Alec F. Henderson

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Education

University of Connecticut, Storrs, CT **Expected Graduation – May 2026**
GPA: 4.00 / 4.00
M.S. Student – Department of Natural Resources and the Environment
"*Integrating remote sensing methods to understand carnivore occupancy and habitat"*
Advisors – Dr. Tracy Rittenhouse and Dr. Zhe Zhu

Villanova University, Villanova, PA **Graduated – May 2022**
GPA: 3.95 / 4.00
Bachelor of Science in Environmental Science, minor in Computer Science
Summa Cum Laude
Honors Degree Thesis with Distinction – *"Mapping Habitat Suitability of the American Chestnut in Pennsylvania: Can we Restore this Foundational Tree to our Forests?"*

Relevant Coursework (Villanova University[1], University of Connecticut[2])

GIS for Conservation Management[1], GIS for Urban Sustainability[1], GIS for Environmental Systems[1], Ecosystem Ecology[1], Landscape Ecology[2], Population Dynamics[2], Mammalogy[2], Wildlife Management Techniques[2], Environmental Data Analysis[2], Principles of Database Systems[1], Python Scripting Geospatial Analysis[2], Quantitative Remote Sensing Methods[2]

Professional Experience

University of Connecticut, Graduate Research Assistant **Aug 2024 – Present**

- Using a variety of remote sensing methods to model carnivore occupancy and habitat in Connecticut and Virginia
- Modeling drivers of occupancy for gray foxes, bobcats, and fishers in Connecticut using a statewide camera trap survey and occupancy models
- Building a Convolutional Neural Network (CNN) model to automate object detection from black bear video collars in Virginia. The model can identify anthropogenic structures (buildings and roads), environmental features (trees and understory species), and wildlife (deer and other bears) from the collar footage
- Integrating wildlife video collar footage with high spatial and temporal resolution satellite data to map understory species distribution in Virginia
- *Advised by Dr. Tracy Rittenhouse and Dr. Zhe Zhu*

The American Chestnut Foundation, Research Contractor **Mar 2023 – Present**

- Generated a range-wide habitat suitability model for American chestnuts
- Creating a web dashboard so that landowners can easily determine if their property can support American chestnut restoration projects
- Preparing two publications: one about building the planting-informed, range-wide habitat suitability model and one about building and sharing the public site-selection restoration tool

- *Supervised by Sara Fitzsimmons and Dr. Vasiliy Lakoba*

Villanova University, Spatial Analyst Consultant **Sep 2022 – Nov 2022**
- Produced Google Earth Engine scripts to assist a Villanova professor studying land surface temperature across the USA
- Generated land surface temperature data for the contiguous United States averaged seasonally
- *Supervised by Dr. Peleg Kremer*

Alaska Raptor Center, Summer Wildlife Interpreter **May 2022 – Aug 2022**
- Led engaging and informative tours for groups of up to 100 visitors, teaching the public about raptors, wildlife conservation and rehabilitation, and the environment of southeast Alaska
- *Supervised by Richard Hart*

Villanova University, Honors Senior Thesis **Sep 2021 – May 2022**
- Modeled species distribution for American chestnut trees in Pennsylvania at multiple scales and resolutions with an ensemble of SDM techniques using ArcMap, MaxEnt, and R
- Presented findings for Villanova Honors Department, the Department of Geography and the Environment, Falvey Memorial Library, and The American Chestnut Foundation
- Published two first-author publications
- *Advised by Dr. Jennifer Santoro and Dr. Peleg Kremer*

University of Göttingen, DAAD RISE Wildlife Internship **Jun 2021 – Oct 2021**
- Classified behavior of small mammals collected from camera trap videos in different experimental forest plots
- Identified and visualized trends in small mammal behavior using R statistical software
- *Supervised by Dr. Scott Appleby*

University of New Mexico, NSF REU Student Researcher **May 2020 – Aug 2020**
- Developed and carried out a research project mapping movement and species distributions of large mammals across Sevilleta National Wildlife Refuge
- Analyzed on a 10-year-running database of camera trap images
- Utilized R and ArcMap to illustrate spatial and temporal trends in mammal activity
- Gained experience in long field days, driving a 4WD truck off-road, searching for tracks and scat near modeled habitat corridors
- *Supervised by Dr. Alesia Hallmark*

