiana, USA

Chandler H. C., **G. C. Brooks**, K. C. Jones, B. K. Rincon, A. K. Martin, and C. A. Haas. 2024. Lessons learned from long-term monitoring and research of Reticulated Flatwoods Salamander (*Ambystoma bishopi*) populations on Eglin Air Force Base. Southeast Partners in Amphibian and Reptile Conservation Annual Meeting, Nauvoo, AL, USA

Hultin E. A., H. K. Kindsvater, **G. C. Brooks**, and L. Castello. 2024. Predicting population dynamics of *Arapaima* spp. from social and ecological variables. World Fisheries Conference, Seattle, WA, USA

**Brooks, G. C.**, W. A. Hopkins, and H. K. Kindsvater. 2023. Concurrent threats jeopardize the viability of Virginia's hellbender populations. Joint Meeting of Ichthyologists and Herpetologists, Norfolk, VA, USA

Ulans, A., **G. C. Brooks**, and L. Jacobs. 2023. Anxiety in broiler chickens is affected by strain, body weight, and environmental complexity. The 56th Congress of the International Society for Applied Ethology, Tallin, Estonia

Uyeda J. C., **G. C. Brooks**, H. K. Kindsvater, N. Bone, C. Mull, and H. Conrad. 2022. Macroevolutionary modeling of life history evolution in vertebrates. Evolution, Cleveland, OH, USA.

**Brooks, G. C.** and C. A. Haas. 2021. On the importance of critical race theory in science. Academic Symposium on Critical Race Theory, Virginia Tech, VA, USA

\*Hawkins, R., J. Metzgar, **G. C. Brooks**, and C. A. Haas. 2019. A tale of natural history collections education at Virginia Tech. Society for the Preservation of Natural History Collections Conference, Chicago, IL, USA

\*Nelson, C. A., **G. C. Brooks**, C. A. Haas, and M. R. Stocker. 2019. Incorporating technology and multidisciplinary thinking into university collections. Society for the Preservation of Natural History Collections Conference, Chicago, IL, USA

**Brooks, G. C.**, Y. Jiao, T. A. Gorman, and C. A. Haas. 2017. A novel Bayesian approach to model biphasic growth in an endangered salamander, *Ambystoma bishopi*. Annual Meeting of the Ecological Society of America, Portland, OR, USA

**Poster** (Presenter: 1, Co-author: 5, \*Undergraduate/technician mentee: 4, Total: 10)

Martin, A. K., **G. C. Brooks**, H. C. Chandler, \*K. C. Jones, \*B. K. Rincon, and C. A. Haas. 2024. Tracking Reticulated Flatwoods Salamander (*Ambystoma bishopi*) recovery in response to habitat restoration. Joint Meeting of Ichthyologists and Herpetologists, Pittsburgh, PA, USA

Hultin, E. A., **G. C. Brooks**, H. K. Kindsvater, and L. Castello. 2024. Identifying drivers of Arapaima population dynamics in a floodplain ecosystem. Southern Division American Fisheries Society Meeting, Chattanooga, TN, USA

Engler, T., C. A. Haas, N. M. Caruso, and **G. C. Brooks**. 2023. Tracking the decline and recovery of salamanders in Appalachian forests for 30 years following timber harvest. Joint Meeting of Ichthyologists and Herpetologists, Norfolk, VA, USA

\*Leipold, A. E., N. M. Caruso, **G. C. Brooks**, and C. A. Haas. 2019. Variations of growth within the breeding and non-breeding seasons of the Reticulated Flatwoods Salamander (*Ambystoma bishopi*). Annual Southeastern Partners in Amphibian and Reptile Conservation Meeting, Black Mountain, NC, USA

\*Rincon, B., N. M. Caruso, **G. C. Brooks**, \*K. C. Jones, and C. A. Haas. 2019. Monitoring Reticulated Flatwoods Salamanders with PIT tag antennas: Our first season of insights. Annual Southeastern Partners in Amphibian and Reptile Conservation Meeting, Black Mountain, NC, USA

