



# Ethan S. Duvall

PHD CANDIDATE

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## About Me

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I am a PhD Candidate at Cornell University and President of the Amazon Research & Conservation Collaborative (ARCC), a 501(c)(3) non-profit organization. I strive to conduct research and develop programs/projects that improve the way we understand and protect biodiversity.

## Education

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### PhD(c), Ecology and Evolutionary Biology

ADVISOR: DR. ALEX FLECKER

Cornell University, NY

2020-present

### B.S., Environmental Science, Terrestrial Ecology Emphasis

ADVISOR: DR. JOHN McLAUGHLIN

Western Washington University, WA

2016-2019

## Publications

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\* equal authorship contribution; † mentored undergraduate researcher

### Manuscripts published or in press

1. **Duvall, E.S.\***, Roman, J., Pearson, H., Le Roux, E., Malhi, Y., and Abraham A.J.\*, **2024**. Resisting the carbonization of animals as climate solutions. *Nature Climate Change*
2. Abraham, A.J., Doughty, C.E., Plummer, K.E. and **Duvall, E.S.**, **2024**. Supplementary bird feeding as an overlooked contribution to local phosphorus cycles. *Frontiers in Ecology and the Environment*, p.e2793.
3. **Duvall, E.S.**, Hoeneisen, N.A., Suárez, E. and Flecker, A.S., **2024**. Geophagy by a large herbivore (capybara, *Hydrochoerus hydrochaeris*) driven by a human sodium supply. *Biotropica*, 56(3), p.e13314.
4. **Duvall, E.S.**, Griffiths, B.M., Clauss, M. and Abraham, A.J., **2023**. Allometry of sodium requirements and mineral lick use among herbivorous mammals. *Oikos*, 2023(9), p.e10058.
5. Abraham, A.J., **Duvall, E.S.**, Le Roux, E., Ganswindt, A., Clauss, M., Doughty, C.E. and Webster, A.B., **2023**. Anthropogenic supply of nutrients in a wildlife reserve may compromise conservation success. *Biological Conservation*, 284, p.110149.
6. **Duvall, E.S.**, Schwabe, E.K. and Steensma, K.M., **2023**. A win-win between farmers and an apex predator: investigating the relationship between bald eagles and dairy farms. *Ecosphere*, 14(3).
7. Abraham, A.J., **Duvall, E.**, Ferraro, K., Webster, A.B., Doughty, C.E., Le Roux, E. and Ellis-Soto, D., **2023**. Understanding anthropogenic impacts on zoogeochemistry is essential for ecological restoration. *Restoration Ecology*, 31(3), p.e13778.
8. Buchanan, B.P., Sethi, S.A., Cuppett, S., Lung, M., Jackman, G., Zarri, L., **Duvall, E.**, Dietrich, J., Sullivan, P., Dominitz, A. and Archibald, J.A., **2022**. A machine learning approach to identify barriers in stream networks demonstrates high prevalence of unmapped riverine dams. *Journal of Environmental Management*, 302, p.113952.
9. **Duvall, E.S.**, **2022**. Spatiotemporal Responses of Wintering Bald Eagles to Changes in Salmon Carcass Availability in the Pacific Northwest. *Northwest Science*, 95(3-4), pp.307-316.

### Manuscripts in review or revision

- **Duvall, E.S.**, Derry, L., McIntyre, P., and Flecker, A.S., **In review**. Phenology and flight shape the elemental composition of birds.

- Abraham A.J.\*, Roman, J., Pearson, H., Le Roux, E., Malhi, Y., and **Duvall, E.S.\*** *In review*. The uncertainty of rewilding for carbon capture and climate mitigation.
- Clauss, M., **Duvall, E.S.**, ... et al., and Abraham, A.J. *In review*. Zoos must embrace animal death for conservation and education.
- Abraham, A.J., le Roux, E., **Duvall, E.S.**, Doughty, C.E., Riond, B., Ortmann, S., Terranova, M., Clauss, M. *In review*. Sodium retention in large herbivores: physiological insights and zoogeochemical consequences.
- Abraham, A.J., Hempson, G.P., le Roux, E., Maré, C., Taylor, L., Webster, A.B., Duvall, E.S., et al., ... *In review*. Sodium constraints on large-herbivore communities in Africa.

