Migratory birds in tropical agro-ecosystems: Assessing the influence of patch and landscape factors on habitat quality Brett A. Bailey¹, David I. King^{1,2} ¹Dept. of Environmental Conservation, University of Massachusetts, Amherst ²Northern Research Station, U.S. Forest Service





This project aims to model habitat quality for Neotropical migratory birds within a coffee-growing region of Northern Honduras, with emphasis on



Results

Preliminary data indicate differences in abundance and condition of migratory birds among modified and natural habitats. Future analyses will incorporate

Wood Thrush (*Hylocichla mustelina*).

<u>Introduction</u>

Identification of habitats that support non-breeding migrants by providing sufficient resources for both winter survival and successful spring migration is a critical research priority. As agricultural development continues throughout the tropics, effective conservation planning requires an understanding of the role that local and landscape structure play in determining the quality of agricultural habitat for migratory birds. While shade-grown coffee has been shown to support a considerable diversity and abundance of Neotropical migrants, factors that influence the quality of coffee habit warrant further exploration.



Habitat Quality Analysis *Estimate survival rates from:

telemetry, point counts, recapture / re-sighting data *Quantify habitat quality using: survival estimates, body condition, abundance survival rates from various sources including telemetry.

Figure 1. Percentage of point count sites with GWWA, WOTH, and mixed-species flock detections across 5 color-coded habitat types (see map).



Table 1. Raw banding data for all migrants from the2012 field season separated by habitat type.

<u>Study Site</u>

Location: Subirana, Yoro Department, Honduras Area: 30,000ha Elevation: 793m to 1622m Coffee: Shaded plots, 2-50⁺ha Forest: 2 major forest types, Pine-Oak & humid evergreen

Field Methods

Bird sampling:

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*Point Counts: 3x/year, 50 sites (25-coffee, 25-forest), GWWA & WOTH playback
*Mist Nets: 2 days/year, 10 12m-nets, 15 sites
*Radio Telemetry: 20 Wood Thrushes/year, 10 locations
Habitat sampling: structure & composition
0.04ha plots: 50 count locations

<u>Vegetation & Landscape Analysis</u>
*Develop ASTER & LANDSAT-based land classification,
*Generate metrics that characterize the diversity, density, and complexity of habitat patches
*Combine landscape metrics with measures of local understory and canopy vegetation
*Develop ecologically relevant hierarchical models that explain local variation in habitat quality



	Nsites	Captures	Richness	Fat	Muscle	ASY:SY	M:F	Parasites
\bigcirc	3	41	16	.95	1.75	2.66	5.33	.09
	4	70	16	1.73	2.01	1.37	2.2	.18
	3	63	15	1.74	1.82	.96	1.53	.07
	2	18	10	1.5	1.94	.37	2	.05
	4	46	18	1.95	1.93	.81	2.57	.21

Applications

This study addresses numerous research priorities within the fields of ornithology and conservation biology by:

*collecting demographic information for migrant species of high concern
*creating a robust local assessment of coffee habitat suitability for Neotropical migrants







Vermivora chrysoptera

*quantifying the role of landscape structure in tropical

agro-ecosystems

A model for research in the tropics

This research was made possible through a partnership with the Mesoamerican Development Institute (MDI), a producer of sustainable technologies for processing coffee. The implementation of our research was completed in tandem with MDI sustainability and development initiatives benefiting a Honduran coffee cooperative, COMISUYL. Additional funding provided by US Forest Service International Programs and the USFWS office of migratory bird management.

Research Benefits:

*Enables integration with community
*Facilitates access to private lands
*Promotes community outreach
*Stimulates the local economy
*Creates possibilities for long-term, Honduran-led research opportunities Contact the authors: Brett A. Bailey babailey@eco.umass.edu www.brett-bailey.com David I. King dking@fs.fed.us For more info on MDI: www.mesoamerican.org