## GRANTS

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**External** (totaling >\$1,200,000 to date)

2024: Restoring degraded wetlands to reverse imperiled species declines. C.A Haas (PI), **G.C. Brooks**, K.C. Jones. U.S. Fish and Wildlife Service State Wildlife Grant, \$300,000

2024: Flatwoods Salamander Monitoring and Endangered Species Management on Eglin Air Force Base, Florida. C.A Haas (PI), M.C. Mims, L.I. Blanc, **G.C. Brooks**, A.K Martin, J.R. Walters. U.S. Fish and Wildlife Service, \$475,000

2023: Creating a framework to guide restoration and management of longleaf pine embedded wetlands in the southeastern United States. H.C. Chandler (PI), **G.C. Brooks**, D. McLaughlin, and C.A. Haas. U.S. Department of Agriculture Natural Resources Conservation Service, \$200,000

2023: Endangered Species Adaptive Management and Monitoring on Eglin Air Force Base, Florida. C.A Haas (PI), L.I. Blanc, T.A. Gorman, **G.C. Brooks**, J.R. Walters. U.S. Fish and Wildlife Service, \$165,000

2023: Predicting the persistence of salamanders: Consequences of phenological shifts for species of management concern on DoD lands. C.A. Haas (PI), H.C. Chandler, N.M. Caruso, and **G.C. Brooks**. Department of Defense Strategic Environmental Research and Development Program, \$27,000

2022: Preliminary assessments for translocation of Reticulated Flatwoods Salamanders onto private lands. **G.C. Brooks** (PI), C.A. Haas, and H.C. Chandler. U.S. Fish and Wildlife Service, \$100,000

2019: Temporal patterns in the reproductive ecology of the Florida Bog Frog. The Society for the Study of Amphibians and Reptiles Roger Conant Grant in Herpetology, \$500

**Internal** (totaling \$13,350 to date)

2023: Virginia Tech Postdoctoral Association Travel Grant to attend the Joint Meeting of Ichthyologists and Herpetologists, Norfolk, VA, USA. \$500

2022: Wetland loss along the Blue Ridge Parkway. **G.C. Brooks** (PI), C.A. Haas, H.C. Chandler, E. Brooks, J. Petters, and K. Diaz. University Libraries Collaborative Research Grant. \$10,000

2019: Fish and Wildlife Graduate Student Association Travel Grant to attend the Joint Meeting of Ichthyologists and Herpetologists, Snowbird, UT, USA. \$600

2019: College of Natural Resources Instructional Support Fund to purchase teaching microscopes. **G.C. Brooks** (PI), C.A. Haas, L. Castello, D. Orth. \$2,000

2018: Virginia Tech Graduate Student Association Travel Fund to attend the Joint Meeting of Ichthyologists and Herpetologists, Rochester, NY, USA. \$250

## HONORS AND AWARDS

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Wisconsin Initiative for Science Literacy Award

Population Ecology Young Author Award

Georgia Pacific Dean's Graduate Fellowship

Dwight Chamberlain Graduate Wildlife Fellowship

Virginia Tech's Instructor of Record Award

Fish and Wildlife Conservation's Outstanding Teaching Assistant of the Year Award

## TEACHING EXPERIENCE

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<b>Instructor</b> <i>Inclusive Pedagogy</i>	Spring 2022
<b>Instructor</b> <i>Introduction to Ecological Modeling in R</i>	Spring 2022
<b>Instructor</b> <i>4344 Herpetology</i>	Spring 2020
<b>Instructor</b> <i>2324 Wildlife Field Biology</i>	Spring 2019
<b>Course Assistant</b> <i>4984 Natural History Collections and Curation</i>	Spring 2019
<b>Mentor</b> <i>4994 Undergraduate Research</i>	2018-2019
<b>Teaching Assistant</b> <i>2324 Wildlife Field Biology</i>	2016-2018