### **Manuscripts in preparation**

- Chen, L.†, Patterson, A., Flecker, A.S., **Duvall, E.S.** *In preparation*. Trophic position, phenology, and body size influence nutrient release by songbirds
- Viswanathan, N.†, **Duvall, E.S.** *In preparation*. Building a path for pumas in the eastern United States

### **Honors & Awards**

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- Best student talk (Whittaker Award), Cornell's EEB December Symposium: 2023
- Best student talk, Conference on Biological Stoichiometry: 2023
- Amazon Center for Environmental Education & Research (ACEER) Conservation Fellow: 2022
- Theodore Gordon Flyfishers (TGF) Scholar Award: 2021
- Western Washington University's Thomas Henry Huxley Award – “**This award recipient demonstrated exceptional scholastic achievement and has been involved in the community, served Huxley College, and has shown all-around excellence in environmental studies**”: 2019
- Honorary Commencement Speaker – Huxley College of the Environment, WWU: 2019

### **Grants & Fellowships**

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#### **RESEARCH GRANTS (TOTAL AMOUNT: \$45,115)**

- 2023: The Athena Fund for Research at the Cornell Lab of Ornithology (\$8,380)
- 2023: Cornell Chapter of Sigma Xi Graduate Research Award (\$1,000)
- 2023: Cornell Latin American and Caribbean Studies Program (LACS) Research Grant (\$1,500)
- 2022: USFQ-Cornell Global Strategic Collaboration Award (\$10,000 – split equally)
- 2022: Cornell Lab of Ornithology Undergraduate Experiential Learning Grant (\$5,000)
- 2022: Theodore Gordon Flyfisher's Scholar Award (\$5,000)
- 2020: The Athena Fund for Research at the Cornell Lab of Ornithology (\$5,635)
- 2020: Sustainable Biodiversity Fund; Atkinson Center for Sustainability (\$7,000)
- 2019: Dean's Fund of Sustainability Studies Award; Huxley College of the Environment (\$1,000)
- 2018: Washington Chapter of The Wildlife Society Research Grant Award (\$600)

#### **TRAVEL GRANTS (TOTAL AMOUNT: \$5,100)**

- 2024: Cornell Lab of Ornithology Student Travel Grant (\$1,250)
- 2023: Cornell EEB Orenstein Fund Travel Award (\$750)
- 2023: Cornell University Graduate Conference Travel Grant (\$500)
- 2022: Cornell University Graduate Conference Travel Grant (\$600)
- 2022: Cornell Agriculture & Life Sciences Graduate Travel Fund (\$2,000)

#### **FELLOWSHIPS (TOTAL AMOUNT: \$51,584)**

- 2023: Paul Graduate Fellowship in the Life Sciences, Cornell University (\$18,343)

- 2020: Cornell University First-year Graduate Fellow in Life Sciences (\$33,241)

## Presentations

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Asterisks (\*) indicates presenter; dagger (†) indicates mentored undergraduate

### INVITED SEMINARS

1. **Duvall, E.\* (2023)** Zoogeochemistry: exploring animal roles in earth's elemental cycles. *University of Toronto, Department of Biology Seminar Series*

### INVITED TALKS

1. • **Duvall, E.\***, Griffiths, B., Clauss, M., and A. Abraham (2023) Drivers of sodium deficiency, supplementation, and dispersal by large herbivores. *Ecological Society of America (ESA) Conference*

### ORAL PRESENTATIONS

1. **Duvall, E.\* (2023)** Mega-herbivores need more salt. Cornell University, *Department of Ecology and Evolutionary Biology December Symposium \*Awarded best student oral presentation\**
2. **Duvall, E.\***, Derry, L., McIntyre, P., Flecker, A. (2023) Patterns of variation in the ionomics of birds. *Conference on Biological Stoichiometry \*Awarded best student oral presentation\**
3. **Duvall, E.\***, Derry, L., Flecker, A. (2022) Stoichiometry of birds and implications for ecosystem ecology. *Ecological Society of America (ESA) Conference*
4. **Duvall, E.\***, McLaughlin, J. (2022) Riverbird responses to dam removals on the Elwha River. *Salish Sea Ecosystem Conference*
5. **Duvall, E.\***, McLaughlin, J. (2021) Riverbird responses to dam removals on the Elwha River. *Olympic National Park Science Symposium*
6. **Duvall, E.\* (2019)** Nooksack River Bald Eagles: Current Status and Conservation Recommendations. *Whatcom Wildlife Advisory Committee*

