

# DIRECTED RESEARCH PROJECTS

THE SCHOOL FOR FIELD STUDIES

SPRING 2024

### Australia

# The vascular and non-vascular plant diversity of a palm swamp forest in Mission Beach, Queensland, Australia

Faculty advisors: Dr. David Tng and Dr. Deborah Apgaua Student authors: Max Perry Newman<sup>1</sup>, Rachael Elizabeth Tomasko<sup>2</sup>, Althea Hope<sup>3</sup>, Ian Torrens-Martin<sup>3</sup>, Allen Everett Zhan<sup>4</sup> 1 Brown University, 2 Kenyon College, 3 Smith College, 4 Wheaton College

### Assessing the flammability of Australian littoral rainforest species and their feasibility for green firebreak plantings

Faculty advisors: Dr. David Tng and Dr. Deborah Apgaua Student authors: Anika Elizabeth Eastman<sup>1</sup>, Katherine Anne Grace<sup>1</sup>, Caroline Shin<sup>2</sup> 1 Skidmore College, 2 The Ohio State University

#### Establishing a biocultural arboretum at the Centre for Rainforest Studies

Faculty advisors: Dr. David Tng and Dr. Deborah Apgaua Student authors: Elizabeth Lauren Martinm<sup>1</sup>, Emma Pauline Kaplan<sup>2</sup>, Emma Christine<sup>3</sup>, Kenney Margaret Elizabeth Muldoon<sup>4</sup> 1 University of Wisconsin Madison, 2 Grinnell College, 3 Elon University, 4 Rochester Institute of Technology

#### Rainforest and savanna Grevillea species exhibit divergent leaf and stem but not flammability traits

Faculty advisors: Dr. David Tng and Dr. Deborah Apgaua Student authors: Shea Elsie Issendorf<sup>1</sup>, Elizabeth Joanne Karatzas<sup>2</sup>, Hung Minh Pham<sup>3</sup> 1 The University of Minnesota, 2 The University of Massachusetts Amherst, 3 Denison University

#### Exploring landowner perceptions of revegetation on the Atherton Tablelands

Faculty advisors: Dr. Mia Derhé and Dr. Sigrid Heise-Pavlov Student authors: Devon Fischer<sup>1</sup>, Hannah Brazus<sup>2</sup>, Hannah Saglimbeni<sup>3</sup> 1 Smith College, 2 Miami University, 3 University of Virginia

#### From canopy to dung: how dung beetles can help assess recovery of reforested plots of land

Faculty advisors: Dr. Mia Derhé and Dr. Sigrid Heise-Pavlov Student authors: Elias Gorby<sup>1</sup>, Elise Farley<sup>2</sup>, Miyanna Gamero<sup>3</sup>, Ollie Safford<sup>4</sup> 1 University of Redlands, 2 Amherst College, 3 University of Wisconsin, 4 Whitman College

# Assessing leaf litter invertebrate diversity and distribution within established revegetation plots of northeast Queensland's wet tropics

Faculty advisor: Dr. Mia Derhé Student authors: Owen McCarthy<sup>1</sup>, Grace Filson<sup>2</sup>, Leah Arnold<sup>3</sup> 1 Middlebury College, 2 Dickinson College, 3 Wheaton College

# Barriers to reforestation: Mabi Rainforest restoration on a cinder cone slope in far north Queensland, Australia

Faculty advisor: Dr. Sigrid Heise-Pavlov Student authors: Sheila F. Hulseman<sup>1</sup>, Madelyn E. Radtke<sup>2</sup>, Eleanor L. Buchanan<sup>3</sup>, EJ Holm<sup>4</sup>, Andrew D. Kim<sup>5</sup>

1 College of the Holy Cross, 2 University of Wisconsin, 3 Brown University, 4 Bates College, 5 Brown University

### Bhutan

#### **Effect of distance from settlements and roads on prey species occurrence in Bumdra-Taktsang area** Faculty advisor: Tshering Tempa

