Protected area and private land conservation + community engagement

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Community ecology and population dynamics

Fully "intact" or "naturally functioning" communities of competition, predation, parasitism, and mutualism are the first stages of ecological and evolutionary processes. However, the conservation strategies for these communities are often pushed over thresholds beyond which they cannot recover.

In our research, we aim to quantify the impacts of change on community dynamics and ecosystem functions.

Causes and ecological consequences

The harvest of wildlife for human consumption in the Americas. Nevertheless, surprisingly little is known about the short- and long-term impacts of these interactions on the health of wildlife and their ecosystems.

Landscape planning and management

Land planning for wildlife conservation involves visualizing, quantifying, and modeling landscape areas, planning and studies of wildlife corridors, and remote sensing. Practitioners in these fields face significant challenges in understanding the occurrence and movement across vast, complex landscapes, and provide practical strategies for land management and habitat protection while considering "real-world" trade-offs for people and economies.

Research in my group employs the tools of landscape ecology to characterize animal movements, design and test corridor networks among protected areas, quantify interactions between people and wildlife at local and continental scales, and work with stakeholders to design and evaluate locally-based strategies for wildlife monitoring.

The Eric and Wendy Schmidt Center for Data Science and Environment at Berkeley

Unifying the power of data, computing, and environmental science to create practical and scalable solutions to our planet's most pressing environmental problems.
Human demography and reserve size predict wildlife extinction in West Africa

Justin S. Brashares', Peter Arcese and Moses K. Sam

Published: 07 December 2001 | https://doi.org/10.1098/rspb.2001.1815

Accelerated Human Population Growth at Protected Area Edges

GEORGE WITTMeyer, PAUL ELSEN, WILLIAM T. BEAN, A. COLEMAN O. BURTON, AND, JUSTIN S. BRASHARES | Authors Info & Affiliations
The possibility that international investment in protected areas would turn parks into magnets for human immigration (the “honeypot” hypothesis) and thereby reduce conservation effectiveness has been a concern of conservationists, economists, and the development community for some years. Wittemyer et al. (p. 123) now confirm that rates of human population growth around 306 protected areas in 45 countries across Africa and Latin America are nearly twice the country averages. The high population growth around protected areas is correlated with international donor funding to parks and the consequent creation of park-related jobs and services and, disappointingly, is associated with accelerated rates of deforestation.
Twenty-year trend in protected area islandization across the world’s biomes. From 2001-2020, half of protected areas (51%) exhibited a significant positive increase in habitat edges along boundaries that met unprotected land, signaling a 20-year loss in habitat continuity ($n = 4,466$). Thirty percent of protected areas exhibited a significant decreasing trend, while the remainder showed no change.
The Bushmeat Monitoring Network

Major urban market (N = 51)
Rural or small urban market (N = 56)

* Locations are approximate
COVID impacts on wildlife consumption

Mean monthly bushmeat biomass (metric tons)

- Pre-COVID
- COVID

Rural markets

Urban markets

Foreign markets
Spatial patterns of African wildlife consumption

COVID Bushmeat biomass index

Distance of market to nearest protected area (km)
Ecological consequences of fences

Alex McInturff

Christine Wilkinson
Fence Ecology: Frameworks for Understanding the Ecological Effects of Fences

Alex McIntuff, Wenjing Xu, Christine E Wilkinson, Nandintsetseg Dejid, Justin S Brashares

BioScience, Volume 70, Issue 11, November 2020, Pages 971-985,
30 x 30 is the boldest and largest commitment to (land, carbon and biodiversity) conservation in human history
WHAT is being protected? WHERE is it being protected? HOW is it being protected? and What defines ‘protected’?

The New York Times
More Than Twice the Size of Texas
That’s how much land Biden wants to conserve over the next decade. But is it possible?

By Arthur Middleton and Justin Brashares
The authors are professors in the department of environmental science, policy and management at the University of California, Berkeley.

Dec. 31, 2020

Millie Chapman

What is the potential contribution of private land conservation towards biodiversity and carbon storage goals?
Easement mean < Fee mean (richness and carbon)

Easement mean > Fee mean (carbon, not richness)

Easement mean > Fee mean (richness, not carbon)

Easement mean > Fee mean (richness and carbon)

Chapman et al., In review

In 39/50 states, conservation easements have higher mean richness and/or carbon density values than fee owned protected areas.
Autonomous recording unit features
Upload of acoustic media (wac, wav, mp3, flac)
Live tagging of dynamic spectrograms
Rapid species verification using BirdNET and detailed tag parameters

Remote camera features
Upload of image sets
Custom settings including options for facial blurring and Megadetector AI results
Rapid and efficient species and image verification

Avian point count features
Supported by the Boreal Avian Modelling Project
Upload and view point count data
Download and synthesize with ARU data

How it works:
Raw audio data + metadata
Final prediction
"Northern Cardinal, highly likely"
3-second spectrograms
BirdNET algorithm
Species probabilities
eBird occurrence mask
91% 14% 9%

The Bioacoustic Unit has a growing library of automated recognizers, models which can be used to scan acoustic datasets for individual species. Here we briefly discuss what a recognizer is, how these models are made, and how they can be applied. You can find our freely available recognizers here. All were built in Wildlife Acoustics Songscope software.
AI to assist conservation decision-making in:

- Spatial prioritization and design of new conservation investment, including restoration
- Spatial and temporal prioritization for management and monitoring in traditional and non-traditional conservation lands
- Lowering barriers to accessibility and application of products to streamline and democratize data collection, classification and visualization

Thank you!

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