### POSTERS

1. Chen, L.†\*, Patterson, A., Flecker, A., and **Duvall, E.S. (2023)** River-dependent bird responses to impacts of dam removal. *Western Washington University Scholars Week*
2. **Duvall, E.\***, Jones, R.\*, and Pollack, S.\* (2018) River-dependent bird responses to impacts of dam removal. *Western Washington University Scholars Week*

## Research Experience

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### PhD Researcher

ADVISOR: ALEX FLECKER

Cornell University

2020-present

- Investigating the stoichiometry of terrestrial vertebrates and its scaling consequences on animal nutrition, nutrient cycling, and ecosystem functioning
- Successfully completed a consortium of field and laboratory work combined with statistical modelling and analyses

### Independent Researcher

ADVISOR: JOHN MC LAUGHLIN

Washington State, USA

2018-2020

- Conducted independent research after graduating from Western Washington University
- Investigated overwintering bald eagle populations and their responses to declining salmon carcasses

## Teaching Positions

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- Worked one-on-one with students daily on introductory topics of animal biology and ecology
- Conducted weekly oral exams with students to evaluate their knowledge and facilitate learning
- Led the course's Cardiopulmonary Lab, including final lab report grading and assistance

**Ecology Field Camp Teaching Assistant**

- Supported semester-long field camp based along the Elwha River, WA, and Grande Ronde River, OR
- Assisted students with independent research projects and graded regular field assignments
- Led river expeditions as primary rafting guide on the Grande Ronde River, OR

## Professional Positions

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**President & Founder**

- Founded **ARCC**, a 501(c)(3) with the mission of supporting conservation in the western Amazon Rainforest through interdisciplinary research, community engagement, and communication initiatives
- Working with multiple indigenous, academic, and business partners in the Ecuadorian Amazon to tackle systematic conservation challenges
  - Empowering local conservation leadership through local research and journalism fellowships
  - Preserving Traditional Ecological Knowledge (TEK) through indigenous partnerships
  - Educating and collaborating with indigenous leaders to facilitate biodiversity conservation

**GIS Program Lead**

- Led the development, implementation, and management of Cascade's GIS program
- Oversaw GIS web application development for asset and water management

**Environmental Science Intern**

- Developed static and interactive maps and conducted spatial data analysis in support of organization needs: RFP/RFQ/Public Works; legal, planning, engineering and operations issues; algae/invasive plant treatment, stormwater, etc.

**Field Technician**

- Completed multi-night backcountry expeditions in the Cascade Mountains, WA, to retrieve radio collars from mountain goats as part of the mountain goat translocation research program

**Outdoor Recreation Guide**

- Led mountain biking, backpacking, climbing, and other outdoor experiences for corporate groups, families, and kids camps
- Managed diverse personalities in extreme outdoor conditions and experiences

# Science Communication

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## BLOG ARTICLES

1. **Duvall, E.** (2023, January 18). Reflections On Ecotourism And Wildlife Conservation In The Peruvian Amazon. ACEER. Retrieved from <https://aceer.org/reflections-on-ecotourism-and-wildlife-conservation-in-the-peruvian-amazon>
2. **Duvall, E.** (2019, December 11). Eagles, Salmon, and a Free-flowing River. American Rivers Retrieved from <https://www.americanrivers.org/2019/12/eagles-salmon-and-a-free-flowing-river/>
3. **Duvall, E.** (2020, June 20). Why save water in the PNW? We Need Water. Retrieved from <https://weneedwater.org/why-conserve-water-in-the-pnw/>

## MAGAZINE ARTICLES

- **Duvall, E.** (2023, April 4). Riverbirds: An Integrative Measure of Ecosystem Health. *Gordon's Quill Volume 34: "Thoughts on Conservation"*

## PODCAST APPEARANCES

1. CBC Radio (2023, April 1). Eagles are eating cows instead of salmon – and farmers are happy Retrieved from <https://www.cbc.ca/player/play/2188569155552>

