VII. STANDING COMMITTEES

A. Academic and Student Affairs Committee

Integrating Research and Undergraduate Teaching – Notes from the Field

For information only.

John E. Banks, Ph.D.
Associate Professor of Biology
Interdisciplinary Arts and Sciences
University of Washington, Tacoma

Ph.D., Zoology, University of Washington, 1997
M.S., Applied Mathematics, University of Southern California, 1990
B.A., Mathematics, Pomona College, 1986

Using a mixture of field experiments and mathematical models, I have been exploring issues at the interface of agricultural ecology and conservation biology for the past two decades. I am particularly interested in how natural vegetation may be incorporated into agroecosystems in order to bolster both pest control and biological diversity. My recent work involves conducting field experiments with the help of UWT undergraduates in both temperate and tropical ecosystems, with a focus on insect biodiversity and land use/management. Courses I regularly teach include Ecology and its Applications, Introduction to Restoration Ecology, Environmental Entomology, Costa Rica Field Studies, and Tropical Ecology & Sustainability.

Integrating research & undergraduate teaching: Notes from the field

John E. Banks

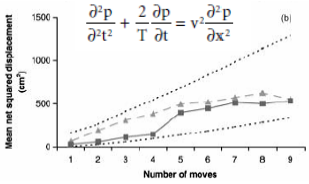
University of Washington, Tacoma, Environmental Science, Interdisciplinary Arts & Sciences, Tacoma, WA

Presentation to UW Board of Regents, March 18th 2010, UW Tacoma

Research in Pac NW

Pest management, biological control, ecotoxicology

(Population models, surrogate species – insects, salmonids, etc.)



WSU

NC State

Louisiana State

Uppsala

Oxford

WA DNR

NPS

Nisqually NWR

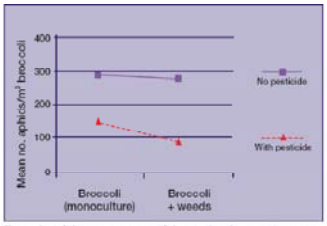
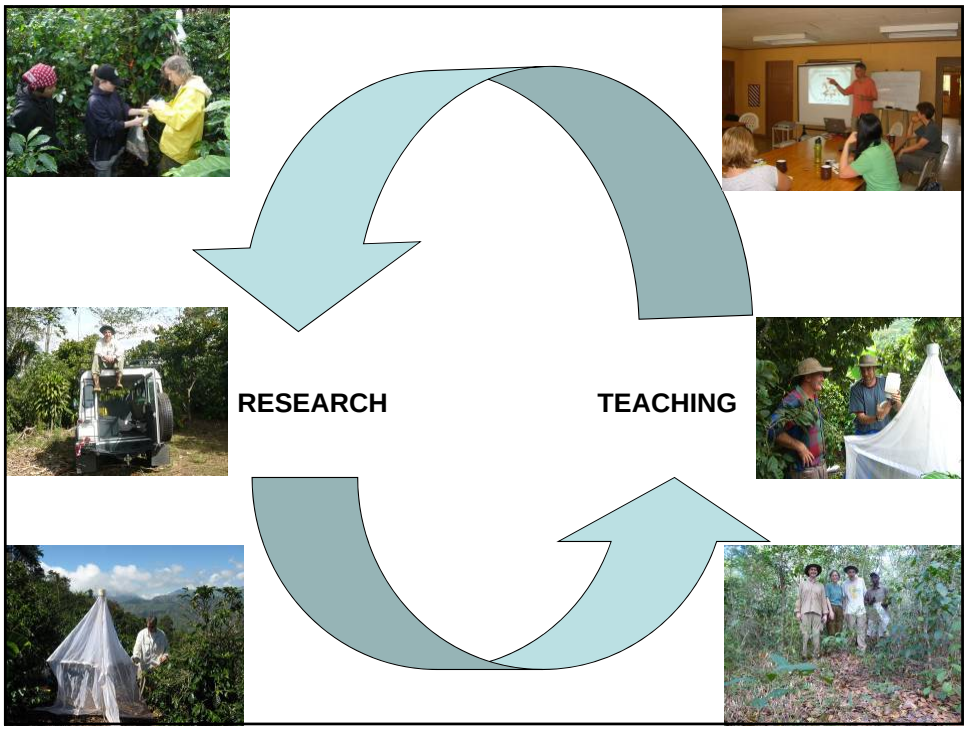