Student authors: Brodie Leo<sup>1</sup>, Emma Watkins<sup>2</sup>, Ethan Krull<sup>3</sup>, Jenna Ward<sup>4</sup>, Oliver Satola<sup>5</sup> 1 Williams College, 2 Gonzaga University, 3 University of Wisconsin/Madison, 4 Clark University, 5 University of Michigan/Ann Arbor

#### **Effects of physical properties of the Taktsang-Bumdra landscape on occupancy of predator species** Faculty advisor: Tshering Tempa

Student authors: Charlie Haberstock<sup>1</sup>, Justin Boshears-Hazen<sup>2</sup>, Lauren Hagerty<sup>3</sup>, Rachel Bottum<sup>4</sup>, Sydney Cohen<sup>5</sup>, Tanner Alger<sup>4</sup>

1 Hamilton College, 2 University of Massachusetts/Amherst, 3 Lehigh University, 4 Grinnell College, 5 Brandeis University

#### Assessing the impacts of climate change on water resources: a case of Tsendona, Paro, Bhutan Faculty advisor: Norbu Wangdi

Student authors: Brandon Neifert<sup>1</sup>, Brooke Peterson<sup>2</sup>, Chloe Miller<sup>3</sup>, Jessica Dean<sup>4</sup>, Lillian Sharp<sup>5</sup>, Mia Jones<sup>6</sup>

1 Whitman College, 2 University of Minnesota, 3 Colorado State University, 4 Denison University, 5 University of Michigan, 6 Dickinson University

### The impacts of development on the culinary traditions and food basket in Paro Valley

Faculty advisor: Kuenga Wangmo

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#### The impacts of climate change on the culinary traditions and food basket in Paro Valley

Faculty advisor: Kuenga Wangmo Student authors: Erica Li<sup>1</sup>, Evelyn Zelmer<sup>2</sup>, Gabrielle Levine<sup>3</sup>, Vivien Owusu-Sampah<sup>4</sup>, Zoe Cultrara<sup>5</sup> 1 Smith College, 2 University of Richmond, 3 Brandeis University, 4 Colorado State University/Fort Collins, 5 University of Richmond

### Cambodia

#### Soil in the Tonle Sap: assessing nutrients, pH, and microbial communities Faculty advisor: Megan English Student authors: Isabelle Larson<sup>1</sup>, Grace Winkelman<sup>2</sup> 1 Bates College, 2 Lewis & Clark College

#### Assessing water quality parameters and macroinvertebrate bioindicators near Kampong Khleang Commune, Tonle Sap Lake

Faculty advisor: Megan English Student authors: Liberty Chesney<sup>1</sup>, Jordan Durst<sup>2</sup> 1 University of Redlands, 2 The Pennsylvania State University

# Strike a pose: a camera trap survey analyzing the impact of domestic water buffalo *Bubalus bubalis* reintroduction on species richness and relative abundance across seasonal ponds in Cambodia's northern plains

Faculty advisor: Megan English Student authors: Anna Hoehlein<sup>1</sup>, Sara Reiss<sup>2</sup>, Julia Willey<sup>3</sup> 1 Elon University, 2 Vassar College, 3 University of San Diego

#### Survivalist fishers of the Tonle Sap

Faculty advisor: Tim Frewer Student authors: Whitney Bryington<sup>1</sup>, Jolina Rich<sup>2</sup>, Alyna Sigel<sup>3</sup> 1 Hampshire College, 2 University of Massachusetts, 3 University of North Carolina

#### Filming the survivalist fishers of the Tonle Sap

Faculty advisor: Tim Frewer Student author: Mayu Joiner<sup>1</sup> 1 Ithaca college

#### Land use and land cover change in Kampong Khleang and surrounding areas

Faculty advisor: Jean-Christophe Diepart Student authors: Kaitlin Cowan<sup>1</sup>, Erica Erdenesanaa<sup>2</sup>, Nathan Parr<sup>3</sup> 1 Franklin & Marshall College, 2 Bowdoin College, 3 University of Michigan