## SELECTED PRESS APPEARANCES

- USA TODAY (2023, March 18). Bald eagles adapt after climate change diminishes salmon Retrieved from <https://www.usatoday.com/story/news/nation/2023/03/18/bald-eagles-adapt-after-climate-change-11470297002/>

# Volunteer Leadership Positions

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## President: Tropical Biology and Conservation Graduate Student Association

ITHACA, NY, USA

Cornell University

2022-2024

- Led weekly meetings and discussions with Cornell students, staff, and faculty (30+ regular people)
- Hosted Cornell's annual Tropical Biology and Conservation Symposium (2023, 2024)

## Vice President: Tropical Biology and Conservation Graduate Student Association

ITHACA, NY, USA

Cornell University

2021-2022

## Youth Mentor

ITHACA, NY, USA

Ithaca Learning Web

2021-2023

- Facilitated apprenticeship opportunities for Ithaca youth to gain experience in scientific field and laboratory work, as well as useful professional development skills before applying to college

## Treasurer: Biogeochemistry Graduate Student Association

ITHACA, NY, USA

Cornell University

2021-2023

- Responsible for budgeting annual expenses for regular meetings, annual symposium, and writing retreats

## Youth Representative Committee Member

NORTH BEND, WA, USA

North Bend Parks and Recreation

Committee

2021-2023

- Led the installation of recycling and compost bins throughout the town of North Bend, WA
- Led implementation of recreational park signs throughout the town of North Bend, WA

## Co-founder: Be the change leadership conference

NORTH BEND, WA, USA

North Bend Youth Council

2021-2023

- Co-developed the “Be the change” Leadership Conference, a 2-day annual conference which brought 100+ high school students together to inspire and educate on topics of mental health, adversity, and career development

## Skills & Certificates

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### CERTIFICATES

- Wilderness First Aid certificate, AVH Global (current as of April 2023)
- River Studies and Leadership certificate (from River Management Society)
- ACA Swiftwater Rescue Certificate: Level 2

### LABORATORY & FIELD TOOLS/TECHNIQUES

- **Elemental analyses:** inductively coupled mass spectrometry (ICP-OES); gas chromatography (GC); ion chromatography (IC); mobile gas concentration analyzers (e.g., GasScouterG4301)
- **Spatial data processing:** remote sensing; image analysis; LiDAR; radio telemetry
- **Wildlife tracking and survey methods:** camera trapping, acoustic identification (birds, amphibians), visual identification (birds, amphibians, reptiles, mammals), track identification

### COMPUTER SOFTWARE/PROGRAMS/LANGUAGES

- **GIS:** ArcGIS Pro; ArcGIS Online; ESRI Products; QGIS; Google Earth Engine
- **Statistical:** R, RStudio, Python, SQL, MATLAB, Java
- **Office:** Microsoft Excel, Word, PowerPoint, Canva
- **Sound/Video:** Adobe Lightroom, Adobe After Effects, Ableton, Audacity
- **Other Analytic Software:** NetLogo, Dragonfly

### LANGUAGES

- English: Fluent
- Spanish: Conversational
- Quechua: Beginner
- Waorani: Beginner

## Invited Workshops

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### Woodstoich 5: advancing synthesis and integration in ecology and evolution

Aarhus, Denmark

ACCEPTED ATTENDEE

October 2023

- Workshop hosted every four years to advance synthesis and integration in ecology and evolution
- Completed a week of intensive collaboration with international early-career researchers

### Global Zoogeochimistry Workshop

Aarhus, Denmark

INVITED ATTENDEE

October 2023

- Workshop to advance synthesis of global zoogeochimistry research
- Completed a week of intensive collaboration and paper writing

## Organizations & Affiliations

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### Association for Tropical Biology and Conservation (ATBC)

MEMBER

2022-present

**Ecological Society of America (ESA)**

MEMBER

2022-present

**Northwest Scientific Association**

MEMBER

2020-present

**River Management Society**

MEMBER

2019-present

**Wildlife Society: Washington Chapter**

MEMBER

2018-2020

**Puget Sound ESRI User Group**

MEMBER

2018-2020