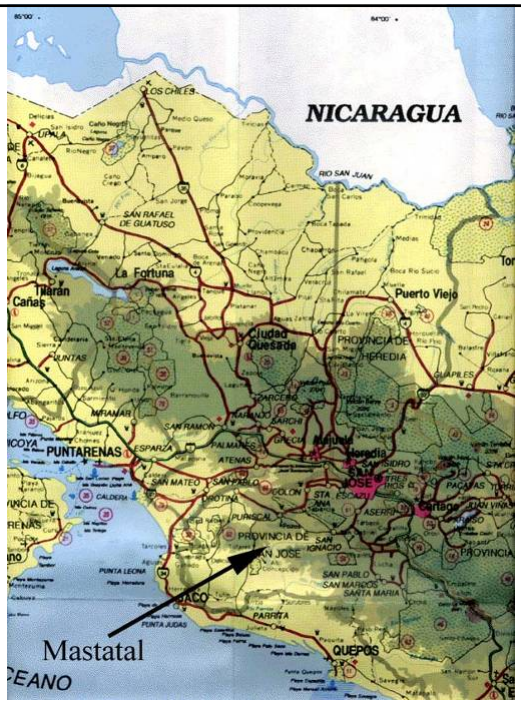
Figure 5. Aphid response to increased diversity (weedy margins) treatments 4 days after selective pesticide application (see Banks and Stark 2004 for details). Skewed lines indicate that the effects of increased vegetation diversity are stronger in conjunction with pesticide use.


Research & Teaching
• Applied environmental problems
• Curiosity
• Skills/Knowledge


RESEARCH
TEACHING

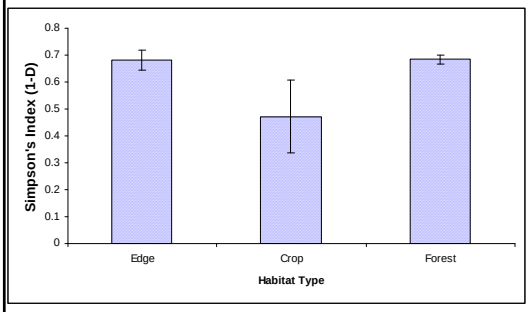
Field Ecology in the Tropics

- How can we reconcile agricultural production and conservation biology?
  - Farmland & forests (Mastatal, Costa Rica)
  - Coffee practice effects on yields, biodiversity (Tarrazú, Costa Rica)
- How do we balance conservation of biodiversity with anthropogenic development/management?
  - Birds, arthropods, & elephant disturbance (Watamu, Kenya)
  - Turtle conservation and coastal development (Watamu, Kenya)



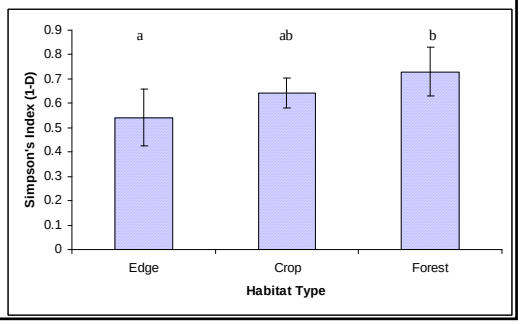
Farms and rain forest fragments: how useful are farms for conservation of biological diversity?

Beetle diversity, Mastatal 2003-2005



Banks, Sandvik, & Keesecker 2007
Pan-Pacific Entomologist

Spider diversity, Mastatal 2004 & 2005



- **Diversity similar in farm and forest for both beetles and spiders**
- **Different *types* of beetles, spiders across different habitats**

Tropical Ecology

- How can we reconcile agricultural production and conservation biology?
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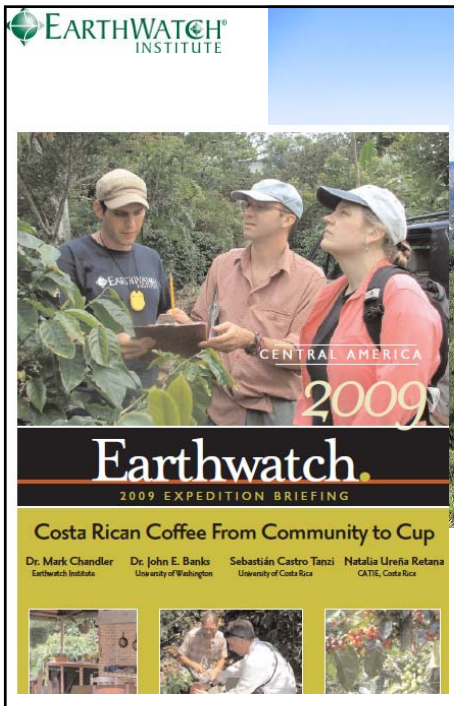