### Livelihood diversification strategies of two villages in the Tonlé Sap floodplain: Cheay Chet and Preaek Sramaoch

Faculty advisor: Jean-Christophe Diepart Student authors: Camille Newman<sup>1</sup>, Eliza Sullivan<sup>2</sup> 1 Wellesley College, 2 College of the Holy Cross

### Chile

#### Indigenous presence in Torres del Paine Biosphere Reserve Faculty advisor: Rafaela Retamal D. Student authors: Kiara Bonilla<sup>1</sup>, Owen Jakel<sup>2</sup> 1 University of Colorado/Boulder, 2 Whitman College

# Wetlands in Torres del Paine Biosphere Reserve: perceptions and interactions of park rangers, estancieros, and other residents

Faculty advisor: Rafaela Retamal D. Student authors: Isha Goyal<sup>1</sup>, Sammy Stuhlmiller<sup>2</sup> 1 University of Colorado/Boulder, 2 Whitman College

**The estancia, its industry, and our future: climate change and its impacts on Magallanes** Faculty advisor: Rafaela Retamal D. Student author: Michael Keegan<sup>1</sup> 1 Williams College

#### **Cleaning Río Natales watershed**

Faculty advisor: Rafaela Retamal D. Student author: Mariana Woeber Gardner<sup>1</sup> 1 Denison University

#### Modernist urban planning in the downfall of Chilean water conservation

Faculty advisor: Rafaela Retamal D. Student author: Cole Sullivan<sup>1</sup> 1 Whitman College

### Evaluating the effectiveness of on-site digital cameras for capturing phenological data in southern Patagonia

Faculty advisor: Francisco Aguirre Student authors: Delaney Carlin<sup>1</sup>, Audrey Lemoine<sup>2</sup>, Erin O'Donovan<sup>3</sup> 1 Scripps College, 2 Colby College, 3 College of the Holy Cross

### Drought indicators in southern Patagonia: analysis of ENSO and SAM climate oscillation impact on endorheic lakes

Faculty advisor: Francisco Aguirre Student authors: Fiona Madrid<sup>1</sup>, Jesse Paull<sup>2</sup>, Sydney Paull<sup>3</sup> 1 Barnard College, 2 Central Washington University, 3 Eckerd College

#### Snowpack contamination in southern Patagonia: feasibility and opportunities of study

Faculty advisor: Francisco Aguirre Student authors: Claire Beebe<sup>1</sup>, Harry Robison<sup>1</sup> 1 Colby College

### WRF hydro model for flood prediction and management of Río de las Minas watershed in Magallanes region, Chile

Faculty advisor: Francisco Aguirre Student authors: Julia Hale<sup>1</sup>, Katelyn Woodruff<sup>2</sup> 1 Vassar College, 2 University of Colorado/Boulder

#### Seasonal variation of macroinvertebrate communities in southern Patagonian streams

Faculty advisor: Shaw Nozaki Lacy Student author: Al Lake<sup>1</sup> 1 Williams College

#### Parasites and projections: modeling and mapping tree and fungal niches in southern Patagonia

Faculty advisor: Shaw Nozaki Lacy Student author: Ari Lawrence<sup>1</sup> 1 University of Minnesota/Twin Cities

#### Carbon sequestration in post-wildfire reforestation area of Laguna Azul: reuptake modeling

Faculty advisor: Shaw Nozaki Lacy Student authors: Kathryn Hawkes<sup>1</sup>, Daisy Rebozo<sup>2</sup> 1 Colorado College, 2 University of Washington

#### Understanding the influence of directional winds on wildfire dynamics in southern Patagonia Faculty

Faculty advisor: Shaw Nozaki Lacy Student authors: Grace Aho<sup>1</sup>, Margaret Burgess<sup>2</sup>, Pranav Parekh<sup>3</sup> 1 University of Minnesota, 2 Whitman College, 3 Vassar College

### Optimizing field methods for estimating river cross-sectional area: insights from southern Chilean Patagonia

Faculty advisor: Shaw Nozaki Lacy Student author: Grace Carter<sup>1</sup> 1 Williams College

#### Accuracy of various methods of measuring river geomorphology

Faculty advisor: Shaw Nozaki Lacy Student author: Helena Shapiro<sup>1</sup> 1 University of Colorado/Boulder