Villanova University, Undergraduate GIS Research Assistant **Jan 2020 – May 2020**
- Assisted a professor and graduate student in spatial analysis of the Urban Heat Island effect in Philadelphia using ArcMap and Google Earth Engine
- *Supervised by Dr. Peleg Kremer*

Villanova University, Undergraduate Research Fellow **Jun 2019 – Aug 2019**

- Assessed impact of road salt on watersheds through field sample collection, lab analysis, and GIS-based analysis
- Ran sample analyses for chloride and trace metals using ion chromatography and inductively coupled plasma mass spectrometry
- Analyzed associations between stream chloride, trace metals, and land use with JMP statistical software
- *Supervised by Dr. Steven Goldsmith*

Publications

- **Henderson, A.**, Santoro, J. A., & Kremer, P. (2022). Ensemble Modeling for American Chestnut Distribution: Locating Potential Restoration Sites in Pennsylvania. *Frontiers in Ecology and Evolution*, 795.
- **Henderson, A. F.**, Santoro, J. A., & Kremer, P. (2023). Impacts of spatial scale and resolution on species distribution models of American chestnut (Castanea dentata) in Pennsylvania, USA. *Forest Ecology and Management*, *529*, 120741.
- (In Preparation) **Henderson, A.**, Santoro, J., Lakoba, V., & Fitzsimmons, S., In Prep. Distribution modeling and range-wide planting experience inform American chestnut reintroduction suitability. *Ecological Applications*.

Presentations

- The Wildlife Society, 2025
  Presentation: Mesocarnivores in an Exurban Mosaic: Is Occupancy of Bobcats, Gray Foxes, and Fishers Best Explained by Urban Infrastructure, Natural Landscape Characteristics, or Intraguild Competition? (https://youtu.be/UNZB04A3s2c)
- UConn CAHNR Graduate Research Forum, 2025 – Best Poster in Subject
  Poster: Determining What Features of Connecticut's Developed Landscape Facilitate Mesocarnivore Occupancy
- Villanova Honors Senior Thesis Research Conference, 2022
  Presentation: Mapping Habitat Suitability of the American Chestnut in Pennsylvania: Can we Restore this Foundational Tree to our Forests? (https://youtu.be/qpzBRaKr3S4)
- The American Chestnut Foundation Chestnut Chat, 2022
  Invited Presentation: Habitat Modeling for American Chestnut (https://youtu.be/GL1l7_g0_8s)
- Villanova Falvey Scholars Research Conference, 2022
  Presentation: Mapping Habitat Suitability of the American Chestnut in Pennsylvania: Can we Restore this Foundational Tree to our Forests?
- Sevilleta National Wildlife Refuge Annual REU Symposium, 2020
  Presentation: Mapping Mammal Movement Using Camera Trapping
- Villanova Student Research Symposium, 2019
  Poster: Exploring the Freshwater Salinization Syndrome Along a Gradient of Suburban Development

Awards and Honors

- National Science Foundation GRFP Honorable Mention (2024)
- Villanova University Presidential Scholar (2018-2022)
- Phi Beta Kappa (Inducted May 2022)
- Gamma Theta Upsilon Geography Honors Society (Inducted April 2022)
- Villanova University's Rachel Carson Award for Excellence in the Environment- recognition as the top graduating environmental science major based on GPA, research, and department service (2022)
- Villanova University's Falvey Scholar Award- recognition for outstanding undergraduate research (2022)

Applicable Skills

- **GIS:** QGIS and ESRI ArcGIS software – ArcMap, ArcPro, ArcGIS Online, Field Maps, Collector, Survey123, Story Maps
- **Programming:** R, Python, MATLAB, Java, JavaScript, SQL, and C++
- **Database Management:** SQL, Microsoft Access
- **Statistical Methods:** Occupancy Models, Home Range Estimation, Matrix Population Models, Machine Learning (Random Forest, CNNs, MaxEnt), Species Distribution Models, Habitat Suitability Models, Habitat Permeability and Movement Corridor Analysis
- **Field Methods:** Radio Telemetry, Small Mammal Trapping and Handling, Invertebrate Capture-Mark-Resight, Bat Acoustic Surveys
- **Remote Sensing:** Google Earth Engine, ENVI, Earth Explorer, PlanetScope