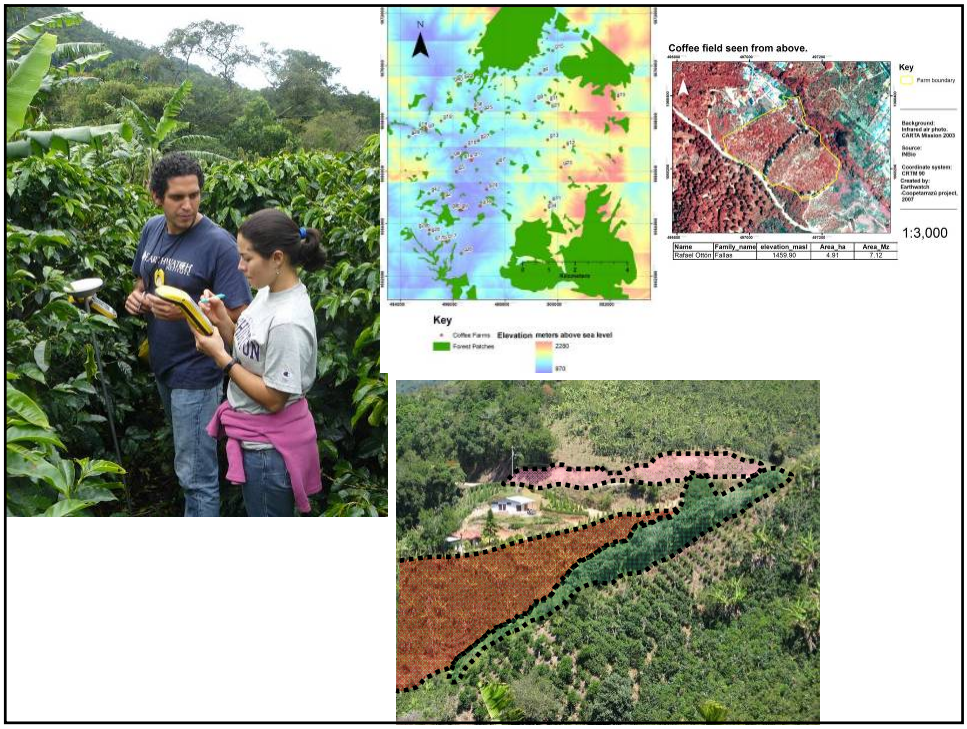
Tarrazú, Costa Rica

Farmer practices & biological diversity









Coffee field seen from above.
Key
Farm boundary
1:3,000
Key
Coffee Farms
Forest Patches
Elevation meters above sea level
2280
870

Tropical Ecology

- How can we reconcile agricultural production and conservation biology?
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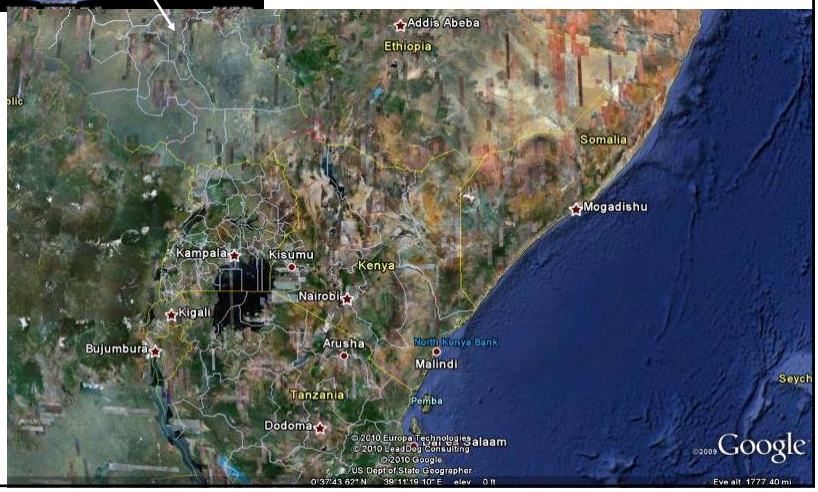
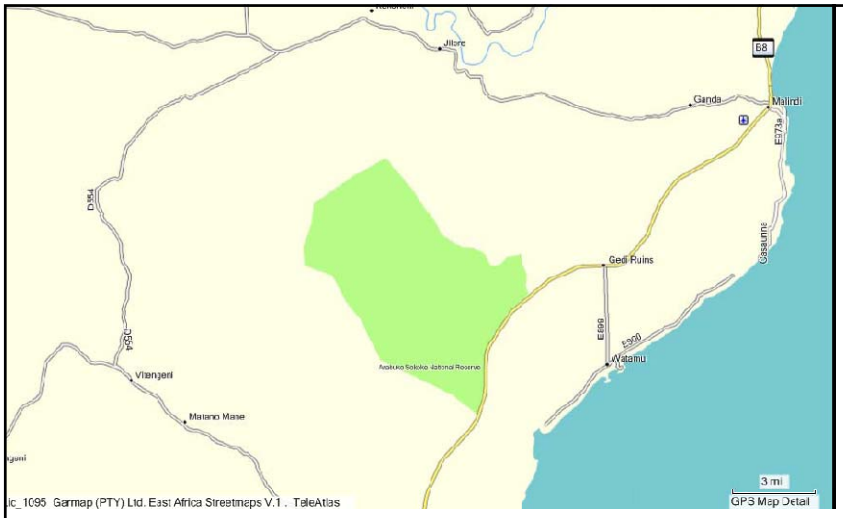
E. Africa: Birds, beetles, & elephants (oh my!)