### **Costa Rica**

**Community action and food security through the Monteverde Community Garden** Faculty advisor: Mary Little Student authors: Malin Nystorm<sup>1</sup>, Colleen Vine<sup>2</sup>, Anna Silverman<sup>3</sup>, Lauren Iversen<sup>4</sup>, Shane Fitzpatrick<sup>5</sup>, Henry Shuler<sup>6</sup> 1 Barnard College, 2 Allegheny College, 3 University of Wisconsin/Madison, 4 Pennsylvania State University/State College, 5 College of the Holy Cross, 6 Dickinson College

#### Assessing how plant functional traits influence species flammability in Atenas, Costa Rica

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#### Flammability of native and non-native plants in the Bosque Municipal of Atenas, Costa Rica

Faculty advisor: Milena Cambronero Student authors: Jack Riccobono<sup>1</sup>, Sónia McCollum<sup>2</sup> 1 Muhlenberg College, 2 Mount Holyoke College

#### Leaf traits explain species flammability in a forest fragment in Atenas, Costa Rica

Faculty advisor: Milena Cambronero Student authors: Shira Goldman<sup>1</sup>, Ava Piebenga<sup>2</sup> 1 Smith College, 2 Colorado College

#### Comparing amphibian and reptile diversity between two clouded forests in Costa Rica

Faculty advisor: Víctor Acosta, assisted by Ricardo Sánchez Student authors: Kate Boutell<sup>1</sup>, Douglas Giles<sup>2</sup>, Phoebe Shubin<sup>3</sup>, Abha Upadhye<sup>4</sup> 1 Oberlin College, 2 Wake Forest University, 3 University of Massachusetts/Amherst, 4 The Ohio State University

#### Variability in bat communities across various sites within Costa Rica's tropical premontane forest belt

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#### Variation of functional traits according to size and habitat in three Cecropia species

Faculty advisor: Gerardo Avalos Student authors: Ariel Schwartzman Miles<sup>1</sup>, Liya Miksovsky<sup>2</sup>, Tyler Caine<sup>3</sup> 1 Vassar College, 2 Yale University, 3 Brandeis University

### Variation in sexual size dimorphism and fit to Rensch's rule in Costa Rican hummingbirds Faculty advisor: Gerardo Avalos

Student authors: Claire Labuda<sup>1</sup>, Ethan Ruderman<sup>2</sup>, Reece H. Brown<sup>3</sup>, Annalise H. Thapaliya<sup>4</sup> 1 Colorado State University, 2 Amherst College, 3 Columbia University, 4 Lehigh University

#### Kenya

#### Effectiveness of the Mbirikani Predator Consolation Fund: mitigating human-lion conflicts and enhancing attitude, tolerance, and coexistence within communities Faculty advisor: Richard Kiaka Student authors: Aaron Richmond-Crosset<sup>1</sup>, Alexandra Greene<sup>2</sup>, Pranneil Thankavel<sup>3</sup>

1 Clark University, 2 Dickinson College, 3 University of Wisconsin

### Challenges and long-term sustainability of the Mbirikani Predator Consolation Fund

Faculty advisor: Richard Kiaka Student authors: Dylan Maddux<sup>1</sup>, Ella Elizabeth Francis<sup>2</sup>, Gabrielle Roman<sup>3</sup> 1 Grinnell College, 2 Pitzer College, 3 Yale College

# Abundance, distribution, and habitat preference of grey crowned crane *Balearica regulorum gibbericeps* in Amboseli National Park and its environs

Faculty advisor: John Kiringe Student authors: Natalie Angstadt<sup>1</sup>, Halle Banks<sup>2</sup>, Sanjit Ramesh Chandran<sup>3</sup> 1 Wesleyan University, 2 Colorado State University, 3 Yale-NUS College

# Abundance, distribution, habitat quality, and key threats facing grey crowned crane in the Amboseli ecosystem, Kenya

Faculty advisor: John Kiringe Student authors: Luke Chavez<sup>1</sup>, Amina Farah<sup>2</sup> 1 Wesleyan University, 2 Trinity College