### Invited Seminars

<i>Species Status Assessments</i> , Department of Forest and Wildlife Ecology, UW-Madison	2026
<i>Quantitative Methods in Ecology</i> , Department of Integrative Biology, UW-Madison	2025
<i>Amphibian Conservation</i> , Center for Applied Population Biology, Lincoln Park Zoo	2025
<i>Life-History Evolution</i> , School of Natural Sciences, Macquarie University	2025
<i>Population Dynamics</i> , Department of Forest and Wildlife Ecology, UW-Madison	2024
<i>Evolutionary Ecology</i> , Department of Biology, The Citadel	2023
<i>Animal Behavior</i> , Department of Biology, Randolph College	2023
<i>Herpetology</i> , Department of Fish and Wildlife Conservation, Virginia Tech	2021-2025
<i>Wildlife Biology</i> , Department of Biology, Randolph College	2022
<i>Graduate Seminar</i> , Department of Fish and Wildlife Conservation, Virginia Tech	2019-2022

## TRAINING AND CERTIFICATES

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Using Writing to Teach, UW-Madison

Anti-Racist Teaching, Virginia Tech

Creating an Inclusive Workplace, Virginia Tech

AIBS Writing for Impact and Influence Workshop, online

Certificate of Professional Development, Virginia Tech  
Reducing Implicit Bias and Stereotype Threat in the Classroom, Virginia Tech  
Advancing Diversity Workshop, Virginia Tech  
Preparing the Future Professoriate Certificate, Virginia Tech  
Carl Gans Workshop on Best Practices in Natural History Collections  
Disrupting Academic Bullying Workshop, Virginia Tech  
Graduate Education Development Institute Pedagogy Certificate, Virginia Tech

## PROFESSIONAL SERVICE

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### Reviewer for Manuscripts

The American Naturalist, Aquatic Conservation: Marine and Freshwater Ecosystems, Biodiversity and Conservation, Canadian Journal of Zoology, Ecology and Evolution, Functional Ecology, Herpetologica, Hydrobiologia, Ichthyology and Herpetology, Integrative Zoology, Journal of Wildlife Management, PeerJ, Proceedings of the Southeastern Association of Fish and Wildlife Agencies, Scientific Reports, Theoretical Ecology, Wetlands Ecology and Management

### Judge for Student Awards

Louis Stokes Alliance for Minority Participation Undergraduate Poster Award, American Society of Ichthyologists and Herpetologists Stoye Oral Presentation Award, Society of Systematic Biologists Graduate Student Research Award

### Societal Memberships

American Society of Ichthyologists and Herpetologists, American Society of Naturalists, British Herpetological Society, Herpetologists League, Society for the Study of Amphibians and Reptiles, Society of Systematic Biologists, Virginia Herpetological Society, Wisconsin Herpetological Association, Wisconsin Society for Ornithology

### Broader Impacts

- Helped found the Natural History Collections Club (NHCC) at Virginia Tech
- Coordinated various museum outreach events for the Virginia Tech's chapter of the Wildlife Society, the Virginia Tech Science Festival, local 4-H groups, and preschoolers from the Virginia Tech Child Development Center for Learning and Research

## FIELD EXPERIENCE

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### Europe

- Air and water quality monitoring at landfill sites across southern England
- Great Crested Newts (*Triturus cristatus*) surveys for Surrey Amphibian and Reptile Group
- Herpetofauna surveys in England for the National Amphibian and Reptile Recording Scheme
- Behavioral study of waterfowl breeding ecology in South Yorkshire
- Heathland restoration prior to reintroduction of Sand Lizards (*Lacerta agilis*) in England
- Manipulative experimental study of plant-pollinator interactions in southern Portugal

### United States

- Radiotelemetry of reintroduced Eastern Indigo Snakes (*Drymarchon couperi*)
- Drift fence and dipnet for Reticulated Flatwoods Salamanders (*Ambystoma bishopi*)
- Sampling invertebrate communities of ephemeral wetlands in longleaf pine forests
- Wetland restoration in longleaf pine flatwoods
- Frog Call surveys on Eglin Air Force Base
- Surveys to assess the population status of Bog Turtles (*Glyptemys muhlenbergii*)