Conservation & Sustainability Field Course in Kenya

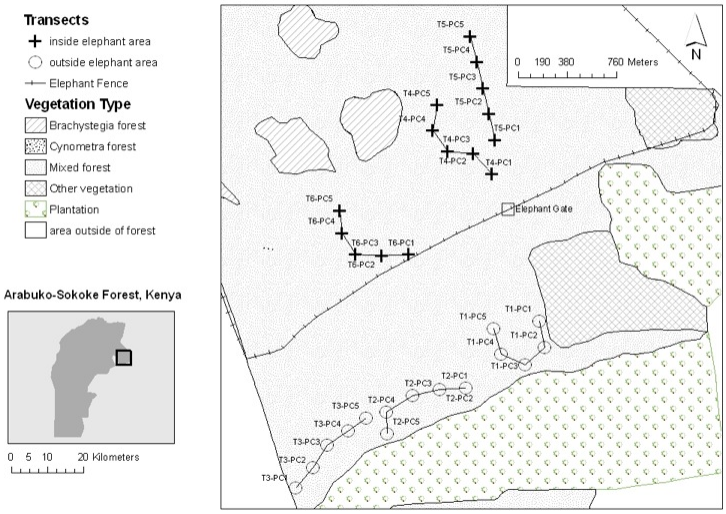
February 2010



Arabuko-Sokoke Forest

KENYA WILDLIFE SERVICE

Transects and Point Counts in Arabuko-Sokoke Forest



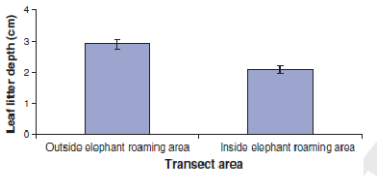


Figure 4 Comparison of leaf litter depth (cm) outside versus inside elephant roaming area. Leaf litter was higher outside the elephant area (*t*-test, $n = 3$, $t = -6.7$, df = 4, $P = 0.003$)

Less leaf litter inside elephant area

African Journal of Ecology

The cascading effects of elephant presence/absence on arthropods and an Afrotropical thrush in Arabuko-Sokoke Forest, Kenya

John E. Banks[1]*, Colin Jackson[2,3], Lisa M. Hannon[1], Christopher M. Thomas[1], Albert Baya[2] and Laban Njoroge[3]

[1]University of Washington, Environmental Science, Interdisciplinary Arts and Sciences, Tacoma, WA, U.S.A., [2]A Rocha Kenya, Watamu, Kenya and [3]National Museums of Kenya, Ornithology Section, Nairobi, Kenya

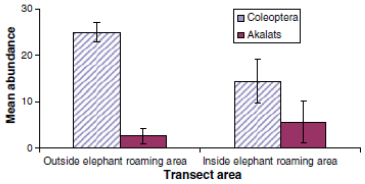


Figure 2 Comparison of abundance of Coleoptera and Akalats inside and outside elephant roaming areas. Data represent means of three transects for each habitat treatment. Coleoptera were more abundant outside of elephant area (*t*-test, $n = 3$, $t = -3.144$, df = 4, $P = 0.035$), whereas akalats were not significantly different in abundance inside versus outside elephant area (*t*-test, $P > 0.05$)

More beetles outside elephant area

Local Ocean Trust: Watamu Turtle Watch

Beach condition (plastics, vegetation/erosion) & nesting data


Beach condition (plastics, vegetation/erosion) & nesting data


Development vs. conservation??