# Abundance, distribution, and threats facing grey crowned crane in Amboseli National Park and its environments

Faculty advisor: Jennifer Wanyingi Student authors: Rachel Bartelt<sup>1</sup>, Solveig Olson<sup>2</sup> 1 University of Minnesota/Twin Cities, 2 Grinnell College

# The influence of socio-cultural perceptions, politics, and intervention measures on giraffe bushmeat activities in the Amboseli ecosystem

Faculty advisor: Jennifer Wanyingi Student authors: Abigael Dawson<sup>1</sup>, Noah Randall<sup>2</sup>, Charlotte Veenstra-VanderWeele<sup>3</sup> 1 Robert Morris University, 2 University of Colorado/Boulder, 3 Barnard College

# The dynamics, severity, and community awareness of giraffe bushmeat activity within the Amboseli ecosystem

Faculty advisor: Jennifer Wanyingi Student authors: Mikayla Stowe<sup>1</sup>, Amelia Thrasher<sup>2</sup> 1 University of Minnesota, 2 Ohio Wesleyan University

# The role of community in Masai Giraffe conservation and mitigating bushmeat activity in the Amboseli Ecosystem

Faculty advisor: Jennifer Wanyingi Student authors: Sailor Brown<sup>1</sup>, Alexandra Zolman<sup>2</sup> 1 University of Redlands, 2 Wake Forest University

### Panama

Surfonomics in Bocas del Toro: a tourism demand analysis of surf ecosystem value Faculty advisor: Leon Mach Student authors: Joseph Degraw<sup>1</sup>, Sophia Kishimoto<sup>2</sup>, Julia Lynch<sup>3</sup>, Alina Malin<sup>4</sup>, Zea Segnitz<sup>5</sup> 1 Whitman College, 2 University of San Franciso, 3 St. Michael's College, 4 University of Michigan, 5 Northeastern University

# Empowering Ngöbe indigenous communities through tourism: assessing dimensions of empowerment in the Bocas del Toro archipelago

Faculty advisor: Leon Mach and Laura Bruce Student authors: Sabilah Alibhai<sup>1</sup>, Aarani Balendran<sup>2</sup>, Gabby Cournoyer<sup>2</sup> 1 Connecticut College, 2 University of Michigan

# Land-use change decreases species richness and biodiversity of Panamanian leaf-litter frog communities

Faculty advisor: Daniel Medina Student authors: Isabelle Dugan<sup>1</sup>, Owen Hardy<sup>2</sup>, Kayla O'Shea<sup>3</sup>, Mattie Vandiver<sup>4</sup> 1 University of Michigan, 2 Bates College, 3 Brandeis University, 4 Vassar College

### Land use change induces microhabitat alterations with implications on Oophaga pumilio species

Faculty advisor: Daniel Medina Student authors: Chiara Bachmann Gómez<sup>1</sup>, Allison Conwell<sup>2</sup>, Helena Lepre<sup>3</sup>, Lucy Zullo<sup>4</sup> 1 Whitman College, 2 Skidmore College, 3 University of Vermont, 4 Hamilton College

#### Population structure of keystone herbivorous reef fishes in Bocas del Toro, Caribbean Panama Faculty

Faculty advisor: Dagoberto E. Venera-Pontón Student authors: Charlotte Latham<sup>1</sup>, Danielle Nader<sup>2</sup>, Kasia Jackson<sup>2</sup>, Kellen Kennedy<sup>3</sup> 1 Eckerd College, 2 University of San Diego, 3 University of Michigan

Herbivory and aggression in keystone herbivorous fishes from Bocas Del Toro, Panama

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### Tanzania

#### A Survey of the plant species use and availability among the Hadzabe of Lake Eyasi, northern Tanzania Faculty advisor: John Mwamhanga

Student authors: Matt Butler<sup>1</sup>, True Usiatynski<sup>2</sup>, Andrew Fredericks<sup>3</sup> 1 Iowa State University, 2 Mount Holyoke College, 3 Hamilton College

### Documenting medicinal plant usage, knowledge acquisition, and conservation perspectives of the Hadzabe northern Tanzania, Africa

Faculty advisor: John Mwamhanga Student authors: Madis Kennedy<sup>1</sup>, Margot Collins<sup>2</sup> 1 Kenyon College, 2 University of Massachusetts/Amherst

# The assessment of the tourist satisfaction and economic potential of Maasai cultural bomas, northern Tanzania

Faculty advisor: John Mwamhanga Student authors: Frainer Castillo<sup>1</sup>, Kenya Twyman<sup>2</sup> 1 Franklin & Marshall College

# Small mammal community ecology in community protected forest and Maize field in Karatu district, northern Tanzania

Faculty advisor: Egidius James Rwebuga Student authors: Ella Webber<sup>1</sup>, Shelly Coleman<sup>2</sup>, Kylie Lakin<sup>3</sup> 1 Colby College, 2 University of San Diego, 3 Hollins University

# Investigating bird species community structure in Moyo Hill Community Protected Forest and Lake Manyara Airport compounds

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#### Rangeland health assessment in the Burunge Wildlife Management Area of northern Tanzania

Faculty advisor: Dr. Shem Mwasi Student authors: Daniel Block<sup>1</sup>, Maria Giarusso<sup>2</sup> 1 Brandeis University, 2 The Pennsylvania State University/State College

# Effect of zonation on herbivore density and standing crop biomass calibration in Burunge Wildlife Management Area

Faculty advisor: Dr. Shem Mwasi Student authors: Skyler Williams<sup>1</sup>, Abby Strom<sup>2</sup>, Savannah Vonesh<sup>3</sup> 1 Smith College, 2 University of Minnesota, 3 Davidson College

### Impact of invasive plants on mammal distribution and diversity in Burunge Wildlife Management Area

Faculty advisor: Dr. Shem Mwasi Student authors: Annick Adams<sup>1</sup>, Zoey Ford<sup>2</sup> 1 Whitman College, 2 Northern Arizona University

### **Turks and Caicos Islands**

#### Land Crab Ecology

Faculty advisor: William F. Bigelow Student authors: Annabelle Horsfall<sup>1</sup>, Connor Marll<sup>2</sup>, Lee Mason<sup>1</sup>, Trey McCoy<sup>3</sup> 1 Gonzaga University, 2 Point Loma Nazarene University, 3 Albion College

#### Ecotourism

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# Over the edge: higher lucinid density observed above erosion edges compared to below in fragmented seagrass meadows of the Turks and Caicos Islands

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### Ink-redibly mysterious: *Octopus briareus*' body patterns and behavior are affected by movement and substrate types

Faculty advisor: C.E. O'Brien Student authors: Cailey Johns<sup>1</sup>, Alexa Heerma<sup>2</sup> 1 Denison University, 2 Albion College

#### Investigation of the skin patterning of nocturnal octopus species Callistoctopus furvus

Faculty advisor: C.E. O'Brien Student authors: Ryan Horrigan<sup>1</sup>, George Wall<sup>2</sup> 1 University of Massachusetts/Amherst, 2 Guilford College

# Ecological risk assessment for blue land crabs: investigating microplastic contamination and translocation in *Cardisoma guanhumi* in South Caicos

Faculty advisor: Kassandra Dudek Student authors: Arlette Aguilera<sup>1</sup>, Eurnett Christopher<sup>2</sup>, Trevor Deterville<sup>3</sup>, Laura Hooper<sup>4</sup> 1 Wesleyan University, 2 Lafayette College, 3 University of San Diego, 4 Meredith College

#### Ontogenetic shift in Pterois volitans and Pterois miles in South Caicos

Faculty advisor: Kassandra Dudek Student authors: Cami Bender<sup>1</sup>, Gabby Kreiner<sup>2</sup>, Billy Shogren<sup>3</sup> 1 Wake Forest University, 2 Dickenson College, 3 Amherst College

### Invasive lionfish *Pterois spp.* in South Caicos: sex-specific growth parameters and population dynamics

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